

# Nutrition Update and Carbohydrate Counting

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# What are Primary MNT Goals?

# Goal of Recommendations

## (Revised ADA Guidelines 2008)

- “Make people with diabetes and health care providers aware of beneficial nutrition interventions. This requires best available scientific evidence while taking into account treatment goals, strategies to attain such goals, and changes individuals with diabetes are willing and able to make”

~Diabetes Care 31:53-54, 2008

# Goals of MNT

- 1. Achieve & Maintain
  - BG levels in normal range/close as possible
  - BP in normal range/close as possible
  - Lipid profile lowers the risk of vascular disease
- 2. Prevent/Slow Rate of Complications
- 3. Address individual nutrition needs
- 4. Maintain pleasure of eating

~Diabetes Care 31:561-578, 2008

# Update of ADA Clinical Practice Guidelines

- Increasing evidence that low CHO diets are as effective for weight loss as diets that focus on low fat.
- Can patients stick to the diet for the long term???

# Pearls for Practice

- Modest weight loss if appropriate
- Either lower CHO, fat, or calorie diet
- Physical activity
- Patients with BMI > 35 kg/m<sup>2</sup> may consider bariatric surgery
- Intake of low glycemic index foods higher in fiber
- Balance of CHO's from fruit, veggies, whole grains, legumes, low fat milk
- Monitor CHO- exchanges/estimation/glycemic index/glycemic load
- Limit sucrose, but can be included
- Saturated Fat intake < 7% of total calories
  - Trans Fat minimized
  - Cholesterol < 200 mg/day
- 2 servings of fish/week
- Protein not used to treat/prevent nighttime hypoglycemia
- Restrict ETOH-
  - 1 drink/day or less for women
  - 2 drinks/day or less for men

For patients on a low-  
CHO diet monitor:

lipids

protein intake

kidney function

**What are primary MNT  
goals for people with  
diabetes?**

- Health Care Professional assist in identifying several small changes in eating and physical activity

**Which MNT goal is likely  
to be affected 1<sup>st</sup> by  
lifestyle intervention**

- Primary

- Attain and maintain BG levels as close to normal as possible.

- Effect of MNT is observed 1<sup>st</sup> on glycemia

- Initial focus on CHO counting



**MNT Diabetes Diet**

**MNT Diabetes Diet**

**Carbohydrates**



**MNT Diabetes Diet**

Changes in CHO and food choices improve lipids and lower BP

# What is a healthy diet?

- 5 or more servings/day from variety of fruits and vegetables
- 6 or more servings/day of grain products
- 2-3 servings of fish/week
- 2 servings/day of low fat dairy products
- Limited servings of lean meat or poultry
- Minimal fat choices

- Recent research suggests that no single nutrient or food by itself is the answer. Instead, health benefits realized from food patterns that include combinations of foods containing multiple nutrients.

**Focus on Patterns**  
**not**  
**Single Nutrients**

# Outcomes

- Effects of MNT seen in 6 weeks-3 months
- At:
  - 6 weeks: Are goals being met?
  - 3 months: Change in medical therapy if:
    - No downward trend in A1C
    - Weight loss, but no improvement in BG
    - Doing well with diet and exercise, but further interventions are unlikely to improve medical outcomes.
    - What is patient willing to do.

- RD to assess whether therapy goals have been met if no progress evident- revise goals of MNT

# What are expected outcomes on lipids & BP?

- Saturated fat and Cholesterol  
    ■ <7-10% /200-300 mg/day  
    lowered 10-13%  
    (24-32 mg/day)
- LDL  
    lowered 12-16%  
    (19-25 mg/day)
- Triglycerides  
    ■ <200-300 mg/day  
    lowered 8%  
    (15-17 mg/day)
- Lowered BP's  
    Lowered Na (2400 mg/day)

How much CHO does a  
person with diabetes  
need?

# Nutrient Recommendations

- 1927: Elliot Joslin described optimal diet for a typical patient with diabetes (with or without help of insulin) as containing 100 g CHO/d
- 2008: Recommended Dietary Allowance (RDA)=130 mg CHO/d –(adults + children)

# For individuals with diabetes specific CHO recommendations based on :

- assessment of current eating habits
- metabolic profile
- treatment goals

# Actual CHO's Consumed

- Median intake of:
  - 200-300 g/d - Men
  - 180-230 g/d – Women

# ■ RDA

## ■ CHO

$$\frac{130\text{gm CHO}}{(3 \text{ meals/day})} = \frac{45 \text{ gms CHO}}{(\text{meal})}$$

## ■ Nutrition Recommendations

- Protein 15-20% of total calories
- Saturated Fat < 7% of total calories
- Polyunsaturated Fat ~ 10% of total calories
- 45-50% of total energy from CHO translates to:
  - 45-75 g CHO/meal -women
  - 60-90 g CHO/meal -men

	Inactive Women	Women	Inactive Men	Men
<u>CARBOHYDRATE</u> per meal	30-45 grams (2-3 carb choices)	45-60 grams (3-4 carb choices)	45-60 grams (3-4 carb choices)	60-75 grams (4-5 carb choices)
<u>PROTEIN</u> per meal	2 oz.	2-3 oz.	2-3 oz.	3-4 oz.
Servings added <u>FAT</u> per meal	1	1-2	1-2	2-3
<u>CALORIES</u> per meal	1200-1400	1500-1800	1500-1800	2000-2400
<u>CARBOYHYDRATE</u> per day	150 gm	200 gm	200 gm	300 gm

Selecting healthy foods and planning when you eat can help you feel better and achieve good diabetes control. Discuss any questions or concerns you may have with your dietitian or your diabetes educator.

