



**SOLUTION**

Your Pharmacy Friend

[solutionpharmacy@gmail.com](mailto:solutionpharmacy@gmail.com)

Point wise Lecture along with consisted table, Image and  
Schematic diagrams

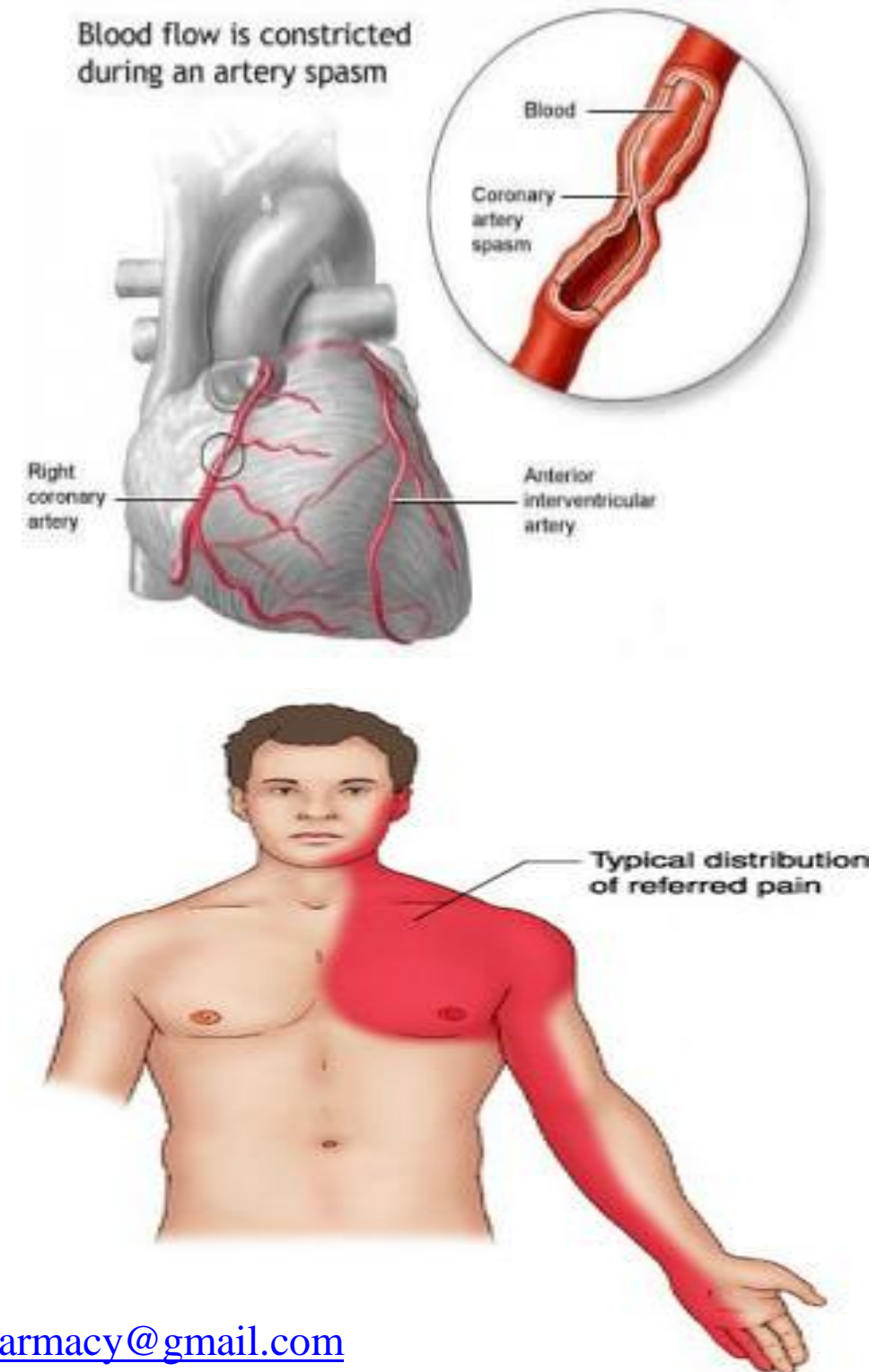
# Angina- Pathophysiology

Basic Introduction with causes, Symptoms, Diagnosis and Treatment

Uploaded By- Solution Pharmacy [www.facebook.com/pharmavideo/](https://www.facebook.com/pharmavideo/) E-Mail- [solutionpharmacy@gmail.com](mailto:solutionpharmacy@gmail.com)

