



Diabetes, Heart Disease, & Stroke

On this page:

- [What is the link between diabetes, heart disease, and stroke?](#)
- [What else increases my chances of heart disease or stroke if I have diabetes?](#)
- [How can I lower my chances of a heart attack or stroke if I have diabetes?](#)
- [How do doctors diagnose heart disease in people with diabetes?](#)
- [What are the warning signs of heart attack and stroke?](#)
- [Clinical Trials for Diabetes, Heart Disease, & Stroke](#)

Having [diabetes](#) means you are more likely to develop [heart disease](#). People with diabetes are also more likely to have certain risk factors, such as [high blood pressure](#) [NIH](#) or high [cholesterol](#), that increase their chances of having a [heart attack](#) or a [stroke](#).

If you have diabetes, you can protect your heart and health by managing your [blood glucose](#), also called blood sugar. You can also protect yourself by controlling your high blood pressure and high cholesterol. If you smoke, get help to stop.

What is the link between diabetes, heart disease, and stroke?

High blood glucose from diabetes can damage your [blood vessels](#) and the nerves that control your heart and blood vessels. Over time, this damage can lead to heart disease.¹

People with diabetes tend to develop heart disease at a younger age than people without diabetes. Adults with diabetes are nearly twice as likely to have heart disease or stroke as adults without diabetes.^{2,3}


The good news is that the steps you take to manage your diabetes also help [lower your chances of having heart disease or stroke](#).

What else increases my chances of heart disease or stroke if I have diabetes?


Your risk for heart disease is greater if you are male rather than female, whether you have diabetes or not.² If you do have diabetes, other factors add to your chances of developing heart disease or having a stroke.

Smoking

Smoking raises your risk of developing heart disease. If you have diabetes, it is important to stop smoking, because both smoking and diabetes narrow blood vessels. Smoking also increases your chances of developing other long-term problems such as

- [lung disease](#) [NIH](#) 
- lower leg infections and [ulcers](#)
- foot or leg [amputation](#)

High blood pressure

If you have [high blood pressure](#) [NIH](#) , your heart works harder to pump blood. High blood pressure can strain your heart, damage blood vessels, and increase your risk of heart attack, stroke, and eye or kidney problems. Have your blood pressure checked regularly and work with your doctor to control or lower high blood pressure.

Abnormal cholesterol levels

[Cholesterol](#) [NIH](#)  is a type of fat, produced by your [liver](#) and found in your blood. You have two kinds of cholesterol in your blood: LDL and HDL.

LDL, often called “bad” cholesterol, can build up and clog your blood vessels. High levels of LDL cholesterol raise your risk of developing heart disease. HDL is sometimes called “good cholesterol.” Higher levels of HDL is linked to lower risk for heart disease and stroke. To improve LDL and HDL levels, limit the amount of fat in your eating plan, eat more plant-based foods, and get regular physical activity.

Another type of blood fat, [triglycerides](#), also can raise your risk of heart disease when the levels are higher than recommended by your health care team.

Obesity and belly fat

Being [overweight or having obesity](#) can make it harder to manage your diabetes and raise your risk for many health problems, including heart disease and high blood pressure. If you are overweight, a healthy [eating plan](#) with fewer calories and more physical activity often will lower your blood glucose levels and reduce your need for medicines.

Excess belly fat around your waist, even if you are not overweight, can raise your chances of developing heart disease.

You have excess belly fat if your waist measures

- more than 40 inches and you are a man
- more than 35 inches and you are a woman

Chronic kidney disease

Heart disease is closely linked with chronic kidney disease, a condition in which your kidneys are damaged and can't filter blood the way they should. Having diabetes is a risk factor for developing kidney disease, which affects about 40% of people with diabetes. Other risk factors for developing kidney disease are high blood pressure and a family history of kidney failure.

If you have risk factors, get tested for kidney disease and protect your kidneys by making healthy food choices, being more active, aiming for a healthy weight, and managing health conditions that cause kidney damage.

