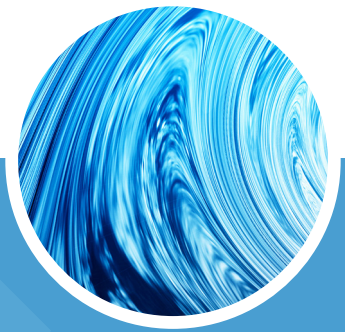
EDUCATION

Treatments for Coronary Artery Disease

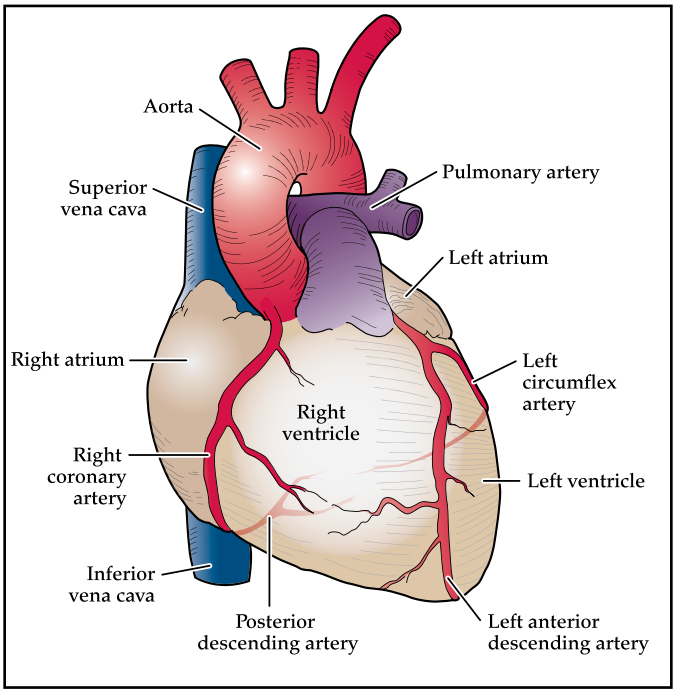


Allina Health

The Heart

The heart is a powerful muscle that pumps oxygen-rich blood throughout your body. The blood vessels that supply oxygen to your heart are called coronary arteries. There are two major coronary arteries which run on the outer surface of the heart. They divide into branches which go into the heart muscle to give it nourishment.

- The **right coronary artery** supplies blood to the right side of the heart. It also sends blood to a portion of the back of the heart's left side.
- The **left coronary artery** usually has two branches. One major branch (the left anterior descending coronary artery) supplies blood to the front of the heart. The other branch (the circumflex coronary artery) supplies blood to the side and part of the back of the heart.



Your heart muscle (myocardium) is about the size of an adult fist.

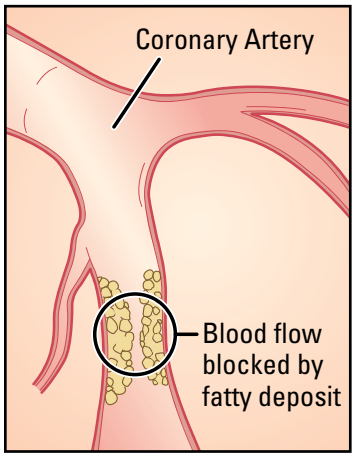
Risk Factors for Heart Disease

Risk factors are habits or conditions that increase the chance of developing a disease. Many heart disease risk factors can be prevented or controlled. Having more than one risk factor is especially serious. Heart disease risk factors are:

- smoking
- diabetes
- high blood pressure
- high blood cholesterol
- family history of early heart disease
- overweight/obesity
- physical inactivity.

Coronary Artery Disease

Coronary artery disease (CAD) happens when the arteries to your heart become narrow. This narrowing is caused by atherosclerosis (fatty deposits inside your arteries) or a blood clot. This makes it difficult for the blood to get to the heart and give it oxygen to work.



Atherosclerosis is a blockage of the arteries and is most often caused by a gradual build-up of plaque (fatty deposits) inside the arteries. As a result, the blood flow and oxygen supply are decreased.

Coronary artery disease can cause angina or a heart attack.

