

Diabetes, Heart Disease & Stroke



SAMPLE

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Life's Simple 7[®] is a program about the seven steps everyone should take to achieve ideal cardiovascular health. Learn more at mylifecheck.heart.org.



This booklet will help you:
Control Your Blood Sugar

Diabetes and Cardiovascular Risk

An estimated 21.1 million American adults are diagnosed with diabetes. It's estimated that another 8.1 million have it but aren't diagnosed. And, more than 80 million adults have prediabetes, which often leads to diabetes. Type 2 diabetes is the most common form, accounting for 90 to 95 percent of diagnosed cases in adults.

People with diabetes are at high risk for cardiovascular diseases such as coronary heart disease (which includes heart attack), stroke, peripheral vascular disease (PAD), heart failure and atrial fibrillation. At least 68 percent of adults over age 65 with diabetes will die of some form of heart disease and 16 percent will die from stroke.

Having diabetes is why it's very important for you to know and control your other risk factors for cardiovascular disease (CVD). This can help reduce your risk of a heart disease or stroke.

Understanding Diabetes

Most of the carbohydrates in the food we eat are turned into a sugar called **glucose**. The body uses glucose for energy and needs glucose to enter the cells. To help glucose get into the body's cells, the pancreas (an organ near the stomach) makes a hormone called **insulin**. Insulin acts as a “key,” unlocking the cell so blood glucose can enter.

When you have diabetes, your body doesn't make enough insulin or can't use its own insulin as well as it should, or both. This causes glucose to build up to excess levels in the blood.



How Diabetes Is Diagnosed

Your healthcare provider will do one of three tests to measure your glucose level to test for diabetes. Each test usually needs to be repeated on a second day to diagnose diabetes.

The most common is a blood test called a **fasting plasma glucose test (FPG)**. You must fast (nothing to eat or drink except water) for eight hours prior to the test. It is measured in milligrams per deciliter (mg/dL).

Diagnosis	Glucose Level
Normal	less than 100 mg/dL
Prediabetes	100 mg/dL to 125 mg/dL
Diabetes	126 mg/dL or higher

Another test is the **HbA1C (or A1C)** test.

It can be used to diagnose prediabetes and diabetes and for monitoring your diabetes.

The A1C test measures your average blood sugar control for the past two to three months.

No fasting is required for this test. Blood sugar is measured by the amount of glycosylated hemoglobin (A1C) in your blood.

Diagnosis	A1C
Normal	less than 5.7%
Prediabetes	5.7% to 6.4%
Diabetes	6.5% or higher

A third test is the **Oral Glucose Tolerance Test (OGTT)**. This test measures how well your body handles a standard amount of glucose. Your healthcare provider will draw your blood before and two hours after you drink a large, premeasured drink containing glucose. Then, your doctor can compare the before-and-after glucose levels contained in your plasma to see how well your body processed the sugar. These levels are measured in mg/dL.

Diagnosis	Glucose Level
Normal	Less than 140 mg/dL
Prediabetes	140 to 199 mg/dL
Diabetes	200 mg/dL or higher

What Type Are You?

There are two main types of diabetes: Type 1 and Type 2. A family history of diabetes can increase a person's risk of developing the condition.

Type 1 diabetes is usually diagnosed in children and young adults. However, it is a life-long, chronic condition and accounts for 5 to 10 percent of diabetes. With type 1, the pancreas makes little or no insulin. Without insulin, the body is unable to take the glucose (blood sugar) it gets from food into cells to fuel the body. People with type 1 diabetes must take insulin or other medicines daily.

Type 2 diabetes is the most common form of diabetes. It appears most often in adults. But adolescents and young adults are developing type 2 diabetes at growing rates. Type 2 diabetes develops when the body doesn't efficiently use the insulin it makes. This is called **insulin resistance**. Also, the pancreas may not make enough insulin for the body's needs. **Pre-diabetes** is a condition in which blood glucose levels are higher than normal, but not yet diabetic. Pre-diabetes often results from impaired fasting glucose or impaired glucose tolerance. People with pre-diabetes are at higher risk for developing type 2 diabetes and people with type 2 diabetes are at higher risk for developing heart disease and stroke.

