



15 years

Diabetes Fundamentals Nutrition and Exercise

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Poll Question 1

▶ For someone with newly diagnosed type 2 diabetes, what would be appropriate nutrition goals?

- A. Avoid all desserts and processed foods
- B. Try to lose 5-10% of current body weight
- C. Eat less than 7% saturated fat
- D. Eat breakfast
- E. Avoid sugary beverages



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Poll Question 2

▶ Which of the following servings equals ~ 15 gms of carbohydrate?

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



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Poll Question 3

▶ Which of the following is true about alcohol and diabetes?

- 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.



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Poll Question 4

▶ If someone with type 1 is underweight, what are some possible causes?

- A. Eating too much junk food
- B. Celiac disease
- C. A sit down job
- D. DiaBulimia
- E. Gastroparesis.



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Poll Question 5

▶ Which of the following are accurate exercise recommendations 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. Not sure



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Poll Question 6

▶ What are some exercise precautions for people with diabetes?

- a. Exercise must be done daily for 30 mins to be effective
- 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



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Poll Question 7

▶ Which of the following is a SMART Goal?

- a. I will lose 5% of my body weight
- b. I will eat less sugary foods during the week.
- c. I will monitor my blood sugars on a regular basis.
- d. I will eat one less bag of chips every day for 1 week.
- e. Not sure



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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



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Good Resources

- ▶ Review Exchange List
- ▶ Review ADA Standards of Care:

Nutrition Therapy Recommendations for the Management of Adults With Diabetes

Reviews/Commentaries/ADA Statements

Exercise and Type 2 Diabetes

The American College of Sports Medicine and the American Diabetes Association: joint position statement

Steve R. Coenen, PhD, FACSM¹ Richard R. Ryan, MS² *diabetes (COVID-19, blindness, kidney, and nerve disease, and angiotensin II(1)) do through regular physical activity (PA) improve prevention of these diseases and to improve outcomes. 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Diabetes Education SERVICES

Assess Knowledge, Self Management Skills



- ▶ Eating Patterns
 - ▶ Preferences, portion sizes, timing on meals and snacks, eating environment, disordered eating



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Medical Nutrition Therapy – ADA 2014



- 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.



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Medical Nutrition Therapy – ADA 2014

- ▶ Focus on the Individual
- ▶ Maintain pleasure of eating
- ▶ Provide positive messages about food
- ▶ Limit food choices only when backed by science
- ▶ Provide practical tools
- ▶ Refer to a RD and Diabetes Education – Lowers A1c by 1-2%



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Medical Nutrition Therapy – What Medicare Covers

- ▶ 3 hours initial benefit in first calendar year
- ▶ 2 hours follow-up annually
- ▶ Must be ADA/AADE Recognized
- ▶ MNT for diabetes and renal



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Approach Depends on Patient

- New Type 2
 - Portion Control
 - Plate Method
 - Record Keeping
 - Education
- On Insulin?
 - Carb counting
 - Post prandial checks



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Sodium, Fat and Fiber

- ▶ Sodium – Try and keep less than 2,300 mg a day
- ▶ Vitamin and mineral supplements not recommended -lack of evidence.
- ▶ 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



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Average American Consumes 25 teaspoons of sugar a day (400 cal)

- ▶ Warning label on sodas proposed
- ▶ One soda has 12 teaspoons sugar
- ▶ On avg, 1 person consumes 40 gallons of soda each year
- ▶ ADA guidelines “limit sodas and beverages with sugar, High Fructose Corn Syrup, (HFCS)



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ADA recommendation Eat Less Junk Food & Sugary Drinks –

- ▶ Less Processed Foods
- ▶ Less Sugary Beverages
 - ▶ increase visceral adiposity
 - ▶ With sugar or
 - ▶ High fructose corn syrup
- ▶ Soda Tax?
- ▶ Junk Food Tax?



