



## *X-Plain* *Angina*

### Reference Summary

#### Introduction

Angina is pain in the chest and surrounding areas of the body that occurs when the heart does not get enough oxygen. Angina is also called angina pectoris. “Pectoris” is Latin for “chest”.

More than 6 million Americans suffer from angina. Knowing how to recognize and prevent angina can mean the difference between life and death.

This reference summary will help you learn about the signs of angina, what causes it, treatment options, and how to prevent the serious diseases that it may be a sign of.



#### Symptoms

Most patients feel severe chest pain or pressure during angina. This pain can spread to the arms, neck, back, and jaw. Some people feel indigestion and nausea.

Angina may cause a feeling of heaviness or tightness in the arms, elbows, and wrists, mainly on the left side.

Fatigue and shortness of breath could also be a sign of angina.

Angina pectoris usually occurs when a person exerts a lot of physical effort for a few minutes. It goes away when the person rests or takes medication. Sometimes it can occur at rest also.

#### Anatomy

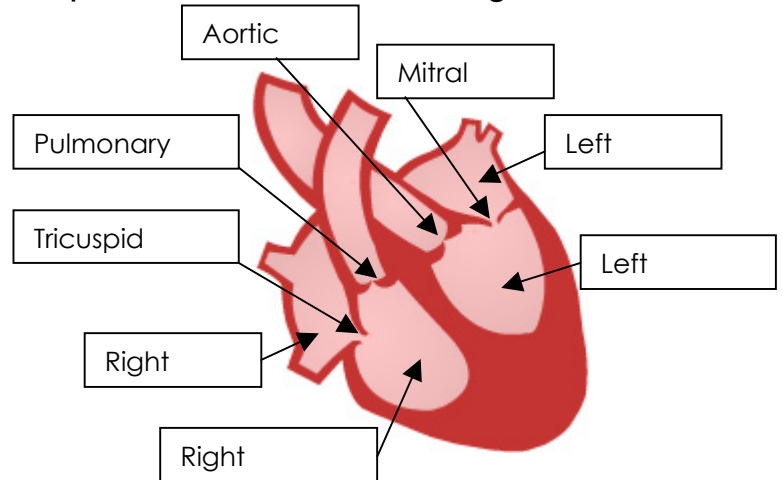
The heart is responsible for pumping blood to all the organs in the body. It is a highly specialized muscle that is expected to work continuously, without rest, for a lifetime!

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The heart is divided into the right and the left sides. Each side has 2 chambers: the atrium and the ventricle. Special valves, that prevent blood from flowing backward, divide the chambers.

Blood loaded with oxygen comes from the lung and enters the left atrium. It stays there until the mitral valve opens up and the atrium contracts. This forces the blood into the left ventricle. The blood is then pumped to the rest of the body through the aortic valve into the biggest blood vessel of the body, the aorta.



After the blood comes back from circulating through the body, it goes into the right atrium. From there it is pumped into the right ventricle through the tricuspid valve and then to the lung through the pulmonic valve.

In the lung, the blood picks up oxygen and returns to the left atrium, where the whole cycle starts again.

The heart needs a continuous supply of oxygen and sugar to be able to function. Oxygen-rich blood is delivered to the heart through the coronary arteries. These arteries branch off from the aorta.

The heart contracts automatically in a very coordinated way. Special cells located in the atrium set off the electric current needed to cause the atrium to contract.

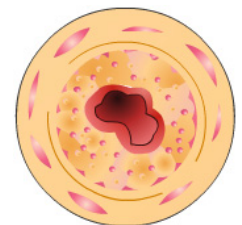
The electric current spreads to the ventricles through specialized cells. This causes the ventricles to contract after the atrium does.

## Causes

Angina is a sign of coronary artery disease. Coronary artery disease develops if the blood vessels that carry oxygen to the heart are clogged.

Fatty materials, called plaque, can narrow the blood vessels of the heart. This is called atherosclerosis.

Atherosclerosis can cause decreased blood flow and oxygen to the heart muscle; this is called ischemia. Angina is one of the symptoms



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of ischemia; the earlier it is discovered and treated, the better are the chances of recovery.

Angina can occur due to other conditions that may affect the way blood flows to the heart, as well. Abnormal heart valves, abnormal heart rhythms, and anemia can all lead to angina.

### Angina vs. Heart Attack

Sometimes a heart artery becomes completely blocked by plaque or blood clots. When this occurs, blood flow to that part of the heart stops. Without blood, the cells of the affected heart muscle will become permanently damaged; this is what happens during a heart attack.

The signs of a heart attack are similar to those of angina, with 3 main differences:

The pain is more severe.

The pain usually lasts longer than 5 minutes.

Medication or rest does not relieve the pain.

If not treated, angina could lead to a heart attack.

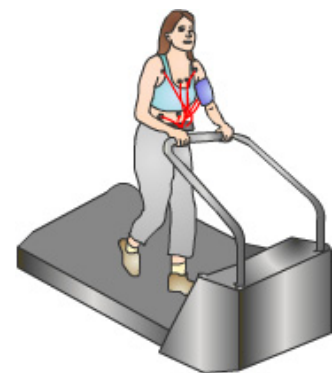
### Diagnosis

To help determine the cause of chest pain and discomfort, the doctor and healthcare providers will first take a medical history and do a physical exam.

To determine if the patient has angina, the doctor may do several tests. An electrocardiogram, or EKG, is used to record heart rhythms.

