

Session One Objectives

- Provide nutrition guidelines for school nurses working with students with diabetes
- Describe methods of diabetes medical nutrition therapy for Type 1 and Type 2 diabetes
- Describe how macronutrients affect blood glucose and weight

Goals of Medical Nutrition Therapy (MNT)

- To provide adequate energy to ensure normal growth and development
- Improve health through healthy food choices and physical activity
- Attain and maintain optimal metabolic outcomes

Goals of Medical Nutrition Therapy (MNT)

- Address individual nutritional needs
- To provide self-management education for treatment of acute complications
 - Hypoglycemia and hyperglycemia
- To decrease risk of chronic diabetes complications

Question

True or False

Management of diabetes at school is best accomplished when the student is not allowed to eat sweets.

Treatment of Diabetes

- Self-management training/education
- Medical Nutrition Therapy
- Exercise
- Medications
 - Oral agents
 - Insulin

MNT Considerations

- Age and ideal body weight
- Pattern of growth and weight gain
- Typical food intake at home/school
 - What, when, where
- Activity patterns
- Home and school schedule

Question

True or False

Medical Nutrition Therapy for Type 1 and Type 2 diabetes...

_____ is the same.

_____ CHO intake for Type 1 can be more flexible.

Management of Type 2 Diabetes

- Weight management
- Controlled carbohydrate intake
- Blood glucose monitoring
- Possibly oral medications
- Physical activity

Why - Weight Management for Type 2 Diabetes

- Helps maintain glucose control
- Decreases insulin resistance
- Weight loss can improve lipid levels
- Improves general health and self esteem

How - Weight Management for Type 2 Diabetes

- Calorie control/reduced calorie intake vs. "low calorie diet"
- 3 meals and 2 - 3 snacks per day
- Controlled carbohydrate/low sugar
 - Some sweets are allowed
- Low fat = fewer calories, cholesterol
 - Low fat dairy products, lean meats

How - Weight Management for Type 2 Diabetes

- Eat fruits, vegetables, whole grain products
- Increase/regular physical activity
- Note: No written orders for school
 - No ADA diet
 - Occasionally may need to offer alternative foods for weight loss

Management of Type 1 Diabetes

- Insulin administration
- Managed carbohydrate intake
 - Some sweets are allowed
- Blood glucose monitoring
- Physical activity

How - Management of Type 1 Diabetes

- Carbohydrate management
- Calorie control
- Fat control
 - Lean meats and dairy products
- Eat fruits, vegetables, and whole grain products

Question

What are the 3 main “fuels,” macronutrients, in foods?

C _____

P _____

F _____

How Carbohydrate Affects Blood Glucose

- Large effect on blood glucose
- Up to 100% becomes glucose
- Digests in 15 minutes to 2 hours
- Blood glucose highest 1 hour after eating
- Fiber slows digestion

What is a Carbohydrate?

- Macronutrient the body breaks down into glucose
- Provides energy/calories
- Many foods with CHO provide vitamins and minerals for body maintenance and growth

Question

Carbohydrate food sources include:

___ Corn	___ Cheese
___ Yogurt	___ Milk
___ Bread	___ Egg
___ Fruit	___ Peas

Other Macronutrients

- Protein
 - Provides energy and is essential for growth
 - Small effect on blood glucose
 - Digests in 3 - 4 hours
 - Slows down digestion of CHO

Other Macronutrients

- Sources include meat, poultry, eggs, cheese, peanut butter, milk products, soy

Other Macronutrients

- Fat
 - High calorie content
 - Small effect on blood glucose
 - Digests in 4 - 5 hours
 - Slows down digestion of CHO
 - Sources include oils, butter, margarine, nuts, creams, salad dressings

Other Macronutrients

- Saturated fats, cholesterol, and trans fats increase risk of CV disease

Question

What kinds of foods affect blood glucose most?