Diabetes Increases CVD Risk

Uncontrolled diabetes can be very dangerous. Over time, high blood sugar can lead to many serious health problems. These include heart disease and stroke, blindness, kidney disease, nerve disease and limb amputations. Diabetes kills or contributes to the deaths of over 246,000 Americans each year.

Even when glucose levels are under control, diabetes greatly increases the risk of heart disease, which tends to be more severe in people with diabetes. They also have a higher risk of heart failure and other complications.



In fact, adults with diabetes have heart disease death rates about two to four times higher than adults without diabetes.

Diabetes also increases the risk of stroke and peripheral artery disease (disease of arteries in the arms or legs). The risk of stroke is up to six times higher among people with diabetes.

Other CVD Risk Factors

Many people with diabetes tend to:

- Have high LDL (bad) cholesterol levels.
- Have high blood pressure.
- Be overweight or obese.
- Be physically inactive.

When pre-diabetes or diabetes occur along with these other CVD risk factors, the risk of heart disease and stroke increases even more. Diabetes is associated with atherosclerosis (hardening of the arteries) and blood vessel disease. People with diabetes who also have high blood pressure also have higher risk for heart failure, kidney disease, heart attack and stroke.

When you have diabetes, you must take action to control these risk factors. It's also important for you to know the warning signs of heart attack and stroke and how to respond to them. They're listed on page 24 of this booklet.

Reducing Your Risk

Changing your habits is key in preventing coronary heart disease and stroke.

Medication may still be needed to control your risk factors. But you can reduce your risk by taking these actions:

- Control your diabetes.
- Don't smoke and avoid second-hand smoke.
- Control your blood pressure.
- Improve your cholesterol.
- Eat a heart-healthy diet.
- Reach and maintain a healthy weight.
- Be physically active.



Controlling Diabetes

If you're pre-diabetic, take steps now to delay or prevent type 2 diabetes. If you have type 2 diabetes, regular medical checkups are critical to help keep your blood sugar under control.

Your healthcare provider may regularly run an A1C test to monitor your condition. The results will give him or her a good idea of how well your diabetes treatment plan is working. If you have diabetes, your A1C goal is less than seven percent.

Work with your healthcare provider to develop healthy eating habits, control your weight and get regular physical activity. You may need to check your sugar level daily and monitor your carbohydrate intake. You may also need medicines to help control your blood sugar or insulin levels.

Remember, it's very important to control blood glucose to help reduce your risk of heart disease and stroke.



Don't Smoke

Smoking cigarettes and other tobacco products raises the risk of heart disease and stroke. It also increases the risk of cancer, lung disease and other major health problems. If you smoke, get help to quit. Also, avoid second-hand smoke.

Controlling Blood Pressure

When you have diabetes, it's important to keep your blood pressure under control. High blood pressure increases the risk of heart attack, stroke, heart failure, kidney failure and eye problems in people with diabetes.

You should have your blood pressure measured at every routine diabetes visit. Monitoring your blood pressure at home can be helpful in *addition* to regular monitoring at your healthcare provider's office. The American Heart Association recommends an automatic, cuff-style, bicep (upper-arm) monitor.

It is recommended that most people with diabetes maintain a blood pressure of less than 140/90 mm Hg. For some individuals, a lower systolic (the top number) of less than 130 may be appropriate.

If your blood pressure is high, your doctor will likely recommend adopting important healthy lifestyle behaviors prior to taking medicine to help lower it.

These include:

- Being more physically active.
- Losing weight if needed.
- Consuming less than 1,500 mg of sodium per day.
- Eating more fresh fruits, vegetables, whole grains and low-fat dairy products in place of other carbohydrates.

- Moderating your alcohol intake. If you drink alcohol, drink no more than one drink per day for a woman and two drinks per day for a man.

Controlling Cholesterol

Adults with diabetes should have their cholesterol checked at least once a year. Your healthcare provider will do a blood test called a “fasting lipoprotein profile”. It assesses several types of fat in the blood. It is measured in milligrams per deciliter (mg/dL). The test gives you four results: total cholesterol, LDL (bad) cholesterol, HDL (good) cholesterol, and triglycerides (blood fats). Talk to your doctor about your results and how this affects your overall risk.

