Nutrition and Carbohydrate Counting

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Conflict of Interest--None

Objectives

- What foods increase blood glucose.
- Basic portion sizes for carbohydrate
- How to help patients avoid hyper and hypoglycemia
- The importance of nutritional status and food choices to aid Bg.
- Whenever possible Refer to a CDCES—Certified Diabetes Care and Education Specialist for help.

Types of food and blood sugar

- Understanding how different foods and amounts of food effect blood sugar levels is the first step toward making healthy food choices.

- Food is made up of carbohydrate, protein, and fat—and all of these have an effect on blood sguars

Carbohydrates

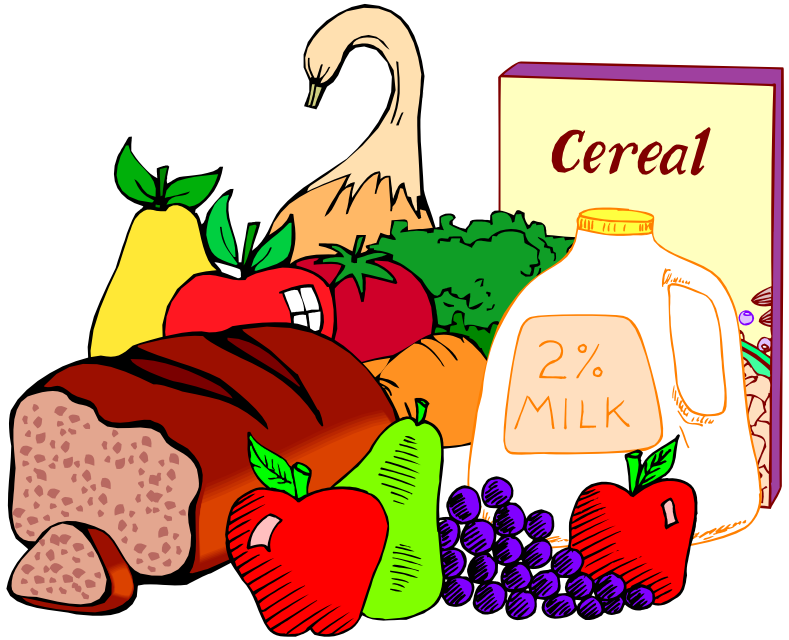
Foods with carbohydrates, or "carbs," have the most dramatic effect on raising blood sugar levels. Since many healthy foods contain carbohydrates, they are important to include in a healthy diet.

- Largest part of a healthy diet
- Body's main source of energy
- Come mostly from plant foods
- Three types
  - Sugars
  - Starches
  - Fiber

Carbohydrate and Diabetes

Healthy options Include:

- whole grains
- fruits
- vegetables
- low-fat milk



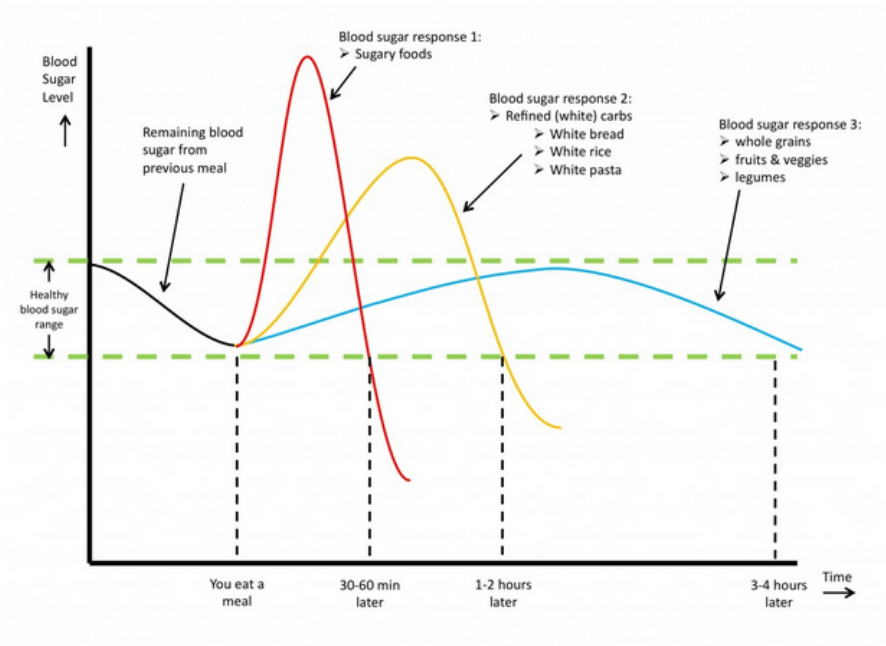
Carbohydrate , Cont

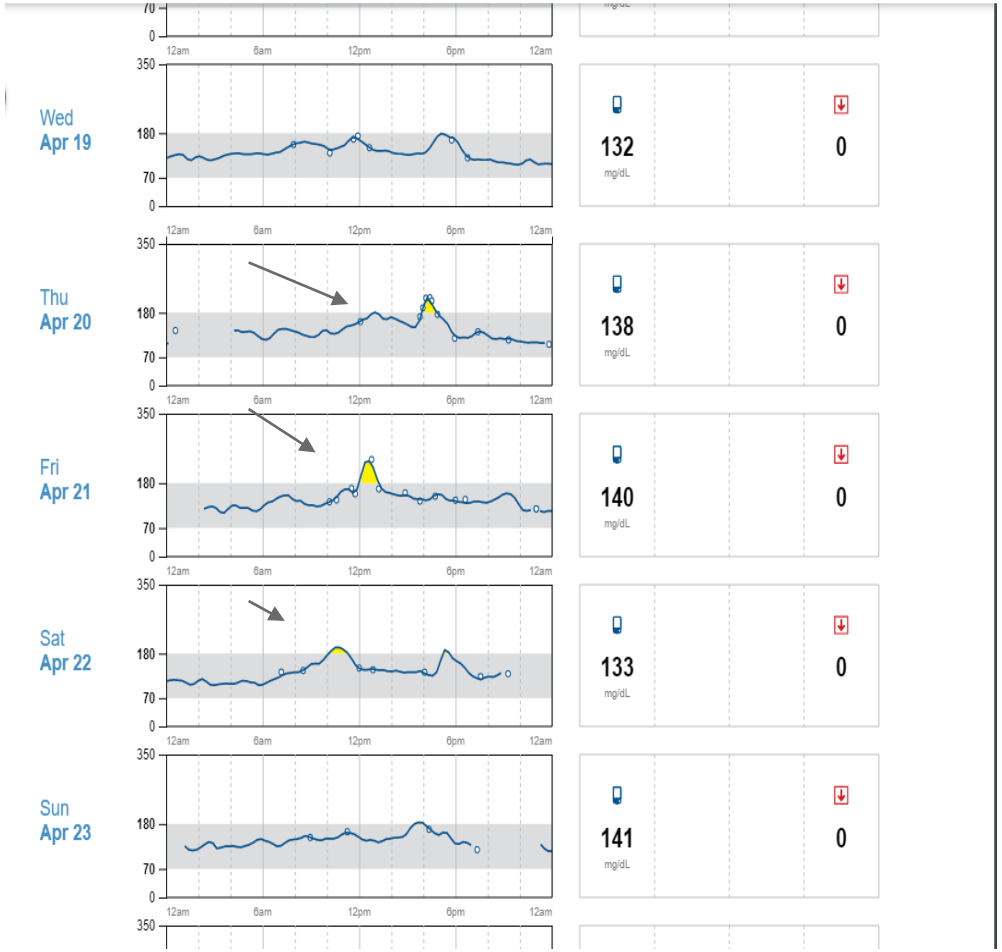
- Meat, fish, chicken and fats including butter, cheese, and oils have none to few carbohydrates

Carbohydrate and Diabetes

- Several things affect how much your blood glucose increases after you eat:
  - amount of carbohydrate
  - type of sugar or starch
  - cooking and food processing
  - food form
  - other foods in the meal that slow digestion

Blood glucose variability





Blood sugar response to “sweets” versus “whole” foods.
Slide on the right, Yellow sections are when my patient had large amount of sweets versus “whole” foods.

Carbohydrate and Diabetes

- Limited amounts of sugar or foods containing sugar can be used without affecting blood glucose
  (when substituted for other carbohydrates at the meal)
- Large amounts of sugar-containing foods are not recommended

SPAGHETTI AND MEATBALLS

20 Years Ago

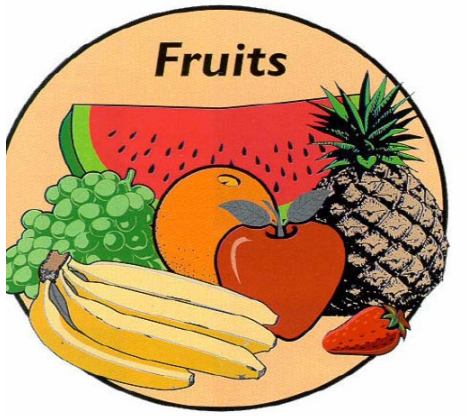
500 calories, 45 grams Carb
1 cup spaghetti with sauce and
3 small meatballs