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Losing 2-8kg Early in diagnosis Type 2 Helpful

ADA 2014

- ▶ Weight Loss –
 - ▶ *The optimal macronutrient intake to lose weight not known*
 - ▶ *The literature does not support one particular nutrition therapy to reduce weight, but rather a spectrum of eating patterns that result in reduced energy intake.*
- ▶ To lose one pound – avoid 3,500 cal
 - ▶ Decrease intake 250-500 cal daily + exercise



Diabetes Education SERVICES

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



Diabetes Education SERVICES

Bariatric Surgery

- ▶ Consider for adults with BMI 35 or greater
- ▶ Increases gut hormone availability
- ▶ Need life long support and monitoring
- ▶ More likely to cause remission* with recently diagnosed diabetes (more beta cell mass)
 - ▶ 68% remission within 5 years
 - ▶ 35% redeveloped diabetes
- ▶ Long term benefits still under investigation

*remission = BG levels normal without meds



Diabetes Education SERVICES

USDA www.myplate.gov

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 saludable sabe buenísima



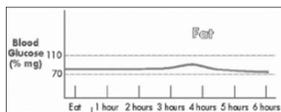
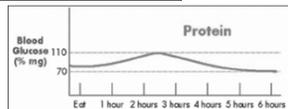
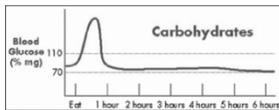
El Método del Plato es una manera simple de planificar las comidas para usted y su familia. No necesita contar nada ni leer largas listas de alimentos. Todo lo que necesita es un plato de 9 pulgadas.



1/4 de proteína, 1/4 de almidón, 1/2 de vegetales. Plato de 9 pulgadas

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How nutrients affect blood sugar



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Carbs affect Post meal Blood Glucose

- o Starch
- o Fruit
- o Milk
- o Desserts

Starchy foods



*ADAM



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Carbohydrate Needs for Most Adults

	Grams	Servings
Each Meal	45-60 gm	3 - 4
Snacks	15-30 gm	1- 2



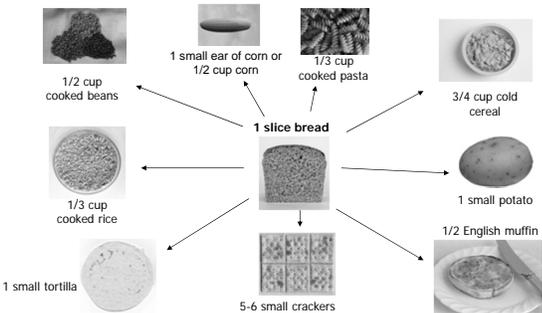
Carbs affect Post Meal Blood Glucose
RDA – at least 130 gms of Carb a day



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Carb Counting - Starch

Each Food has:
80 Calories
15 grams carb



Diabetes Education SERVICES

Carb counting- fruit

Each Food has:
60 Calories
15 grams carb

1 slice bread

- 1 small fresh fruit
- 1/2 cup fruit juice
- 1/2 banana
- 1/2 cup unsweetened apple sauce
- 17 small grapes
- 1 cup melon
- 1/4 cup dried fruit
- 2 tsp raisins
- 1 1/4 cup strawberries

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Carb Counting - Milk

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

1 slice bread

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

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Carb Counting - Sweets

Each Food has:
Calories vary
15 grams carb

1 slice bread

- 2 inch square cake or brownie, unfrosted
- 1/2 cup diet pudding
- 1/2 cup regular jello
- 2 tsp light syrup
- 2 small cookies
- 1 tbsp syrup, jam, jelly, table sugar, honey
- 1/4 cup sorbet
- 1/2 cup ice cream or frozen yogurt
- 1/2 cup sherbet

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Choose Healthy Carbs

- o Carbs have fiber, vitamins, minerals and phytonutrients
- o 25 gms of fiber a day
- o Power Carbs include:
 - o Beans
 - o Veggies
 - o Fruits
 - o Whole grain foods



