

HEART ATTACK (MYOCARDIAL INFARCTION)

What is a heart attack (myocardial infarction or MI)?

A heart attack, or myocardial infarction, occurs when one or more regions of the heart muscle experience a severe or prolonged lack of oxygen caused by blocked blood flow to the heart muscle.

The blockage is often a result of atherosclerosis - a build-up of plaque, known as cholesterol, and other fatty substances. Plaque inhibits and obstructs the flow of blood and oxygen to the heart, thus reducing the flow to the rest of the body. The cause of a heart attack is a blood clot that forms within the plaque obstructed area.

If the blood and oxygen supply is cut off severely or for a long period of time, muscle cells of the heart suffer severe and devastating damage and die. The result is damage or death to the area of the heart that became affected by reduced blood supply.

What are the risk factors for heart attack?

There are two types of risk factors for heart attack, including:

Inherited (or genetic):	Acquired:
Inherited or genetic risk factors are risk factors you are born with that cannot be changed, but can be improved with medical management and lifestyle changes.	Acquired risk factors are caused by activities that we choose to include in our lives that can be managed through lifestyle changes and clinical care.

Who is most at risk - inherited (genetic) factors?

- persons with inherited hypertension - high blood pressure.
- persons with inherited low levels of HDL (triglycerides) or high levels of LDL (low-density lipoprotein) blood cholesterol.
- persons with a family history of heart disease (especially with onset before age 55).
- aging men and women.
- persons with type 1 diabetes.
- women, after the onset of menopause (generally, men are at risk at an earlier age than women, but after the onset of menopause, women are equally at risk).

Who is most at risk - acquired risk factors?

- persons with acquired hypertension - high blood pressure.
- persons with acquired low levels of HDL (triglycerides) or high levels of LDL (low-density lipoprotein) blood cholesterol.
- cigarette smokers.
- people who are under a lot of stress.
- individuals who lead a sedentary lifestyle.
- persons overweight by 30 percent or more.

A heart attack can happen to anyone - it is only when we take the time to learn which of the risk factors apply to us, specifically, can we then take steps to eliminate or reduce them.

Managing heart attack risk factors:

Managing your risks for a heart attack begins with:

- examining which of the risk factors apply to you, and then taking steps to eliminate or reduce them.
- becoming aware of conditions like hypertension or abnormal cholesterol levels, which may be "silent killers."
- modifying risk factors that are acquired, not inherited, through lifestyle changes. See your physician as the first step in starting the right way to make these changes.
- consulting your physician soon to determine if you have risk factors that are genetic or inherited and cannot be changed, but can be managed medically and through lifestyle changes.

What are the warning signs of a heart attack?

The following are the most common symptoms of a heart attack. However, each individual may experience symptoms differently. Symptoms may include:

Indigestion, also known as upset stomach or dyspepsia, is a painful or burning feeling in the upper abdomen that may include nausea; abdominal bloating; belching; vomiting; severe pain in the upper right abdomen; discomfort unrelated to eating; and indigestion accompanied by shortness of breath, sweating, or pain radiating to the jaw, neck, or arm. The symptoms of indigestion may resemble other medical conditions, such as chest pain. Always consult your physician for diagnosis.

- severe pressure, fullness, squeezing, pain and/or discomfort in the centre of the chest that lasts for more than a few minutes.
- pain or discomfort that spreads to the shoulders, neck, arms, or jaw.
- chest pain that increases in intensity.
- chest pain that is not relieved by rest or by taking cardiac prescription medication.
- chest pain that occurs with any/all of the following (additional) symptoms:
 - sweating, cool, clammy skin, and/or paleness
 - shortness of breath
 - nausea or vomiting
 - dizziness or fainting
 - unexplained weakness or fatigue
 - rapid or irregular pulse

Although chest pain is the key warning sign of a heart attack, it may be confused with indigestion, pleurisy, pneumonia, or other disorders.

Responding to heart attack warning signs:

If you, or someone you know exhibits any of the above warning signs, act immediately. Call 082 911, or your local emergency number.

Treatment for a heart attack:

The goal of treatment for a heart attack is to relieve pain, preserve the heart muscle function, and prevent death.

Treatment in the emergency department may include:

- intravenous therapy - nitroglycerin, morphine.
- continuous monitoring of the heart and vital signs.
- oxygen therapy - to improve oxygenation to the damaged heart muscle.
- pain medication - by decreasing pain, the workload of the heart decreases, thus, the oxygen demand of the heart decreases.
- cardiac medication - such as betablockers or calcium channel blockers to promote blood flow to the heart, prevent blood clotting, improve the blood supply, prevent arrhythmias, and decrease heart rate and blood pressure.
- fibrinolytic therapy - intravenous infusion of a medication which dissolves the blockage, thus, restoring blood flow.
- antithrombin/antiplatelet therapy - used to prevent further blood clotting.

