



# HEALTH

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## Diet and Diabetes

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### Quick Facts...

Diabetes management should consider nutrition, physical activity and pharmacologic therapies that optimize the individual's personal health and fitness goals.

The overall goals of nutrition therapy include achievement and/or maintenance of near-normal blood glucose levels, optimal serum lipid levels and reasonable weight, and the prevention of acute and long-term complications.

There is no one diet prescription for people with diabetes. Four possible alternative methods for planning diets use: 1) the Food Guide Pyramid, 2) Plate Model, 3) the Diabetic Exchange Lists, and 4) Carbohydrate Counting.

In 1994, the American Diabetes Association and the American Dietetic Association approved new dietary recommendations for people with diabetes. These recommendations signal a change in philosophy regarding nutritional care for diabetes. It is now recognized that diabetes encompasses a variety of metabolic abnormalities and that individuals need different approaches. The belief that a single diabetic or ADA diet exists for people with diabetes is no longer valid. Rather, it is recommended that people with diabetes work with their diabetes management team (registered dietitian, nurse, physician and other health care professionals, as needed) to develop a nutrition care plan that fits their own metabolism, nutrition and lifestyle requirements.

The new recommendations incorporate medical research of the last decade.

### Goals of Diabetes Management

The three cornerstones of diabetes management are diet, physical activity and medication if needed (i.e., insulin or oral glucose-lowering agents). Food raises blood glucose and blood fat levels. Activity and medications lower blood glucose and blood fat levels. A balance of diet, activity and medication leads to good management of diabetes.

The overriding goal of nutrition therapy for people with diabetes is improved metabolic control. Additional goals include: 1) maintain near-normal blood glucose levels; 2) achieve optimal serum lipid levels; 3) attain a reasonable, achievable and maintainable body weight; 4) prevent and treat acute and long-term complications; and 5) improve overall health through optimal nutrition.

### Type 1 Diabetes

As of 1997, diabetes is now categorized as Type 1 or Type 2, based on the underlying physiological problem rather than treatment. Type 1 diabetes, formerly known as insulin-dependent diabetes mellitus (IDDM), is characterized by the destruction of the pancreatic beta cells that produce insulin. The end result is absolute insulin deficiency. Insulin must be taken regularly. Type 1 diabetes occurs most often in children and young adults, but it can occur at any age. People with this type of diabetes can have trouble getting enough energy and keeping their body weight at a healthy level.

Current dietary recommendations include integrating insulin therapy into normal eating and exercise patterns. This allows a person to adjust the timing and quantity of insulin injections based on monitored blood glucose levels.

Previously, people who took insulin had to follow a rigid pattern of eating that did not always match a person's usual eating and physical activity patterns. This sometimes created conflicts that resulted in varying degrees of

noncompliance. The current recommendations are more flexible; they recommend integrating insulin therapy into the individual's usual eating and exercise patterns. They also allow a person to adjust the timing and quantity of insulin injected in accordance with monitored blood glucose levels.

Frequent blood glucose monitoring is recommended. Blood glucose monitoring helps show which foods, physical activities and/or times of the day elevate an individual's blood glucose level. By adjusting insulin dose to meet needs, a person may have more near-normal blood glucose levels and help reduce the risk for short- and long-term complications.

It is still highly recommended that people using insulin therapy eat at consistent times and consume consistent amounts of carbohydrates to synchronize with the time-action of the insulin preparation they are using. However, by using multiple daily injections and frequent monitoring of blood glucose levels, people with diabetes can quickly adjust to account for changes from their usual eating and exercise habits. Proper, consistent monitoring is the key.

#### **For more information:**

The following resources are available from the American Dietetic Association: Exchange Lists for Meal Planning; Carbohydrate Counting (*three levels*). Call 1 (800) 877-1600 ext. 5000 for current prices.

#### **References**

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## **Type 2 Diabetes**

Type 2 diabetes, formerly known as non-insulin dependent diabetes mellitus (NIDDM), is by far the most common form of the condition. More than 90 percent of all people with diabetes have this type.

Type 2 diabetes develops because of insulin resistance, in which the body is unable to use the insulin properly, combined with a relative (not absolute) insulin deficiency. Typically, people with Type 2 diabetes are over 45, overweight and sedentary, with a family history of diabetes. Recently, however, we have seen an alarming trend in the United States of Type 2 diabetes developing in adolescence. These youth tend to be 10 to 19 years old with a strong family history of Type 2 diabetes. They are slightly more likely to be girls than boys, to be African-American, Hispanic or Native American than other racial groups, and to be obese rather than of normal weight.

