

## Patient Handout

# Carbohydrate Counting Basics

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Keeping your blood glucose levels in the recommended target range can help to prevent or delay the long-term complications of diabetes. Foods containing carbohydrates (CHOs) increase blood glucose levels. Counting the amount of CHOs that are in your meals can help you manage your blood glucose levels and help you feel good more often. If you are taking insulin, CHO counting can also help you estimate how much fast-acting (meal-time) insulin you will need.

### What Is Carbohydrate Counting?

CHO counting is a method of meal planning that is based on the number of grams of CHO in food.<sup>1</sup> Because CHO-rich foods have the greatest impact on blood glucose levels, CHO counting can help keep your blood glucose levels within your target range.

### Foods Containing Carbohydrates

There are 3 main energy sources in food: CHOs, proteins, and fats. Your body needs all of these sources of energy, so none of them should be eliminated from your diet.

CHO foods are those containing starch and complex sugar; examples are grains such as bread and cereal, fruits and starchy vegetables such as potatoes, and dairy products. These foods provide important nutrients such as vitamins, minerals, and fiber for good health. Although foods like cake and cookies also contain CHOs, these foods are typically high in fat and calories and low in vitamins, minerals, and fiber. Because these foods may make it more difficult for you to manage your weight, you should reserve sweets and desserts for special occasions.

Foods that contain CHOs and the recommended serving sizes are shown in **Table I**. Each serving size is equal to 15 grams of CHO and is considered 1 CHO choice. A complete list of serving sizes for food groups and corresponding CHO content can be found in a booklet titled, "Exchange Lists for Meal Planning" (produced by the American Diabetes Association and the American Dietetic Association; available at [www.diabetes.org/store](http://www.diabetes.org/store)).

**Table I.** Sample serving sizes for foods containing carbohydrates.

Grains/Starches	Fruit	Dairy*	Starchy Vegetables
Bread: 1 slice (1 oz)	100% Fruit juice: 1/2 cup	Milk: 1 cup (12 g)	Winter squash (acorn, pumpkin): 1 cup
Pasta or rice: 1/3 cup cooked	Apple: small (4 oz)	Light yogurt: 6 oz (12 g)	Corn, peas, mashed potatoes, beans, yams or sweet potatoes: 1/2 cup each
Cooked cereal: 1/2 cup (oatmeal)	Dried fruit: 1/4 cup		
Dry cereal: 3/4 cup <sup>†</sup>	Fruit cocktail: 1/2 cup		
	Grapefruit: 1/2 large (11 oz)		

oz = ounce; g = gram.

\*Choose low-fat (1%) or fat-free dairy products to reduce saturated fat and calories in your diet.

<sup>†</sup>Serving sizes for cold cereals vary greatly. Always read the nutrition facts panel on the cereal box for accurate nutrient content.

### How Carbohydrate Counting Works

Once you know how many grams of CHO you need at each meal you will be able to choose foods from any of the food groups that contain CHOs to meet your daily allowance. This method of meal planning offers variety in food choices.

### How Many Grams of Carbohydrate Should I Eat?

The amount of CHOs you should eat is based on several factors, including your sex, weight, level of physical activity, medications (including insulin), and blood glucose goals. Eating the same amount of CHOs at each meal at about the same time each day is important to help maintain proper blood glucose levels. A registered dietitian, diabetes educator, or other member of your health care team can help you develop a meal plan that is right for you.

Here is an example to show you how it works. Judy is a 38-year-old woman with type 2 diabetes. Judy's dietitian determined that she needs 172 grams of CHO each day. How many CHO choices is Judy allowed each day?

Step 1: CHOs are measured in grams. Step 2: 15 grams CHO = 1 CHO choice.

Step 3: Total CHO (grams) per day ÷ 15 grams CHO = number of CHO choices per day.

To calculate the number of CHO choices per day for Judy, we start with 172 grams CHO per day: 172 grams ÷ 15 grams = 11½ CHO choices per day. A sample meal plan developed for Judy is shown in **Table II**.

**Table II.** Sample meal plan developed for Judy.\*

Meal	Total CHO Choices	Food Item	CHO (grams)	CHO Choices
Breakfast	3	Corn flakes: 1 cup	23	1½
		Fat-free milk: 4 oz	7	½
		Banana: 4 oz	15	1
Lunch	3	Pita bread: 1 whole	30	2
		Tomato & cucumber salad	0	0
		Lean turkey: 2 oz	0	0
		Grapes: 17	15	1
Snack	2	Fat-free yogurt: 8 oz	15	1
		Tangerine: 1 small	15	1
Dinner	3½	Baked salmon: 4 oz	0	0
		Brown rice: 1 cup	45	3
		Broccoli: 1½ cups cooked	5	½
<b>Total</b>	<b>11½</b>		<b>170</b>	<b>11½</b>

CHO = carbohydrate; oz = ounce.

\*This is a sample meal plan. Check with your health care team, as your needs may be different.

## What to Eat Every Day

Use the following guidelines to help you make healthy food choices.<sup>2</sup>

- Build your meals around wholesome, fiber-rich starches and grains like oats, whole wheat, barley, and beans.
- Choose tomatoes and nonstarchy vegetables such as spinach and broccoli more often.
- Count starchy vegetables, like potatoes, corn, and peas, as part of your total CHO choices.
- Include 2 to 4 servings of fruit daily.
- Choose 4 to 6 ounces of lean protein foods like skinless poultry and fish.
- Select fat-free or low-fat dairy products.
- Use monounsaturated or polyunsaturated fats. Using monounsaturated fats in place of saturated fats has been shown to reduce the risk of heart disease.<sup>3</sup>
  - Monounsaturated fats include olive oil, canola oil, nuts, and avocados.
  - Polyunsaturated fats include corn oil, salad dressings, mayonnaise, and margarine.
- Diets high in saturated fats such as bacon, butter, cream cheese, shortening, and sour cream can increase the risk of heart disease.

## Glucose Testing

Keep a glucose diary and share the results with your health care team. Testing your blood glucose levels before and after meals will help you and your health care team to determine whether the amount of CHOs you are eating at each meal is right for you. Blood glucose levels that are high after eating may indicate that your meal plan needs to be changed. Your doctor also may need to make adjustments to your diabetes medications or insulin doses. *Before making any changes to your diabetes care plan, be sure to talk with your doctor.*

## REFERENCES

1. American Diabetes Association. [www.diabetes.org/diabetesdictionary.jsp](http://www.diabetes.org/diabetesdictionary.jsp). Accessed December 28, 2007.
2. American Diabetes Association. Using the Diabetes Food Pyramid. [www.diabetes.org/nutrition-and-recipes/nutrition/foodpyramid.jsp](http://www.diabetes.org/nutrition-and-recipes/nutrition/foodpyramid.jsp). Accessed December 27, 2007.
3. American Heart Association. Fats 101. [www.americanheart.org/presenter.jhtml?identifier=3045789](http://www.americanheart.org/presenter.jhtml?identifier=3045789). Accessed January 2, 2008.

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