



## **Education**

### **Myocardial Infarction (Heart Attack)**

#### **What is a myocardial infarction (MI)?**

Myocardial infarction (MI) is a heart attack. It occurs when there is a sudden, complete blockage of blood flow to a part of the heart.

#### **How does it occur?**

Myocardial infarction may occur at any time and often occurs without warning. As we grow older, our coronary arteries may become narrowed by the buildup of cholesterol plaque. When the arteries narrow, less blood can go through them, and less oxygen gets to the heart muscle. The process of narrowing is called atherosclerosis. The narrower the artery becomes, the more likely it is that a blood clot may form and block the artery completely, causing a heart attack. Sometimes sudden blockages can occur even in places where the artery was not narrow before.

A heart attack may also occur when the heart muscle needs more oxygen than the blood vessels can provide. This might happen, for example, during hard exercise such as shoveling snow, or with a sudden increase in blood pressure. Less commonly, a heart attack can occur due to coronary spasm. Coronary spasm is a sudden and temporary narrowing of a small part of an artery that supplies blood to the heart. It may be caused by smoking or drugs such as cocaine.

Risk factors for heart disease include:

- cigarette smoking
- a family history of heart attack
- diabetes
- overweight
- high blood pressure
- high blood cholesterol
- low HDL cholesterol (that is, too little "good" cholesterol)
- stress
- a lifestyle that does not include much physical activity.

Lack of blood and oxygen during a heart attack damages the heart muscle. Part of the heart muscle usually dies. However, if only a small amount of heart muscle dies, your odds of surviving and living normally afterward are good. Early treatment of heart attacks is the best way to improve your odds.

Heart attacks can cause death in several ways:

- If too much muscle dies, the heart is not able to pump enough blood to the rest of the body.
- Damage to the heart cells that regulate the heartbeat may cause fatal heart rhythm problems.
- Sometimes, the heart muscle weakens and can tear as a result of the damage. This causes internal bleeding.

You are more likely to have a heart attack as you get older. Heart attacks are more likely to occur at a younger age in men than in women. Female hormones seem to help protect women until menopause, when the body produces less of these hormones. Heart disease is more likely to be correctly diagnosed in men and less likely to be suspected in women.

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## What are the symptoms?

You may feel pressure or pain in the middle of your chest. It may extend into your shoulder and arm or into your abdomen or jaw. The discomfort may be severe or may be fairly mild. (Some people think they have indigestion and do not get medical help as soon as they should.) If you think someone is having a heart attack, call 911 and get emergency care immediately. In severe cases, sudden death may occur.

Other typical symptoms that often occur with the chest pain are:

- shortness of breath
- sweating
- nausea or vomiting
- weakness or lightheadedness
- paleness.

Women may have different heart attack symptoms than men. Women may have symptoms such as:

- a burning sensation in the upper abdomen
- lightheadedness
- an upset stomach
- sudden weakness or unexplained tiredness.

Because they may not have chest pain with these symptoms, many women may ignore symptoms of a heart attack.

## How is it diagnosed?

Your health care provider examines you and asks about your immediate symptoms and your medical history. He or she may use the following tests:

- A heart monitor can show abnormal heart rates or rhythms.
- An ECG (electrocardiogram) measures and records the electrical activity of your heart. It gives early information about areas of heart muscle that are damaged.
- Your blood oxygen level can be monitored by a sensor that is attached to your finger or ear.
- Blood tests are used to find out whether the heart muscle has been damaged.
- A chest x-ray can show abnormal heart size and signs of heart failure (poor pumping by the heart).
- Doppler ultrasound (echocardiogram) is a type of scan used to examine your heart valves, muscles, and blood flow, and to look at how efficiently your heart is pumping.
- A coronary angiogram (cardiac catheterization) is a special x-ray procedure in which dye is used to find out which blood vessel is blocked and how severely.

These tests may be done in the hospital or after you leave the hospital.

## How is it treated?

Heart attacks require immediate hospital treatment. Medicines that dissolve the coronary artery blood clot are quickly given through a vein and by mouth. Another way to break up the blood clot is to have an immediate balloon angioplasty procedure. Your heart rhythm is monitored and rhythms that might be dangerous are treated promptly. Some people need a temporary heart pacemaker. You may stay in the hospital 2 to 6 days. For part of that time, you will probably be in a special intensive care unit for heart patients.

Your health care provider may use medicine to:

- reduce your pain
  - stabilize your heart rhythm
  - make it easier for you to breathe
  - lower your blood pressure
  - prevent further damage to your heart
  - dissolve blood clots.
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The exact treatment you receive depends on how you feel, how much heart muscle is damaged, and how much the arteries in your heart are blocked or narrowed. You will be started on beta-blocker drugs and aspirin, and possibly other medicines, to lessen the risk of another heart attack. In some cases, your health care provider may recommend balloon angioplasty or a stent to improve blood flow to the heart. This may mean a longer stay in the hospital.

You may have a low-level treadmill stress test before you leave the hospital. The results of this test will help your provider decide what treatments and exercise are best for you or may be needed in the future.

After a heart attack, it is important to begin a rehab program. This involves a closely watched and gradually increasing exercise program, as well as education about diet and other ways to improve your health and prevent more heart attacks in the future.

### How can I take care of myself?

Follow the treatment plan your health care provider prescribes. In addition:

- Eat healthy food that is low in fat and sodium.
- Lose weight if you need to, and maintain the lower weight.
- Exercise regularly, according to your provider's instructions.
- If you smoke, quit.
- Keep your cholesterol at a normal level.
- Keep your blood pressure under control.
- Follow your provider's instructions for medicine and follow-up appointments.
- Talk with your provider about any questions or fears you may have.
- Carry your medication with you and know how to take it properly. A list of the names and doses and instructions for taking each medicine can be helpful to have.

If you get chest pain, call 911. Immediate emergency care improves your chances of survival and of avoiding damage to your heart.

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