



Heart Attack: What You Need to Know

What is a Heart Attack?

The heart works 24 hours a day, pumping oxygen and nutrient-rich blood to the body. Blood is supplied to the heart through its coronary arteries. If a blood clot suddenly blocks a coronary artery, it cuts off most or all blood supply to the heart, and a heart attack results.

Cells in the heart muscle that do not receive enough oxygen-rich blood begin to die. The more time that passes without treatment to restore blood flow, the greater the damage to the heart.

Each year, more than one million people in the U.S. have a heart attack and about half—515,000—of them die. Half of those who die do so within one hour of the start of symptoms and before reaching the hospital.

A heart attack is an emergency. Call 9-1-1 if you think you or someone else may be having a heart attack. Prompt treatment of a heart attack can help prevent or limit damage to the heart and prevent sudden death.

It is important to call 9-1-1 because emergency personnel can give a variety of treatments and medicines at the scene. They carry drugs and equipment that can help your medical condition, including:

- oxygen
- heart medications, such as nitroglycerin
- pain relief treatments, such as morphine
- defibrillators that can restart the heart if it stops beating

If blood flow in the blocked artery can be restored quickly, permanent heart damage may be prevented. Yet, many people do not seek medical care for two hours or more after symptoms start.

The symptoms of a heart attack can include chest discomfort, discomfort in other areas of the upper body, shortness of breath, and other symptoms.

Discomfort can occur in other areas of the upper body, including pain or numbness in one or both arms, the back, neck, jaw or stomach.

Shortness of breath often happens along with, or before chest discomfort.

Other symptoms may include breaking out in a cold sweat, having nausea and vomiting, or feeling light-headed or dizzy.

Signs and symptoms vary from person to person. In fact, if you have a second heart attack, your symptoms may not be the same as the first heart attack. Some people have no symptoms. This is called a “silent” heart attack.

Angina is chest pain or discomfort that occurs when your heart muscle does not get enough blood. Angina symptoms can be very similar to heart attack symptoms. If you have angina and notice a sudden change or worsening of your symptoms, talk with your doctor right away.

If you think you may be having a heart attack, or if your angina pain does not go away as usual when you take your angina medication as directed, call 9-1-1 for help. You can begin to receive life saving treatment in the ambulance on the way to the emergency room.



Causes and Risk Factors

Most heart attacks are caused by a blood clot that blocks one of the coronary arteries, the blood vessels that bring blood and oxygen to the heart muscle. When blood cannot reach part of your heart, that area starves for oxygen. If the blockage continues long enough, cells in the affected area die.

Coronary artery disease is the most common underlying cause of a heart attack. Coronary artery disease is the hardening and narrowing of the coronary arteries caused by the buildup of plaque inside the walls of the arteries. Over time, the buildup of plaque can:

- narrow the arteries so that less blood flows to the heart muscle,
- completely block the arteries and flow of blood, or
- cause blood clots to form and block the arteries.

A less common cause of heart attacks is a severe spasm or tightening of the coronary artery that cuts off blood flow to the heart. These spasms can occur in persons with or without coronary artery disease. Artery spasm can sometimes be caused by emotional stress, exposure to cold, cigarette smoking, or by taking certain drugs like cocaine.

Certain factors make it more likely that you will develop coronary artery disease and have a heart attack. These risk factors include some things you cannot change. If you are a man over age 45 or a woman over age 55 you are at greater risk. Having a family history of early heart disease, diagnosed in a father or brother before age 55 or in a mother or sister before age 65 is another risk factor.

You are also at risk if you have a personal history of angina or previous heart attack, or if you have had a heart procedure such as angioplasty or heart bypass.

Importantly, there are many risk factors that you can change. These include:

- smoking
- obesity
- physical inactivity
- high blood pressure
- high blood cholesterol
- diabetes

You can help prevent a heart attack by knowing about your risk factors for coronary artery disease and heart attack and taking action to lower your risks.

You can lower your risk of having a heart attack, even if you have already had a heart attack or have been told that your chances of having a heart attack are high. To prevent a heart attack, you will need to make lifestyle changes. You may also need to get treatment for conditions that raise your risk.

