HEART ATTACK

Compiled by:

Dr Gotabhaya Ranasinghe
MBBS, MD, MRCP (Lond.), FCCP

Consultant Cardiologist
Cardiac Interventionalist

NHSL Colombo, Sri Lanka

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What Is a Heart Attack?

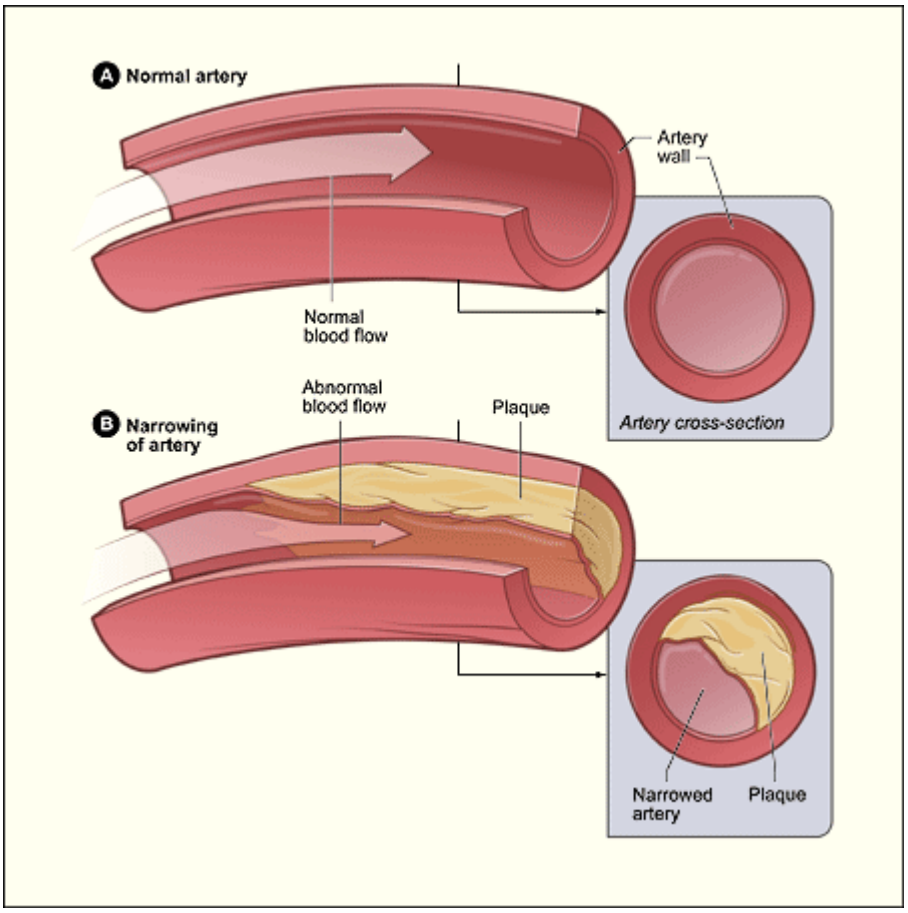
A heart attack occurs when blood flow to a section of heart muscle becomes blocked. If the flow of blood isn't restored quickly, the section of heart muscle becomes damaged from lack of oxygen and begins to die.

Heart attack is a leading killer of both men and women in the developed and developing countries. But fortunately, today there are excellent treatments for heart attack that can save lives and prevent disabilities. Treatment is most effective when started within 1 hour of the beginning of symptoms.

What Causes a Heart Attack?

Most heart attacks occur as a result of coronary artery disease (CAD). CAD is the buildup over time of a material called plaque on the inner walls of the coronary arteries. Eventually, a section of plaque can break open, causing a blood clot to form at the site. A heart attack occurs if the clot becomes large enough to cut off most or all of the blood flow through the artery.

Coronary Artery With Plaque Buildup



The illustration shows a normal artery with normal blood flow (figure A) and an artery containing plaque buildup (figure B).

