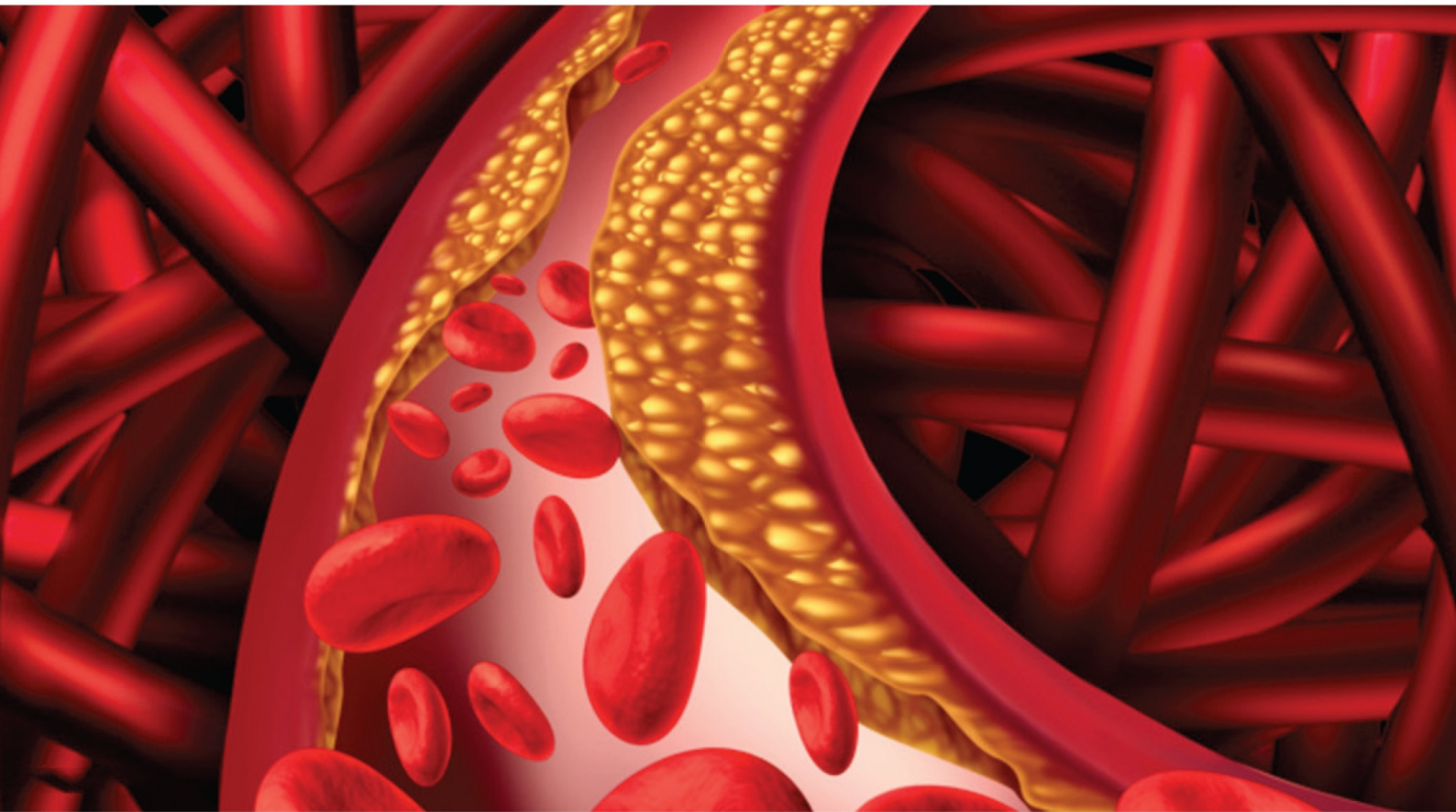


Coronary Artery Disease

Coronary Angiogram

Percutaneous Coronary Intervention (PCI)



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Tel. : 022-2384 1543 / 98205 53969 (Monday - Friday: 5.00 p.m. to 8.00 p.m.)

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CORONARY ARTERY DISEASE

Key Points

- Coronary artery disease happens when plaque buildups inside the blood vessels that bring blood and oxygen to your heart muscle. Plaque increases the chance that blood clots may form and block a blood vessel, and this can cause a heart attack.
- Your treatment may include a combination of diet changes, exercise, medicines, and surgery.
- Follow your healthcare provider's advice about exercising, eating a healthy diet, watching your weight, not smoking, and checking your blood pressure.

What is coronary artery disease?

Coronary artery disease (CAD) is a type of heart disease caused by a problem with the blood vessels that bring blood and oxygen to the heart muscle. These arteries are called the coronary arteries. This disease increases your risk for heart attack and sudden death.

What is the cause?

Fatty deposits called plaque may build up in blood vessels and make them narrower. The narrowing decreases the amount of blood flow to the heart. Plaque also increases the chance that blood clots may form and block a blood vessel, which can cause a heart attack or stroke.

Your risk for CAD may be higher if you:

- Have a family history of coronary artery disease at an early age
- Smoke
- Have high blood pressure
- Have diabetes
- Are very overweight
- Don't get enough exercise
- Have high levels of blood fat such as high cholesterol level

What are the symptoms?

Coronary artery disease may not cause any symptoms. When there are symptoms, the most common one is chest pain, called angina. You may feel:

- A feeling of tightness or heaviness in the chest
- Squeezing, pressure, or burning in the chest

Angina symptoms usually:

- Last for 5 minutes or less and go away with rest or medicine such as nitroglycerin.

- Happen when the heart has to work harder, such as after a heavy meal or during physical activity or emotional stress.

Angina may also happen when you are resting.

Call for help right away if you have symptoms of a heart attack. The most common symptoms include:

- Chest pain or pressure, squeezing, or fullness in the center of your chest that lasts more than a few minutes, or goes away and comes back (may feel like indigestion or heartburn)
- Pain or discomfort in one or both arms or shoulders, or in your back, neck, jaw, or stomach
- Trouble breathing
- Breaking out in a cold sweat for no known reason
- If your provider has prescribed nitroglycerin for angina, pain that does not go away after taking your nitroglycerin as directed

Along with these symptoms, you may also feel very tired, faint, or sick to your stomach.