You can make lifestyle changes to lower your risk of having a heart attack.

- Eat a healthy diet to prevent or reduce high blood pressure and high blood cholesterol, and to maintain a healthy weight.
- If you smoke, quit.
- Exercise as directed by your doctor.
- If you are obese or overweight, lose weight gradually.
- Get treatment for related conditions that might make having a heart attack more likely.
- If you have high blood cholesterol, follow your doctor's advice about lowering it. Take medications to lower your cholesterol as directed.
- Get treatment for related conditions that might make having a heart attack more likely.

- If you have high blood pressure, follow your doctor's advice about keeping it under control. Take blood pressure medications as directed.
- If you have diabetes, sometimes called high blood sugar, follow your doctor's advice about keeping blood sugar levels under control. Take your medicines as directed.

Diagnosis and Treatment

Diagnosis and treatment of a heart attack can begin when emergency personnel arrive after you call 9-1-1. Do not put off calling 9-1-1 because you are not sure that you are having a heart attack.

Diagnosis

At the hospital emergency room, doctors will work fast to find out if you are having or have had a heart attack. They will consider your symptoms, medical and family history, and test results. Initial tests will be quickly followed by treatment if you are having a heart attack.

Tests used in diagnosing a heart attack include an electrocardiogram, blood tests, nuclear heart scan, cardiac catheterization, and coronary angiography.

The electrocardiogram, also known as ECG or EKG, is used to measure the rate and regularity of your heartbeat.

Blood tests are also used in diagnosing a heart attack. When cells in the heart die, they release enzymes into the blood. They are called markers or biomarkers. Measuring the amount of these markers in the blood can show how much damage was done to your heart. Doctors often repeat these tests to check for changes.

The nuclear heart scan uses radioactive tracers to outline the heart chambers and major blood vessels leading to and from the heart. A nuclear heart scan shows any damage to your heart muscle.

In cardiac catheterization, a thin, flexible tube is passed through an artery in your groin or arm to reach the coronary arteries. This test allows your doctor to:

- determine blood pressure and flow in the heart's chambers
- collect blood samples from the heart, and
- examine the arteries of the heart by x-ray.

Coronary angiography is usually done with the cardiac catheterization. A dye that can be seen on an x-ray is injected through the catheter into the coronary arteries. It shows where there are blockages and how severe they are.

Treatment

Treatment for a heart attack may begin in the ambulance or in the emergency department and continue in a special area of the hospital called a coronary care unit.

The coronary care unit is specially equipped with monitors that continuously monitor your vital signs. These include

- an EKG which detects any heart rhythm problems
- a blood pressure monitor, and
- pulse oximetry, which measures the amount of oxygen in the blood.

In the hospital, if you have had or are having a heart attack, doctors will work quickly to restore blood flow to your heart and continuously monitor your vital signs to detect and treat complications.

Restoring blood flow to the heart can prevent or limit damage to the heart muscle and help prevent another heart attack. Doctors may use clot-busting drugs called thrombolytics and procedures such as angioplasty.

- **Clot-busters or thrombolytic drugs** are used to dissolve blood clots that are blocking blood flow to the heart. When given soon after a heart attack begins, these drugs can limit or prevent permanent damage to the heart. To be most effective, these drugs must be given within one hour after the start of heart attack symptoms.
- **Angioplasty procedures** are used to open blocked or narrowed coronary arteries. A stent, which is a tiny metal mesh tube, may be placed in the artery to help keep it open.
- **Coronary artery bypass surgery** uses arteries or veins from other areas in your body to bypass your blocked coronary arteries.

Many medications are used to treat heart attacks. They include beta blockers, ACE inhibitors, nitrates, anticoagulants, antiplatelet medications, and medications to relieve pain and anxiety.

- **Beta blockers** slow your heart rate and reduce your heart's need for blood and oxygen. As a result, your heart beats with less force, and your blood pressure falls. Beta blockers are also used to relieve angina and prevent second heart attacks and correct an irregular heart-beat.
- **Angiotensin-converting enzyme or ACE inhibitors** lower your blood pressure and reduce the strain on your heart. They are used in some patients after a heart attack to help prevent further weakening of the heart and increase the chances of survival.

