

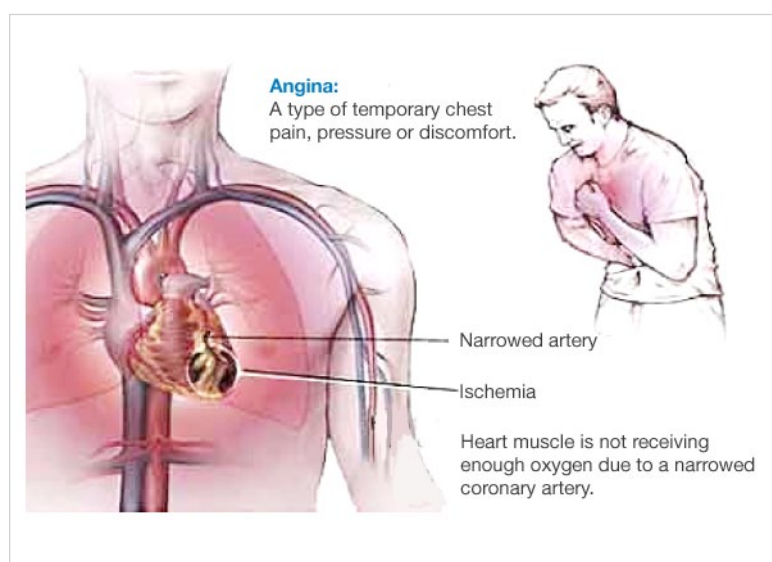
What is angina?

Angina—also sometimes called *angina pectoris*—is a symptom of an underlying heart condition. It means that the heart is not getting enough blood and as a result, not enough oxygen. This decrease of oxygen being delivered to the muscle of the heart happens if one or more coronary arteries are narrowed or blocked, a condition called **atherosclerosis**.

This type of blockage may result in chest pain. And while angina does not usually damage the heart, and the pain might only last a few minutes, it is a warning sign that you should not ignore. Your body is telling you that your risk for a heart attack or cardiac arrest is increased. Very simply, angina is your heart’s way of getting your attention.

Did You Know...?

Angina pectoris is Latin for “squeezing of the chest”



An angina attack is **not** the same as a heart attack, although many of the symptoms are the same. An angina attack may be provoked by extremes in emotion (being very angry or upset), eating a large meal or eating it very quickly, doing more exercise than usual (overexerting yourself), being exposed to extremes in temperature (too hot or too cold), or smoking. If the angina is a result of physical activity, stopping the activity generally stops the pain. But no matter what the cause of the chest pain or discomfort, it is important that you get medical attention as soon as possible.

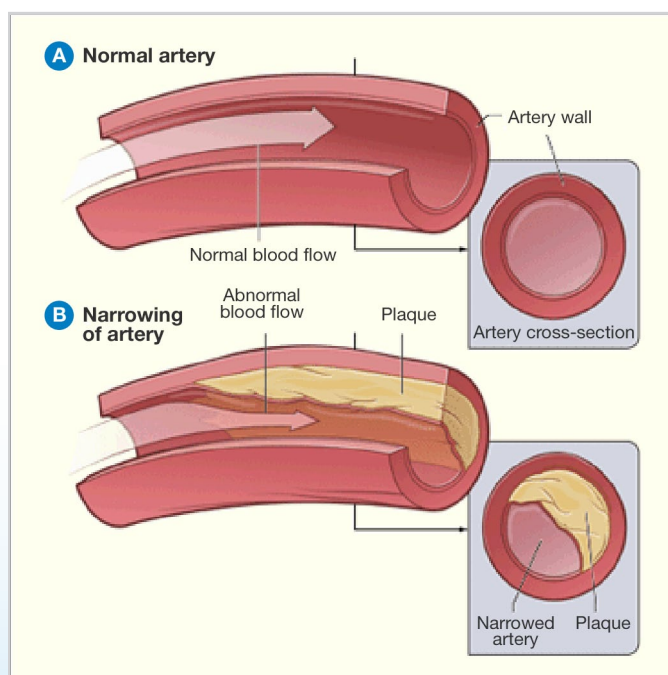
There are several different kinds of angina. These are explained here.

Different types of angina

Five different kinds of angina have been identified, with the two most common being **stable angina** and **unstable angina**.

Stable angina occurs when the heart has to work harder than normal, during exercise, for example. It has a regular pattern, and if you already know that you have stable angina, you will be able to predict the pattern. Once you stop exercising, or take medication (usually nitroglycerin) the pain goes away, usually within a few minutes.

