

# Chest Pain Associated with Heart Disease

Angina is chest pain or discomfort that occurs when an area of your heart muscle doesn't get enough oxygen-rich blood. Angina may feel like pressure or squeezing in your chest. The pain also may occur in your shoulders, arms, neck, jaw, or back. It can feel like indigestion.

Angina itself isn't a disease. Rather, it's a symptom of an underlying heart problem. Angina is usually a symptom of coronary artery disease (CAD), the most common type of heart disease.

CAD occurs when a fatty material called plaque (plak) builds up on the inner walls of the coronary arteries. These arteries carry oxygen-rich blood to your heart.

When plaque builds up in the arteries, the condition is called atherosclerosis (ATH-er-o-skler-O-sis).

## Atherosclerosis

Image

Figure A shows a normal artery with normal blood flow. Figure B shows an artery containing plaque buildup.

Plaque causes the coronary arteries to become narrow and stiff. The flow of oxygen-rich blood to the heart muscle is reduced. This causes pain and can lead to a heart attack.

## Types of Angina

The three types of angina are stable, unstable, and variant (Prinzmetal's). Knowing how the types are different is important. This is because they have different symptoms and require different treatment.

### Stable Angina

Stable angina is the most common type. It occurs when the heart is working harder than usual. Stable angina has a regular pattern. If you know you have stable angina, you can learn to recognize the pattern and predict when the pain will occur.

- The pain usually goes away in a few minutes after you rest or take your angina medicine.

- Stable angina isn't a heart attack, but it makes a heart attack more likely in the future.

### Unstable Angina

- Unstable angina doesn't follow a pattern. It can occur with or without physical exertion and isn't relieved by rest or medicine.
- Unstable angina is very dangerous and needs emergency treatment. It's a sign that a heart attack may happen soon.

### Variant (Prinzmetal's) Angina

Variant angina is rare. It usually occurs while you're at rest. The pain can be severe. It usually happens between midnight and early morning. This type of angina is relieved by medicine.

### Overview

It's thought that nearly 7 million people in the United States suffer from angina. About 400,000 patients go to their doctors with new cases of angina every year. Angina occurs equally in men and women. It can be a sign of heart disease, even when initial tests don't show evidence of CAD.

Not all chest pain or discomfort is angina. A heart attack, lung problems (such as an infection or a blood clot), heartburn, or a panic attack also can cause chest pain or discomfort. All chest pain should be checked by a doctor.

### Underlying Causes

Angina is a symptom of an underlying heart condition. Angina pain is the result of reduced blood flow to an area of heart muscle. Coronary artery disease (CAD) usually causes the reduced blood flow.

This means that the underlying causes of angina are generally the same as the underlying causes of CAD.

Research suggests that damage to the inner layers of the coronary arteries causes CAD. Smoking, high levels of fat and cholesterol in the blood, high blood pressure, and a high level of sugar in the blood (due to insulin resistance or diabetes) can damage the coronary arteries.

When damage occurs, your body starts a healing process. Excess fatty tissues release compounds that promote this process. This healing causes plaque to build up where the arteries are damaged. Plaque narrows or blocks the arteries, reducing blood flow to the heart muscle.

Some plaque is hard and stable and leads to narrowed and hardened arteries. Other plaque is soft and is more likely to break open and cause blood clots.

The buildup of plaque on the arteries' inner walls can cause angina in two ways. It can:

- Narrow the arteries and greatly reduce blood flow to the heart
- Form blood clots that partially or totally block the arteries

### **Immediate Causes**

There are different triggers for angina pain, depending on the type of angina you have.

#### **Stable Angina**

Physical exertion is the most common trigger of stable angina. Severely narrowed arteries may allow enough blood to reach the heart when the demand for oxygen is low (such as when you're sitting). But with exertion, like walking up a hill or climbing stairs, the heart works harder and needs more oxygen.

**Other triggers of stable angina include:**

- Emotional stress
- Exposure to very hot or cold temperatures
- Heavy meals
- Smoking

#### **Unstable Angina**

Blood clots that partially or totally block an artery cause unstable angina. If plaque in an artery ruptures or breaks open, blood clots may form. This creates a larger blockage. A clot may grow large enough to completely block the artery and cause a heart attack. For more information, see the animation in "What Causes a Heart Attack?"

Blood clots may form, partly dissolve, and later form again. Angina can occur each time a clot blocks an artery.

#### **Variant Angina**

A spasm in a coronary artery causes variant angina. The spasm causes the walls of the artery to tighten and narrow. Blood flow to the heart slows or stops. Variant angina may occur in people with or without CAD.