How is it diagnosed?

Your healthcare provider will ask about your symptoms and medical history and examine you. Tests may include:

- Blood tests
- An ECG (also called an EKG or electrocardiogram), which measures and records your heartbeat
- An exercise treadmill test to see how your heart works when you exercise
- An echocardiogram, which uses sound waves (ultrasound) to see how well your heart is pumping
- Angiogram, which is a series of X-rays taken after your healthcare provider injects a special dye into your blood vessels to show the walls of the arteries and any blockage
- CT scan, which uses X-rays and a computer to show detailed pictures of the arteries

How is it treated?

Your treatment depends on many factors, such as your age, heart muscle function, and other health problems. At first, treatment may include diet changes and an exercise program. Your healthcare provider may prescribe medicine.

- Many people need to take 2 or more medicines to help prevent a heart attack or stroke. It may take several weeks or months to find the best treatment for you.
- Your provider may also prescribe other types of medicine to lower blood pressure, help stop chest pain, control an irregular heartbeat, help prevent blood clots, or lower blood fat (cholesterol).

If your coronary arteries are badly blocked, you may need balloon angioplasty and a coronary stent, or bypass surgery.

- A balloon angioplasty opens blocked blood vessels and improves blood flow. A metal mesh device called a stent is usually left in the blood vessels to help keep them open.

- Bypass surgery uses blood vessels from other parts of the body, or manmade material, to make a new path around a blocked area.

How can I take care of myself?

If you have coronary artery disease, there are things you can do to take care of yourself now and prevent problems in the future.

- Follow your provider's advice about activity, exercise, medicine, and follow-up visits.
- Lower the amount of salt, saturated and trans fats, and cholesterol in your diet.
- Work with your healthcare provider to control diabetes, blood pressure, or other health problems you may have.
- Try to keep a healthy weight. If you are overweight, talk to your provider about ways to lose weight.
- If you smoke, try to quit. Talk to your healthcare provider about ways to quit smoking.
- Ask your healthcare provider:
 - How and when you will get your test results
 - How long it will take to recover
 - If there are activities you should avoid and when you can return to your normal activities
 - How to take care of yourself at home
 - What symptoms or problems you should watch for and what to do if you have them
- Make sure you know when you should come back for a checkup. Keep all appointments for provider visits or tests.
- Taking a low-dose aspirin every day may help prevent a heart attack or stroke. Not everyone should take aspirin. Ask your healthcare provider if you should take aspirin and if so, how much to take.

How can I help prevent coronary artery disease?

You can prevent this disease with a heart-healthy lifestyle:

- Eat a healthy diet and keep a healthy weight.
- Stay fit with the right kind of exercise for you.
- Find ways to manage stress.
- Don't smoke.
- Limit your use of alcohol.

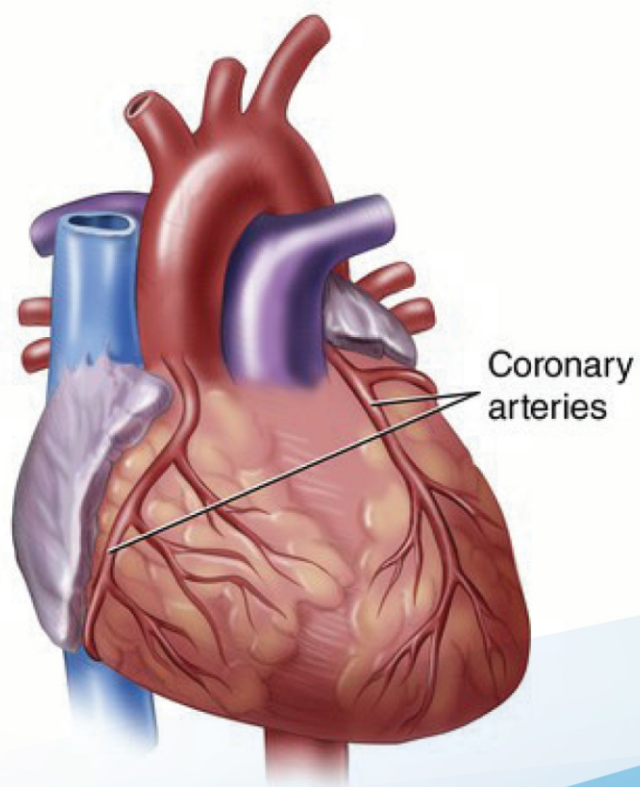
Talk to your healthcare provider about your personal and family medical history and your lifestyle habits. This will help you know what you can do to lower your risk for coronary artery disease.

If you have a strong family history of CAD, a healthy lifestyle may slow the start of the disease and maybe even keep you from getting it. However, you must have regular checkups to keep a close watch on the health of your heart.

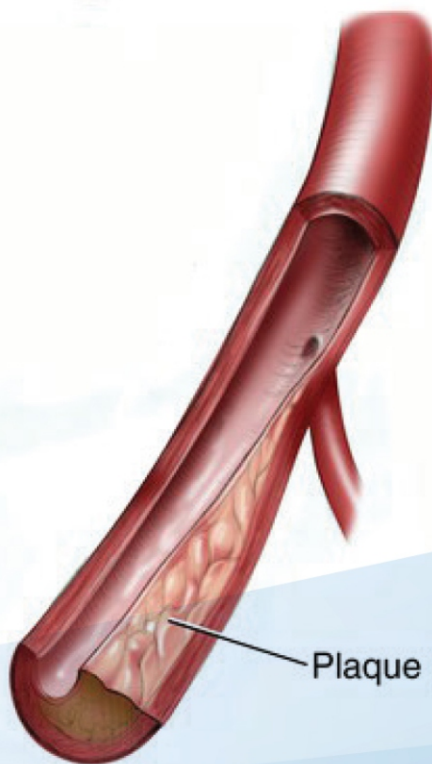
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Plaque Buildup in Arteries