This diagram shows a healthy artery (top) in which blood flow is normal. The artery shown on the bottom has become narrow because fatty deposits called plaque have formed.



Unstable angina is more serious, and may be a sign that a heart attack could happen soon. There is no predictable pattern to this kind of angina; it can just as easily occur during exercise as it can while you are resting. It should always be treated as an emergency. People with unstable angina are at increased risk for heart attacks, cardiac arrest, or severe cardiac arrhythmias (irregular heartbeat or abnormal heart rhythm).

Less common kinds of angina include:

- variant angina
- microvascular angina
- atypical angina

Variant angina is also known as **Prinzmetal's angina**. It often occurs while someone is resting (usually between midnight and 8:00 in the morning), and it has no predictable pattern—that is, it is not brought on by exercise or emotion. This kind of angina may cause severe pain, and is usually the result of a spasm in a coronary artery. Most people who have variant angina have severe atherosclerosis (hardening of the arteries), and the spasm is most likely to occur near a buildup of fatty plaque in an artery.

Microvascular angina—sometimes referred to as Syndrome X—occurs when tiny vessels in the heart become narrow and stop functioning properly, even if the bigger arteries are not blocked by plaque. Usually it is treated with common angina medications.

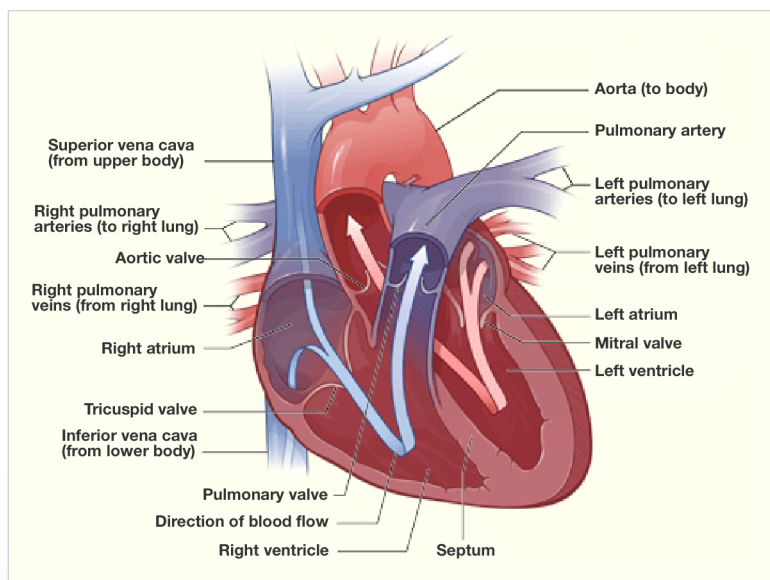
Atypical angina often doesn't cause pain, but you may feel a vague discomfort in your chest, experience shortness of breath, feel tired or nauseous, have indigestion, or pain in your back or neck. Women are more likely than men to have feelings of vague chest discomfort.

In order to understand what causes angina, it might be helpful to first understand a little bit about how your heart works.

How your heart works

You've probably heard the heart described as a pump, which is really the simplest description of this remarkable organ. It is not much bigger than your fist—and yet every single day it pumps about 7,500 litres of blood throughout your body, and beats about 100,000 times. Your blood carries oxygen and nutrients, which your body needs to survive.

Think of it like this. An electrical system controls your heart, putting out little signals that make the walls of your heart contract. Every contraction makes blood pump into our circulatory system. This system—made up of blood vessels called arteries, capillaries and veins—pumps blood into every part of your body. The valves in your heart—aortic, pulmonary, mitral and tricuspid—make sure that the blood flows the right way. If your heart isn't pumping properly, your blood won't circulate properly.



The right ventricle pumps blood from your heart to your lungs. Every time you take a breath, oxygen moves from your lungs to your blood vessels and gets added to your blood.

Blood flows through your heart like this: the inside of your heart is divided into four separate chambers. The top two are called atria, and it is their job to collect blood. The two on the bottom are called ventricles, which pump the blood out. The left side of the heart pumps this oxygen-rich blood through your arteries, the oxygen gets used, and then your veins carry it back to the right side of your heart. It is a continuous and intricate system of pumping and circulation.

In **coronary artery disease** (CAD), the arteries are narrowed because of fatty deposits called plaque, reducing blood flow through them. Coronary artery disease is one of the primary causes of angina.

How common is angina?

- The Canadian Community Health Survey in 2001 reported that there were 483,000 cases of angina in Canada.
- It is estimated that there about 47,000 new cases of angina every year.
- The prevalence of angina increases after age 50.