**Other causes of spasms in the coronary arteries are:**

- Exposure to cold
- Emotional stress
- Medicines that tighten or narrow blood vessels
- Smoking
- Cocaine use

## **Who Is At Risk for Angina?**

Angina is a symptom of an underlying heart condition, usually coronary artery disease(CAD). So if you're at risk for CAD, you're also at risk for angina.

[Risk factors for CAD include:](#)

- Unhealthy cholesterol levels.
- High blood pressure.
- Cigarette smoking.
- Insulin resistance or diabetes.
- Overweight or obesity.
- Metabolic syndrome.
- Lack of physical activity.
- Age. (The risk increases for men after 45 years of age and for women after 55 years of age.)
- Family history of early heart disease.

## **Populations Affected**

People sometimes think that because men have more heart attacks than women, men also suffer from angina more often. In fact, angina occurs equally among women and men. It can be a sign of heart disease, even when initial tests don't show evidence of CAD.

Unstable angina occurs more often in older adults.

Variant angina is rare. It accounts for only about 2 out of 100 cases of angina.

People who have variant angina are often younger.

## [What Are the Signs and Symptoms of Angina?](#)

Pain and discomfort are the main symptoms of angina. Angina is often described as pressure, squeezing, burning, or tightness in the chest. It usually starts in the chest behind the breastbone.

Pain from angina also can occur in the arms, shoulders, neck, jaw, throat, or back. It may feel like indigestion.

Some people say that angina discomfort is hard to describe or that they can't tell exactly where the pain is coming from.

Symptoms such as nausea (feeling sick to your stomach), fatigue (tiredness), shortness of breath, sweating, light-headedness, or weakness also may occur.

Women are more likely to feel discomfort in their back, shoulders, and abdomen.

## **Symptoms vary based on the type of angina.**

### [Stable Angina](#)

The pain or discomfort:

- Occurs when the heart must work harder, usually during physical exertion
- Doesn't come as a surprise, and episodes of pain tend to be alike
- Usually lasts a short time (5 minutes or less)
- Is relieved by rest or medicine
- May feel like gas or indigestion
- May feel like chest pain that spreads to the arms, back, or other areas

### Unstable Angina

The pain or discomfort:

- Often occurs at rest, while sleeping at night, or with little physical exertion
- Comes as a surprise
- Is more severe and lasts longer (as long as 30 minutes) than episodes of stable angina
- Is usually not relieved with rest or medicine
- May get continually worse
- May mean that a heart attack will happen soon

### Variant Angina

The pain or discomfort:

- Usually occurs at rest and during the night or early morning hours
- Tends to be severe
- Is relieved by medicine

**Chest pain that lasts longer than a few minutes and isn't relieved by rest or angina medicine may mean you're having (or are about to have) a heart attack. Call 9–1–1 right away.**

### How Is Angina Diagnosed?

The most important issues to address when you go to the doctor with chest pain are:

- What's causing the chest pain
- Whether you're having or are about to have a heart attack

Angina is a symptom of an underlying heart problem, usually coronary artery disease(CAD). The type of angina pain you have can be a sign of how severe the CAD is and whether it's likely to cause a heart attack.

If you have chest pain, your doctor will want to find out whether it's angina. He or

she also will want to know whether the angina is stable or unstable. If it's unstable, you may need emergency medical attention to try to prevent a heart attack.

To diagnose chest pain as stable or unstable angina, your doctor will do a physical exam, ask about your symptoms, and ask about your risk factors and your family history of CAD or other heart disease.

He or she may also ask questions about your symptoms, such as:

- What brings on the pain or discomfort and what relieves it?
- What does the pain or discomfort feel like (for example, heaviness or tightness)?
- How often does the pain occur?
- Where do you feel the pain or discomfort?
- How severe is the pain or discomfort?
- How long does the pain or discomfort last?

### **Diagnostic Tests and Procedures**

If your doctor suspects that you have unstable angina or that your angina is related to a serious heart condition, he or she may order one or more tests.