# ANGINA

Angina is chest pain or discomfort that occurs if 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 can occur in your shoulders, arms, neck, jaw, or back.** Angina pain may even feel like indigestion. Angina isn't a disease; it's a symptom of an underlying heart problem. **Angina usually is a symptom of coronary heart disease (CHD).** is the most common type of heart disease in adults. It occurs if a waxy substance called plaque builds up on the inner walls of your coronary arteries. These arteries carry oxygen-rich blood to your heart.



# TYPES OF ANGINA

***Stable Angina-*** Stable angina is the most common type of angina. It occurs when the heart is working harder than usual. Stable angina has a regular pattern. **The pain usually goes away a few minutes after you rest or take your angina medicine.** Stable angina isn't a heart attack, but it suggests that a heart attack is more likely to happen in the future.

***Unstable Angina-*** Unstable angina doesn't follow a pattern. It may occur more often and be more severe than stable angina. Unstable angina also can occur with or without physical exertion, and **rest or medicine may not relieve the pain.** Unstable angina is very dangerous and requires emergency treatment. This type of angina is a sign that a heart attack may happen soon.

***Variant (Prinzmetal's) Angina-*** Variant angina is rare. A spasm in a coronary artery causes this type of angina. **Variant angina usually occurs while you're at rest, and the pain can be severe.** It usually happens between midnight and early morning. Medicine can relieve this type of angina. Uploaded By- Solution Pharmacy [www.facebook.com/pharmavideo/](http://www.facebook.com/pharmavideo/) E-Mail- [solutionpharmacy@gmail.com](mailto:solutionpharmacy@gmail.com)

# CAUSES OF ANGINA

The following risk factors increase your risk of coronary artery disease and angina

- ❖ **Tobacco use-** Chewing tobacco, smoking and long-term exposure to second-hand smoke damage the interior walls of arteries including arteries to your heart, allowing deposits of cholesterol to collect and block blood flow.
- ❖ **Diabetes-** Diabetes is the inability of your body to produce enough or respond to insulin properly. Insulin, a hormone secreted by your pancreas, allows your body to use glucose, which is a form of sugar from foods. Diabetes increases the risk of coronary artery disease, which leads to angina and heart attacks by speeding up atherosclerosis and increasing your cholesterol levels.
- ❖ **High blood pressure-** Blood pressure is determined by the amount of blood your heart pumps and the amount of resistance to blood flow in your arteries. Over time, high blood pressure damages arteries by accelerating hardening of the arteries.

- ❖ **High blood cholesterol or triglyceride levels-** Cholesterol is a major part of the deposits that can narrow arteries throughout your body, including those that supply your heart. A high level of the wrong kind of cholesterol, known as low-density lipoprotein (LDL)
- ❖ **Personal or family history of heart disease-** If you have coronary artery disease or if you've had a heart attack, you're at a greater risk of developing angina.
- ❖ **Older age-** Men older than 45 and women older than 55 have a greater risk than do younger adults.
- ❖ **Lack of exercise-** An inactive lifestyle contributes to high cholesterol, high blood pressure, type 2 diabetes and obesity. However, it is important to talk with your doctor before starting an exercise program.
- ❖ **Obesity-** Obesity raises the risk of angina and heart disease because it's associated with high blood cholesterol levels, high blood pressure and diabetes. Also, your heart has to work harder to supply blood to the excess tissue.