Family history of heart disease

A family history of heart disease may add to your chances of developing the condition. If one or more of your family members had a heart attack before age 50, you have double the chance of developing heart disease compared with people who have no family history of the disease.⁴

You can't change whether heart disease runs in your family. But if you have diabetes, it's even more important to take steps to protect yourself from heart disease and decrease your chances of having a stroke.

How can I lower my chances of a heart attack or stroke if I have diabetes?

Taking care of your diabetes is important to help you protect your heart. You can substantially lower your chances of having a heart attack or stroke by taking the following steps to keep your heart and blood vessels healthy.⁵

Manage your diabetes ABCs

Know your diabetes ABCs to help you manage your blood glucose, blood pressure, and cholesterol. Stop smoking if you have diabetes to lower your chances of developing heart disease.

A is for the A1C test

The [A1C test](#) shows your average blood glucose level over the past 3 months. This is different from the blood glucose checks you do every day. The higher your A1C number, the higher your blood glucose levels have been during the past 3 months. High levels of blood glucose can harm your heart, blood vessels, kidneys, feet, and eyes.

The A1C goal for many people with diabetes is below 7%. Some people may do better with a slightly higher A1C goal. Your A1C goals may also change as you get older and your lifestyle changes. Ask your health care team what your goal should be.

B is for blood pressure

Blood pressure is the force of your blood against the wall of your blood vessels. If your blood pressure gets too high, it makes your heart work too hard. High blood pressure can cause a heart attack or stroke

and damage your kidneys and eyes.

The blood pressure goal for most people with diabetes is below 140/90 mm Hg. Ask what your goal should be.

C is for cholesterol

A buildup of cholesterol, a form of fat found in your blood, can cause a heart attack or stroke. Ask your health care team what your cholesterol numbers should be. If you are over 40 years old, you may need to take medicine, such as a [statin](#) [NIH](#) [↗](#), to lower your cholesterol levels and protect your heart. Some people with very high LDL (“bad”) cholesterol may need to take medicine starting at a younger age.

[Learn about getting your cholesterol checked](#) [↗](#).

S is for stop smoking

Quitting smoking is especially important for people with diabetes because both smoking and diabetes narrow blood vessels, so your heart has to work harder. E-cigarettes aren’t a safe option either.