Once the condition has been diagnosed and the patient stabilized, additional procedures to restore coronary blood flow may be utilized. Those procedures include:

- CORONARY ANGIOPLASTY - with this procedure, a catheter is used to create a bigger opening in the vessel to increase blood flow. Although angioplasty is performed in other blood vessels, Percutaneous Transluminal Coronary Angioplasty (PTCA) refers to angioplasty in the coronary arteries to permit more blood flow into the heart. There are several types of PTCA procedures, including:
 - BALLOON ANGIOPLASTY - a small balloon is inflated inside the blocked artery to open the blocked area.
 - ATHERECTOMY - the blocked area inside the artery is cut away by a tiny device on the end of a catheter.
 - LASER ANGIOPLASTY - a laser used to "vaporize" the blockage in the artery.
 - CORONARY ARTERY STENT - a tiny coil is expanded inside the blocked artery to open the blocked area and is left in place to keep the artery open.
- CORONARY ARTERY BYPASS - Most commonly referred to as simply "bypass surgery," this surgery is often performed in people who have angina (chest pain) and coronary artery disease (where plaque has built up in the arteries). During the surgery, a bypass is created by grafting a piece of a vein above and below the blocked area of a coronary artery, enabling blood to flow around the obstruction. Veins are usually taken from the leg, but arteries from the chest may also be used to create a bypass graft.

Angina Pectoris

Angina versus a Heart Attack

Angina may have similar symptoms as a heart attack, such as a crushing, squeezing pain in the chest; a feeling of pressure in the chest; or pain radiating in the arms, shoulders, jaw, neck, and/or back. However, unlike the chest pain associated with a heart attack, the pain from angina usually goes away within a few minutes with rest or with the use of a cardiac prescription medication (i.e. nitroglycerin).

What is angina pectoris?

Angina pectoris (or simply angina) is recurring chest pain or discomfort that happens when some part of the heart does not receive enough blood. Angina is a symptom of coronary heart disease (CHD), which occurs when arteries that carry blood to the heart become narrowed and blocked due to atherosclerosis.

What are the symptoms of angina pectoris?

Angina pectoris occurs when the heart muscle (myocardium) does not receive an adequate amount of blood needed for a given level of work (insufficient blood supply is called ischemia). The following are the most common symptoms of angina. However, each individual may experience symptoms differently. Symptoms may include:

- a pressing, squeezing, or crushing pain, usually in the chest under the breast bone.
- pain radiating in the arms, shoulders, jaw, neck, and/or back.

The chest pain associated with angina usually begins with physical exertion. Other triggers include emotional stress, extreme cold and heat, heavy meals, excessive alcohol consumption, and cigarette smoking. Angina chest pain is usually relieved within a few minutes by resting or by taking prescribed cardiac medications.

The symptoms of angina pectoris may resemble other medical conditions or problems. Always consult your physician for more information.

Angina pectoris and heart attack risk:

An episode of angina does not indicate that a heart attack is occurring, or that a heart attack is about to occur. Angina does indicate, however, that coronary heart disease is present and that some part of the heart is not receiving an adequate blood supply. Persons with angina have an increased risk of heart attack.

A person who has angina should note the patterns of his/her symptoms – what causes the chest pain, what it feels like, how long episodes usually last, and whether medication relieves the pain. Call for medical assistance if the angina episode symptoms change sharply.

Diagnosing angina pectoris:

In addition to a complete medical history and medical examination, a physician can often diagnose angina pectoris by noting the patient's symptoms and how/when they occur. Certain diagnostic procedures may also determine the severity of the coronary heart disease, and may include:

- **ELECTROCARDIOGRAM (ECG OR EKG)** - A test that records the electrical activity of the heart, shows abnormal rhythms (arrhythmias or dysrhythmias) and detects heart muscle damage.
- **STRESS TEST (USUALLY WITH ECG; ALSO CALLED TREADMILL OR EXERCISE ECG)** - A test that is given while a patient walks on a treadmill or pedals a stationary bicycle to monitor the heart during exercise. Breathing and blood pressure rates are also monitored. A stress test may be used to detect coronary artery disease, and/or to determine safe levels of exercise following a heart attack or heart surgery.
- **CORONARY ARTERIOGRAM (OR ANGIOGRAM)** - With this procedure, x-rays are taken after a contrast agent is injected into an artery to locate the narrowing, occlusions, and other abnormalities of specific arteries.

Treatment of angina pectoris:

Specific treatment for angina pectoris will be determined by the physician based on:

- your age, overall health, and medical history.
- extent of the disease.
- your tolerance for specific medications, procedures, or therapies.
- expectations for the course of the disease.
- your opinion or preference.

The underlying coronary artery disease that causes angina should be treated by controlling existing risk factors: high blood pressure, cigarette smoking, high blood cholesterol levels, and excess weight.

Medications may be prescribed for people with angina. The most common is nitro-glycerine which helps to relieve pain by widening the blood vessels. This allows more blood flow to the heart muscle and decreases the workload of the heart.