If your cholesterol is high, your doctor will likely recommend adopting important healthy lifestyle changes prior to taking medicine to help lower it.

These include:

- Being more physically active.
- Losing weight if needed.
- Eating less saturated and *trans* fats
- Eating fruits, vegetables, whole grains and other healthier foods

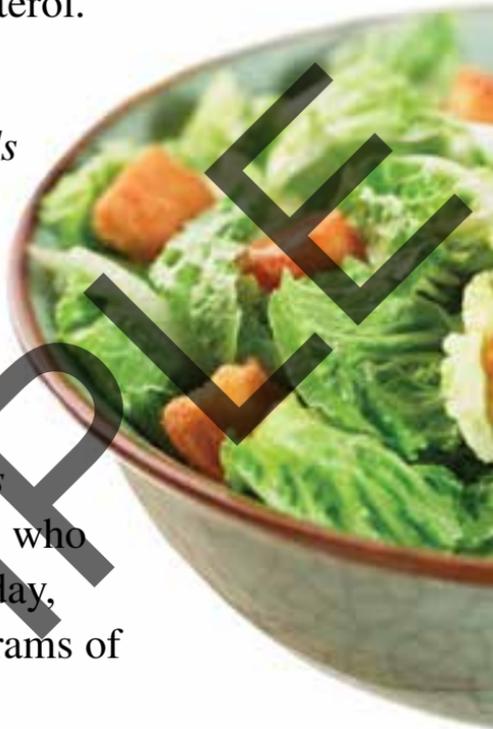
These lifestyle changes, especially weight reduction, can help improve most components of the cholesterol profile in diabetic patients.

Be sure to read the Nutrition Facts label on foods to see how much saturated and *trans* fat is in the food you're eating—and limit the amount you eat. Reducing your saturated and *trans* fat intake is especially important if your doctor has said you should lower your LDL cholesterol.

*The American Heart Association recommends that adults who would benefit from lowering LDL cholesterol limit their saturated fat intake to five to six percent of total calories each day.** For a person who needs 2,000 calories a day, this is about 11 to 13 grams of saturated fat.

It is also recommended that patients between 40 and 75 years of age with diabetes and LDL-C levels between 70 and 189 mg/dL are most likely to benefit by taking a statin, a cholesterol-lowering medicine.

** To learn more about our guidelines and scientific statements, visit [heart.org/statements](https://www.heart.org/statements).*



Healthy Eating

Nutrition plays an important role in the treatment of type 2 diabetes and CVD risk prevention.

Your healthcare team may work with you to develop a nutrition plan which includes fruits and vegetables, whole grains, legumes (beans and peas), and dairy products in place of other carbohydrates. Also working with your healthcare provider to develop an eating plan that distributes your calories and carbohydrates over the course of the day is important to managing your glucose levels.

If you take diabetes medicine, learn to time taking your medicine with snacks and meals. Carry easy-to-eat carbohydrates with you, such as bananas or whole grain granola bars, in case your blood sugar falls too low in between meals and snacks.



The American Heart Association recommends an eating plan that includes:

- Fruits and vegetables
- Whole-grains
- Low-fat dairy products
- Skinless poultry
- Fish
- Legumes (dried beans and peas)
- Nontropical vegetable oils
- Unsalted nuts and seeds



A healthy dietary pattern should also limit:

- Saturated and *trans* fats
- Red meat
- Sodium (salt)
- Sweets, added sugars and sugar-sweetened beverages

If you drink alcohol, do so in moderation. That means no more than one drink per day for women or two drinks per day for men.

Heart-Check Mark

The American Heart Association can help you make smarter choices when grocery shopping. Look for products with the Heart-Check mark throughout the grocery store.



Visit heartcheckmark.org for more information and a list of certified foods.

Losing Weight

Excess weight increases your risk of heart disease. Obesity strains your heart and raises blood pressure. It also contributes to higher LDL (bad) cholesterol and triglyceride levels, and lower HDL (good) cholesterol levels.

Your healthcare provider may suggest losing some weight to help control your diabetes and lower your CVD risk. A weight loss of three to five percent sustained over time is associated with clinically meaningful health benefits. Larger weight loss (five to 10 percent) can produce even greater benefits. Weight loss helps to lower insulin resistance, body fat and blood pressure levels.