- **EKG (Electrocardiogram)**  
An EKG is a simple test that detects and records the electrical activity of your heart. An EKG shows how fast your heart is beating and whether it has a regular rhythm. It also shows the strength and timing of electrical signals as they pass through each part of your heart.  
Certain electrical patterns that the EKG detects can suggest whether CAD is likely. An EKG also can show signs of a previous or current heart attack. However, some people with angina have a normal EKG.
- **Stress Testing**  
During stress testing, you exercise to make your heart work hard and beat fast while heart tests are performed. If you can't exercise, you're given medicine to speed up your heart rate.  
During exercise stress testing, your blood pressure and EKG readings are checked while you walk or run on a treadmill or pedal a bicycle. Other heart tests, such as nuclear heart scanning or echocardiography, also can be done at the same time.  
If you're unable to exercise, a medicine can be injected into your bloodstream to make your heart work hard and beat fast. Nuclear heart scanning or echocardiography is then usually done.  
When your heart is beating fast and working hard, it needs more blood and

oxygen. Arteries narrowed by plaque can't supply enough oxygen-rich blood to meet your heart's needs.

[A stress test can show possible signs of CAD, such as:](#)

- Abnormal changes in your heart rate or blood pressure
- Symptoms such as shortness of breath or chest pain
- Abnormal changes in your heart rhythm or your heart's electrical activity
- **Chest X Ray**

A chest x ray takes a picture of the organs and structures inside the chest, including your heart, lungs, and blood vessels. A chest x ray can reveal signs of heart failure, as well as lung disorders and other causes of symptoms that aren't due to CAD.
- **Coronary Angiography and Cardiac Catheterization**

Your doctor may ask you to have coronary angiography (an-jee-OG-ra-fee) if other tests or factors show that you're likely to have CAD. This test uses dye and special x rays to show the insides of your coronary arteries. To get the dye into your coronary arteries, your doctor will use a procedure called cardiac catheterization (KATH-e-ter-i-ZA-shun). A long, thin, flexible tube called a catheter is put into a blood vessel in your arm, groin (upper thigh), or neck. The tube is then threaded into your coronary arteries, and the dye is released into your bloodstream. Special x rays are taken while the dye is flowing through the coronary arteries. Cardiac catheterization is usually done in a hospital. You're awake during the procedure. It usually causes little to no pain, although you may feel some soreness in the blood vessel where your doctor put the catheter.
- **Blood Tests**

Blood tests check the levels of certain fats, cholesterol, sugar, and proteins in your blood. Abnormal levels may show that you have risk factors for CAD. Your doctor may order a blood test to check the level of C-reactive protein (CRP) in your blood. Some studies suggest that high levels of CRP in the blood may increase the risk for CAD and heart attack. Your doctor also may order a blood test to check for low hemoglobin (HEE-muh-glow-bin) in your blood. Hemoglobin is an iron-rich protein in the red blood cells that carries oxygen from the lungs to all parts of your body. If you have low hemoglobin, you may have a condition called anemia (uh-NEE-me-eh).

## **How Is Angina Treated?**

Treatments for angina include lifestyle changes, medicines, medical procedures, and cardiac rehabilitation (rehab). [The main goals of treatment are to:](#)

- Reduce pain and discomfort and how often it occurs
- Prevent or lower the risk of heart attack and death by treating the underlying heart condition
- Lifestyle changes and medicines may be the only treatments needed if your symptoms are mild and aren't getting worse. When lifestyle changes and medicines don't control angina, you may need medical procedures or cardiac rehab. Unstable angina is an emergency condition that requires treatment in the hospital.

## **Lifestyle Changes**

Making lifestyle changes can help prevent episodes of angina. You can:

- Slow down or take rest breaks if angina comes on with exertion.
- Avoid large meals and rich foods that leave you feeling stuffed if angina comes on after a heavy meal.
- Try to avoid situations that make you upset or stressed if angina comes on with stress. Learn ways to handle stress that can't be avoided.
- You also can make lifestyle changes that help lower your risk of heart disease. An important lifestyle change is adopting a healthy diet. This will help prevent or reduce high blood pressure, high blood cholesterol, and obesity.
- Follow a heart healthy eating plan that focuses on fruits, vegetables, whole grains, low-fat or no-fat dairy products, and lean meat and fish. The plan also should be low in salt, fat, saturated fat, trans fat, and cholesterol.
- Quitting smoking, if you smoke. Avoid secondhand smoke.
- Being physically active. Check with your doctor to find out how much and what kinds of activity are safe for you.
- Losing weight, if you're overweight or obese.
- Taking all medicines as your doctor prescribes, especially if you have diabetes.

## **Medicines**

Nitrates are the most commonly used medicines to treat angina. They relax and widen blood vessels. This allows more blood to flow to the heart while reducing its workload.

Nitroglycerin is the most commonly used nitrate for angina. Nitroglycerin that dissolves under your tongue or between your cheeks and gum is used to relieve an angina episode. Nitroglycerin in the form of pills and skin patches is used to prevent attacks of angina. These forms of nitroglycerin act too slowly to relieve pain during an angina attack.