- Fatty foods – meats, fried foods
- Starchy foods – fruits, juice, milk
- Desserts/chocolate

Exercise and Diabetes

- Effects on blood glucose
 - Generally exercise will lower blood glucose
 - For students who are highly competitive, exercise may raise blood glucose

Exercise Guidelines for Type 1 Diabetes

- Monitor blood glucose
 - Before and after exercise
- Food intake may need to be increased
- Fluid intake is essential



Exercise Guidelines for Type 1 Diabetes

- A source of fast-acting CHO should be easily accessible for low blood sugars
- May require a decrease in insulin
 - Pump patients may use a temporary lower basal rate or disconnect the pump for up to one hour

Exercise Guidelines for Type 1 Diabetes

- Continue monitoring blood glucose after exercise is completed

Fast Acting CHO Sources

- | | |
|---------------------|---|
| • Juice | • Raisins |
| • Glucose tablets | • Regular soda |
| • Nonfat or 1% milk | • Regular fruit flavored drinks |
| • Candy, no fat | • Plain crackers, no fat or peanut butter |
| • Sugar | • Fruit rollup |
| • Honey | |

Questions



Session Two Objectives

- Describe use of basic CHO counting for set meal plans/snacks
- Describe use of advanced CHO counting for insulin dosing
- Identify resources for CHO counting
- Identify ways to support students in managing their diabetes

So How Do You Count Carbohydrates?



Management of Carbohydrate Intake

- Two options
 1. Prescribed amount of carbohydrate (CHO) with each meal and snack
 2. Carbohydrate counting and adjusting insulin to food intake at meals and snacks

Carbohydrate Management at School

1. Prescribed amounts of CHO for lunch and snack(s)
 - Prescribed amount of rapid acting insulin with lunch
 - Snack – may take extra insulin
 - Written orders for CHO amounts can be obtained from dietitian

Carbohydrate Management at School

2. CHO counting and adjusting insulin doses at lunch to food eaten
 - Some may count CHO for snacks and take insulin accordingly
 - For MDI
 - I:CHO ratio will be written on the school orders

Carbohydrate Management at School

- For Insulin Pump
 - I:CHO ratio is programmed into the pump

Carbohydrate Management at School

- Insulin administration – when?
 - Give before meal/snack to prevent elevated blood glucose
 - Give after meal/snack if in orders or if blood glucose is low

Exchange List for Diabetes

- Used by some for MNT since 1950
- Lists of measured foods that equal an “exchange”/serving/choice
- Divides foods into food groups
 - CHO
 - Starches, fruit, milk, other
 - Non-starchy vegetables

Exchange List for Diabetes

- Meat and meat substitutes
- Fats
- Free foods
- Combination foods

**1 Carbohydrate Serving =
15 grams Carbohydrate**

The Fruit Group

- Fresh fruit
 - 1 cup – tennis ball size
 - 1/2 banana
 - 1/8 cantaloupe
 - 15 grapes
 - 1 cup watermelon

The Fruit Group

- Canned fruit, light
 - 1/2 cup
- 100% fruit juice
 - 4 ounces
- Dried fruit
 - 2 tablespoons

The Starch Group

- Starches
 - 1 slice bread
 - 1/3 cup rice or pasta
 - 1/2 cup cereal
 - 1 small roll, biscuit
 - 1/2 bun

The Starch Group

- Starchy vegetables
 - 1/2 cup corn, peas, potatoes, dried beans

The Milk Group

- Milk
 - 8 ounces
- Yogurt
 - 1 cup
- Pudding and ice cream
 - 1/3 - 1/2 cup

Non-starchy Vegetables

- Do not count as a CHO exchange
- “Free” foods, “filler” foods
- < 20 calories; < 5 grams CHO
- Good sources of vitamins, minerals, and fiber
- Include carrots, green beans, leafy vegetables, cucumbers, tomatoes, squash, okra, celery, broccoli

Exchange Lists

- Advantages
 - Provides a framework for grouping foods
 - Emphasizes important nutrition concepts
 - Calories as well as sodium, fiber, types of fats
 - Can be supplemented by reading food labels

Exchange Lists

- Disadvantages
 - Not appropriate if family cannot understand “exchanges”
 - CHO may not be as accurate
 - Often more rigid/complex meal plans
 - Calories, pro, fat

Carbohydrate Counting

- Around since 1920’s
- Focus is on techniques to optimize blood glucose control
- Used to match pre-meal insulin doses to the demand created by food
- Note: other nutrition aspects must be addressed separately

Carbohydrate Counting

- Easier to learn than exchanges
- Insulin dose calculated based on CHO intake
- Greater flexibility in meals
- More variety in food choices
- More accurate control of blood sugar
- Utilizes food labels to make meal planning easier