Healthy artery

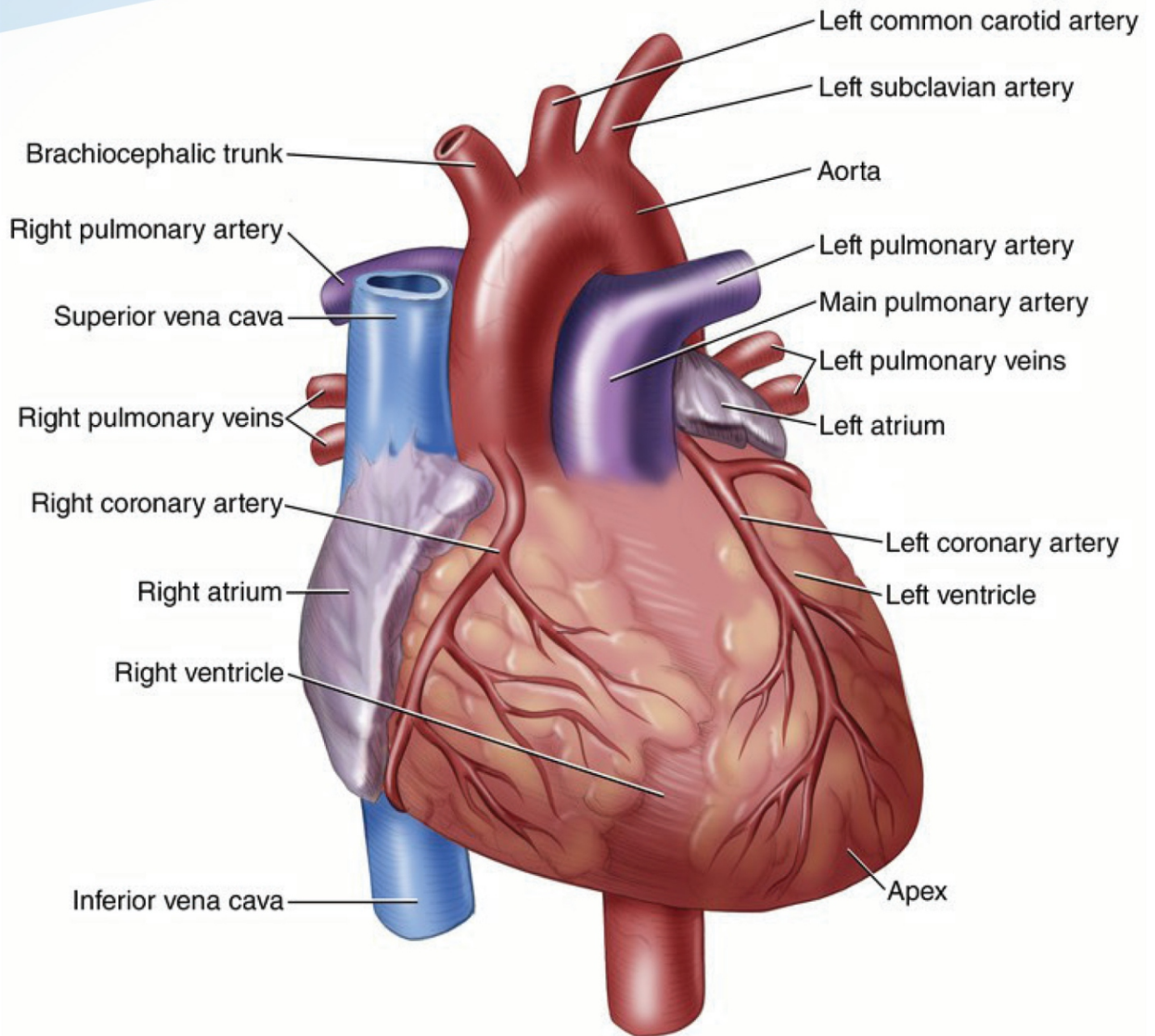


Plaque (fatty deposit)



Atherosclerosis

Heart: External View



CORONARY ANGIOGRAM

Key Points

- A coronary angiogram is a series of X-rays used to look for narrow, weak, or blocked parts of the coronary arteries, which bring blood to the heart muscle. The results can help your healthcare provider see if you need treatment to widen an artery, or to remove or bypass a blockage in an artery.
- Tell your healthcare provider about all medicines and supplements that you take. Ask your healthcare provider if you need to avoid taking any medicine or supplements before the procedure.
- Ask your healthcare provider how and when you will get your test results and how to take care of yourself at home.

What is a coronary angiogram?

A coronary angiogram is a series of X-rays taken after your healthcare provider injects a dye into the blood vessels that bring blood to the heart muscle. These arteries are called the coronary arteries. The test looks for narrowing, weakness, or blockages in these arteries that decrease blood flow to the heart muscle.

When is it used?

A coronary angiogram is done to check for problems in the coronary arteries. For example, your healthcare provider can see where an artery is blocked and how much is blocked. The results can help your provider see if you need treatment to widen an artery, remove a blockage, or bypass a blockage in an artery.

You may have a coronary angiogram if:

- You have had a stress test that shows abnormal results.
- You have chest pain.
- You have had a heart attack.
- You are going to have heart surgery, like replacement of a heart valve.

How do I prepare for this procedure?

- You may or may not need to take your regular medicines the day of the procedure. Tell your healthcare provider about all medicines and supplements that you take. Some products may increase your risk of side effects. Ask your healthcare provider if you need to avoid taking any medicine or supplements before the procedure.
- Tell your healthcare provider if you have any food, medicine, or other allergies such as latex.
- Tell your provider if you have had kidney problems or an allergy to chemicals, such as contrast dye.

- Your healthcare provider will tell you when to stop eating and drinking before the procedure. This helps to keep you from vomiting during the procedure.
- Follow your provider's instructions about not smoking before and after the procedure. Smokers may have more breathing problems during the procedure and heal more slowly. It's best to quit 6 to 8 weeks before surgery.
- Follow any other instructions your healthcare provider gives you.
- Ask any questions you have before the procedure. You should understand what your healthcare provider is going to do. You have the right to make decisions about your healthcare and to give permission for any tests or procedures.