Canadian Agency for Drugs and Technologies in Health, 2007

Who is at risk for angina?

As described under “How the heart works”, one of the main causes of angina is **coronary artery disease (CAD)**. This describes a disease in which build-ups of fatty deposits block the flow of blood through the arteries. If we are exercising, cells in the heart (**myocardium**) may require additional oxygen (and more blood), but a blockage in the artery means it is not able to handle this extra demand. So what happens? The message about this lack of oxygen and blood is translated by our brains as pain, but if you rest or take medication, the pain will go away.

An inadequate amount of oxygen supplied to body tissue is called **ischemia**, and we therefore use the term **myocardial ischemia** to mean that there is not enough oxygen being supplied to our heart muscle. Angina doesn't usually starve our cells of oxygen completely, so they don't die.

Angina may also be caused by **coronary artery spasm**. This happens if any of the blood vessels that supply our heart muscle contract strongly. Such a contraction can cause a decrease or complete stop of the flow of blood to the heart, and this can lead to a heart attack. Coronary artery spasm can also be caused by the use of drugs like cocaine.

Risk factors for angina are similar to those for other heart disease, and include:

- high blood pressure (for more on high blood pressure, click [here](#))
- diabetes
- unhealthy cholesterol levels
- smoking
- lack of exercise
- obesity
- too much salt in your diet
- excessive use of alcohol
- family history of CAD or stroke
- being male
- being a postmenopausal woman
- age—the risk increases for men over the age of 45 and for women over the age of 55

What are the symptoms of angina?

The symptoms of angina are different for different people, but regardless, they are usually experienced after heavy exercise or because of emotional stress. Learn to recognize and pay attention to the following symptoms:

- pain that begins in the middle of your chest and then spreads to your left arm, back, neck or jaw; usually this is not a sharp pain, but a dull one
- a feeling of pressure, tightness or squeezing in your chest or arms
- a feeling of persistent indigestion that is moderate or severe
- numbness, or a lack of feeling in your arms, shoulders or wrists

The symptoms vary according to the type of angina you have. If, for example, you have **stable angina**, the pain or discomfort:

- happens when your heart has to work harder, during exercise for example
- is no surprise to you, and feels the same each time it happens
- usually lasts less than 5 minutes, and stops if you rest or take medication
- might feel like indigestion

Unstable angina is different. The pain or discomfort:

- often happens when you are sleeping or resting
- takes you by surprise
- might last as long as 30 minutes and might become progressively worse
- cannot be relieved with rest or medication
- might be a sign of a heart attack that will happen soon

Unstable angina tends to happen more often in older adults.

How is angina diagnosed?

Describing your symptoms as carefully as you can will be a big help to your physician in determining your health condition. Being able to tell your doctor what you were doing when the pain occurred, what it felt like, where you feel the pain, and how long it lasts are very useful pieces of information. If your doctor thinks that you might have **unstable angina** or that your angina is linked to a serious heart disease or condition, tests will be scheduled for you that will allow your physician to make a firm diagnosis.

Important to know...

Not all chest pain is caused by angina. Other possible causes include:

- acid reflux or indigestion
- inflammation of bones or tissue in your chest or breast bone, or muscular pain in your chest or back
- a spasm of your esophagus

Several tests are available, and you may have one or more of them. These tests include:

- an **electrocardiogram** (ECG), which involves hooking you up to a machine that detects and records your heart's electrical activity; this is a painless procedure and does not take very long
- a **stress test**, during which you will exercise at increasing rates of exertion (generally by running on a treadmill); an ECG will monitor you the entire time so that the doctor can see what changes occur in your heart rhythm when you exercise
- if the results of a stress test are not conclusive, or if you are unable to exercise, a nuclear stress test may be ordered. You will be injected with a special material (like thallium) and specially designed cameras will take pictures of your heart to see how well blood is flowing
- a **stress echocardiogram** can show normal or abnormal movement in the heart muscle as your heart contracts, and involves having an echocardiogram while you are at rest, and then again while you exercise
- a **computed tomography (CT) scan** is like a high-speed x-ray and can show the doctor how much calcium is in your arteries; the level of calcium can help to show whether you have coronary artery disease

If one or more of these tests do show that you have angina, the diagnosis might be confirmed by undergoing **cardiac catheterization**. A special dye will be injected into your arteries, and then photographs taken of them that allows the doctor to see if they are narrow.