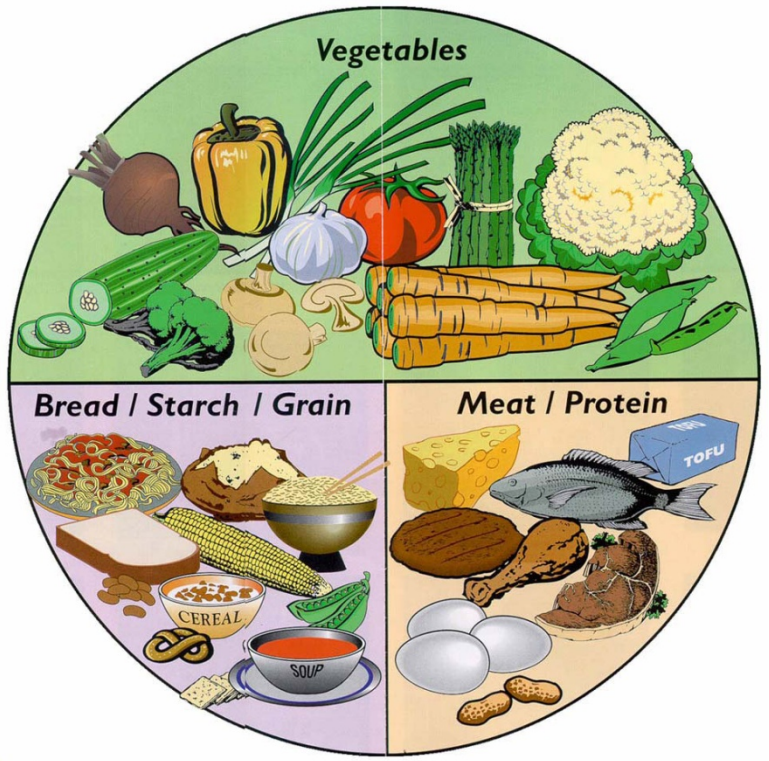
Today

1,025 calories, 90 grams Carb
2 cups of pasta with sauce and 3
large meatballs

Calorie Difference: 525 calories, 45 grams Carb

The Plate Method





WELL-AHEAD

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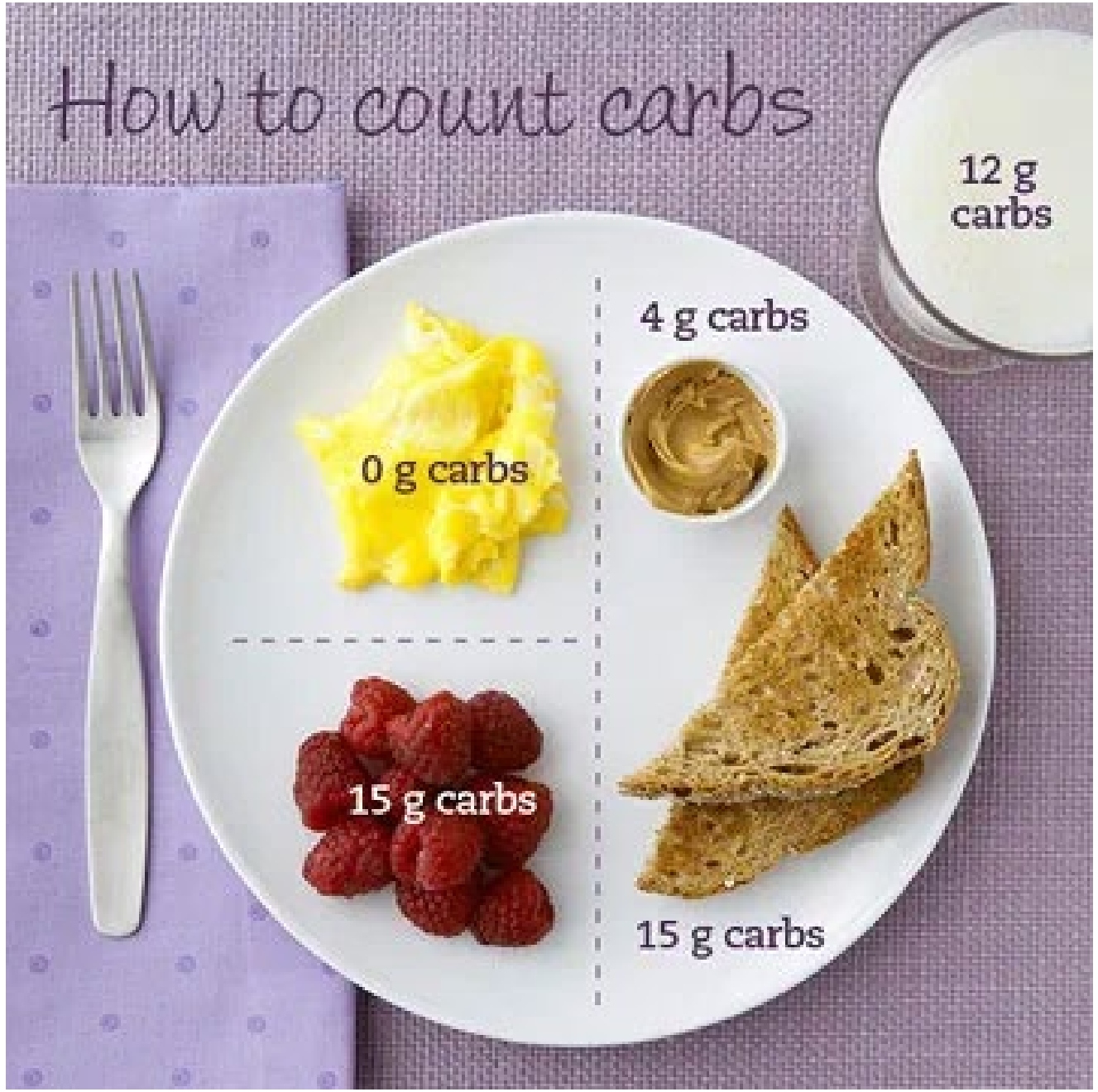