Heart With Muscle Damage and a Blocked Artery

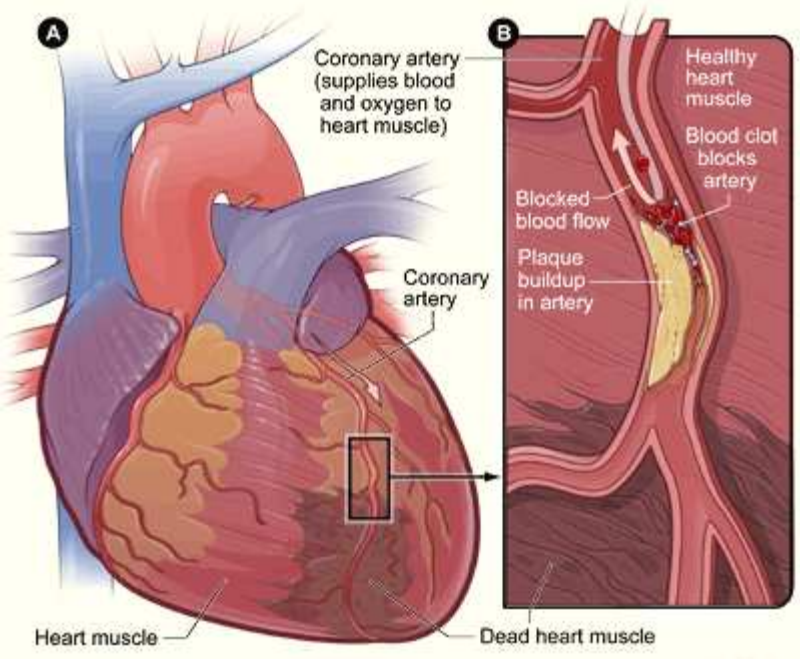


Figure A is an overview of a heart and coronary artery showing damage (dead heart muscle) caused by a heart attack. Figure B is a cross-section of the coronary artery with plaque buildup and a blood clot.

The blocked blood flow prevents oxygen-rich blood from reaching the part of the heart muscle fed by the artery. The lack of oxygen damages the heart muscle. If the blockage isn't treated quickly, the damaged heart muscle begins to die.

Another less common cause of heart attack is a severe spasm (tightening) of a coronary artery that cuts off blood flow through the artery. These spasms can occur in coronary arteries that don't have CAD. It's not always clear what causes a coronary artery spasm, but sometimes it can be related to:

- Taking certain drugs, such as cocaine
- Emotional stress or pain
- Exposure to extreme cold
- Cigarette smoking

During a heart attack, if the blockage in the coronary artery isn't treated quickly, the heart muscle will begin to die and be replaced by scar tissue. This heart damage may not be obvious, or it may cause severe or long-lasting problems.

Severe problems linked to heart attack can include heart failure and life-threatening arrhythmias (irregular heartbeats). Heart failure is a condition in which the heart can't pump enough blood throughout the body. Ventricular fibrillation is a serious arrhythmia that can cause death if not treated quickly.

Warning Signs of A Heart Attack

The most common heart attack signs and symptoms are:

- Chest pain or discomfort —uncomfortable pressure, squeezing, fullness, or pain in the center of the chest that can be mild or strong. This pain or discomfort lasts a few minutes or longer and may go away and come back.
- Pain or discomfort in one or both arms, the back, neck, jaw, or stomach (mimicking gastritis).
- Shortness of breath may occur with or before chest discomfort.
- Other signs include nausea (feeling sick to your stomach), vomiting, lightheadedness or fainting, or breaking out in a cold sweat.

Acting fast at the first sign of heart attack symptoms can save your life and limit damage to your heart. Treatment is most effective when started within 1 hour of the beginning of symptoms.

Who Is At Risk for a Heart Attack?

Certain risk factors make it more likely that you will develop coronary artery disease (CAD) and have a heart attack. Some risk factors for heart attack can be controlled, while others can't.