Achieving and maintaining weight loss has long been a primary dietary focus for people with Type 2 diabetes. Although this is still considered important, the 1994 nutrition recommendations stress achieving blood glucose control, along with normal blood lipid levels and normal blood pressure. These factors, if controlled, help reduce the risk of long-term complications of diabetes.

An initial strategy for Type 2 diabetes is to improve food choices to better meet the recommendations of the *Dietary Guidelines for Americans* and the Food Guide Pyramid. Reducing fat, especially saturated fat, is highly recommended. Space meals to spread nutrient intake throughout the day. Even mild to moderate weight loss (10 to 20 pounds) has been shown to improve diabetes control. Lifestyle changes that moderately decrease calorie intake (250 to 500 kcal per day) and increase energy expenditure are strongly encouraged.

## **Major Nutrient Recommendations**

**Protein.** The 1994 recommendation for acceptable levels of protein intake more closely reflects the intake of the general population. It is now recommended that proteins provide 10 to 20 percent of total daily calories. Protein needs to be more restricted, however, at the onset of nephropathy (renal disease).

**Fat.** Diabetes is associated with a three- to four-fold increase in the risk for cardiovascular disease (CVD). Diabetes itself is a strong independent risk factor for CVD. Thus, steps that help reduce this risk are important. Diets high in total fat and saturated fat are known to increase the risk for CVD.

Specific recommendations for the percentage of energy from fat vary depending on the individual's glycemic and lipid values and on body weight status. For individuals more than two years old with normal blood lipid values and who maintain a reasonable weight, adhering to the Dietary Guidelines

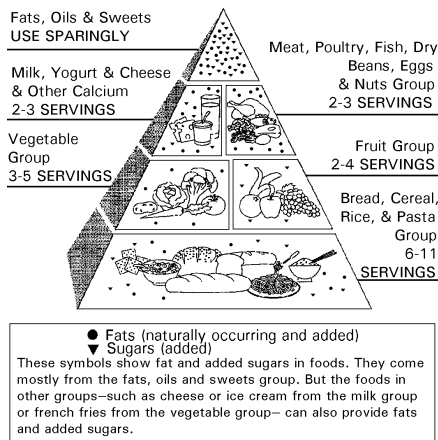


Figure 1: The Food Guide Pyramid.

*Saccharin, aspartame, acesulfame K and sucralose are safe to consume by people with diabetes, within a balanced diet.*

recommendation of no more than 30 percent of total calories from fat and no more than 10 percent of calories from saturated fat is recommended.

If total cholesterol and/or low-density lipoprotein (LDL) cholesterol are high, the National Cholesterol Education Program Step 2 diet is recommended. Total fat should be 30 percent or less of total daily calories, dietary cholesterol should be limited to 200 mg/day or less, and saturated fat should be 7 percent or less of total daily calories.

If a person has elevated triglycerides and very-low-density lipoproteins (VLDL's), a moderate intake of carbohydrates (45 to 50 percent of total calories), restricted intake of saturated and polyunsaturated fats (less than 10 percent of energy each), and somewhat elevated intake of monounsaturated fats (up to 20 percent of total daily calories) may be beneficial. Good sources of monounsaturated fats are olive oil, canola oil, avocados and nuts. Carbohydrates are slightly reduced because of their effect on raising triglycerides. Some people who eat a high carbohydrate diet may have elevated triglycerides. Weight loss and increased physical activity may also lead to improvements.

If a person is obese, one of the easiest ways to reduce caloric intake is to reduce total fat intake. Fat is the most calorically dense nutrient, so eating less of it will decrease total calorie intake if all other nutrients remain at a similar intake. Thus, a low-fat diet is beneficial for weight loss in some individuals.

**Carbohydrate.** The percentage of carbohydrate in the diet also will vary according to individual needs and goals. In general, 50 to 60 percent of total caloric intake should come from carbohydrates. Important sources of carbohydrates include breads, cereals, grains, pasta, fruits and vegetables. Again, carbohydrates may be reduced in some people's diets to address individual problems.