How to count carbs
12 g carbs
4 g carbs
0 g carbs
15 g carbs
15 g carbs

Nutrition Facts

2 servings per container
Serving size 1 1/2 cup (208g)

Amount per serving
Calories 240

	% Daily Value*
Total Fat 4g	5%
Saturated Fat 1.5g	8%
Trans Fat 0g	
Cholesterol 5mg	2%
Sodium 430mg	19%
Total Carbohydrate 46g	17%
Dietary Fiber 7g	25%
Total Sugars 4g	
Includes 2g Added Sugars	4%
Protein 11g	
Vitamin D 2mcg	10%
Calcium 260mg	20%
Iron 6mg	35%
Potassium 240mg	6%

* The % Daily Value (DV) tells you how much a nutrient in a serving of food contributes to a daily diet. 2,000 calories a day is used for general nutrition advice.

The “total carbohydrate” number listed on the label includes all types of carbs – sugar, starch and fiber.

Choose foods with less than 10% Daily Value for saturated fat and sodium.
Choose foods with less than 6% Daily Value for Added Sugars
Try to choose foods with more dietary fiber, which is listed on the label under total carbohydrates.

If you eat 1 ½ Cup portion = 46g Carb or
46/15 = ~ 3 servings Carb

If you eat the box, you’d have 3 cups = 92g or
92/15 = ~ 6 servings Carb

Issues

Portions! The average Americans underestimate how much they eat by 30%.

- The amount of carbohydrates found in that food
- “Hidden” sources of carbohydrates
- Looking only at Sugars listed on the label
- Forgetting to look at the serving size first!

Which Plate is Better??

A 10 inch dinner plate-a typical dinner plate

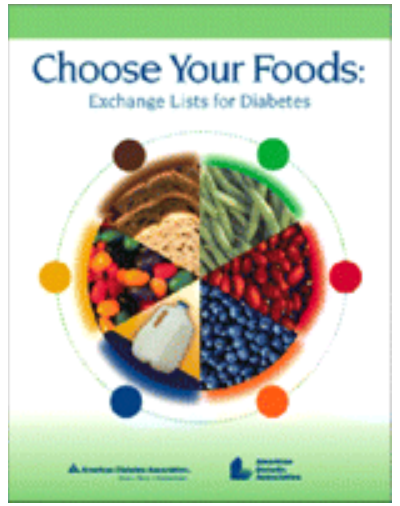
A 8 inch dinner plate- this is the recommended plate to use

Visualize Portion Sizes

- 1 cup pasta/rice is about the size of a fist (check with measuring cups. Some people have big or small hands).
- 1 oz of cheese is about the size of your thumb.
- 1 or 2 oz of crackers, nuts, or snack crackers equals a handful.
- 1 fruit is about the size of a tennis ball.

Exchange List for Meal Planning

- Oldest method for meal planning.
- Based on Dietary Guidelines and My Pyramid.
- Includes a variety of foods.
- Emphasizes label reading and most exchanges are listed under the food label.