Major risk factors for heart attack that you can control include:

- Smoking
- High blood pressure
- High blood cholesterol
- Overweight and obesity
- Physical inactivity
- Diabetes (high blood sugar)

Risk factors that you can't change include:

- Age. Risk increases for men older than 45 years and for women older than 55 years (or after menopause).
- Family history of early CAD. Your risk increases if your father or a brother was diagnosed with CAD before 55 years of age, or if your mother or a sister was diagnosed with CAD before 65 years of age.

Certain CAD risk factors tend to occur together. When they do, it’s called metabolic syndrome. In general, a person with metabolic syndrome is twice as likely to develop heart disease and five times as likely to develop diabetes as someone without metabolic syndrome.

How Is a Heart Attack Diagnosed?

The diagnosis of heart attack is based on your symptoms, your personal and family medical history, and the results of diagnostic tests.

ECG (Electrocardiogram)

This test detects and records the electrical activity of the heart. Certain changes in the appearance of the electrical waves on an ECG are strong evidence of a heart attack. An ECG also can show if you're having arrhythmias (abnormal heartbeats), which a heart attack (and other conditions) can cause.

Blood Tests

During a heart attack, heart muscle cells die and burst open, letting certain proteins out in the bloodstream. Blood tests can measure the amount of these proteins in the bloodstream. Higher than normal levels of these proteins in the bloodstream is evidence of a heart attack.

Commonly used blood tests include troponin tests, CK or CK–MB tests, and serum myoglobin tests. Blood tests are often repeated to check for changes over time.

Coronary Angiography

Coronary angiography is a special x-ray exam of the heart and blood vessels. It's often done during a heart attack to help pinpoint blockages in the coronary arteries.

The doctor passes a catheter (a thin, flexible tube) through an artery in your arm or groin (upper thigh) and threads it to your heart. This procedure—called cardiac catheterization—is part of coronary angiography.

A dye that can be seen on x ray is injected into the bloodstream through the tip of the catheter. The dye lets the doctor study the flow of blood through the heart and blood vessels.

If a blockage is found, another procedure, called angioplasty, may be used to restore blood flow through the artery. Sometimes during angioplasty, the doctor will place a stent (a small mesh tube) in the artery to help keep the artery open.

How Is a Heart Attack Treated?

Early treatment can prevent or limit damage to the heart muscle. Acting fast, at the first symptoms of heart attack, can save your life. Medical personnel can begin diagnosis and treatment even before you get to the hospital.

Certain treatments are usually started right away if a heart attack is suspected, even before the diagnosis is confirmed. These include:

- Oxygen
- Aspirin to prevent further blood clotting
- Nitroglycerin, to reduce the workload on the heart and improve blood flow through the coronary arteries
- Treatment for chest pain

Once the diagnosis of heart attack is confirmed or strongly suspected, treatments to try to restore blood flow to the heart are started as soon as possible. Treatments include medicines and medical procedures.

Medicines

A number of different kinds of medicines may be used to treat heart attack. They include the following.

Thrombolytic Medicines

These medicines (also called clot busters) are used to dissolve blood clots that are blocking the coronary arteries. To be most effective, these medicines must be given within the first hour (golden hour) after the start of heart attack symptoms.

Beta Blockers

These medicines decrease the workload on your heart. Beta blockers also are used to relieve chest pain or discomfort and to help prevent additional heart attacks. Beta blockers also are used to correct arrhythmias (irregular heartbeats).

Angiotensin-Converting Enzyme (ACE) Inhibitors

These medicines lower blood pressure and reduce the strain on your heart. They also help slow down further weakening of the heart muscle.

Anticoagulants

These medicines thin the blood and prevent clots from forming in your arteries.

Antiplatelet Medicines

These medicines (such as aspirin and clopidogrel) stop platelets (a type of blood cell) from clumping together and forming unwanted clots.

Other Medicines

Medicines may also be given to relieve pain and anxiety, and to treat arrhythmias, which often occur during a heart attack.