- **Angina (chest pain)** happens when not enough blood flows to your heart muscle. This is a pressure or tightness in the chest. It is caused by blockages in the coronary arteries from plaque (fatty deposits). Angina is usually brought on by stress or activity and goes away with rest.
- **Heart attack (myocardial infarction)** happens when an artery that feeds your heart muscle becomes blocked by a clot, which can form suddenly and are often caused by plaque. When the blood cannot flow to the heart, damage or death to the heart muscle may occur. The pain may feel crushing and lasts longer than angina. You may have shortness of breath, sweating or other symptoms.

Tests

Your health care provider will want you to have one or more different tests to see how your heart is working and if an artery has become blocked.

Electrocardiogram (ECG or EKG)

An electrocardiogram (ECG or EKG) is a test that records electrical impulses from your heart. Electrode patches (discs) attached to your chest send your heart's electrical activity information to a special machine and is recorded on a moving strip of paper.

Your health care provider will look at the ECG pattern and can tell if abnormalities are affecting the electrical impulses through your heart. The ECG can show if you have had or are having a heart attack.

Exercise stress test or treadmill test

An exercise stress test (or a treadmill test) monitors the electrical activity of your heart during exercise. Exercise increases your heart rate and causes your heart to work harder to pump blood to the rest of your body.

The test will show how your heart responds to this "stress." This test is often used to tell if there are blockages in your coronary arteries. It can not tell if or when a clot may suddenly happen.

Stress echocardiogram

A stress echocardiogram (echo) is a test to see how well your heart responds to exercise. This test uses ultrasound with a regular stress test to record images of your heart before and after exercise.

Nuclear myocardial scan/nuclear imaging test

A nuclear myocardial scan or nuclear imaging test helps measure how much blood flows through your heart's arteries. You will receive a small, safe dose of a radioactive material into a vein in your arm. A special camera will scan your heart. You will receive a second dose of the radioactive material while you exercise on a treadmill.

If you cannot be on a treadmill, you will receive a medicine (such as adenosine) that dilates or relaxes the walls of the arteries of your heart. Arteries with blockages do not relax as much so there is not as much blood flow through them.

You may also receive a medicine called dobutamine. This medicine will simulate the "stress" of exercise by increasing the stress on your heart wall. The camera will scan your heart again.

Coronary angiogram (or cardiac catheterization)

A coronary angiogram (or cardiac catheterization) is a test used to decide if there are areas of narrowing or blockage inside your coronary arteries.

A catheter (small, thin tube), will be inserted through a blood vessel in your arm or leg. An X-ray dye (contrast) will be injected to allow the X-ray to "see" your arteries. A special camera will be used to take pictures of blood flowing through your arteries.

Food and liquid directions before surgery

These directions are based on your scheduled arrival time. Not following these directions could mean your procedure will be delayed or canceled.

Alcohol and tobacco: 24 hours

- Do not drink any alcohol 24 hours before your scheduled arrival time.
- Do not smoke, vape, use chewing tobacco or use any other tobacco products up to 24 hours before your scheduled arrival time.

Solid foods: 8 hours

- Eat up to 8 hours before your scheduled arrival time.
  - — Eat light meals such as oatmeal or toast.
  - — Do not eat foods that are heavy or high in fat such as meat or fried foods.

Clear liquids: 2 hours

- Drink only clear liquids up to 2 hours before your scheduled arrival time.
  - — Drink water, fruit juice without pulp, black coffee, clear pop or tea.
  - — Do not have milk, yogurt, energy drinks or alcohol.

Medicines

- Take your medicines as directed with a small sip of water.
  - — Talk with your cardiologist if you have diabetes or if you take warfarin (Jantoven®).

Before the procedure

- If you have diabetes, ask your cardiologist if you should take your insulin or other diabetes medicine(s) before your procedure.
- If you have an allergy to the X-ray contrast, tell your cardiologist or nurse.
- At the hospital, you will sign a consent form and wear a hospital gown.
- Your arm and/or groin area will be cleaned and the hair shaved if needed.
- A nurse will start an intravenous (IV) line for medicine during the test.
- You may receive medicine to relax you.