What happens during the procedure?

This procedure is usually done at the hospital.

Before the procedure you will be given medicine and IV fluids via an IV line. You will be awake during the procedure. You will be given a local anesthetic to numb the area where the catheter will be inserted. You may also be given medicine to help prevent blood clots.

Your healthcare provider will put a small tube called a catheter through your skin and into a blood vessel in your groin or arm. Your provider will guide the catheter to the coronary arteries.

Dye will be put into your arteries and X-rays will be taken as the dye moves through them. Your healthcare provider may then put a different catheter into the heart and record the blood pressure in each of the 4 chambers of the heart and the lung arteries. Other measurements that show how your heart is working may be done as well.

At the end of the procedure, your healthcare provider will remove the catheter and put pressure on the area where the catheter was put in (the puncture site) to control any bleeding. The procedure usually takes about an hour.

What happens after the procedure?

After the procedure you may stay in a recovery area for at least a few hours or overnight. The puncture site may be bruised and sore for a few days.

Ask your healthcare provider:

- How and when you will get your test results
- How long it will take to recover
- If there are activities you should avoid and when you can return to your normal activities
- How to take care of yourself at home
- What symptoms or problems you should watch for and what to do if you have them

Make sure you know when you should come back for a checkup. Keep all appointments for provider visits or tests.

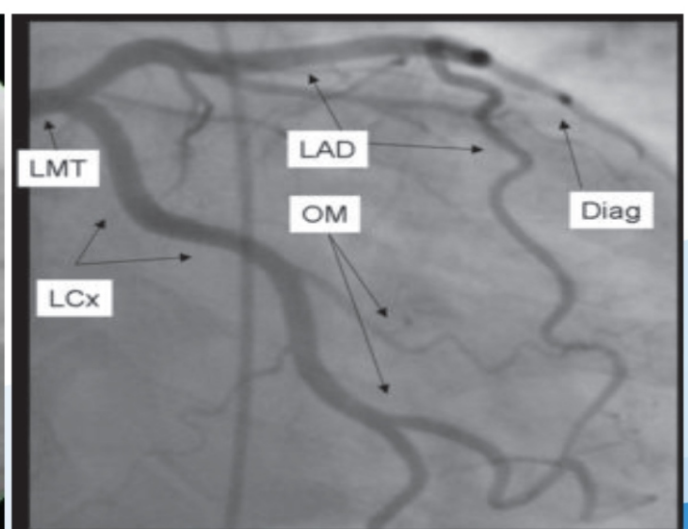
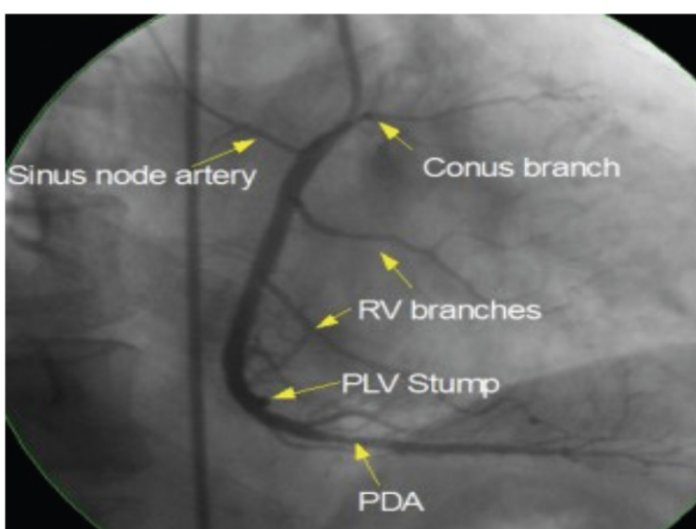
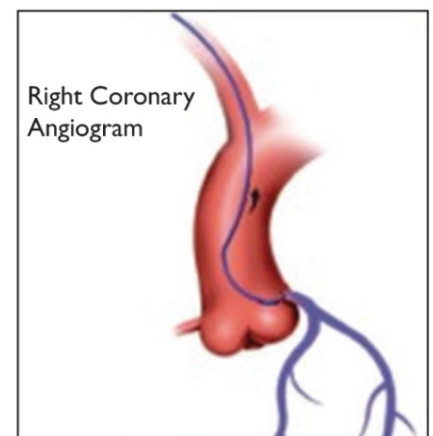
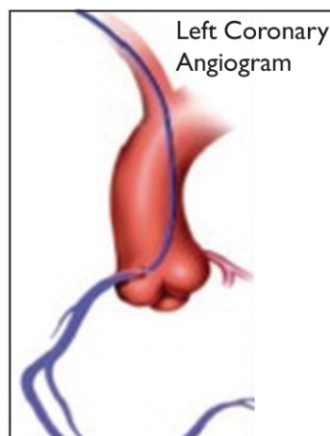
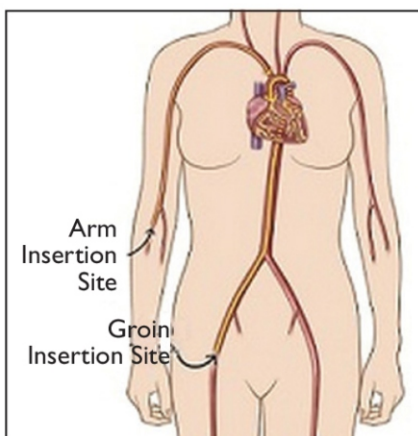
What are the risks of this procedure?