Medical Procedures

If medicines can't stop a heart attack, medical procedures—surgical or nonsurgical—may be used. These procedures include the following.

Angioplasty & Stenting (PCI)

This nonsurgical procedure can be used to open coronary arteries that are blocked by a blood clot. During angioplasty, a catheter (a thin, flexible tube) with a balloon on the end is threaded through a blood vessel to the blocked coronary artery. Then, the balloon is inflated to push the plaque against the wall of the artery. This widens the inside of the artery, restoring blood flow.

During angioplasty, a small mesh tube called a stent may be put in the artery to help keep it open. Some stents are coated with medicines that help prevent the artery from becoming blocked again. This form of treatment is currently considered the most effective way of treating a heart attack.

Coronary Artery Bypass Grafting (CABG)

Coronary artery bypass grafting is a surgery in which arteries or veins are taken from other areas of your body and sewn in place to bypass (that is, go around) blocked coronary arteries. This provides a new route for blood flow to the heart muscle.

Treatment After You Leave the Hospital

Most people spend several days in the hospital after a heart attack. When you leave the hospital, treatment doesn't stop. At home, your treatment may include daily medicines and cardiac rehabilitation (rehab). Your doctor may recommend lifestyle changes, including quitting smoking, losing weight, changing your diet, and increasing your physical activity, to lower your chances of having another heart attack.

Cardiac Rehabilitation

Your doctor may prescribe cardiac rehab to help you recover from a heart attack and to help prevent another heart attack. Almost everyone who has had a heart attack can benefit from rehab. The heart is a muscle, and the right exercise will strengthen it.

But cardiac rehab isn't only about exercise. It also includes education, counseling, and learning about reducing your risk factors. Rehab will help you learn the best way to take care of yourself after having a heart attack and how to prevent having another one.

The cardiac rehab team may include doctors (your family doctor, a cardiologist, and/or a surgeon), nurses, exercise specialists, physical and occupational therapists, dietitians, and psychologists or other behavioral therapists.

How Can a Heart Attack Be Prevented?

Lowering your risk factors for coronary artery disease (CAD) can help you prevent a heart attack. (See "Who Is At Risk for a Heart Attack?") Even if you already have CAD, you can still take steps to lower your risk of heart attack.

Reducing the risk of heart attack usually means making healthy lifestyle choices. You also may need treatment for medical conditions that raise your risk.

Healthy Lifestyle Choices

Healthy lifestyle choices to help prevent heart attack include:

- Following a low-fat diet rich in fruits and vegetables. Pay careful attention to the amounts and types of fat in your diet. Lower your salt intake. These changes can help lower high blood pressure and high blood cholesterol.
- Losing weight if you're overweight or obese.
- Quitting smoking.
- Doing physical activity to improve heart fitness. Ask your doctor how much and what kinds of physical activity are safe for you.

Treat Related Conditions

In addition to making lifestyle changes, you can help prevent heart attacks by treating conditions you have that make a heart attack more likely:

- High blood cholesterol. You may need medicine to lower your cholesterol if diet and exercise aren't enough.
- High blood pressure. You may need medicine to keep your blood pressure under control.
- Diabetes (high blood sugar). If you have diabetes, control your blood sugar levels through diet and physical activity (as your doctor recommends). If needed, take medicine as prescribed.

Have an Emergency Action Plan

Make sure that you have an emergency action plan in case you or someone else in your family has a heart attack. This is especially important if you're at high risk or have already had a heart attack.

Talk with your family doctor about the signs and symptoms of heart attack, when you should call for emergency care or ambulance, and steps you can take while waiting for medical help to arrive.

Life After a Heart Attack

Many people survive heart attacks and live active and full lives. If you get help quickly, treatment can limit the damage to your heart muscle. Less heart damage improves your chances for a better quality of life after a heart attack.