**Sugar.** It has been a long held belief that simple sugars are more rapidly digested and absorbed than starches, and therefore are more likely to cause high blood sugar levels. This premise has not been supported by scientific evidence. The 1994 guidelines allow the use of sugar and sugar-containing foods in **modest** amounts as part of a balanced diet. It should be remembered, however, that sugar-containing foods must be substituted for other carbohydrate foods and not simply added on top of what is eaten. The first consideration should be the total amount of carbohydrate eaten. Adding sugars to the "okay" list represents a major shift in diabetes care, but an important one with regard to long-term compliance. This does not mean that sweets should be eaten with every meal or even every day. Sweets also can be high in calories. As stated in the *Dietary Guidelines for Americans*, moderation is the key.

**Non-nutritive Sweeteners.** Saccharin, aspartame, acesulfame K and sucralose have been approved by the Food and Drug Administration (FDA) and can be used by people with diabetes, including pregnant women, within a balanced diet. Because saccharin can cross the placenta, other sweeteners are better choices during pregnancy.

**Fiber.** Fiber recommendations for people with diabetes are the same as for the general population, 20 to 35 grams from a wide variety of sources daily. This is more than most Americans consume. Because of the potential beneficial effect of soluble fibers on serum lipids and glucose metabolism, people with diabetes are advised to get adequate amounts of fiber from the carbohydrates they eat. Good sources of soluble fiber include oat products, many fruits and vegetables, cooked beans, rice bran and psyllium seeds.

## Methods for Planning Diets

Dietary management of diabetes should be designed to meet total nutrient and health needs, not just blood glucose needs. Begin with an assessment of the individual's usual eating habits, including food likes and dislikes, eating and work schedules, as well as treatment goals identified by the

health care team. The better dietary management fits into one's usual routine, the more likely it is to be successful. The following diet planning systems can be helpful when planning meals and snacks for people with diabetes.

**Dietary Guidelines/Food Guide Pyramid.** The Food Guide Pyramid strives to put the *Dietary Guidelines for Americans* into action. It provides a conceptual framework for selecting the kinds and amounts of various foods, which together provide a nutritious diet. The Pyramid focuses on variety and recognizes that one food group, although providing some nutrients, does not provide all the nutrients needed in a day's time. It also focuses on reducing the amount of added fat and sugar in the diet. The bread/cereal, vegetable and fruit groups make up the base of the diet. For more details, request fact sheet 9.306, *Guide to Daily Food Choices*.

**Plate Model.** The Plate Model, commonly used in Europe, is a simple method for teaching meal planning. A 9-inch dinner plate serves as a pie chart to show proportions of the plate that should be covered by various food groups. This meal planning approach is simple and versatile.

**Diabetic Exchange Diets.** In this system, food is separated into six categories based on macro nutrient content (i.e., starch/bread, meat and substitutes, vegetable, fruit, milk and fat). Individuals, with the help of a physician or dietitian, design a daily meal plan based on a set amount of servings from each category. The Food Exchange method allows a person to measure rather than weigh food. This saves time and encourages compliance. Any food may be substituted for another within the same food exchange list. Some foods may be placed in more than one exchange list. As with other methods, all meals and snacks should be eaten at about the same time each day and be consistent in the amount of food consumed.

**Carbohydrate Counting.** Some people choose to count the grams of carbohydrate in various foods, then adjust the amount of carbohydrate consumed during the day as a reflection of blood glucose levels. One choice from the starch, fruit or milk list supplies about 15 grams of carbohydrate. Each choice is considered one carbohydrate choice. A meal plan outlines the number of carbohydrate choices a person may select for meals and snacks. This method requires great diligence with diet and blood glucose monitoring.

## Using Nutritional Labeling

With any of the diet planning methods mentioned above, the nutrition facts label found on most foods can provide much useful information. If you are counting carbohydrates, total grams of carbohydrates per serving are listed on the label, along with grams of sugars and dietary fiber. For more information on food labeling, request 9.365, *The New Food Label*.

If you are using the exchange lists method of diet planning, exchanges can be developed for new foods based on the grams of protein, carbohydrate and fat provided per serving. Be aware that the serving sizes given on labels may not be the same as those used in the *Exchange Lists for Meal Planning*. For example, the label serving size for orange juice is 8 fluid ounces. In the Exchange Lists, the serving size is 4 ounces (1/2 cup). Thus, a person who drinks 1 cup of orange juice has consumed two fruit exchanges.

If you are using the Food Guide Pyramid in menu planning, pay close attention to the percent daily value column of the nutrition facts label. Look for foods that have low percent daily values for fat, saturated fat and cholesterol, and high percent daily values for fiber. Other label information to look for is calories per serving and calories from fat.

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