CHO

Issues

**CHO diet =**

Confusion ?

Contradiction ?

**ANOTHER BEST-SELLING  
DIET BOOK IN THE WORKS...**



**“Diet Tip #97: Eat a pint of ice cream to reduce your craving for sweets. Diet Tip #98: To melt your waistline, eat your pizza very, very hot. Diet Tip #99: Chewing burns more calories than not chewing...”**

# 2 Things to Remember re: CHO's & Diets

## ■ 1<sup>st</sup>:

- Foods containing CHO (fruits, veggies, grains, low fat dairy products) are always a better choice than foods that do not contribute to health (soft drinks, sweets, chips, crackers, desserts.)

## ■ 2<sup>nd</sup>:

- Total amount of CHO is more important than the source.
  - Quantity vs. Quality

# Sugars vs. Starches

- 2 Categories:
  - Sugars includes glucose, fructose, lactose
  - Starches are long chains of glucose units hooked together. (ie. Grains, pasta, potatoes)
- When eaten, CHO's are for the most part broken down into glucose.

CARB=CARB=CARB

# Meal Planning Approaches

Exchange System = Exchange Lists for Meal Planning

- Carbohydrate Counting:
  - Counts g
- Carbohydrate Choices:
  - (Basic or Consistent Carb Counting)
  - Advanced
- Counting Method:
  - Counts calories and or grams of fat
- Glycemic Index (G.I.)/ Glycemic load
- Plate Method

# Exchange List for Meat Planning a.k.a. The Exchange System

- Organizes foods into 3 main groups:
  - CHO's
  - Meat & Meat Substitutes
  - Fat
- Patient chooses from “exchange lists” rather than dictate exactly what is eaten.

Groups/ Lists	Carbs (g)	Protein (g)	Fat (g)	Calories
<b>Carbohydrate Group</b>				
Starch	15	3	1 or less	80
Fruit	15	---	---	60
Milk				
fat free	12	8	0-3	90
low fat	12	8	5	120
whole	12	8	8	150
Other Carbs	15	Varies	Varies	Varies
Vegetables	5	2	---	25
<b>Meat &amp; Meat Substitute Groups</b>				
Very Lean	---	7	0-1	35
Lean	---	7	3	55
Medium-fat	---	7	5	75
High-fat	---	7	8	100
<b>Fat Group</b>	---	---	5	45

# CHO Counting

- CHO Counting- meal planning approach that focuses on total amount of CHO.
- 1-2 hours within eating, 90-100% of digestible starches & sugars. (Turn up BS)

# Basic CHO Counting

- Establish/Follow a specific number of CHO choices/g/meal
- 1 CHO choice = 15 g

## Choices vs. Servings

- Consistent

## Food from a Meal

## Converted to Fuel

Carbohydrate: about 100%

Protein: minimal

Fat: minimal

**Blood Glucose**



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graph LR; A[Carbohydrate: about 100%] --> D[Blood Glucose]; B[Protein: minimal] --> D; C[Fat: minimal] --> D;
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# Advanced CHO Counting

- Identify grams by reading labels, referencing CHO resources, weighing and measuring portions.
- Take amount of insulin to cover specific amount of CHO.
- Apply individualized CHO-to-insulin ratio (grams of CHO to units of insulin)
- Allows more flexibility.

# Counting Methods

Count calories and/or grams of fat.

# Plate Method

**IDAHO PLATE METHOD** LUNCH AND DINNER

**Fruits**

**Vegetables**

**Bread / Starch & Grain**

**Meat / Protein**

**Milk**

1 CUP

**LOW FAT ICE CREAM**

1/2 CUP

1 FRUIT = 1 MILK = 1 STARCH

*Servings from these food groups can be traded for each other. Example: If you do not want milk for lunch, eat an extra serving of fruit instead. If you have diabetes, these foods will raise your blood sugar about the same amount and can be traded. Ask a dietitian how you can make sure you get enough calcium in your diet. Meats and vegetables can not be traded.*

**Servings at Lunch and Dinner:**

- 1/4 plate bread / starch / grain
- 1/4 plate meat / protein
- 1 small piece fruit
- 1 cup milk, yogurt or 1/2 cup pudding or ice cream
- 1/2 plate vegetables

# Glycemic Index

- Rates food on how fast they raise blood sugar on a scale of 0-100.
- The higher the number the faster the food is digested raising blood sugar.
  - $< 55$  = low glycemic
  - $> 70$  = high glycemic

**So Now What?**

# What is Optimal Diet?

- A key strategy for achieving glycemic control is to monitor carbohydrate by counting, exchanges or experienced based estimation.
- Use of glycemic index and load may be modestly beneficial vs. consisting only total CHO.

- Current guidelines do not recommend low glycemic index or high protein diet, but...

- “Nutrition counseling should be tailored to the personal needs of the individual with pre-diabetes or diabetes and his or hers willingness and ability to make changes.”

~Diabetes Care 2008; 31 **Suppl**



**"This is so romantic, Darling. Just you and me and your dietician."**