If you quit smoking

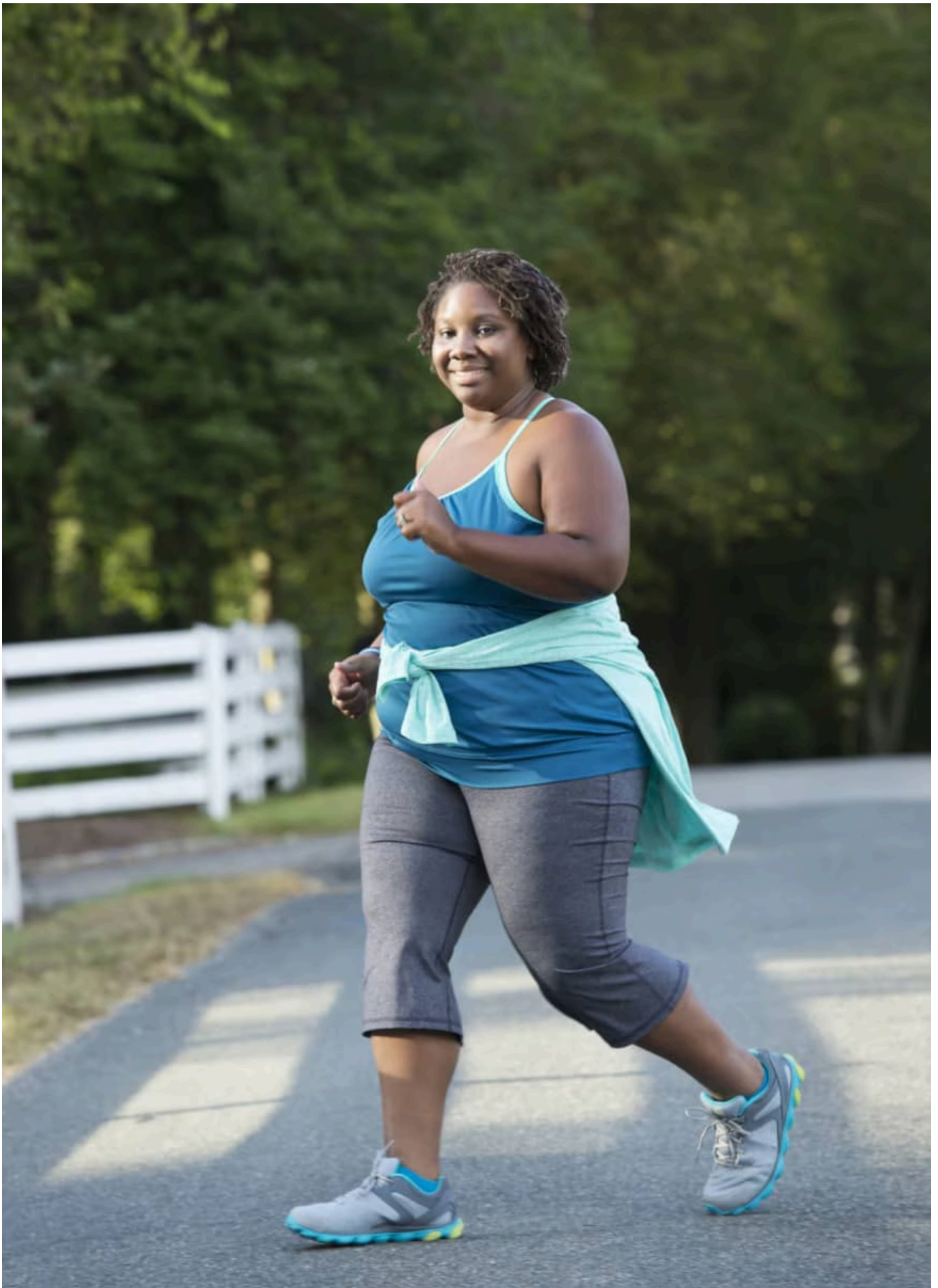
- you will lower your risk for heart attack; stroke; nerve, kidney, and eye disease; and amputation
- your blood glucose, blood pressure, and cholesterol levels may improve
- your blood circulation will improve
- you may have an easier time being physically active

If you smoke or use other tobacco products, stop. Ask for help so you don’t have to do it alone. You can start by calling the National Quitline at 1-800-QUITNOW or 1-800-784-8669. For tips on quitting, go to [Smokefree.gov](#) [↗](#).

Ask your health care team about your goals for A1C, blood pressure, and cholesterol, and what you can do to reach these goals. To improve your diabetes self-management skills, you may want a referral to a diabetes educator or a [registered dietitian](#). [Medicare, some private insurers, and other organizations](#) will provide financial assistance for some of these services.

You can keep track of your ABCs with a diabetes record form. You can use it when you meet with your health care team in person or remotely. Talk with your team about your goals and how you are doing, and whether you need to make any changes to your diabetes care plan.

Develop or maintain healthy lifestyle habits



Develop or maintain healthy lifestyle habits. Physical activity can help you manage your diabetes and may help you cope with stress.

[Healthy lifestyle habits](#) that you stick with can help you manage your diabetes and prevent heart disease.

- Follow your [healthy eating plan](#).
- Make physical activity [part of your routine](#).
- Stay at or get to a healthy weight.
- Get enough sleep.

Learn more about these tips to [manage diabetes](#).

[Watch a video about what you can do to keep your heart healthy](#) [↗](#).

[Learn about the Body Weight Planner](#), which may help you create a personal plan to reach your goal weight.

Learn to manage stress



Yoga and other forms of exercise can help reduce stress.