Carbohydrate Counting

- **Basic**
 - Eat balanced healthy meals
 - Learn CHO content of foods
 - Follow meal plan with set amount of CHO at each meal/snack and fixed insulin dose
 - Eat meals and snacks at set times

Carbohydrate Counting

- **Advanced**
 - Adjust insulin to the CHO in foods to be eaten
 - Use calculated I:CHO ratios
 - 1:18 = 1 unit insulin for 18 grams CHO
 - Flexible meal/snack times and amount of carbohydrate eaten

Carbohydrate Counting

- **Example**
 - Sandwich - 2 slices bread = 30 grams CHO
 - Potato chips - 1 bag = 26 grams
 - Milk - 1 cup = 12 grams
 - ½ banana = 15 grams
 - Total = 83 grams CHO

Carbohydrate Counting

- **If Insulin: CHO ratio is 1:18**
 - Insulin dose needed = $83/18 = 4.61$ units
 - Insulin by syringe – dose = 4.5 or 5.0
 - Insulin by pump – pump will calculate to nearest decimal possible for that pump

Carbohydrate Resources

- Exchange lists for diabetes
- Carbohydrate counting books
- Restaurant/fast food booklets
- Food labels

Carbohydrate Resources

www.calorieking.com
www.diabetes.org
www.americanheart.org
www.eatright.org

Read the Nutrition Facts Labels!

- ### 3 Things to Read on a Food Label
- Serving size
 - Total carbohydrate
 - Includes dietary fiber, sugar, other carbohydrate, and sugar alcohols
 - Total fat
 - < 5 grams is healthier

Nutrition Facts			
Serving Size ½ cup (114g)		Vitamin A 80%	
Servings Per Container 4		Vitamin C 60%	
Amount Per Serving		Calcium 4%	
Calories 90		Iron 4%	
Calories from Fat 30		* Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs:	
% Daily Value*		Calories: 2,000 2,500	
Total Fat 3g	5%	Total Fat	Less than 65g 80g
Saturated Fat 0g	0%	Sat Fat	Less than 20g 25g
Cholesterol 0mg	0%	Cholesterol	Less than 300mg 300mg
Sodium 300mg	13%	Sodium	Less than 2,400mg 2,400mg
Total Carbohydrate 13g	4%	Total Carbohydrate	300g 375g
Dietary Fiber 3g	12%	Dietary Fiber	25g 30g
Sugars 3g		Calories per gram:	
Protein 3g		Fat 9 • Carbohydrate 4 • Protein 4	

- ### Question
- Which of the following will not raise blood glucose level?
- a. Sugar
 - b. Other carbohydrate
 - c. Fiber
 - d. Sugar alcohols
 - e. Non-nutritive sweeteners

- ### Carbohydrate Considerations
- Sugar
 - Sources
 - Other carbohydrate
 - Fiber
 - If > 5 grams, subtract
 - Sugar alcohols
 - If >20 grams, subtract half

- ### Snack Ideas
- Fruit
 - Pudding
 - Popcorn
 - Muffin
 - Yogurt
 - Snack bars
 - Low fat ice cream
 - Pretzels
 - Chips - pita, bagel
 - Snack mix
 - Crackers
 - Cheese
 - Peanut butter sandwich

Question

Which snack is better?

- a. 1 cup of strawberries
- b. 5 Vanilla Wafers

Free Foods

- Gelatin – sugar free
- Popsicle – sugar free
- Sugar free drinks
- Fat free cream cheese
- Whip topping – 2 tablespoons
- Mini rice cakes – 2
- Animal crackers – 2

Free Foods

- Popcorn – 1 cup
- Carrots
- Celery
- Broccoli
- Cucumber slices
- Salad dressing Tbsp (1 Tbsp.)
- Berries – ¼ cup

Parties at School

- Can still participate and eat food at parties!
- Communicate with parents before party
 - Change insulin dose to cover party food
 - Plan party around snack time

Parties at School

- Encourage teacher or parents to provide healthy snacks at parties
- Use fat-free whipped topping as icing on cakes or cookies

How to Be Supportive

- Be knowledgeable
- Be empathetic
- Offer ideas/ways to make healthy choices
- Inform/educate teachers
- Provide resources
- Communicate with parents

Questions