Medical Follow-up

After a heart attack, you will need treatment for coronary artery disease to prevent another heart attack. Your doctor may recommend:

- Lifestyle changes, such as quitting smoking, following a healthy diet, increasing your physical activity, and losing weight, if needed
- Medicines to control chest pain or discomfort, blood pressure, blood cholesterol, and your heart’s workload
- Participation in a cardiac rehabilitation program

Returning to Normal Activities

After a heart attack, most people without chest pain or discomfort or other complications can safely return to most of their normal activities within a few weeks. Most can begin walking immediately. Sexual activity also can begin within a few weeks for most patients. Discuss with your doctor a safe schedule for returning to your normal activities.

If allowed by State law, driving can usually begin within a week for most patients who don’t have chest pain or discomfort or other complications. Each State has rules about driving a motor vehicle following a serious illness. People with complications shouldn’t drive until their symptoms have been stable for a few weeks.

Anxiety and Depression After a Heart Attack

After a heart attack, many people worry about having another heart attack. Sometimes they feel depressed and have trouble adjusting to the new lifestyle that's needed to limit further heart trouble. Your doctor may recommend medicine or professional counseling if you have depression or anxiety. Physical activity can improve mental well-being, but you should consult with your doctor before starting any fitness activities.

Risk of a Repeat Heart Attack

Once you've had a heart attack, you're at higher risk for another one. It's important to know the difference between angina and a heart attack. The pain of angina usually occurs after exertion and goes away in a few minutes when you rest or take medicine as directed. During a heart attack, the pain is usually more severe than angina, and it doesn't go away when you rest or take medicine. If you don't know whether your chest pain is angina or a heart attack, seek advice from your doctor.

Remember, the symptoms of a second heart attack may not be the same as those of a first heart attack. Don't take a chance if you're in doubt. Always seek advice from your doctor early, if you or someone you're with has symptoms of a heart attack.

Unfortunately, most heart attack victims wait 2 hours or more after their symptoms begin before they seek medical help. This delay can result in lasting heart damage or death.

Key Points

- A heart attack occurs when blood flow to a section of heart muscle becomes blocked. If the flow of blood isn't restored quickly, the section of heart muscle becomes damaged from lack of oxygen and begins to die.
- Heart attack is a leading killer of both men and women in the world.
- Today there are excellent treatments for heart attack that can save lives and prevent disabilities. Treatment is most effective when started within 1 hour of the beginning of symptoms.
- Unfortunately, many heart attack victims wait 2 hours or more after their symptoms begin before they seek medical help. This delay can result in lasting heart damage or death.
- If you think you or someone with you is having a heart attack, call your doctor right away.
- Heart attacks occur most often as a result of a condition called coronary artery disease (CAD).
- Heart attack also can be caused by a condition called spasm (tightening) of a coronary artery.
- Certain risk factors increase the changes of developing CAD and having a heart attack (for example, age, a family history of CAD, smoking, and being overweight or obese). Some risk factors can't be controlled, while others can.
- The warning signs of heart attack aren't the same for everyone. However, common signs and symptoms of a heart attack are:
    - Chest pain or discomfort—uncomfortable pressure, squeezing, fullness, or pain in the center or the chest that can be mild or strong. This pain or discomfort lasts a few minutes or longer and may go away and come back.
    - Pain or discomfort in one or both arms, the back, neck, jaw, or stomach.
    - Shortness of breath may occur with or before chest discomfort.
    - Other signs include nausea (feeling sick to your stomach), vomiting, lightheadedness or fainting, or breaking out in a cold sweat.
- Treatments for heart attack include medicines and procedures to open blocked arteries (such as angioplasty).
- Lowering your risk for CAD can decrease your chances of having a heart attack (or second heart attack). This usually involves making healthy lifestyle choices and treating conditions related to CAD such as high cholesterol, high blood pressure, overweight and obesity, and diabetes.
- Most people are able to return to their normal activities after a heart attack. Ask your doctor when you can resume daily activities such as driving, exercise, work, sexual activity, strenuous activities (for example, running or heavy lifting), and travel.

~Many people survive heart attacks and live active and full lives~