Managing diabetes is not always easy. Feeling stressed, sad, lonely, or angry is common when you are living with diabetes. You may know what to do to stay healthy but may have trouble sticking with your plan over time. Long-term stress can raise your blood glucose and blood pressure, but you can learn ways to lower your stress. Try deep breathing, gardening, taking a walk, doing yoga, talking with a loved one, working on a hobby, or listening to your favorite music. Learn more about healthy ways to [cope with stress](#) [NIH](#) [↗](#).

Take medicine to protect your heart

Medicines may be an important part of your treatment plan. Your doctor will prescribe medicine based on your specific needs. Medicine may help you

- meet your A1C (blood glucose), blood pressure, and cholesterol goals.
- reduce your risk of blood clots, heart attack, or stroke.
- treat [angina](#) [NIH](#) [↗](#), or chest pain that is often a symptom of heart disease. Angina can also be an early symptom of a heart attack.

- treat heart failure, which is a form of heart disease in which your heart cannot pump blood well enough for your body to work properly.



Take medicines as prescribed.

Ask your doctor whether you should take daily aspirin. Aspirin is not safe for everyone. Your doctor can tell you whether taking aspirin is right for you and exactly how much to take.

Statins can reduce the risk of having a heart attack or stroke in some people with diabetes. In addition, certain diabetes medicines have been shown to reduce the risk of heart attacks and death in patients at very high risk of having a heart attack. Talk with your doctor to find out whether taking a statin or a diabetes medicine that reduces heart attack risk is right for you.

Take medicines the way your doctor or health care team tells you to. Talk with your doctor or [pharmacist](#) if you have questions about your medicines. Before you start a new medicine, ask your doctor about possible side effects and how you can avoid them. If the side effects of your medicine bother you, tell your doctor. Don't stop taking your medicines without checking with your doctor first.

How do doctors diagnose heart disease in people with diabetes?

Doctors [diagnose heart disease in people with diabetes](#) [NIH](#) based on their

- symptoms
- medical and family history
- how likely they are to have heart disease
- a physical exam
- results from tests and procedures

Tests used to monitor your diabetes—A1C, blood pressure, and cholesterol—help your doctor decide whether it is important to do additional tests to check your heart health or to refer you to a specialist such as a [cardiologist](#).



Your health care professional will do a physical exam.

Ask your health care team these questions.

- What can we do to lower my chances of getting heart disease?
- How can we work together to help me maintain my goals for A1C, blood pressure, and cholesterol?
- What medicines, such as aspirin or a statin, will help protect my heart?
- Are there diabetes medicines that will help protect my heart?

What are the warning signs of heart attack and stroke?

Call 9-1-1 right away if you have any of these warning signs of a heart attack

- pain or pressure in your chest that lasts longer than a few minutes or goes away and comes back
- pain or discomfort in one or both of your arms or shoulders, or your back, neck, or jaw
- shortness of breath
- sweating or light-headedness
- indigestion or nausea (feeling sick to your stomach)
- feeling very tired

Treatment works best when it is given right away. Warning signs can be different in different people. You may not have all the listed symptoms.

Women may experience chest pain, nausea, and vomiting; feel very tired (sometimes for days); and have pain that spreads to the back, neck, throat, arms, shoulders, or jaw. People with [diabetes-related nerve damage](#) may not notice any chest pain.

If you have [angina](#) [NIH](#), it's important to know how and when to seek medical treatment.



Call 9-1-1 if you have the warning signs of a heart attack or stroke. Treatment works best when given right away.

Call 9-1-1 right away if you have any of these warning signs of a stroke, including sudden

- weakness or numbness of your face, arm, or leg on one side of your body
- confusion, or trouble talking or understanding
- dizziness, loss of balance, or trouble walking
- trouble seeing out of one or both eyes
- sudden, severe headache

If you have any one of these warning signs, call 9-1-1. You can help prevent permanent damage by getting to a hospital within an hour of a stroke.