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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



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Nutrition Facts	
Serving Size 1/2 cup (114 g)	
Servings Per Container 4	
Amount Per Serving	
Calories 90	Calories from Fat 30
% Daily Value*	
Total Fat 3g	5%
Saturated Fat 0g	0%
Cholesterol 0g	0%
Sodium 300mg	13%
Total Carbohydrate 13g	4%
Dietary Fiber 3g	12%
Sugars 3g	
Protein 3g	
Vitamin A 50%	Vitamin C 60%
Calcium 4%	Iron 4%

1 tsp sugar = 4 gms

Fooducate App – gives grade and nutrition info.



	Calories	2000	2500
Total Fat	Less than	65g	80g
Sat Fat	Less than	25g	25g
Cholesterol	Less than	300mg	300mg
Sodium	Less than	2400mg	2400mg
Total Carbohydrate	Less than	300g	375g
Fiber	Less than	25g	30g



Calories per gram: Fat 9 Carbohydrates 4 Protein 4

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Dietary Fat and Cholesterol Guidelines

- ▶ Avg Calorie distribution for PWD
 - ▶ 45% of calories from carbs
 - ▶ 30-40% from fat,
 - ▶ 16-18% from protein
- ▶ Guidelines from ADA
 - ▶ Saturated fats <10% of calories
 - ▶ Limit trans fat as much as possible
 - ▶ Limit total dietary cholesterol to 300 mg/day



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Fats- 9 calories per gram

- ▶ **Monounsaturated - healthy**
 - Olive & canola oils, Nuts, Avocado
 - Lowers total cholesterol and LDL
 - Raise HDL, high in omega 3 fatty acids
- ▶ **Polyunsaturated - healthy**
 - corn, walnut, safflower, soybean
 - Lowers total cholesterol and LDL
- ▶ **Saturated fats** (limit <10%)
 - Animal products – meat, chicken, pork, fish, skin, cheese butter, dairy
 - Plant products include; palm, coconut, palm kernel oil
 - Solid at room temp

Serving sizes

- 1 tsp butter, margarine, oil, mayonnaise
- 1 Tbsp salad dressing, cream cheese, seeds
- 2 Tbsp avocado, cream, sour cream
- 1 slice bacon



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Unhealthy Dietary Fats

- ▶ **Trans Fat – strong link between diet high in trans fat and heart disease**
 - ▶ Lowers HDL
 - ▶ Increases LDL
 - ▶ May increase wt gain and abdominal fat
 - ▶ May contribute to type 2 diabetes
- ▶ Look on label and look for words “hydrogenated” or “partially hydrogenated”.



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Saturated Fatty Acids – Not all equal

- ▶ The odds of incident type 2 diabetes is lower in people who have high plasma levels of odd-chain saturated fatty acids that come primarily from dairy fats
- ▶ In contrast, even-chain saturated fatty acids, such as those that come from consuming alcohol, soft drinks, or margarine, were associated with a greater likelihood of diabetes in the study, published online August 6 in *Lancet Diabetes & Endocrinology*. These fatty acids include palmitic acid, the most common saturated fatty acid in the US diet.
- ▶ "These results add to growing evidence that dairy fat might reduce insulin resistance and type 2 diabetes; benefits that might be greatest for cheese and yogurt,"
 - ▶ Dr. Mozzafarian -



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Diabetes Prevention Program Focus on fat = wt loss success

To help you lose weight and improve your health, stay as close as possible to your fat and calorie goals.
Find your starting weight below. Your fat and calorie goals are in the same row. Circle your fat and calorie goals.