During the procedure

- Your arm and/or groin will be cleaned again, your blood pressure will be taken, and you will be put on a heart monitor. This monitor lets the cardiac technician watch your heart rate and blood pressure during the test.
- Your cardiologist will inject a local anesthetic (to numb the area) where the catheter will be placed. This may sting.
- You will not feel the catheter being placed.
- Once the catheter is in place, your doctor will take pictures of your heart. You may be asked to hold your breath or to cough. You may feel a brief (up to 30 seconds) hot flash when dye is injected into your left ventricle. When more information is needed, especially when the doctor suspects a heart valve problem, the right side of the heart is examined.
- After the test, the catheter will be taken out and pressure held directly on the site until bleeding stops.
- The procedure may take an hour or more.

After the Procedure

- Nurses will check your pulse, blood pressure and insertion site often.
- You will stay flat in bed for as long as ordered by your doctor.
- You will be able to eat and drink as soon as you like. Be sure to drink extra fluids to get the dye out of your body. If you have heart failure, you will be given special instructions.You will not see any change in the color of your urine.
- The results of your test will be discussed with you and your primary care provider.

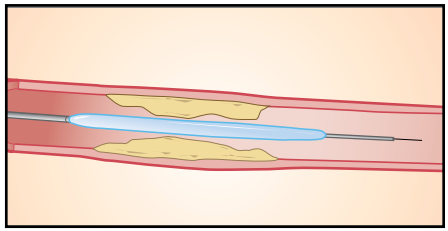
Treatment

If a blockage has been found in your artery, you will need treatment. The three most common types of treatment are angioplasty/coronary stent placement, coronary artery bypass surgery (CAB) and medical therapy (which may include changes in your medicine, and food and beverages).

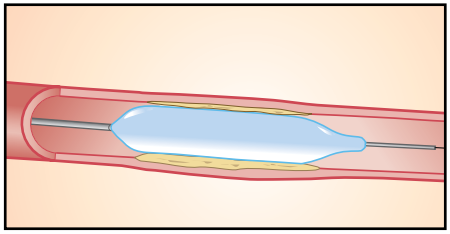
Angioplasty

Angioplasty is a method used to repair a narrowed or blocked artery. This treatment helps more blood flow through your coronary arteries.

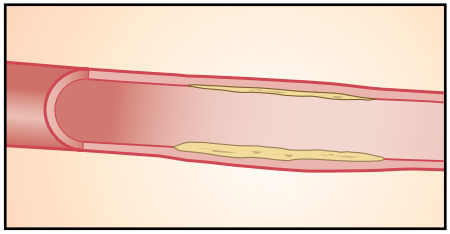
- When you are in the cardiac catheterization lab, a tube with a tiny balloon at the tip is inserted through the groin or a arm artery.
- The tube is guided through the arteries of your body to the blocked coronary artery.
- The balloon is inflated one or more times.
- The inflated balloon squeezes the build-up of plaque against your artery wall and slightly stretches the vessel to improve blood flow.
- After the procedure the balloon is removed from your body.



A tube with a tiny balloon is guided through the arteries of your body to the blocked coronary artery.



The balloon is inflated to squeeze the build-up of plaque against your artery wall.

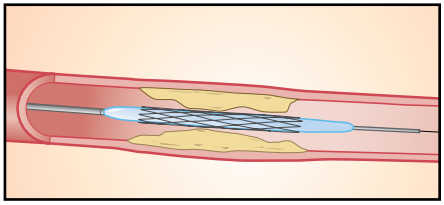


The artery wall is stretched to improve blood flow.

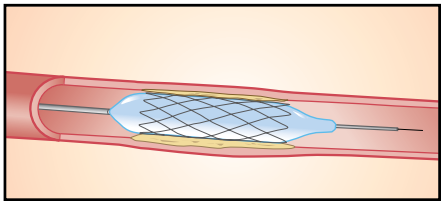
Coronary stent

A coronary stent helps more blood flow through your arteries.