Ask your healthcare provider to help you set a healthy weight goal. He or she may prescribe a plan that adjusts your calorie intake to lose weight safely. Work together to form a plan that lets you choose from a variety of foods (including your favorites).

Eating fewer foods high in calories and increasing physical activity will help you lose extra pounds and maintain a healthy weight. Following the tips in the Healthy Eating section (page 12) and Physical Activity section (page 16) can help.

If lifestyle changes don't result in meeting your desired weight-loss goals, talk to your doctor about other weight loss alternatives, including medications or surgery. A body mass index (BMI) of 30 kg/m² or more (or 25 to 30 if you are managing diabetes and another condition) may mean that weight loss medications may be considered. To learn more about BMI, visit heart.org/bmi.

If weight loss medications are prescribed, your doctor should be sure that you know about the drugs and their side effects. You should also receive lifestyle support along with the prescription. If you have not lost five percent of your body weight after three months, your healthcare provider should evaluate if a new plan should be tried.

In cases of severe obesity, weight loss surgery, also called bariatric or metabolic surgery, may be considered.

Physical Activity

Physical activity is as important as your healthy eating plan! Regular physical activity helps lower insulin resistance. This means your body can use its own insulin more effectively.

Physical activity can help control blood cholesterol, diabetes and weight. It can also help lower blood pressure and reduce your risk of heart disease and stroke.

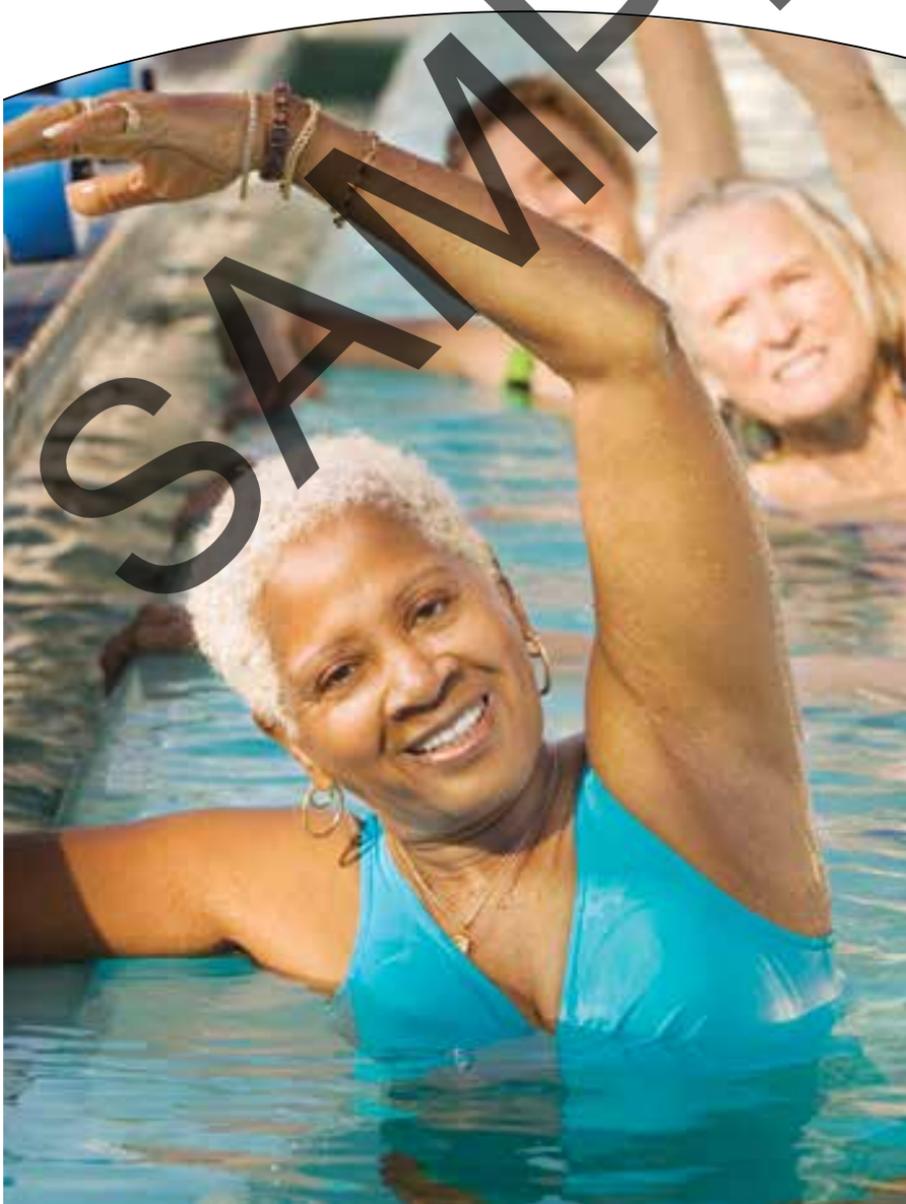
- Physical activity burns calories and helps lower blood glucose levels. That helps your body use food for energy more efficiently.
- Physical activity improves blood flow through the small blood vessels (capillaries). It also improves your heart's pumping power.
- The amount of physical activity necessary to achieve a healthy body weight varies greatly from person to person.