Every procedure or treatment has risks. Some possible risks of this procedure include:

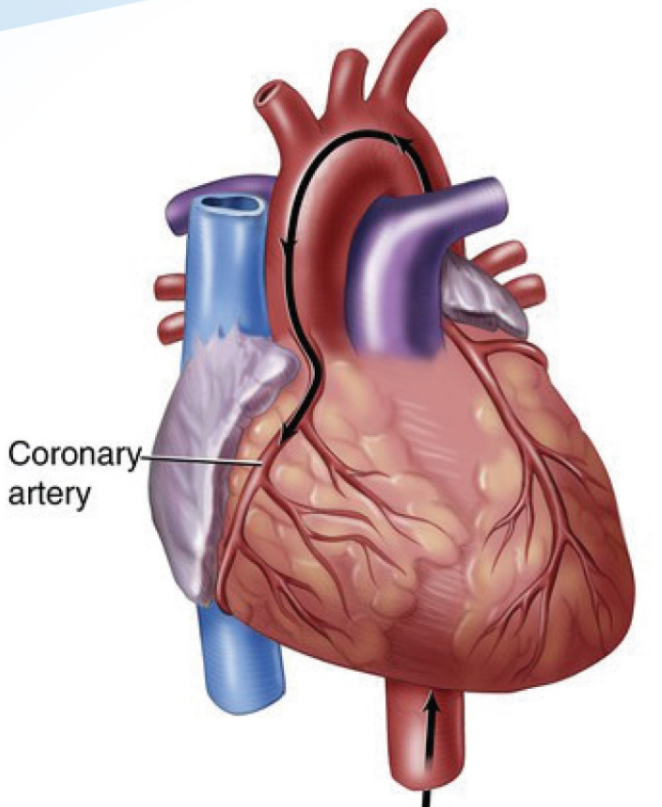
- You may have problems with anesthesia.
- You may have infection, bleeding, or blood clots.
- Other parts of your body may be injured during the procedure.
- You may have an allergic reaction to the dye.
- The procedure can cause irregular heart rhythms, which might need treatment.
- While not common, a heart attack or stroke might be triggered by the procedure.

Ask your healthcare provider how these risks apply to you. Be sure to discuss any other questions or concerns that you may have.

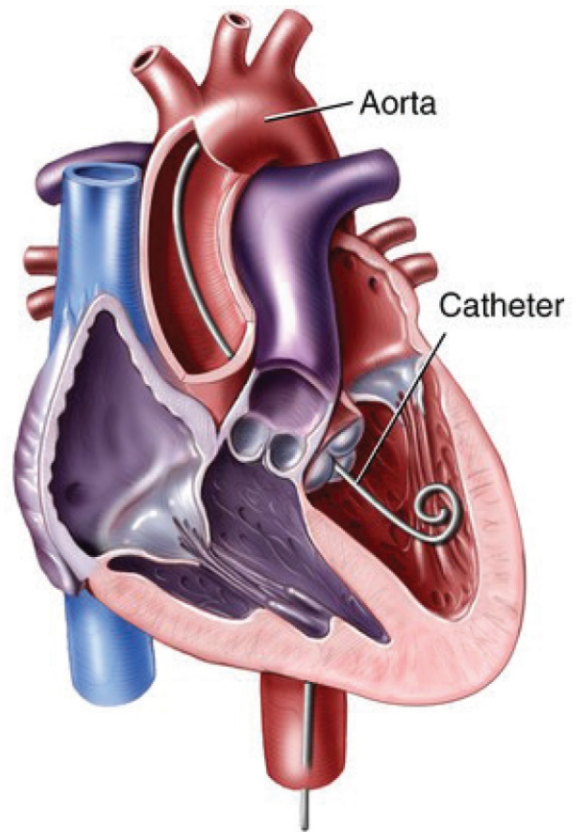
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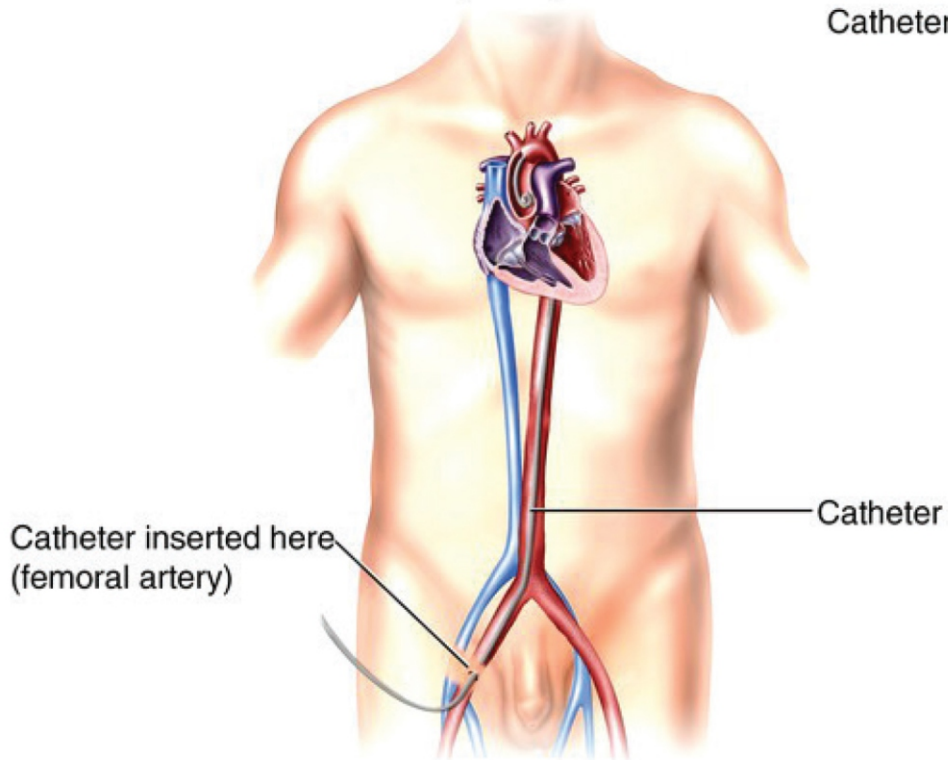
Heart Catheterization



Path of catheter into coronary artery



Catheter in left ventricle



PERCUTANEOUS CORONARY INTERVENTION (PCI)

What is percutaneous coronary intervention (PCI)?

Arteries carry blood to all parts of your body. Heart arteries can become blocked or narrowed by plaque. Plaque is a buildup of fats, cholesterol, and other substances on the inside walls of the arteries.