- **Nitrates**, such as nitroglycerin, relax blood vessels and relieve chest pain. Anticoagulants, such as heparin and warfarin, thin the blood and prevent clots from forming in your arteries.
- **Antiplatelet medications**, such as aspirin and clopidogrel, stop platelets from clumping together to form clots. They are given to people who have had a heart attack, have angina, or have had an angioplasty.
- **Glycoprotein IIb-IIIa inhibitors** are potent antiplatelet medications given intravenously to prevent clots from forming in your arteries.
- Doctors may also prescribe medications to relieve pain and anxiety and oxygen therapy or medications to treat irregular heart rhythms which often occur during a heart attack.

While you are still in the hospital or after you go home, your doctor may order other tests, such as an echocardiogram. An echocardiogram uses ultrasound to make an image of the heart which can be seen on a video monitor. It shows how well the heart is filling with blood and pumping it to the rest of the body.

Your doctor may also order a stress test to see how well your heart works when it has a heavy workload. You run on a treadmill or pedal a bicycle or receive medicine through a vein in your arm to make your heart work harder. EKG and blood pressure readings are taken before, during, and after the test to see how your heart responds.

Often, an echocardiogram or nuclear scan of the heart is performed before and after exercise or intravenous medication. The test is stopped if chest pain or a very sharp rise or fall in blood pressure occurs. Monitoring continues for 10 to 15 minutes after the test or until your heart rate returns to baseline.

Life After a Heart Attack

There are millions of people who have survived a heart attack. Many recover fully and are able to lead normal lives.

If you have already had a heart attack, your goals are to:

- recover and resume normal activities as much as possible
- prevent another heart attack, and
- prevent complications, such as heart failure or cardiac arrest.

After a heart attack, you will need to see your doctor regularly for checkups and tests to see how your heart is doing. Your doctor may recommend:

- lifestyle changes, such as quitting smoking, changing your diet, or increasing your physical activity
- medications, such as aspirin and nitroglycerin tablets for angina.
- After a heart attack, your doctor may recommend:
 - medications to lower your cholesterol or blood pressure and help reduce your heart's workload
 - participation in a cardiac rehabilitation program.

Most people who do not have chest pain or other complications are able to return to their normal activities within a few weeks after an uncomplicated heart attack. Most can begin walking immediately and resume sexual activity within a few weeks.

Most patients who do not have chest pain or other complications can usually begin driving within a week, if allowed by state law. Each state has rules for driving a motor vehicle following a serious illness. Patients with complications or chest pain should not drive until their symptoms have been stable for a few weeks.

After a heart attack, many people worry about having another heart attack. They often feel depressed and may have trouble adjusting to a new lifestyle. You should discuss your feelings with your doctor. Your doctor can give you medication for anxiety or depression. Spend time with family, friends, and even pets. Affection can make you feel better and less lonely. Most people stop feeling depressed after they have fully recovered.

Having a heart attack increases your chances of having another one. Therefore, it is very important that you and your family know how and when to seek medical attention. Talk to your doctor about making an emergency action plan and discuss it with your family.

The emergency action plan should include

- a description of the symptoms of a heart attack
- instructions for the prompt use of aspirin and nitroglycerin
- information about how to access emergency medical services in your community, including calling 9-1-1
- the name and location of the nearest hospital that offers 24-hour emergency heart care

Many heart attack survivors also have chest pain or angina. The pain usually occurs after exertion or with emotional stress and goes away in a few minutes when you rest or take your angina medication—nitroglycerin—as directed. In a heart attack, the pain is usually more severe than angina, and it does not go away when you rest or take your angina medication. If you think your chest pain could be a heart attack, call 9-1-1.

Helpful Resources

National Heart, Lung, and Blood Institute

301-496-4236

www.nhlbi.nih.gov/health/dci

The National Heart, Lung, and Blood Institute provides detailed information on heart attacks. Call or visit the web site for information.

Source: National Heart, Lung, and Blood Institute

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