

ANGINA PECTORIS

What is angina?

ANGINA PECTORIS ("ANGINA") is a recurring pain or discomfort in the chest that happens when some part of the heart does not receive enough blood. It is a common symptom of coronary heart disease (CHD), which occurs when vessels that carry blood to the heart become narrowed and blocked due to atherosclerosis.

Angina feels like a pressing or squeezing pain, usually in the chest under the breast bone, but sometimes in the shoulders, arms, neck, jaws, or back. Angina is usually precipitated by exertion. It is usually relieved within a few minutes by resting or by taking prescribed angina medicine.

What brings on angina?

Episodes of angina occur when the heart's need for oxygen increases beyond the oxygen available from the blood nourishing the heart. Physical exertion is the most common trigger for angina. Other triggers can be emotional stress, extreme cold or heat, heavy meals, alcohol, and cigarette smoking.

Does angina mean a heart attack is about to happen?

An episode of angina is not a heart attack. Angina pain means that some of the heart muscle is not getting enough blood temporarily--for example, during exercise, when the heart has to work harder. The pain does **NOT** mean that the heart muscle is suffering irreversible, permanent damage. Episodes of angina seldom cause permanent damage to heart muscle.

In contrast, a heart attack occurs when the blood flow to a part of the heart is suddenly and permanently cut off. This causes permanent damage to the heart muscle. Typically, the chest pain is more severe, lasts longer, and does not go away with rest or with medicine that was previously effective. It may be accompanied by indigestion, nausea, weakness, and sweating. However, the symptoms of a heart attack are varied and may be considerably milder.

When someone has a repeating but stable pattern of angina, an episode of angina does not mean that a heart attack is about to happen. Angina means that there is underlying coronary heart disease. Patients with angina are at an

increased risk of heart attack compared with those who have no symptoms of cardiovascular disease, but the episode of angina is not a signal that a heart attack is about to happen. In contrast, when the pattern of angina changes--if episodes become more frequent, last longer, or occur without exercise--the risk of heart attack in subsequent days or weeks is much higher.

A person who has angina should learn the pattern of his or her angina--what cause an angina attack, what it feels like, how long episodes usually last, and whether medication relieves the attack. If the pattern changes sharply or if the symptoms are those of a heart attack, one should get medical help immediately, perhaps best done by seeking an evaluation at a nearby hospital emergency room.

Is all chest pain "angina"?

No, not at all. Not all chest pain is from the heart, and not all pain from the heart is angina. For example, if the pain lasts for less than 30 seconds or if it goes away during a deep breath, after drinking a glass of water, or by changing position, it almost certainly is NOT angina and should not cause concern. But prolonged pain, unrelieved by rest and accompanied by other symptoms may signal a heart attack.

How is angina diagnosed?

Usually the doctor can diagnose angina by noting the symptoms and how they arise. However one or more diagnostic tests may be needed to exclude angina or to establish the severity of the underlying coronary disease. These include the electrocardiogram (ECG) at rest, the stress test, and x-rays of the coronary arteries (coronary "arteriogram" or "angiogram").

The ECG records electrical impulses of the heart. These may indicate that the heart muscle is not getting as much oxygen as it needs ("ischemia"); they may also indicate abnormalities in heart rhythm or some of the other possible abnormal features of the heart. To record the ECG, a technician positions a number of small contacts on the patient's arms, legs, and across the chest to connect them to an ECG machine.

For many patients with angina, the ECG at rest is normal. This is not surprising because the symptoms of angina occur during stress. Therefore,

the functioning of the heart may be tested under stress, typically exercise. In the simplest stress test, the ECG is taken before, during, and after exercise to look for stress related abnormalities. Blood pressure is also measured during the stress test and symptoms are noted.

A more complex stress test involves picturing the blood flow pattern in the heart muscle during peak exercise and after rest. A tiny amount of a radioisotope, usually thallium, is injected into a vein at peak exercise and is taken up by normal heart muscle. A radioactivity detector and computer record the pattern of radioactivity distribution to various parts of the heart muscle. Regional differences in radioisotope concentration and in the rates at which the radioisotopes disappear are measures of unequal blood flow due to coronary artery narrowing, or due to failure of uptake in scarred heart muscle.

The most accurate way to assess the presence and severity of coronary disease is a coronary angiogram, an x-ray of the coronary artery. A long thin flexible tube (a "catheter") is threaded into an artery in the groin or forearm and advanced through the arterial system into one of the two major coronary arteries. A fluid that blocks x-rays (a "contrast medium" or "dye") is injected. X-rays of its distribution show the coronary arteries and their narrowing.

How is angina treated?