You also may need other medicines to treat angina. These medicines may include beta blockers, calcium channel blockers, ACE inhibitors, oral antiplatelet (an-ty-PLAYT-lit) medicines, and anticoagulants (AN-te-ko-AG-u-lants). These medicines can help:

- Lower blood pressure and cholesterol levels
- Slow the heart rate
- Relax blood vessels
- Reduce strain on the heart
- Prevent blood clots from forming

### **Medical Procedures**

When medicines and other treatments don't control angina, you may need a medical procedure to treat the underlying heart disease. Angioplasty (AN-jee-oh-plas-tee) and coronary artery bypass grafting (CABG) are both commonly used to treat angina.

Angioplasty opens blocked or narrowed coronary arteries. During angioplasty, a thin tube with a balloon or other device on the end is threaded through a blood vessel to the narrowed or blocked coronary artery. Once in place, the balloon is inflated to push the plaque outward against the wall of the artery. This widens the artery and restores blood flow.

Angioplasty can improve blood flow to your heart, relieve chest pain, and possibly prevent a heart attack. Sometimes a small mesh tube called a stent is placed in the artery to keep it open after the procedure.

During CABG, healthy arteries or veins taken from other areas in your body are used to bypass (that is, go around) your narrowed coronary arteries. Bypass surgery can improve blood flow to your heart, relieve chest pain, and possibly prevent a heart attack.

Your doctor will help decide which treatment is right for you.

### **Cardiac Rehabilitation**

Your doctor may prescribe cardiac rehab for angina or after angioplasty, CABG, or a heart attack.

The cardiac rehab team may include doctors, nurses, exercise specialists, physical and occupational therapists, dietitians, and psychologists or other behavioral therapists.

#### **Rehab has two parts:**

**Exercise training.** This part helps you learn how to exercise safely, strengthen your muscles, and improve your stamina. Your exercise plan will be based on your individual abilities, needs, and interests.

Education, counseling, and training. This part of rehab helps you understand your heart condition and find ways to reduce your risk of future heart problems. The cardiac rehab team will help you learn how to cope with the stress of adjusting to a new lifestyle and to deal with your fears about the future.

### **How Can Angina Be Prevented?**

You can prevent or lower your risk for angina and coronary artery disease (CAD) by making lifestyle changes and treating related conditions.

- Making Lifestyle Changes
- Healthy lifestyle choices can help prevent or delay angina and CAD. To make lifestyle changes, you can:
- Follow a healthy eating plan. (See "How Is Angina Treated" for more information.)
- Quit smoking, if you smoke. Avoid secondhand smoke.
- Be physically active. Check with your doctor to find out how much and what kinds of activity are safe for you.
- Learn ways to handle stress and relax.

### **Treating Related Conditions**

You also can help prevent or delay angina and CAD by treating related conditions, such as:

- High blood cholesterol. If you have high cholesterol, follow your doctor's advice about lowering it. Take medicines as directed to lower your cholesterol.
- High blood pressure. If you have high blood pressure, follow your doctor's advice about keeping your blood pressure under control. Take blood pressure medicines as directed.
- Diabetes. If you have diabetes, follow your doctor's advice about keeping your blood sugar level under control. Take medicines as directed.
- Overweight or obesity. If you're overweight or obese, talk to your doctor about how to lose weight safely.

### **Living With Angina**

Angina isn't a heart attack, but it does mean that you're at greater risk of having a heart attack than someone who doesn't have angina. The risk is even higher if you have unstable angina. For these reasons, it's important that you know:

- The usual pattern of your angina, if you have it regularly.

- What medicines you take (keep a list) and how to take them. Make sure you're medicines are readily available.
- How to control your angina.
- The limits of your physical activity.
- How and when to seek medical attention.
- Know the Pattern of Your Angina
 

Stable angina usually occurs in a pattern. You should know:

  - What causes the pain to occur
  - What angina pain feels like
  - How long the pain usually lasts
  - Whether rest or medicine relieves the pain
- After several episodes, you will learn to recognize when you're having angina. It's important for you to notice if the pattern starts to change. Pattern changes may include angina that occurs more often, lasts longer, is more severe, occurs without exertion, or doesn't go away with rest or medicines. These changes may be a sign that your symptoms are getting worse or becoming unstable. You should seek medical help. Unstable angina suggests that you're at high risk for a heart attack very soon.

### Know Your Medicines

You should know what medicines you're taking, the purpose of each, how and when to take them, and possible side effects. It's very important that you know exactly when and how to take fast-acting nitroglycerin or other nitrates to relieve chest pain.

