

Your Guide to Diet and Diabetes



Eating for Cardiovascular Health

Increased risks for people with diabetes

It is very important for people who have **Diabetes** to make heart-healthy food choices because of their increased risk for cardiovascular complications. When compared to people without diabetes, people with diabetes have:

- Twice the risk of developing **cardiovascular disease**
- Twice the risk of having a **heart attack**
- A greater chance of having a second heart attack
- A greater chance of dying from a heart attack
- Four times the risk of having a **stroke**

Women with diabetes are particularly susceptible to these complications, and have a greater risk of death from heart attacks and strokes than men with diabetes.

Why do people with diabetes have increased risks?

It is not completely known how diabetes influences the **cardiovascular system**. However, high **blood glucose** and **high blood pressure** in people with diabetes commonly cause changes in blood vessels. These changes may explain why people with diabetes have such high rates of heart disease, stroke, and poor circulation in the legs and feet. This also may be one reason for the high rates of impotence in men with diabetes. Experts recommend that all people with diabetes should try to keep their blood glucose and blood pressure within their target range and should try to follow heart-healthy patterns of eating.

Heart-healthy eating

Heart-healthy eating is a way of eating that will help to keep your heart and cardiovascular system functioning well. Heart-healthy eating includes:

Eating less:

Total fat
Saturated fat
Cholesterol
Trans fat

Choosing more **unsaturated fats** like:

Monounsaturated fat
Polyunsaturated fat

A heart healthful eating plan for lowering blood pressure, blood cholesterol, and triglycerides is based on these American Heart Association dietary guidelines.

Total fat intake should be less than 35 percent of total calories.

- Everyone should limit their saturated fat intake to less than 10 percent of total calories; individuals with high cholesterol should limit their intake of saturated fat to less than seven percent total calories.
- Polyunsaturated fat intake should be no more than 10 percent of total calories.
- Monounsaturated fat makes up the rest of the total fat intake, about 10-15 percent of total calories.
- Everyone should limit their cholesterol intake to less than 300 milligrams per day; individuals with high cholesterol should limit their cholesterol to less than 200 milligrams per day.
- Sodium intake should be no more than 2300 milligrams (2.3 grams) per day.
- Limit alcohol consumption (no more than one drink per day for women and two drinks per day for men).
- Maintain a healthy body weight and a dietary pattern that emphasizes vegetables, fruits, and low-fat or fat-free dairy products.

The goals of the American Heart Association Eating Plan are available at <http://www.americanheart.org>.

What are the risk factors for cardiovascular disease?

- Elevated blood glucose levels resulting in increased **hemoglobin A1c values**
- Elevated blood cholesterol
 - Elevated Low Density Lipoprotein (LDL) level
 - Lower than normal High Density Lipoprotein (HDL) level
- Excess body weight
- High blood pressure

- Smoking

What is cholesterol?

Cholesterol is essential for life and is found in all cells. There are two types of cholesterol, one that our bodies make and dietary cholesterol. The cholesterol that our body makes is a fat-like substance produced by the liver. **Dietary cholesterol** is the cholesterol that other animals produce and that we ingest when we eat animal products like meat and milk. Both types of cholesterol are used to form cell membranes, and to manufacture hormones, bile acids, and vitamin D.

Cholesterol and other fats can't dissolve in the blood. They have to be transported to and from the cells by special carriers composed of lipids and proteins called lipoproteins. The two lipoproteins to be most concerned about are low density lipoproteins (LDL), and high density lipoproteins (HDL).

What is HDL-cholesterol: The “Good” Cholesterol

Some research indicates that HDL-cholesterol carries cholesterol away from the bloodstream and back to the liver, where it is passed out of the body. A high level of HDL seems to protect against cardiovascular disease, and a low level indicates a greater risk. HDL-cholesterol levels range from 40 to 50 mg/dl in the average man; from 50 to 60 mg/dl in the average woman. HDL-cholesterol less than 40 mg/dl is considered low and HDL-cholesterol greater than 60 mg/dl is desirable.