Percutaneous coronary intervention (PCI) is a procedure in which your healthcare provider inserts a flexible tube called a balloon catheter into a blocked artery in your heart to unblock it. It opens up the artery and allows blood to flow without the need for major surgery. A metal mesh device called a stent is often left in the artery to help keep the blood vessel open. The procedure may also be called coronary angioplasty or percutaneous transluminal coronary angioplasty (PTCA). PCI may be done during a heart attack to reduce heart muscle damage.

PCI is successful over 95% of the time. However, there is risk with every treatment or procedure. Talk to your healthcare provider for complete information about whether any of these risks apply to you.

- There are times when the balloon cannot enter the severely narrowed artery.
- Sometimes the narrowed or blocked artery will not widen.
- You may bleed a lot and need medicine or a blood transfusion.
- The artery may be damaged. For example, the catheter might poke a hole in the artery during the procedure. Emergency surgery to repair the hole may be needed.
- There is a risk of injury, bleeding, or infection where the catheter was inserted.

How is PCI done?

Before the procedure:

- You will be asked to sign a consent form for PCI and angiography. Angiography is an X-ray study of the blood vessels using contrast dye. The consent form will state the reason you are having the PCI, what happens during the PCI, and what you may expect afterward.
- There is risk with every treatment or procedure. Talk to your healthcare provider for complete information about whether any of these risks apply to you:
 - Anesthesia problems
 - Bleeding
 - Blood clots
 - Infection
 - Stroke
 - Artery damage and possible emergency surgery
- Tell your healthcare provider if you have any food, medicine, or other allergies such as latex.
- Tell your provider if you have had kidney problems or an allergy to chemicals, such as contrast dye.

- Tell your healthcare provider if you are taking any medicines, including nonprescription drugs, herbal remedies, or recreational or illegal drugs.
- You will have a small tube (IV catheter) inserted into a vein in your hand or arm. This will allow medicine to be given directly into your blood and to give you fluids, if needed.

During the procedure:

- You will be given medicines to prevent pain during your procedure. Local anesthesia numbs the skin where you will have the procedure.
- Your provider will put a catheter into a blood vessel in your arm or groin. A catheter is a very thin, flexible tube. X-rays are used to help see where the catheter is as it is moved to the blocked artery. A thin wire is guided through the catheter into the narrowed blood vessel. Another catheter is moved forward over the wire. This second catheter has a tiny balloon at its tip.
- When the balloon reaches the narrow part of the artery, your provider will inflate the balloon. Inflating the balloon stretches the walls of the narrowed artery. The stretching of the artery greatly improves blood flow through the artery.
- A stent may be left in the artery to help keep it open. It may be coated with medicine to help prevent clots.
- The provider then deflates the balloon and removes the catheters and wire.

After the procedure:

- You will be checked often by nursing staff.
- There will be a pressure dressing on the area where the catheter was inserted to prevent bleeding. The dressing will be checked and changed by your provider or the nursing staff as needed.
- Your blood oxygen level may be monitored by a sensor that is attached to your finger or earlobe.
- A heart (cardiac) monitor may be used to keep track of your heart rate and rhythm.
- Your provider may prescribe medicines to:
 - Relax and widen blood vessels and allow blood to flow through them easier
 - Help prevent blood clots
 - Reduce blood pressure, slow the heart rate, and reduce the workload of the heart
 - Control cholesterol levels
 - Reduce fluid build-up and swelling in the body
 - Reduce straining with a bowel movement
 - Treat pain
- Your provider may recommend other types of therapy to help relieve pain, other symptoms, or side effects of treatment.

What can I do to help?