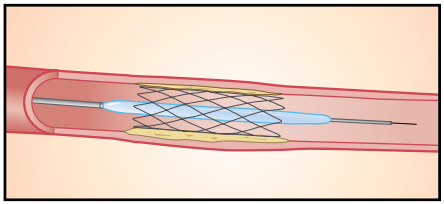
- A stent is a small stainless steel mesh tube that is put on a balloon catheter.
- The catheter is guided into place and the balloon is inflated.
- The stent expands and stays inside the artery to support the walls and keep the artery open. (See pictures on right.)
- Once the stent is placed, it will not be removed. After about 4 weeks, your artery builds a coating of cells around the stent and it will behave like a normal artery wall to your body.



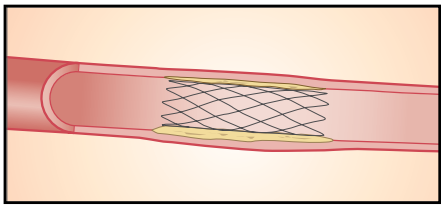
1. The stent is placed on the end of the balloon catheter.



2. The catheter is inserted into the artery and it is inflated.



3. The catheter is deflated.



4. The catheter is removed, leaving the stent in place to keep your artery open.

When to call your health care provider

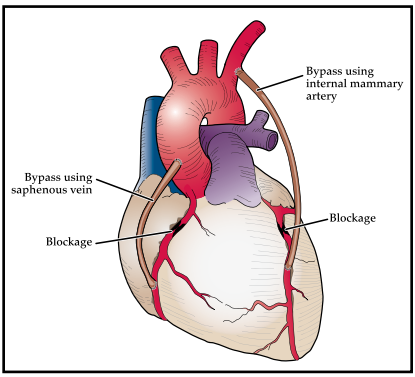
If you have had an angiogram, angioplasty and/or a coronary stent inserted, call your health care provider if you have any of the following:

- at the insertion site:
  - — increased pain, bleeding, redness, swelling or warmth
  - — drainage
- severe pain, a bluish color, or coolness of the arm or leg where the catheter was inserted
- shortness of breath
- chest pain (angina)
- temperature of 100 F or higher
- blood in your urine or are not able to urinate.

Coronary artery bypass surgery (CAB)

If angioplasty and/or placing a stent does not improve your blood flow, you may need to have coronary artery bypass surgery.

This surgery helps more blood get to your heart. A blood vessel, usually from your leg, chest wall, or both is used to make another path for blood around your blocked artery to the heart muscle. The blockage will not be removed. You may hear the abbreviation CABG, which stands for coronary artery bypass graft.



Your health care provider uses a blood vessel to make a path for blood to flow around the blockage.

After CAB surgery questions and answers

Q. How will my incisions heal?

A. Before you leave the hospital, you will be given written instructions about wound care, lifting and driving restrictions and cardiac rehabilitation.

- You may notice swelling in the incision on your leg. This lasts about 3 weeks to 3 months after surgery.
- Keep your leg elevated (raised) as much as possible.
- When elevating your legs, use three to four pillows.
- Try to keep your ankles above your knees and your knees above your hips. This helps extra fluid in your legs get reabsorbed.
- If you have a swollen area at your chest incision, it will usually disappear in 6 weeks to 3 months.

Q. I'm worried about an infection in my incisions. What should I watch for?

A. Call your health care provider if you have concerns about incision care or show any of these signs:

- temperature of 100 F or higher
- tenderness or redness around incision
- increased evidence of pus-like (thick, creamy) drainage.

Q. Do I need to see my primary care provider?

A. It's important to see your primary care provider after you leave the hospital. Some appointments will be made for you and others you may need to make from home. If the appointments are not already made, please make them. Your primary care provider needs to know that this appointment is for a check-up after surgery.

Q. What if I miss a dose of my medicine?

A. Take your medicine on a routine schedule. If you miss a dose do not take twice as much the next time. Resume your schedule with the next dose.

Angina

Q. How will I know if I'm having angina or just incisional pain?

A. **Angina** will likely be similar to the chest pain you had before surgery. This may feel like indigestion, a sharp and/or burning pain, an ache or numbness that begins in or spreads to your neck, jaw, throat, shoulder or back of your arms.

Incisional pain is more constant. It occurs when you move suddenly or change positions. It can be relieved with pain medicines prescribed for you or by using pain relief measures that you used when you were in the hospital. If your pain continues and you are having difficulty deciding if your pain is incisional or angina, call your health care provider.