To achieve healthful HDL levels:

- Participate in regular aerobic exercise such as walking, biking, swimming, or jogging
- Quit smoking
- Lose weight if you are **overweight**, and maintain a healthy body weight

What is LDL-cholesterol: The “Bad” Cholesterol

When a person has too much LDL-cholesterol in the blood, it can slowly build up on the inner walls of the arteries, which supply blood to the heart and brain. Together with other substances it can form plaque, a thick, hard coating that can clog the arteries. A high LDL cholesterol level increases your risk of heart disease. An LDL level between 130-159 is considered borderline high risk for heart disease and an LDL level of 160 or over is considered a high risk.

To achieve healthful LDL and/or total cholesterol levels:

- Eat less saturated fat and cholesterol
- Eat more high **fiber** foods
- Substitute unsaturated fats for saturated fats
- Lose excess weight

What are triglycerides?

Triglycerides are the chemical form in which most fat exists. Triglycerides are the human body's storage form of fat. Blood triglyceride levels above 150 mg/dl are considered high, and may also play a role in forming plaque. Being overweight, drinking large amounts of alcohol, having diabetes and hyperglycemia can cause high blood triglycerides. To reduce elevated triglyceride levels:

To achieve healthful LDL and/or total cholesterol levels:

- Keep blood glucose levels in a normal range
- Limit sugars, sweets, refined carbohydrates, and alcohol
- Lose weight if you are overweight
- Limit your intake of fats and saturated fats

If you would like to find out your HDL, LDL, total cholesterol, and triglyceride levels, ask your health care provider for a lipid profile. A blood lipid profile is a blood test for your total cholesterol, HDL-cholesterol, and triglyceride level, (LDL-cholesterol is estimated from these numbers).

*Note: You need to fast for 12 hours before a blood lipid profile

How high is too high?

The risk for heart disease is increased when there is too much cholesterol and/or triglycerides in your blood. The chart below will help you determine if your cholesterol and triglyceride levels put you at higher risk.

National Institute of Health Recommendations for Blood

	Desirable	Borderline High Risk	High Risk
Total Cholesterol	< 200 mg/dl	200-239 mg/dl	> 240 mg/dl
LDL Cholesterol	< 100 mg/dl	130-159 mg/dl	>160 mg/dl
HDL Cholesterol	> 60 mg/dl	60 - 40 mg/dl	< 40 mg/dl
Triglycerides	< 150 mg/dl	150-199 mg/dl	> 200 mg/dl

If your total cholesterol level is in the "borderline risk" range or "high risk" range, your doctor will probably recheck your blood with an additional evaluation, a "lipid profile."

Dietary factors that increase blood cholesterol

Having high blood cholesterol, high LDL, or low HDL are risk factors for cardiovascular disease. There are five dietary factors that can increase your blood cholesterol levels, increase your LDL level, and/ or lower your HDL level:

- Dietary cholesterol
- Total fat
- Saturated fat
- Trans fat
- Excess calories

Consuming too much dietary cholesterol, total fat, saturated fat, trans fat, or too many calories can raise your blood cholesterol levels and increase your risk for heart disease. Therefore, it is important to know what foods contain these factors, and how you can change your diet to decrease your risk.

Dietary Cholesterol – Dietary cholesterol is different than blood cholesterol. Dietary cholesterol is the cholesterol obtained from food. Only food from animal sources contains dietary cholesterol. Dietary cholesterol only has a slight effect on your total blood cholesterol level. A person's total fat intake, especially saturated fat, has a more significant effect on blood cholesterol levels than dietary cholesterol alone does. However, a person should still have a low-to-moderate intake of dietary cholesterol, which would be less than 300 mg for those without high blood cholesterol and 200 mg for those with high blood cholesterol.

Tips for Reducing Dietary Cholesterol Intake

- Limit intake of egg yolks, liver and other organ meats, meat, and whole milk dairy products.

Total Fat – The total amount of dietary fat eaten has a large impact on blood cholesterol levels. Since many foods contain fat, the best way to find out how many grams of total fat you eat each day is to look at the Nutrition Facts labels of the foods you eat. Eating a lower fat diet tends to lower blood cholesterol and helps keep levels within a normal range. Only 20 – 35 percent of your daily calories should come from fat.