Clinical Trials for Diabetes, Heart Disease, & Stroke

The NIDDK conducts and supports clinical trials in many diseases and conditions, including diabetes. The trials look to find new ways to prevent, detect, or treat disease and improve quality of life.

What are clinical trials for diabetes, heart disease, and stroke?

Clinical trials—and other types of clinical studies—are part of medical research and involve people like you. When you volunteer to take part in a clinical study, you help doctors and researchers learn more about disease and improve health care for people in the future.

Researchers are studying many aspects of diabetes, heart disease, and stroke, such as

- risk factors for heart disease and stroke in specific populations, such as Black Americans with diabetes
- improved imaging techniques and tests to help diagnose and treat conditions that lead to heart attacks and stroke
- the role of genetics in diabetes, heart disease, and stroke



[Find out if clinical studies are right for you](#) [NIH](#) .

Watch a video of NIDDK Director Dr. Griffin P. Rodgers explaining the importance of participating in clinical trials.



Why Should I Join a Clinical Trial?



What clinical trials for heart disease and stroke are looking for participants?

You can view a filtered list of clinical studies on diabetes and heart disease that are federally funded, open, and recruiting at [ClinicalTrials.gov](#) [NIH](#) . A separate list of clinical studies on diabetes and stroke is also available at [ClinicalTrials.gov](#) [NIH](#) . You can expand or narrow the list to include clinical studies from industry, universities, and individuals; however, the National Institutes of Health does not review these studies and cannot ensure they are safe. Always talk with your health care provider before you participate in a clinical study.

References

- [1] Nanayakkara N, Curtis AJ, Heritier S, et al. Impact of age at type 2 diabetes mellitus diagnosis on mortality and vascular complications: systematic review and meta-analyses. *Diabetologia*. 2021;64(2):275–287. doi:10.1007/s00125-020-05319-w
- [2] Barrett-Connor E, Wingard D, Wong N, Goldberg R. [Chapter 18: Heart disease and diabetes](#) (PDF, 1.07 MB) . In: Cowie CC, Casagrande SS, Menke A, et al, eds. *Diabetes in America*, 3rd ed. NIH Pub No. 17-1468. National Institutes of Health; 2018:18.1–18.30
- [3] Pikula A, Howard BV, Seshadri S. [Chapter 19: Stroke and diabetes](#) (PDF, 493.93 KB) . In: Cowie CC, Casagrande SS, Menke A, et al, eds. *Diabetes in America*, 3rd ed. NIH Pub No. 17-1468. National Institutes of Health; 2018:19.1–19.23
- [4] Moonesinghe R, Yang Q, Zhang Z, Khoury MJ. Prevalence and cardiovascular health impact of family history of premature heart disease in the United States: analysis of the National Health and Nutrition Examination Survey, 2007–2014. *Journal of the American Heart Association*. 2019;8(14):e012364. doi:10.1161/JAHA.119.012364
- [5] Wong ND, Zhao Y, Patel R, et al. Cardiovascular risk factor targets and cardiovascular disease event risk in diabetes: a pooling project of the Atherosclerosis Risk in Communities Study, Multi-Ethnic Study of Atherosclerosis, and Jackson Heart Study. *Diabetes Care*. 2016;39(5):668–676. doi:10.2337/dc15-2439

Last Reviewed April 2021

 Previous: Preventing Diabetes Problems	Next:  Low Blood Glucose (Hypoglycemia)
---	--

This content is provided as a service of the [National Institute of Diabetes and Digestive and Kidney Diseases](#) (NIDDK), part of the National Institutes of Health. NIDDK translates and disseminates research findings to increase knowledge and understanding about health and disease among patients, health professionals, and the public. Content produced by NIDDK is carefully reviewed by NIDDK scientists and other experts.

The NIDDK would like to thank:

John B. Buse, M.D., Ph.D., Chief, Division of Endocrinology, and Director, NC Translational and Clinical Sciences Institute, University of North Carolina School of Medicine

 healthinfo@niddk.nih.gov

 1-800-860-8747

 @NIDDKgov