Q. Should I take nitroglycerin if I am having angina? What about calling 911?

A. If you feel symptoms of angina, follow these steps unless your health care provider has given you other instructions:

- Take one nitroglycerin tablet or use one nitroglycerin spray. Sit for 5 minutes.
- If the angina goes away, rest for a while, then continue your normal routine.
- **If the angina does not go away or gets worse, call 911 right away. Do not delay. Do not drive yourself to a hospital emergency room or urgent care.**

Recovery

Recovering from your surgery or other treatment may take several weeks of steady progress before you feel like yourself again. You may feel a little weaker and tired when you arrive home. This is normal.

It is important to slowly increase your activity to regain your strength and independence. Be sure to get plenty of rest as you return to your normal activity level.

The following guidelines are for your recovery. Talk with your health care provider if you have any questions or concerns.

- Take all prescription medicines (such as aspirin or Plavix®) as directed by your doctor.
- Do not lift more than 10 pounds. In general, this lifting restriction lasts 2 weeks to 3 months. Ask your health care provider to recommend what is right for you.
- Take a shower every day with soap that doesn't contain perfume, lotion or moisturizer. Do not take a tub bath until your incisions are completely healed and there are no scabs. This usually takes 2 to 4 weeks.
- Do not smoke or use smokeless tobacco. Smoking increases your heart rate and blood pressure, and narrows your blood vessels. You are at an increased risk of heart attack, stroke and circulation problems. If you need help quitting smoking or using smokeless tobacco, please talk with your health care provider.
- Exercise at least three to five times a week. It is best for you to get some form of exercise every day, such as walking.
  - — Do not walk outdoors in very hot or cold weather. In extreme temperatures, do your walking in a shopping center or other community building.

- Try to walk on level surfaces in a safe area.
- Wait 1 hour after eating a moderate meal before doing exercise.
- You should be able to have a conversation while you exercise. If you are unable to do this, or if you have any problems, rest or slow your pace until you feel comfortable.

- Eat a well-balanced, healthful meals to promote healing. Give yourself a variety of healthful choices. Eat small meals often and nutritious snacks, if you can't manage a large meal. Your appetite will gradually improve after recovery.

Cardiac Rehabilitation

Your health care provider may recommend that you attend a medically supervised program called cardiac rehabilitation.

Cardiac rehabilitation involves structured exercise, education about your heart, information about how to manage your current condition, and a plan for helping to prevent more cardiac problems. Cardiac therapists will guide you through rehabilitation and watch you closely.

Inpatient cardiac rehabilitation

This phase of your rehabilitation takes place while you are still in the hospital. Members of a special cardiac rehabilitation team will meet with you. They may include an occupational therapist, registered nurses, an exercise physiologist, a respiratory care practitioner and a physical therapist.

Your cardiac rehabilitation therapist will work closely with your health care provider to prescribe a step-by-step program of activity and exercise. This will help prevent you from losing muscle mass while you're in the hospital.

This program is designed to monitor your heart's response to exercise and ensures you are safe and able to perform activities of daily living.

Outpatient cardiac rehabilitation

Your rehabilitation may continue on a regular schedule after you leave the hospital. These fully-monitored sessions will help you safely build up your tolerance for activity and improve the strength of your heart so you can return to your normal everyday tasks.

Educational programs and support groups will help you learn how to lower your risks and help yourself recover emotionally and physically.

Long-term maintenance cardiac rehabilitation

After you've completed your outpatient program, it is important to continue in other programs that promote cardiovascular and physical fitness, and support you as you help create a heart-healthy lifestyle. Some hospitals have a medical fitness center for you to continue your exercise program under the supervision of staff trained to monitor people with heart problems.

Benefits of a cardiac rehabilitation program

The benefits of a cardiac rehabilitation program include:

- increasing your activity level, improving your cardiovascular fitness, and increasing your heart's functional capacity
- reducing your risk factors
- giving you more control over your own health
- providing education about reducing risk factors and changing your lifestyle.

Questions or Concerns

If you have any questions or concerns about your treatment or condition, please call your health care provider.

Health care provider: _____

Phone: _____

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