Tips for Reducing Total Fat Intake

- Use 1/2 less fat in every recipe without changing flavor or texture. Although some fat may be essential to a recipe, generally a reduction of 1/2 the fat in a recipe will not alter the product taste or texture.
- Reduce the amount of sauces, dressings, and gravies that you put on foods.
- Make low-fat or non-fat substitutions in recipes. Replace 1 cup of sour cream with 1 cup of plain non-fat yogurt (or try the fat free version of sour cream). Use ground turkey breast,

ground chicken breast, or tofu instead of ground beef.

- Use more herbs and spices to enhance flavor, rather than added fat.
- Use fat-free cooking spray for baking – versus butter or oil.
- Reduce the amount of high-fat items in a recipe, such as nuts, cheese, and chocolate.

The chart below will help you determine the amount of total fat and saturated fat grams that the American Heart Association recommends you eat depending on your calorie level.

Calorie Level	Total Fat (grams)	Saturated Fat (grams) < 10% of total calories	Saturated Fat (grams) < 7% of total calories
1200	40	< 13	< 9
1500	50	< 17	< 12
1800	60	< 20	< 14
2000	67	< 22	< 16
2200	73	< 24	< 17
2500	83	< 28	< 19
3000	100	< 33	< 23

Saturated Fat - Foods high in saturated fats raise blood cholesterol more than foods high in dietary cholesterol. “Saturated” is a word that refers to the chemical structure of some fats. Saturated fats are usually firm or hold their shapes at room temperature. For example, at room temperature butter is solid because it has more saturated fat, versus oil that is liquid, because it does not have a lot of saturated fat. The main sources of saturated fat in the typical American diet are:

- Foods from animals: including beef, beef fat, veal, lamb, pork, lard, poultry fat, butter, cream, milk, cheeses, and other dairy products made from whole milk.

These foods also contain saturated fat:

- Foods from plants: including coconut oil, palm oil, and palm kernel oil (often called tropical oils), and cocoa butter.

Tips for Reducing Total Fat Intake

- Choose leaner cuts of meat.

- Try skinless chicken, fish, and 90%-95% lean ground beef.
- Choose whole cuts of meat rather than ground pork or beef.
- Choose the leaner cuts of meat such as top loin, sirloin, round or flank steak (buy select or choice instead of prime).
- Trim fat from meat before cooking and drain fat from meat once it is cooked.
- Reduce high-fat dairy products. These are high in saturated fat and cholesterol. Choose skim or 1 percent milk, low fat yogurt, and reduced fat cheese. Try low fat frozen yogurt or sherbet instead of ice cream. However, remember to take these carbohydrates into consideration when planning your daily meals.
- Use oils in cooking and baking instead of butter or lard. Olive and canola oils are high in monounsaturated fats.

What are polyunsaturated and monounsaturated fats?

Polyunsaturated and monounsaturated fat are both unsaturated fats. “Poly” means many unsaturated chemical bonds and “mono” means one unsaturated chemical bond. These unsaturated fats are often found in liquid vegetable oils.

- Polyunsaturated oils are liquid at room temperature and in the refrigerator. Common sources of polyunsaturated fat are safflower, sesame and sunflower seeds, corn and soybeans, many nuts and seeds, and their oils.
- Monounsaturated oils are liquid at room temperature but start to solidify at refrigerator temperatures. Canola, olive, and peanut oils, and avocados are sources of monounsaturated fat.
- Both types of unsaturated fats may help lower your blood cholesterol level when used in place of saturated fat in your diet. Remember to be moderate in your intake of all types of fat.
- Poly- or monounsaturated oils — and margarines and spreads made from these oils — should be used in limited amounts in place of fats with a high saturated fat content, such as butter, lard, or hydrogenated shortenings.
- By substituting monounsaturated fat in your diet for saturated and polyunsaturated fats you may be able to keep HDL cholesterol levels high and LDL cholesterol levels low. Overall the highest intake of fat should be from the monounsaturated type (12 – 20 percent of total calories).

Tips for replacing saturated fats with unsaturated fats

- Use oils containing monounsaturated fat like olive oil, canola oil, peanut oil, and sesame oil, instead of oils high in saturated fat like coconut oil and palm oil.
- Use oils high in polyunsaturated fats like corn, soybean, safflower, sunflower, and cottonseed oils instead of coconut oil, palm oil, or hydrogenated vegetable fats.
- Use liquid oils instead of butter, lard, or hardened vegetable shortening.
- Eat foods high in unsaturated fats like fatty fish (salmon, mackerel, tuna) instead of meats high in saturated fat.