The underlying coronary artery disease that causes angina should be attacked by controlling existing "risk factors." These include high blood pressure, cigarette smoking, high blood cholesterol levels, and excess weight. If the doctor has prescribed a drug to lower blood pressure, it should be taken as directed. Advice is available on how to eat to control weight, blood cholesterol levels, and blood pressure. A physician can also help patients to stop smoking. Taking these steps reduces the likelihood that coronary artery disease will lead to a heart attack.

Most people with angina learn to adjust their lives to minimize episodes of angina, by taking sensible precautions and using medications if necessary.

Usually the first line of defense involves changing one's living habits to avoid bringing on attacks of angina. Controlling physical activity, adopting

good eating habits, moderating alcohol consumption, and not smoking are some of the precautions that can help patients live more comfortably and with less angina. For example, if angina comes on with strenuous exercise, exercise a little less strenuously, but do exercise. If angina occurs after heavy meals, avoid large meals and rich foods that leave one feeling stuffed. Controlling weight, reducing the amount of fat in the diet, and avoiding emotional upsets may also help.

Angina is often controlled by drugs. The most commonly prescribed drug for angina is nitroglycerin, which relieves pain by widening blood vessels. This allows more blood to flow to the heart muscle and also decreases the work load of the heart. Nitroglycerin is taken when discomfort occurs or is expected. Doctors frequently prescribe other drugs, to be taken regularly, that reduce the heart's workload. Beta blockers slow the heart rate and lessen the force of the heart muscle contraction. Calcium channel blockers are also effective in reducing the frequency and severity of angina attacks.

What if medication fails to control angina?

Doctors may recommend surgery or angioplasty if drugs fail to ease angina or if the risk of heart attack is high. Coronary artery bypass surgery is an operation in which a blood vessel is grafted onto the blocked artery to bypass the blocked or diseased section so that blood can get to the heart muscle. An artery from inside the chest (an "internal mammary" graft) or long vein from the leg (a "saphenous vein" graft) may be used.

Balloon angioplasty involves inserting a catheter with a tiny balloon at the end into a forearm or groin artery. The balloon is inflated briefly to open the vessel in places where the artery is narrowed. Other catheter techniques are also being developed for opening narrowed coronary arteries, including laser and mechanical devices applied by means of catheters.

Can a person with angina exercise?

Yes. It is important to work with the doctor to develop an exercise plan. Exercise may increase the level of pain-free activity, relieve stress, improve the heart's blood supply, and help control weight. A person with angina should start an exercise program only with the doctor's advice. Many doctors tell angina patients to gradually build up their fitness level--for example, start with a 5-minute walk and increase over weeks or months to 30 minutes

or 1 hour. The idea is to gradually increase stamina by working at a steady pace, but avoiding sudden bursts of effort.

What is the difference between "stable" and "unstable" angina?

It is important to distinguish between the typical stable pattern of angina and "unstable" angina.

Angina pectoris often recurs in a regular or characteristic pattern. Commonly a person recognizes that he or she is having angina only after several episodes have occurred, and a pattern has evolved. The level of activity or stress that provokes the angina is somewhat predictable, and the pattern changes only slowly. This is "stable" angina, the most common variety.

Instead of appearing gradually, angina may first appear as a very severe episode or as frequently recurring bouts of angina. Or, an established stable pattern of angina may change sharply; it may be provoked by far less exercise than in the past, or it may appear at rest. Angina in these forms is referred to as "unstable angina" and needs prompt medical attention.

The term "unstable angina" is also used when symptoms suggest a heart attack but hospital tests do not support that diagnosis. For example, a patient may have typical but prolonged chest pain and poor response to rest and medication, but there is no evidence of heart muscle damage either on the electrocardiogram or in blood enzyme tests.

Are there other types of angina?

There are two other forms of angina pectoris. One, long recognized but quite rare, is called Prinzmetal's or variant angina. This type is caused by vasospasm, a spasm that narrows the coronary artery and lessens the flow of blood to the heart. The other is a recently discovered type of angina called microvascular angina. Patients with this condition experience chest pain but have no apparent coronary artery blockages. Doctors have found that the pain results from poor function of tiny blood vessels nourishing the heart as well as the arms and legs. Microvascular angina can be treated with some of the same medications used for angina pectoris.

Additional information:

- NIH Medline: <http://www.nlm.nih.gov/medlineplus/angina.html>
- American Academy of Family Physicians:
<http://familydoctor.org/online/famdocen/home/common/heartdisease/basics/233.html>
- FDA Heart Health Online:
<http://www.fda.gov/hearthealth/conditions/angina.html>

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