Heart disease in women

Women tend to develop heart disease at an older age than men, and although it is not entirely clear why, some evidence suggests that it might be because the natural estrogen in a woman's body helps protect her from heart disease. As a woman ages, and particularly after menopause, this lack of estrogen may leave her more vulnerable. Many researchers believed that the use of supplemental estrogen (hormone replacement therapy) would help provide protection, but the use of hormonal therapy (HT) has been the object of much debates over the last decade, because of heart safety concerns. The risks associated with HT depend very much on a woman's personal health status. Your overall health, your family history and your age can have an impact on the risks you need to think about. Assessing risk needs to be done with the support and guidance of a health professional. Recent research suggests that women who start HT around the time of menopause can reduce their risk of heart disease, but doctors don't currently recommend HT as a means to address that issue alone. Available evidence also demonstrates that initiation of HT should be done with caution in women who are more than a decade after menopause or older than 60 years of age because of the association with an increased risk of adverse cardiac events.

A woman's angina symptoms can be different from the classic angina symptoms. For example, a woman may have chest pain that feels like a stabbing, pulsating or sharp form of chest pain rather than the more typical vise-like pressure. Women are also more likely to experience symptoms, such as nausea, shortness of breath or abdominal pain. These differences may lead to delays in seeking treatment.

Did you know...?

- Men and women have different hearts. Women's hearts can be a different size and the blood vessels are sometimes more narrow. This can make certain kinds of treatment more difficult.
- Women are more likely than men to have a second heart attack.
- Coronary artery disease is the number one cause of death in Canadian women over the age of 55; heart disease and stroke account for 40% of all deaths among Canadian women.

What treatments are available for angina?

You may have heard people talk about nitrates (nitroglycerin is the most common of these) or know someone who is taking them. This class of medications is the most commonly prescribed for the treatment of angina, and they work by relaxing and widening your blood vessels so that your blood can flow to your heart more easily, and so that your heart doesn't have to work as hard to keep the flow steady. **Nitroglycerin** that can be taken under the tongue (called sublingual) or sprayed into the mouth works very quickly to relieve the pain of an angina attack, while other forms of nitroglycerin, like tablets or patches, can be taken to help prevent an attack from starting.

Treating angina also involves making lifestyle changes that will help you to reduce risk factors. See more in the section titled Living well with angina.

Reducing pain is an important goal of treatment, and by taking medications, reducing risk factors, and/or treating the narrowed arteries with surgery, this can be accomplished. Let's look at the treatment options one by one.

Medications

Nitrates, as discussed above, are available in a number of different forms and your doctor will determine which one is best for you. Headache is a possible side effect. You should not use medications for erectile dysfunction like Viagra for example.

Beta-blockers are a class of medicines used to treat several kinds of heart disease. They work by lowering blood pressure, and slowing your heart rate which means your heart doesn't have to work as hard.

Calcium channel blockers or **calcium antagonists** also work by lowering blood pressure and slowing your heart rate, and are often used if you cannot take a beta-blocker. They may be useful to treat coronary artery spasm.

Antiplatelet medications are blood thinners that work by preventing blood clots from forming and blocking your arteries. The most commonly used antiplatelet medication is **aspirin**, which works by preventing platelets from sticking to blood vessel walls. An enteric-coated aspirin is generally recommended because it is easier on the stomach. A new class of drugs, called **platelet receptor inhibitors**, can stop platelets from sticking together, and are used mostly in the hospital to treat **unstable angina**.

Surgical procedures

Treating unstable angina sometimes requires surgical intervention, with or without the previous use of medications. Two procedures are available:

Angioplasty is a procedure in which a small catheter (a little tube) is inserted into a narrowed or blocked artery. At the top of this catheter is a little balloon that the physician inflates when the catheter has reached the blocked part of the artery. The balloon, when inflated, helps to push the plaque against the wall of the artery. Once the balloon is deflated, it often opens up the blockage enough for more blood to flow through the artery, and this should lessen the pain. In some cases, a small device called a stent will be put in place to help prop your artery open.

There are other medications that might be helpful if you have angina...

Cholesterol-lowering drugs known as statins can help to reduce the chance of a heart attack in someone with angina.

ACE inhibitors, which are used primarily to treat high blood pressure, may reduce the chance of heart attack in people with angina, even if their blood pressure is normal.

If several arteries are severely blocked, **coronary artery bypass surgery** (also sometimes referred to as coronary artery bypass grafting or CABG) may be recommended. This procedure involves taking a healthy artery or vein from another place in your body (your leg, for example), and grafting it in your heart to help the blood go around (or bypass) the blockage.