- Incorporate foods high in polyunsaturated and monounsaturated fats like avocados, nuts, and olive oil into your salads instead of using products high in saturated fats like mayonnaise based dressings.
- Try the new plant-sterol margarine products.

Trans Fat - Foods high in trans fat also raise blood cholesterol. “Trans” is also a word that refers to the chemical structure of certain unsaturated fats when they have had hydrogen added to them to make them firm. Foods with the words “partially hydrogenated vegetable oils” in their ingredient list are likely to be high in trans fat. Baked goods, snack foods, fried foods, margarines, and shortenings often contain trans fats. The best way to find out if a food contains trans fat is to look on the Nutrition Facts label or look for partially hydrogenated fat in the ingredients list.

Tips for Reducing Trans Fat Intake

- Look for processed foods made with unhydrogenated oil rather than hydrogenated oil or saturated fat. If it doesn’t say “hydrogenated” or “partially hydrogenated,” it is unhydrogenated fat.
- Use margarine as a substitute for butter, and choose soft (liquid or tub) margarines over harder, stick forms. Use margarine and other products that contain liquid vegetable oil as the first ingredient and no more than two grams of saturated fat per tablespoon.
- Look for trans fat information on the Nutrition Facts label and choose products with no trans fat added.

Consuming Excess Calories – Eating too many calories leads to weight gain. Weight gain can raise your LDL cholesterol levels, triglyceride levels, and blood glucose levels.

How is excess body weight related to cardiovascular disease?

According to the American Heart Association, weight gain is an independent risk factor for coronary heart disease and stroke. This means that excessive body weight alone (without other risk factors) can increase your risk for cardiovascular disease. For this reason, maintaining a healthy body weight is a high priority. The two major American Heart Association guidelines for maintaining a healthy body weight are:

- Match intake of energy (calories) to overall energy needs; limit consumption of foods with a high caloric density and/or low nutritional quality, including those with a high content of sugars.
- Maintain a level of physical activity that achieves fitness and balances energy expenditure with energy intake. For weight reduction, expenditure should exceed intake.

Sample Menus for Reducing Caloric Intake

Menu 1: Higher Calorie		Menu 2: Lower Calorie	
Breakfast	<ul style="list-style-type: none"> • 2 eggs • 2 pieces white toast • 1 tablespoon butter • 3 strips bacon 	Breakfast	<ul style="list-style-type: none"> • ½ cup egg substitute • ¼ cup cooked mushrooms • ¼ cup cooked spinach • 2 pieces whole wheat toast • Fat free vegetable oil spray
Lunch	<ul style="list-style-type: none"> • Quarter pound burger with cheese • Medium french fries • 1 medium cola 	Lunch	<ul style="list-style-type: none"> • Caesar Salad with grilled chicken • 1 medium diet cola
Dinner	<ul style="list-style-type: none"> • Pork cutlet and mashed potatoes frozen dinner. • 12 fluid ounces lemonade 	Dinner	<ul style="list-style-type: none"> • Beef portabello and mashed potatoes frozen dinner. • 1 cup light ice cream • 12 fluid ounces lemonade.
Nutrition Information			
Calories 2050 kilocalories Total Fat 91 grams Saturated Fat 30 grams Carbohydrate 238 grams		Calories 1235 kilocalories Total Fat 36 grams Saturated Fat 15 grams Carbohydrate 139 grams	

Body Mass Index (BMI)

BMI is a numerical value used by health care providers to determine if a person is underweight, normal weight, overweight, or obese. These weight categories (underweight, normal weight, overweight, and obese) are used to estimate a person's overall risk for developing chronic diseases.

A body mass index calculator is available on the Center for Disease Control website:
<http://www.cdc.gov/nccdphp/dnpa/bmi/calc-bmi.htm>

Visit this website to learn your BMI and what it means.