Weight (lb)	Fat Goal (grams)	Calorie Goal
120-174	33	1,200
175-219	42	1,500
220-249	50	1,800
>250	55	2,000

<http://www.cdc.gov/diabetes/prevention/recognition/curriculum.htm>



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Protein Recommendations -2014

- ▶ For people with diabetes and no diabetes kidney disease, evidence is inconclusive for ideal amount of protein; there fore, goals should be individualized.
- ▶ RDA – 0.8gm good quality protein/kg/day
 - ▶ Protein seems to stimulate insulin response, do not use to treat hypoglycemia
 - ▶ For those with kidney failure, reducing the amount of dietary protein is not recommended. Does not improve outcomes.



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Protein – 4 cal per gram

- o Choose lean protein
 - o Poultry, fish, egg, lean beef
 - o Plant sources- beans, lentils, nuts
 - o Low fat cheese- cottage cheese, mozzarella cheese
- o Limit high fat protein
 - o Bacon & sausage
 - o High fat cuts of beef
 - o Whole milk cheese
- o Serving size
 - o 1 oz = ¼ cup
 - o 3 oz = deck of cards



Diabetes Education SERVICES

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 w/ food.
- ▶ Can cause hypo and worsen neuropathy



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Ms. Gonzales' Daily Meal plan

Break	Lunch	Dinner	Night
5 corn tortillas, 1/2 c. beans, salsa, peppers, egg beaters	Sandwich, low fat potato chips, 1c. juice, 2-4 lowfat cookies	Lg bowl low salt soup, 1c. rice, BBQ meat, salad & cooked vegs 1 glass wine	1 bowl of cereal
Avg BG 120's	Avg BG 200's	Avg BG 200's	Avg BG 180's



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Celiac Disease



- ▶ Type 1 – Affects ~10 \%
- ▶ Immune reaction to gluten - affects function of villi in intestine, decreasing nutrient absorption
- ▶ S/S: bloating, malabsorption, wt loss, fatty stools, diarrhea, muscle tenderness, failure to thrive
- ▶ Diagnosis: measure either anti-endomysial antibodies (EMA) titers or tissue transglutaminase.
- ▶ If positive, refer to GI specialist for endoscopy and biopsy of small intestine to confirm diagnosis.



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Treatment – Gluten Free for Life



- ▶ Avoid
 - ▶ Wheat (einkorn, durum, faro, graham, kamut, semolina, spelt),
 - ▶ Rye
 - ▶ Barley
- ▶ Refer to a dietitian

ASSOCIATED AUTOIMMUNE DISORDERS

- ▶ Insulin-dependent Type 1 Diabetes Mellitus, Liver diseases, Thyroid Disease-Hashimoto's Thyroiditis, Lupus (SLE), Addison's Disease, Chronic Active Hepatitis, Rheumatoid Arthritis



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Ex of Gluten Containing Foods

- | | |
|--|--|
| <ul style="list-style-type: none"> •Brown rice syrup •Breading & coating mixes •Croutons •Energy Bars •Flour or cereal products •Imitation bacon •Imitation seafood •Marinades | <ul style="list-style-type: none"> •Pastas •Processed luncheon meats •Sauces, gravies •Self-basting poultry •Soy sauce or soy sauce solids •Soup bases •Stuffings, dressing •Thickeners (Roux) •Communion wafers And more! |
|--|--|



Diabetes Education SERVICES

Poll question 4

- ▶ 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



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



Physical Activity – Key areas

- ▶ ADA and American College of Sports Medicine recommendations
- ▶ Benefits, barriers precautions
- ▶ Exercise and activity plan (aerobic, resistance training, etc)
- ▶ Adjustment and monitoring of food and/or meds



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Physical Activity - Kids

- ▶ Children should be encouraged to engage in at least 60 minutes of physical activity a day.