Living well with angina

Medications and surgery can help to reduce the build-up of the dangerous plaque that has formed in your arteries. But you also need to manage the risk factors that helped contribute to the plaque, and make some lifestyle changes so that the plaque does not come back and clog your arteries again.

If you smoke, stop. Ask your doctor or pharmacist about a smoking cessation program. Quitting smoking is hard. But it is one of the most important things you can do to improve your heart health and your overall health. Studies show that there are many potential health benefits to quitting smoking for you and those around you. For example, 1 year after quitting excess risk of coronary heart disease is half that of a smoker's.

Exercise regularly. Ask your doctor about an exercise program that is right for you. Exercise can actually help your body grow new blood vessels.

Watch your alcohol intake. Everything in moderation, and that includes alcohol. Men should not drink more than 14 drinks a week, and women should drink no more than nine.

Watch what you eat. You should try to stop eating unhealthy fats and sugars as much as you can, and instead eat more fresh fruits and vegetables, grains and grain products, lean poultry, beef or fish. (For more information about eating healthy, consult the list of resources at the end of this document).

Limit your salt intake. The added salt in processed foods is not healthy to our hearts.

Here are some easy tips on how to reduce the amount of salt you eat:

- Take your salt shaker off the dinner table. Instead of using salt, experiment with herbs, spices, garlic or salt substitutes that you can find at the grocery store. (But make sure that the salt substitute doesn't contain something called "potassium chloride", because this ingredient could be harmful for your heart.) Do not add salt to your food during cooking.
- Check the foods you eat for salt content.
 - Read the labels on foods to figure out how much salt (sodium) they contain. Food labels list their ingredients in order, meaning if salt is one of the first ingredients on the list, there is a lot of salt in the product.
 - Look for foods that have less than 10% (or 200 mg) of the daily value per serving and avoid foods with 20% (or 400 mg) of daily value per serving.
- Eat more fresh fruits and vegetables.
- Eat snacks that are low in salt, like unsalted popcorn.

- Most processed or prepared foods have a lot of salt in them. These types of foods include canned vegetables and frozen dinners. Other foods and sauces that have a lot of salt are:
 - Cheese
 - Lunch meat
 - Pickles
 - Ketchup
 - Barbecue sauce
 - Soya sauce
 - Salad dressing

Watch your weight. Being overweight is a risk factor for angina and other types of heart disease. One way to determine if you may be overweight is to calculate your Body Mass Index, or BMI for short. If your BMI score is 25 or more, you may be at higher risk. If you don't know your BMI, click here to find out what it is:
http://www.hc-sc.gc.ca/fn-an/nutrition/weights-poids/guide-ld-adult/bmi_chart_java-graph_imc_java-eng.php

Have your cholesterol levels checked, and change your eating habits to limit the amount of foods rich in fat you eat. [Cholesterol](#) is a type of fat made by your liver. Some of the cholesterol in your body comes from the food that you eat, like eggs, meat and dairy products. But it's not just the cholesterol in food that can raise your cholesterol. Foods that are high in saturated fats can also raise your cholesterol. Saturated fats are mainly found in red meat and high-fat dairy products.

Control high blood pressure through the use of lifestyle modifications and/or medications. One in five Canadians has [high blood pressure](#). High blood pressure is one of the biggest risk factors for heart disease. If your high blood pressure is properly taken care of, you can significantly reduce your risk of heart disease.

Learn to recognize your patterns of angina. If you know what is likely to cause an angina attack, you can take steps to prevent an attack or at least make it less severe.

Take care of your heart. And be well.

Resources:

There are many good resources for people and their families who are living with heart disease. Several good books and magazines focused on heart health are available through libraries or your local book stores, including ones on meal planning and recipes. You may also find the following websites of interest:

Heart and Stroke Foundation

www.heartandstroke.com/site/c.iklQLcMWJtE/b.3484055/k.BE74/Angina.htm

www.heartandstroke.ns.ca/site/c.otJYJ7MLlqE/b.3669183/k.5B9F/Hearthealthy_cooking.htm

National Heart, Lung and Blood Institute

www.nhlbi.nih.gov/health/dci/Diseases/Angina/Angina_SignsAndSymptoms.html

American Heart Association

www.americanheart.org

Health Canada

www.hc-sc.gc.ca/index-eng.php

Public Health Agency of Canada

www.phac-aspc.gc.ca/cd-mc/cvd-mcv/angina-langine_de_poitaine-eng.php

Dietitians of Canada

www.dietitians.ca

Healthy Ontario

www.healthyontario.com/ConditionDetails.aspx?disease_id=136