## Important Differences Between Stable & Unstable Angina

S.N.	Stable Angina	Unstable Angina
1	Occurs when the heart must work harder, usually during physical exertion	Often occurs at rest, while sleeping at night, or with little physical exertion
2	Doesn't come as a surprise, and episodes of pain tend to be alike	Comes as a surprise
3	Usually lasts a short time (5 minutes or less)	Is more severe and lasts longer than stable angina (as long as 30 minutes)
4	Is relieved by rest or medicine	Usually isn't relieved by rest or medicine
5	May feel like gas or indigestion	May get worse over time
6	May feel like chest pain that spreads to the arms, back, or other areas	May mean that a heart attack will happen soon



## TESTS AND DIAGNOSIS

- ❖ **Electrocardiogram-** Each beat of your heart is triggered by an electrical impulse generated from special cells in your heart.
- ❖ **Stress test-** Sometimes angina is easier to diagnose when your heart is working harder. During a stress test, you exercise by walking on a treadmill or pedalling a stationary bicycle.
- ❖ **Echocardiogram-** An echocardiogram uses sound waves to produce images of the heart. Your doctor can use these images to identify angina-related problems, including whether there are areas of your heart not getting enough blood.
- ❖ **Chest X-ray-** This test takes images of your heart and lungs. This is to look for other conditions that might explain your symptoms and to see if you have an enlarged heart.
- ❖ **Blood tests-** Certain heart enzymes slowly leak out into your blood if your heart has been damaged by a heart attack. Samples of your blood can be tested for the presence of these enzymes.

- ❖ **Coronary angiography-** Coronary angiography uses X-ray imaging to examine the inside of your heart's blood vessels. It's part of a general group of procedures known as cardiac catheterization. During coronary angiography, a type of dye that's visible by X-ray machine is injected into the blood vessels of your heart. The X-ray machine rapidly takes a series of images (angiograms), offering a detailed look at the inside of your blood vessels.
- ❖ **Cardiac computerized tomography (CT) scan-** In a cardiac CT scan, you lie on a table inside a doughnut-shaped machine. An X-ray tube inside the machine rotates around your body and collects images of your heart and chest, which can show if any of your heart's arteries are narrowed or if your heart is enlarged.
- ❖ **Cardiac MRI-** In a cardiac MRI, you lie on a table inside a long tube-like machine that produces detailed images of your heart's structure and its blood vessels.



# MEDICATIONS

If lifestyle changes alone don't help your angina, you may need to take medications.

- ❖ **Nitrates-** Nitrates relax and widen your blood vessels, allowing more blood to flow to your heart muscle. You might take a nitrate when you have angina-related chest discomfort, before doing something that normally triggers angina. The most common form of nitrate used to treat angina is with nitro-glycerine tablets put under your tongue.
- ❖ **Aspirin-** Aspirin reduces the ability of your blood to clot, making it easier for blood to flow through narrowed heart arteries. Preventing blood clots can also reduce your risk of a heart attack. But don't start taking a daily aspirin without talking to your doctor first.
- ❖ **Clot-preventing drugs-** Certain medications such as clopidogrel (Plavix), prasugrel (Effient) and ticagrelor can help prevent blood clots from forming by making your blood platelets less likely to stick together.

❖ **Statins-** Statins are drugs used to lower blood cholesterol. They work by blocking a substance your body needs to make cholesterol. They may also help your body reabsorb cholesterol that has accumulated in plaques in your artery walls, helping prevent further blockage in your blood vessels

❖ **Calcium channel blockers-** Calcium channel blockers, also called calcium antagonists, relax and widen blood vessels by affecting the muscle cells in the arterial walls. This increases blood flow in your heart, reducing or preventing angina.

❖ **Ranolazine (Ranexa)-** Ranexa can be used alone or with other angina medications, such as calcium channel blockers, beta blockers or nitro-glycerine. Unlike some other angina medications, Ranexa can be used if you're taking oral erectile dysfunction medications.

❖ **Beta blockers-** Beta blockers work by blocking the effects of the hormone epinephrine, also known as adrenaline. As a result, the heart beats more slowly and with less force, thereby reducing blood pressure. Beta blockers also help blood vessels relax and open up to improve blood flow, thus reducing or preventing angina.



**Scan the QR code  
to reach solution on Facebook and YouTube**



E Mail- [solutionpharmacy@gmail.com](mailto:solutionpharmacy@gmail.com) & Reach solution at- [www.facebook.com/pharmavideo/](https://www.facebook.com/pharmavideo/)

\* Images are taken from google search. Solution would like to acknowledge all of them