It's also important to know how to correctly store your angina medicines and when to replace them. Your doctor can advise you on this.

If you have side effects from your medicines, let your doctor know. You should never stop taking your medicines without your doctor's approval.

Talk to your doctor if you have any questions or concerns about taking your angina medicines. Tell him or her about any other medicines you might be taking. Some medicines can cause serious problems if they're taken with nitrates or other angina medicines.

### Know How To Control Your Angina

After several episodes, you will know the level of activity, stress, and other factors that can bring on your angina. By knowing this, you can take steps to prevent or lessen the severity of episodes.

Know what level of activity brings on your angina and try to stop and rest before chest pain starts. For example, if walking up a flight of stairs leads to chest pain, then stop halfway and rest before continuing.

When chest pain occurs during exertion, stop and rest or take your angina medicine. The pain should go away in a few minutes. If the pain doesn't go away or lasts longer than usual, call 9–1–1 for emergency care.

### Emotional Stress

Anger, arguing, and worrying are examples of emotional stress that can bring on an angina episode. Try to avoid or limit situations that cause these emotions. Exercise and relaxation can help relieve stress. Alcohol and drug use play a part in causing stress and don't relieve it. If stress is a problem for you, talk with your doctor about getting help for it.

### Eating Large Meals

If this leads to chest pain, eat smaller meals. Also, avoid eating rich foods.

### Know the Limits of Your Physical Activity

Most people with stable angina can continue their normal activities. This includes work, hobbies, and sexual relations. However, if you do very strenuous activities or have a stressful job, talk to your doctor.

### Know How and When To Seek Medical Attention

If you have angina, you're at a higher risk for a heart attack than someone who doesn't have angina. So it's 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. The plan should include making sure you and your family members know:

- The signs and symptoms of a heart attack
- How to use aspirin and nitroglycerin when needed
- How to access emergency medical services in your community
- The location of the nearest hospital that offers 24-hour emergency heart care
- Be sure to discuss your emergency plan with your family members. Take action quickly if your chest pain becomes severe, lasts longer than a few minutes, or isn't relieved by rest or medicine.
- Sometimes, it may be difficult to tell the difference between unstable angina and a heart attack. Either way, it's an emergency situation, and you should call 9–1–1 right away.

### Key Points

- Angina is chest pain or discomfort that occurs when your heart muscle doesn't get enough oxygen-rich blood. Angina is the symptom of an underlying heart condition, usually coronary artery disease (CAD).
- CAD occurs when a fatty material called plaque builds up on the inner walls of the coronary arteries. Plaque causes the coronary arteries to become narrow and stiff. The flow of oxygen-rich blood to the heart muscle is reduced.  
Angina may feel like pressure or a squeezing pain in your chest. The pain also may occur in your shoulders, arms, neck, jaw, or back.
- The most common types of angina are stable angina and unstable angina. A rare type of angina is called variant angina.
- Stable angina occurs when the heart is working harder than usual. Pain from stable angina goes away when you rest or take your angina medicine. Angina medicine, such as nitroglycerin, helps widen and relax the arteries so that more blood can flow to the heart.
- Unstable angina is a very dangerous condition and needs emergency treatment. Unstable angina is a sign that a heart attack may happen soon. Unstable angina can occur with or without physical exertion. It isn't relieved by rest or medicine.
- Variant angina is caused by a spasm (tightening) in a coronary artery. This narrowing of the artery slows or stops blood flow to the heart muscle. The pain may be severe. This type of angina is relieved by medicine.
- Nearly 7 million people in the United States have angina. It occurs equally in men and women.
- Because angina is usually a symptom of CAD, its risk factors are usually the same as those for CAD.
- Pain and discomfort are the main symptoms of angina. Nausea (feeling sick to your stomach), fatigue (tiredness), shortness of breath, sweating, light-headedness, or weakness also may occur.
- If you have chest pain, your doctor will want to find out whether it's angina. To diagnose angina, your doctor will do a physical exam and ask about your symptoms, risk factors, and family history of heart disease. He or she also may order tests to confirm the diagnosis.
- Treatments for angina include lifestyle changes, medicines, medical procedures, and cardiac rehabilitation. Lifestyle changes include following a healthy eating plan, quitting smoking, being physically active, losing weight, and learning how to handle stress and relax.
- You can prevent or lower your risk for angina and CAD by making lifestyle changes and treating related conditions.

If you have angina, it's important to know the pattern of your angina, what

medicines you take (keep a list) and how often you should take them, how to control your angina, and the limits on your physical activity. You should know how and when to seek medical help.