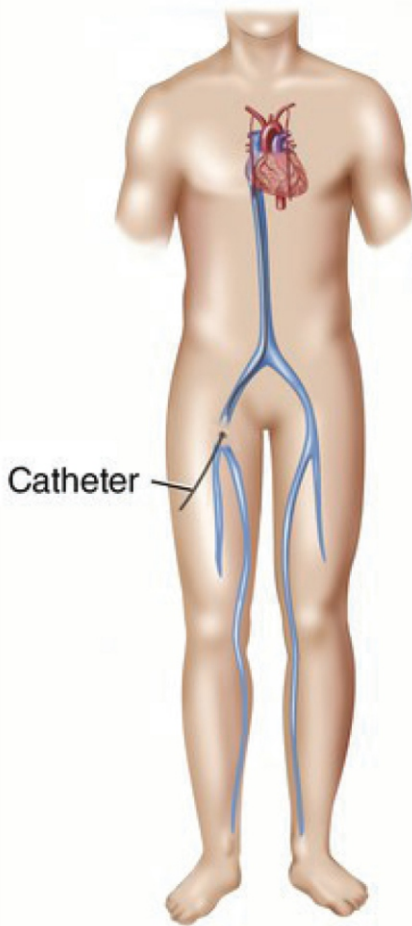
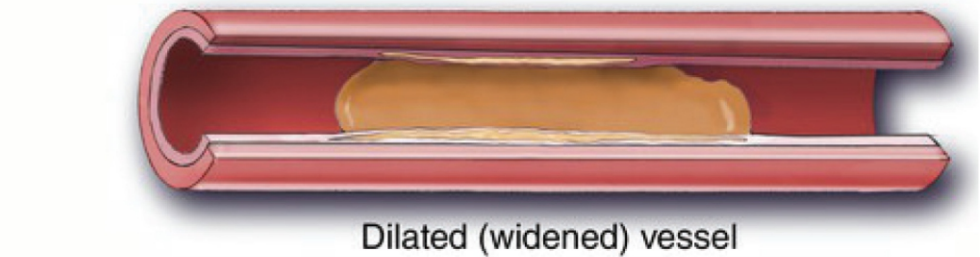
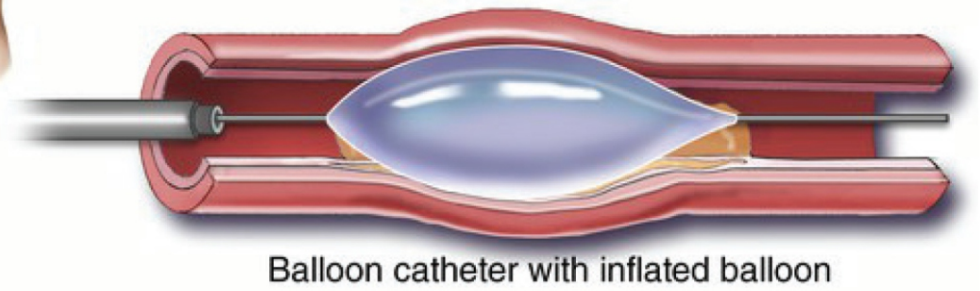
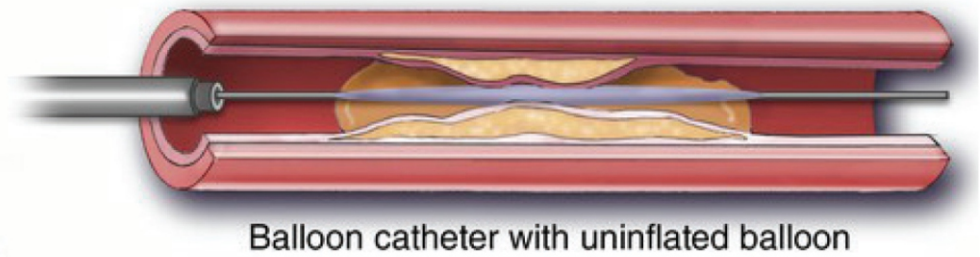
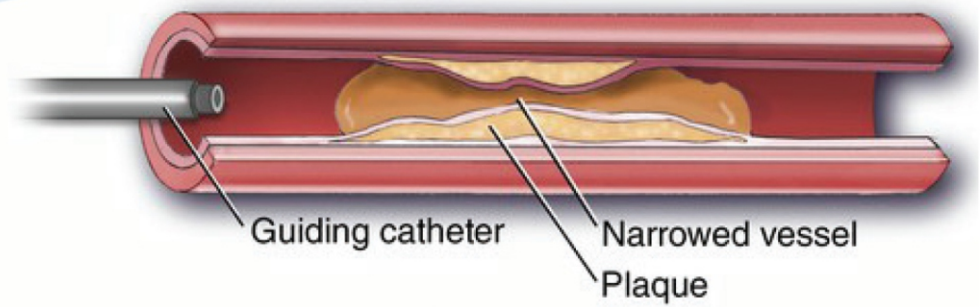
- You will need to tell your healthcare team if you have new or worsening:
 - Chest pain or pressure, squeezing, or fullness in the center of your chest that lasts more than a few minutes, or goes away and comes back (may feel like indigestion or heartburn)
 - Pain or discomfort in one or both arms or shoulders, or in your back, neck, jaw, or stomach
 - Trouble breathing
 - Breaking out in a cold sweat for no known reason
 - Along with the previous symptoms, feeling very tired, faint, or sick to your stomach
 - Pain or numbness in your arm or leg
 - Bleeding, excess bruising, or a lot of swelling where the catheter was inserted
 - Dizziness or lightheadedness
 - Inability to do your normal daily activities
 - Feeling like your heart is beating too fast, too slow, or skipping beats
 - Redness, swelling, pain, warmth, or drainage from your surgical wound
 - Fever, chills, or muscle aches
 - Signs of a problem when you are taking blood thinners, such as:
 - Unusual bruising
 - Red or black bowel movements
 - Cuts that do not stop bleeding
- Ask questions about any medicine, treatment, or information that you do not understand.

How long will I be in the hospital?

How long you stay in the hospital depends on many things, such as your general health, why you are in the hospital, the treatment you need, and how well you recover. This is often between 2 to 3 days after you have the procedure. Talk with your provider about how long your stay may be.

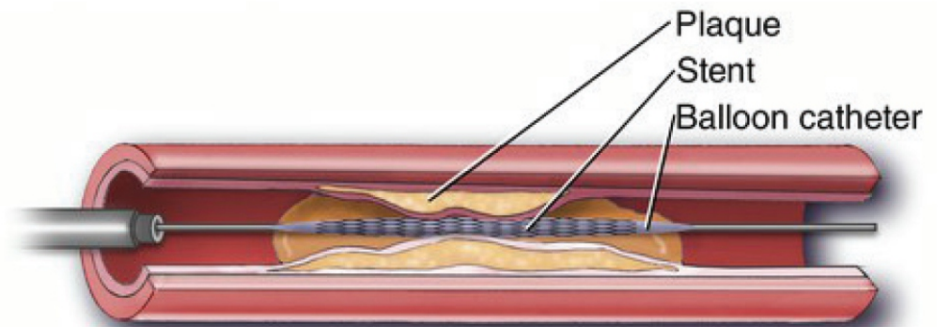
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Blood Vessel Dilation with Balloon Catheter