It is important to note that BMI categories are not gender specific, and that BMI is not a measurement of body composition (fat and lean mass). Talk with your health care provider about your BMI. If you are pregnant, under 18, or a competitive athlete, this tool may not be an accurate measure of health or disease risk.

What dietary changes can help lower blood pressure?

Blood pressure is the pressure exerted by blood flow on artery walls. Blood pressure can change from minute to minute with changes in posture, exercise or sleep. **However, according to the American Heart Association blood pressure should normally be less than 120/80 mmHg for an adult.** Blood pressure that stays between 120-139/80-89 is considered prehypertension and above this level (140/90 mmHg or higher) is considered high (hypertension). Blood pressure is affected by multiple dietary factors. Many studies have shown that specific dietary changes can have powerful and beneficial effects on blood pressure.

A specific eating plan that may be prescribed to reduce high blood pressure is the "Dietary Approaches to Stop Hypertension" (DASH) diet. The DASH diet is rich in fruits, vegetables, and low fat dairy foods, and low in saturated and total fat. It also is low in cholesterol, high in dietary fiber, potassium, calcium, and magnesium, and moderately high in protein. This diet has been proven to lower blood pressure and prevent hypertension in some individuals. The DASH diet suggests:

- 7-8 daily servings from the grains and grain products group (Whole wheat products are encouraged).
- 4-5 daily servings from the vegetables group.
- 4-5 daily servings from the fruit group.
- 2-3 daily servings of low fat or non-fat dairy products.
- 2 or less daily servings from the meat, poultry, and fish group.
- 4-5 servings of nuts, seeds, or legumes every week.

How is fiber related to cardiovascular disease?

Fiber is a food component that comes from plants. Animal foods like meat, milk, eggs, and cheese do not contain any fiber. Foods that do contain fiber include:

- Whole grain breads, cereals, pasta, and rice
- Fruits
- Vegetables
- Beans
- Nuts
- Some soy products

It is important that everyone consume foods rich in fiber, but for people with diabetes or high cholesterol, fiber can be an added benefit. Studies have shown that 25-35 grams of fiber daily can reduce your risk of having a heart attack by as much as 40 percent. Diets high in fiber can also reduce LDL cholesterol levels, and may even lower blood pressure. Some research has even shown that higher fiber diets can help lower high blood glucose levels.

Tips for Increasing Fiber Intake

- Eat foods like whole grain breads and cereals, oatmeal, nuts, dry beans, peas, lentils, fruits, and vegetables often. Try to have one or two of these foods at each meal.
- Choose products labeled as a “good” or “excellent source of fiber” these labels will be on the front of food packages.
- Remember to eat five servings of fruits or vegetables each day.

Sample Menu for Increasing Fiber Intake

Menu 2			
Breakfast	<ul style="list-style-type: none"> • 1 cup oatmeal • 6 ounces skim milk • 1/2 grapefruit 		
Lunch	<ul style="list-style-type: none"> • 1 sandwich (2 ounces of meat on 2 slices of whole wheat bread) • 1/2 cup coleslaw • 1 banana 		
Dinner	<ul style="list-style-type: none"> • 3 ounce chicken breast • 1/3 cup brown rice • 1/2 cup green peas • 1 medium apple • 1 cup shredded lettuce salad with 1 tablespoon low-fat dressing • 8 ounces skim milk 		
Nutrition Information			
Calories	1360 kilocalories	Total Carbohydrate	195 grams
Total Fat	22 grams	Breakfast	60 grams
Saturated Fat	5 grams	Lunch	60 grams
Carbohydrate	195 grams	Dinner	60 grams
Fiber	27 grams		

How can people with diabetes minimize their risk for cardiovascular complications?

To reduce your risk for the cardiovascular complications of diabetes it is important to know the ABCs of diabetes.

- **“A”** stands for **Hemoglobin A1c**. A **hemoglobin A1c** test will give you an average of what your blood glucose levels (both fasting and post-prandial) have been over the past three months. Know your hemoglobin A1c and maintain a HbA1c level of 6.5 percent or lower.
- **“B”** stands for **Blood Pressure**. Know your blood pressure, and work to maintain your goal blood pressure reading within a normal range
- **“C”** stands for **Blood Cholesterol**. Know your blood cholesterol and lipid levels and maintain these values within your target range.