What You Can Do

Regular, moderate-to-vigorous physical activity can help reduce your risk of heart disease. You don't have to be an athlete to lower your risk! Moderate-intensity activities such as brisk walking, gardening, swimming, housework or dancing can all help your heart.

Some complications of diabetes make certain types of physical activity safer than others. Adding physical activity to your diabetes care plan will require a careful balance of food and medication to keep your blood sugar under control.

If you have a chronic condition or a specific medical question, talk with your healthcare provider to find out what kinds and amounts of physical activities are best for you. He or she can recommend a physical activity plan suited to you. Your current fitness level, any



special health concerns and your diabetes treatment plan will all play a role.

You can work up to at least 150 minutes of moderate-intensity aerobic physical activity each week or 75 minutes of vigorous intensity aerobic physical activity (e.g., jogging, running) every week, or a combination of the two. Also, you need two or more days a week of muscle-strengthening activities that work all major muscle groups.

If you need to lower your cholesterol or blood pressure, aim for 40-minutes of moderate to vigorous physical activity three to four times per week.

If you don't have longer blocks of time, you can exercise in 10- to 15-minute segments throughout the week.

Diabetes and Stroke

If you have diabetes, you need to control the risk factors discussed previously. But watch out for other stroke risk factors, too. Talk with your healthcare provider about how to manage any of these:

Atrial Fibrillation (AFib)

In this heart rhythm disorder, the heart's upper chambers "quiver" instead of beating effectively. This can allow blood to pool and clot in the atria. A clot may break off, enter the bloodstream and lodge in an artery leading to a part of the brain. This causes an embolic stroke. AFib increases your risk of stroke by five times.



Previous Heart Attack

If you've had a heart attack, you're at higher risk of having another one. You're also at higher risk of having an ischemic stroke. This is the type caused by a blocked blood vessel that keeps oxygen and nutrients from reaching part of the brain.

Other Heart Disease

People with coronary heart disease or heart failure have a higher risk of stroke. Dilated cardiomyopathy (an enlarged heart), heart valve disease and some types of congenital heart defects also raise stroke risk.

Carotid or Other Artery Disease

Fatty deposits (plaque) in a carotid artery (one of the neck arteries leading to the brain) raise stroke risk. But treatment options are available to remove the plaque buildup.

Peripheral artery disease (PAD) is the narrowing of blood vessels carrying blood to leg and arm muscles. Diabetes increases PAD risk. And people with PAD have a higher risk of an ischemic stroke.

Transient Ischemic Attacks (TIAs)

TIAs are “warning strokes” that only last a short time (usually a few minutes). Don’t ignore them! Call 9-1-1 to get medical help right away. (Review the stroke warning signs in the back of this booklet.) Stroke risk is very high if you’ve had a TIA.

Certain Blood Disorders

A high red blood cell count makes blood clots more likely. This increases stroke risk. Sickle cell anemia is a genetic disorder that mainly affects African Americans. “Sickled” red blood cells are less able to carry oxygen to the body’s tissues and organs. They also tend to stick to blood vessel walls. This can block arteries in the brain and cause a stroke.