A stress EKG may also be done. During this test, the patient is asked to exercise on a treadmill or a bicycle while their EKG is being taken. Changes in the EKG pattern help the doctor determine if the patient has coronary artery disease.

An EKG is pain free and has no complications.

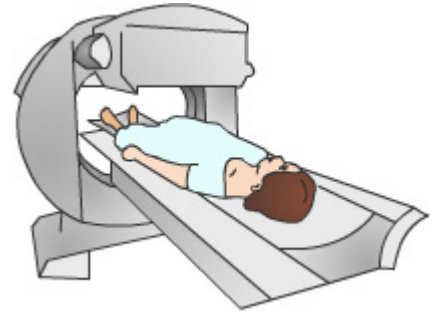


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Complications are rare during a stress EKG. The exercise you may be asked to do could cause angina, if this happens you should inform the physician or technologist doing the test. However, if any problems would arise, immediate treatment is always available. Patients who cannot exercise may be given a medication to cause the heart to beat faster. This medication helps to simulate or imitate exercising.

An echocardiogram is another test that measures the structure and function of the heart. The doctor analyzes images of the heart function on a screen. The echocardiogram is also typically painless.

Another test, called a nuclear scan, is used to study heart function. A small amount of radioactive material is injected into a vein, and then a camera takes pictures of the heart. The parts of the heart that are not getting enough oxygen show up in the picture.



If initial tests show that there may be blockage in the blood vessels of the heart, the doctor may recommend angiography.

During angiography, the doctor inserts a thin tube, called a catheter, into an artery in the groin or arm. The catheter is guided to the heart, and dye is injected into the coronary arteries. X-ray images are then taken which can show blocked heart arteries.

Angiography requires local anesthesia and is usually an outpatient procedure, which means you will go home after the test is completed.

Because of the different types of angina and heart diseases, it is important to check with your doctor when you feel chest pain to find out what is causing it.

## **Treatment Options**

If you have angina, your doctor may prescribe one or more medications to relieve the pain. Some medications work by increasing blood flow to the heart, while others decrease the heart's demand for oxygen.

Nitroglycerine can prevent or stop angina by causing blood vessels to relax. This increases blood flow to the heart and reduces the amount of work the heart needs to do. Nitroglycerine can be taken as a tablet, patch, or ointment.

Other drugs decrease the blood pressure and heart rate, thus decreasing the demand for oxygen. Examples of these are beta-blockers and calcium channel blockers.

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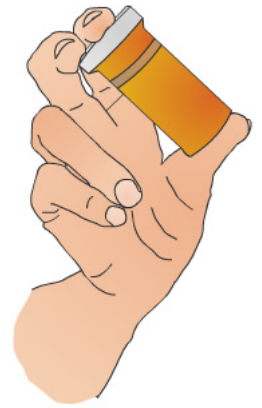
Drugs can prevent the pain associated with angina but they do not treat the underlying disease of the blood vessels in the heart. If you have coronary artery disease, you can prevent it from getting worse by choosing a healthier lifestyle.

Your doctor may recommend angioplasty or surgery if the blockage of your heart arteries is severe or if medication does not help. During a surgical procedure, the doctor may:

Push the plaque against the walls of arteries

Bypass the arteries filled with plaque by using a blood vessel from your leg.

Surgery or angioplasty can open the arteries but they do NOT cure the underlying disease. Lifestyle changes and medications are necessary to prevent further blockage of the arteries.



### **Nitroglycerin**

Nitroglycerin tablets are used for fast relief from angina pain. If your doctor prescribes nitroglycerin for you, follow the steps described on the next few pages when you have angina.

Sit down and rest. If the pain persists, place one tablet under your tongue and let it dissolve completely. The tablet will not work as fast if you swallow it.

Use a second tablet if you still have angina 5 minutes after using the first pill.

Use a third tablet if you still have angina 10 minutes after taking the first pill.

Call 911 if you still have angina 15 minutes after taking the first pill. You may be having a heart attack that needs immediate attention.

Your doctor may give you more specific instructions about your medications. You may be prescribed a spray instead of a tablet, or your doctor may recommend different steps than this program describes.



### **Preventing Angina**

Medications and surgery do not cure coronary artery disease. If healthy lifestyle changes are not made, the blockage of the artery will become even worse until it causes a heart attack that could be fatal.

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The following are the 10 most important tips for living a healthier lifestyle that can improve the health of your heart.

1. Do not smoke.
2. Be physically active, under your doctor's supervision.
3. Eat a healthy, balanced diet rich in fibers and low in fat.
4. Check the level of cholesterol in your blood. If it is high, get it under control.
5. Check your blood pressure regularly. If it is high, keep it under control.
6. Lose weight if you are overweight.
7. Exercise regularly.
8. Check the level of sugar in your blood. If it is high, keep it under control.
9. Get enough sleep at night.
10. Manage stress in your life.



If you have angina or other heart diseases, talk with your doctor before starting an exercise program or a weight loss program.

## Summary

Coronary artery disease is the #1 killer in the United States and angina is one of the most common symptoms of this disease. If not treated, blockage of the coronary artery could become more severe, leading to a heart attack that could be fatal.

It is important to learn the difference between the signs of a heart attack and angina. A heart attack should be treated immediately by calling 911 for emergency.

Medications are available to relieve the pain of angina. However, to control coronary artery disease, medications and surgeries may be needed. Most importantly, however, healthy lifestyle habits should be followed.



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