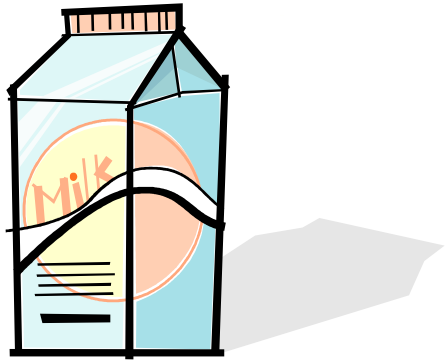


Carbohydrate Counting

- Newest method of meal planning.
- Type 1 or Type 2 can use.
- Requires reading the food label.
- Requires constant blood sugar monitoring. CGMS is a great option.
- When reading the food label, look at total carbohydrate grams only.
- Carbohydrates are found in milk, breads/starches, fruit and starchy vegetables only!

Know Your Carbohydrates

Food	Grams of Carbs/Serving
Starch/Bread	**15 grams**
Fruit	**15 grams**
Milk	**12 grams**
Vegetables	**5 grams**
Meat	**0 grams**
Fat	**0 grams**



Sample 1800 calorie Carbohydrate Counting Meal Plan

- Breakfast: → 2 servings of starch, 1 fruit serving, 1 milk serving, 1 meat serving, 1 fat serving.
- Lunch: → 2 starch servings, 1 fruit servings, ½ milk serving, 2 vegetable servings, 2 meat servings, 2 fats.
- Dinner: → 2 starch servings, 1 fruit serving, 2 vegetable servings, 3 meat servings, 2 fats.
- Snack: → 1 starch serving, 1 fruit serving, ½ milk serving.
- This meal plan is approximately 60 g of carbohydrates per meal and 30 g of carbohydrates per snack.

Examples of One Carbohydrate Choice Snacks

- 1 ounce granola bar
- 3 graham crackers with 1 tbsp. peanut butter
- 3 cups popped non-fat popcorn
- 6 animal crackers
- 1 small muffin
- A 3 inch cookie
- 1 medium apple, orange, pear
- 12-15 cherries or grapes
- ¼ cup dried fruit
- 1 cup soy milk
- ¾ to 1 cup yogurt
- ½ cup sugar free pudding

Todays Situation

- Types of carbohydrate counting
  - Basic carbohydrate counting
    - Consistent amount
    - Ideal for:
      - Weight loss
      - Pt's on diet and exercise alone
      - Pt's pm fixed dose insulin plan
      - Pts on a mixed insulin plan
  - Advanced Carbohydrate counting
    - Patients using MDI
    - Patients willing to measure or quantify food intake
    - Pt's on an insulin pump
    - Pt's that can perform basic math
    - Pt's willing to check BG before and 2 hr PP

Apps for Carb Counting

- Myfitnesspal
- Lose it
- Calorie King
- Carb Manager
- Fooducate
- Diabetic Recipes

Resources For Carb Counting

- https://diabetesed.net/carb-counting-made-easy-free-resource/
- http://www.diabetesed.net/page/_files/THE-DIABETIC-EXCHANGE-LIST.pdf
- https://diabetes.org/healthy-living/recipes-nutrition/understanding-carbs/carb-counting-and-diabetes
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Key points

- If possible refer to a CDCES to help set personalized goals.
- Use measuring tools, at first, and then periodically.
- Learn to estimate
- Read Food labels
- Use online / phone resources
- Carb count by food group

Calculating insulin to Carbohydrate ratio

500 Rule

500 ÷ total daily dose* = grams of carbohydrate covered by 1 unit of rapid-acting insulin (ICR)

Example: Patient taking 50 units/day
500 ÷ 50 = 10

In this example, it's estimated that 1 unit of rapid-acting insulin will cover the rise in blood sugar after the patient has eaten 10 g of carbohydrate.

Based on Body Weight

2.8 x body weight (in pounds) ÷ total daily dose* = ICR

Example: 160-lb patient taking 50 units/day
2.8 x 160 ÷ 50 = 9

In this example, it's estimated that 1 unit of rapid-acting insulin will cover the rise in blood sugar after the patient has eaten 9 g of carbohydrate.

Calculating Sensitivity Factor

- 1,700 ÷ total daily dose = sensitivity factor

  Example: Patient taking 50 units/day
  1,700 ÷ 50 = 34

  In this example, it's estimated that 1 unit of rapid-acting insulin will lower the patient's blood sugar by 34 mg/dL.

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- Keeping Up with the Changing Food Label: International Food Information Council (IFIC) – www.ific.org
- Understanding Food Labels, American Dietetic Association

Questions?

Thank You!