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Physical Activity - ADA

- ▶ Adults with diabetes –
 - ▶ 150 minutes a week of moderate-intensity aerobic physical activity
 - ▶ spread over at least 3 days/wk
 - ▶ Don't miss more than 2 consecutive days of exercise.
- ▶ In absence of contraindications, type 2 adults should engage in resistance training 2x's a wk



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Definitions

- ▶ **Physical activity**
 - ▶ Bodily movement produced by the contraction of skeletal muscle that requires more energy than when resting
- ▶ **Exercise**
 - ▶ Subset of physical activity that is planned, structured and includes repetitive body movements
 - ▶ Performed to improve or maintain physical fitness
- ▶ **Sedentary behavior**
 - ▶ Little on no movement or physical activity



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Progressive Resistance exercise

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



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Benefits of Exercise

- ▶ Improve BG
 - ▶ Improves insulin sensitivity
- ▶ Reduce CV Risk factors
- ▶ Maintain wt loss
- ▶ Contribute to well being
- ▶ Muscle strength
- ▶ Slows decline in mobility



Diabetes Education SERVICES

Importance of Exercise with Diabetes

- ▶ Vital component of prevention as well of the management of type 2 diabetes
- ▶ Greatest impact in improving metabolic abnormalities in type 2 when started early in progression from IR to Pre Diabetes to DM
- ▶ Type 1 – emphasis on adjusting insulin to allow for safe participation in all forms of activity.



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Pre-exercise Eval

- ▶ Use clinical judgment when making physical activity suggestions and check in with provider if unsure.
- ▶ Encourage high risk pts to start with low intensity and short time.
 - ▶ Increase duration and intensity slowly
- ▶ Contraindications to certain types of exercise:
 - ▶ Uncontrolled HTN, severe autonomic or peripheral neuropathy, history of foot lesions, unstable proliferative retinopathy.
 - ▶ Pt w/ complications require a more thorough assessment.



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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.*



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Hormone Response –Type 1

- ▶ Exogenous insulin remains high
- ▶ Increased insulin sensitivity
- ▶ Increased insulin absorption

What is this group at risk for?
What strategies to stay safe before, during and after exercise?



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Hormone Response –Type 2

- ▶ Decreased secretion of endogenous insulin
- ▶ Increased insulin sensitivity
- ▶ Increased glucose disposal



What is this group at risk for?
What strategies to stay safe before, during and after exercise?



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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



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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.



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Hypoglycemia Prevention Strategies

- ▶ Carry fast acting carb/ glucagon ER Kit
- ▶ Extra CHO in post exercise period
- ▶ Caution with alcohol post exercise
- ▶ Adjust carbohydrate prior to planned activity:
 - ▶ If BG < 100 prior to exercise
 - ▶ If using insulin and /or secretagogues
 - ▶ 15 gms carb snack



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Hypoglycemia Prevention

CARBOHYDRATE REPLACEMENT DURING PHYSICAL ACTIVITY

Intensity	Duration	Carbohydrate Replacement	Frequency
Mild to Moderate	<30 min	May not be needed	N/A
Moderate	30 to 60 minutes	15 grams	Each hour
High	>60 min	30 to 50 grams	Each hour



Diabetes & Nutrition Support Services



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Behavior Change and Smart Goals



- ▶ Julie currently walks her dog 3 times a week around the block.
- ▶ Is this exercise?
- ▶ What new and revised SMART Goal could you set with her?



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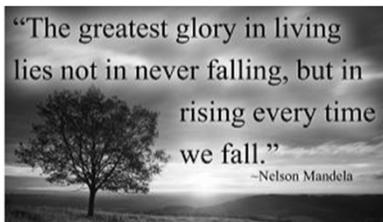
Setting SMART Goals

- ▶ Specific
 - ▶ Measurable
 - ▶ Attainable
 - ▶ Realistic
 - ▶ Timely
- ▶ Behavioral Goal –
 - ▶ Walk the dog around the block 4 days a week.
 - ▶ Walk the dog around the block two times.
 - ▶ Do 10 minutes of weight bearing activity on 2 of the days you don't walk the dog.



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Help Patients Prepare for Setbacks



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Thank You



- ▶ Questions?
- ▶ Email
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- ▶ Web
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