Other Things **You Can Do**

Other factors contribute to heart disease and stroke risk, too. Talk to your healthcare provider to learn more.

Find healthy ways to handle stress. Too much stress over a long time, and unhealthy responses to it, may create health problems in some people. For example, people under stress may overeat, start smoking or smoke more than they otherwise would. A healthier way to handle stress is to increase physical activity.

Avoid excessive alcohol. Drinking too much alcohol raises blood pressure, can cause heart failure and can also lead to stroke. If you don't drink, don't start. And if you do drink, do so in moderation. Many alcoholic drinks have sugars in them, and if your blood sugar is already high, drinking alcohol can make it even higher. Women shouldn't have more than one alcoholic drink a day. Men shouldn't have more than two a day.

Don't use illegal drugs. Intravenous drug abuse carries a high risk of infections of the heart (called endocarditis) and stroke. Researchers have also concluded that cocaine use has been linked to strokes and heart attacks.

For **More Information**

We want people to experience more of life's precious moments. To do that, we want to help you be healthier—in heart and mind. It's why we've made better heart and brain health our mission.

Life is why™ we have created many educational booklets like this to help you and your family make healthier choices to reduce your risk of heart disease and stroke, manage disease or care for a loved one.

Visit **mylifecheck.heart.org** and complete our My Life Check® assessment to get your personal heart score and a custom plan with the seven steps you may need to improve your heart health.

To learn more, call us toll-free at **1-800-AHA-USA1 (1-800-242-8721)** or contact your nearest American Heart Association office. You can also visit our Web site, **heart.org**.

For information on stroke, call **1-888-4-STROKE (1-888-478-7653)** or visit us online at **strokeassociation.org**.

Heart Attack Warning Signs

Some heart attacks are sudden and intense, but most of them start slowly, with mild pain or discomfort. Here are some of the signs that can mean a heart attack is happening.

- **Chest discomfort.** Most heart attacks involve discomfort in the center of the chest that lasts more than a few minutes, or that goes away and comes back. It can feel like uncomfortable pressure, squeezing, fullness or pain.
- **Discomfort in other areas of the upper body.** Symptoms can include pain or discomfort in one or both arms, the back, neck, jaw or stomach.
- **Shortness of breath.** This may occur with or without chest discomfort.
- **Other signs.** These may include breaking out in a cold sweat, nausea or lightheadedness.

As with men, women's most common heart attack symptom is chest pain or discomfort. But women are somewhat more likely than men to experience some of the other common symptoms, particularly shortness of breath, nausea/vomiting and back or jaw pain.

Stroke Warning Signs

- Sudden numbness or weakness of the face, arm or leg, especially on one side of the body
- Sudden confusion, or trouble speaking or understanding
- Sudden trouble seeing in one or both eyes
- Sudden trouble walking, dizziness or loss of balance or coordination
- Sudden, severe headache with no known cause

F.A.S.T. is an easy way to remember how to recognize a stroke and what to do. Spot a stroke FAST. **F**ace drooping. **A**rm weakness. **S**peech difficulty. **T**ime to call 9-1-1.

Dial 9-1-1 Fast

Heart attack and stroke are life-or-death emergencies—every second counts. If you suspect you or someone you are with has any of the symptoms of heart attack or stroke, **immediately call 9-1-1 or your emergency response number** so an ambulance can be sent. **Don't delay—get help right away!**

For a stroke, also note the time when the first symptom(s) appeared. If given within 3 to 4.5 hours of the start of symptoms, a clot-busting drug may improve the chances of getting better faster.

Cut along dotted line and keep



For heart- or risk-related information,
call the American Heart Association at
1-800-AHA-USA1 (1-800-242-8721)
or visit us online at heart.org.

For stroke information, call our American Stroke
Association at **1-888-4-STROKE (1-888-478-7653)** or visit
strokeassociation.org. For information on life after stroke,
call and ask for the Stroke Family Support Network.

The statistics in this brochure were up to date at publication.
For the latest statistics, see the Heart Disease and
Stroke Statistics Update at heart.org/statistics.



National Center
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