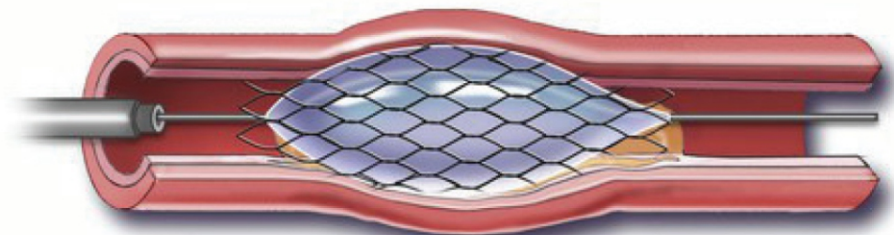


Site of catheter insertion

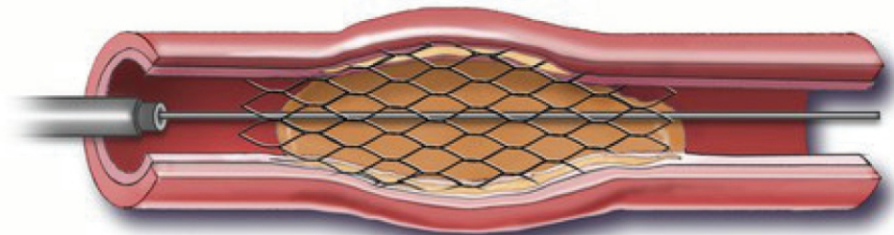
Coronary Artery Stent



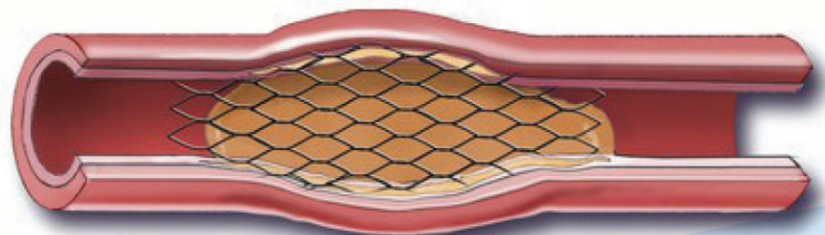
Balloon catheter is inserted into the artery.



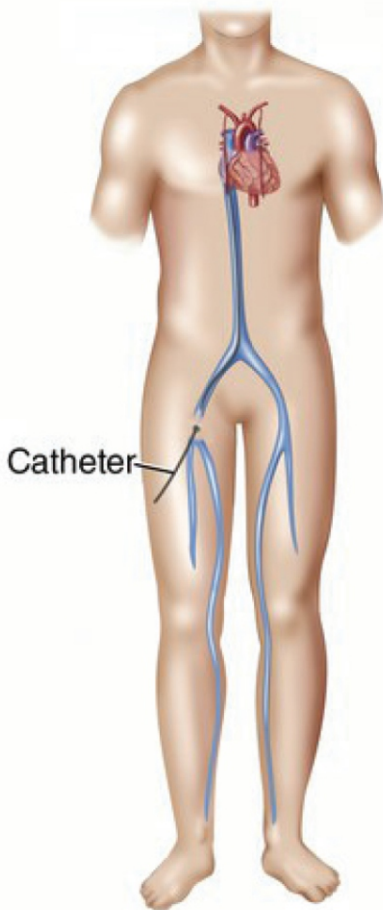
Balloon is inflated to expand the stent.



Balloon is deflated.



Catheter is removed. Stent remains to hold artery open.



Site of catheter insertion

PERCUTANEOUS CORONARY INTERVENTION (PCI) DISCHARGE INFORMATION

What is percutaneous coronary intervention (PCI)?

Arteries carry blood to all parts of your body. Heart arteries can become blocked or narrowed by plaque. Plaque is a buildup of fats, cholesterol, and other substances on the inside walls of the arteries.

Percutaneous coronary intervention (PCI) is a procedure in which your healthcare provider inserts a flexible tube called a balloon catheter into a blocked artery in your heart to unblock it. It can open up the artery and allow blood to flow without the need for major surgery. A metal mesh device called a stent is often left in the artery to help keep the blood vessel open. The procedure may also be called coronary angioplasty or percutaneous transluminal coronary angioplasty (PTCA). PCI may be done during a heart attack to reduce heart muscle damage.

How can I take care of myself when I go home?

How long it takes to get better depends on how much your heart muscle was damaged, how well you recover, your overall health, and any complications you may have. People with successful PCI have good long-term results. However, your arteries may narrow again. If this happens, it usually happens within 6 months after the first procedure. You need to make lifestyle changes to be healthier and to help keep from needing PCI in the future. There are several things you can do.

Management

- Your provider will give you a list of your medicines when you leave the hospital.
 - Know your medicines. Know what they look like, how much you should take each time, how often you should take them, and why you take each one.
 - Take your medicines exactly as your provider tells you to.
 - Carry a list of your medicines in your wallet or purse. Include any nonprescription medicines and supplements on the list.
 - Talk to your provider before you use any other medicines, including nonprescription medicines.
- Your provider may prescribe medicines to:
 - Relax and widen blood vessels and allow blood to flow through them easier
 - Help prevent blood clots
 - Reduce blood pressure, slow the heart rate, and reduce the workload of the heart
 - Control cholesterol levels
 - Reduce fluid build-up and swelling in the body
 - Reduce straining with a bowel movement
 - Treat pain

- Your provider may recommend other types of therapy to help relieve pain, other symptoms, or side effects of treatment.

Appointments

- Follow your provider's instructions for follow-up appointments.
- Keep appointments for any testing you may need.

Talk with your provider about any questions or concerns you have.

Diet, Exercise, and Other Lifestyle Changes

- Follow the treatment plan your healthcare provider prescribes.
- Get plenty of rest while you're recovering. Try to get at least 7 to 9 hours of sleep each night.
- You will probably need to make changes in some of the foods you eat. Ask your provider about the benefits of talking to a dietician to learn what you need in a healthy diet.
- If your angina was caused by plaque build-up in your heart arteries, you will need to eat a diet low in sodium, low in cholesterol and high in fiber.
- Ask your healthcare provider if there are any foods or medicines you should avoid.
- Drink enough fluids to keep your urine light yellow in color, unless you are told to limit fluids.
- Lose weight if you need to and keep a healthy weight.
- Stay physically active as advised by your provider.
- Follow activity restrictions, such as not driving or operating machinery, as recommended by your healthcare provider or pharmacist, especially if you are taking pain medicines.
- Don't smoke. Smoking can worsen poor blood circulation.
- Find ways to make your life less stressful.

Call emergency medical services if you have new or worsening:

- Chest pain or pressure, squeezing, or fullness in the center of your chest that lasts more than few minutes, or goes away and comes back (may feel like indigestion or heartburn)
- Pain or discomfort in one or both arms or shoulders, or in your back, neck, jaw, or stomach
- Trouble breathing
- Breaking out in a cold sweat for no known reason
- If your provider has prescribed nitroglycerin for angina, pain that does not go away after taking your nitroglycerin as directed
- Along with the previous symptoms, feeling very tired, faint, or sick to your stomach

If you have any of these symptoms, do not drive yourself.

Call your provider right away if you have new or worsening:

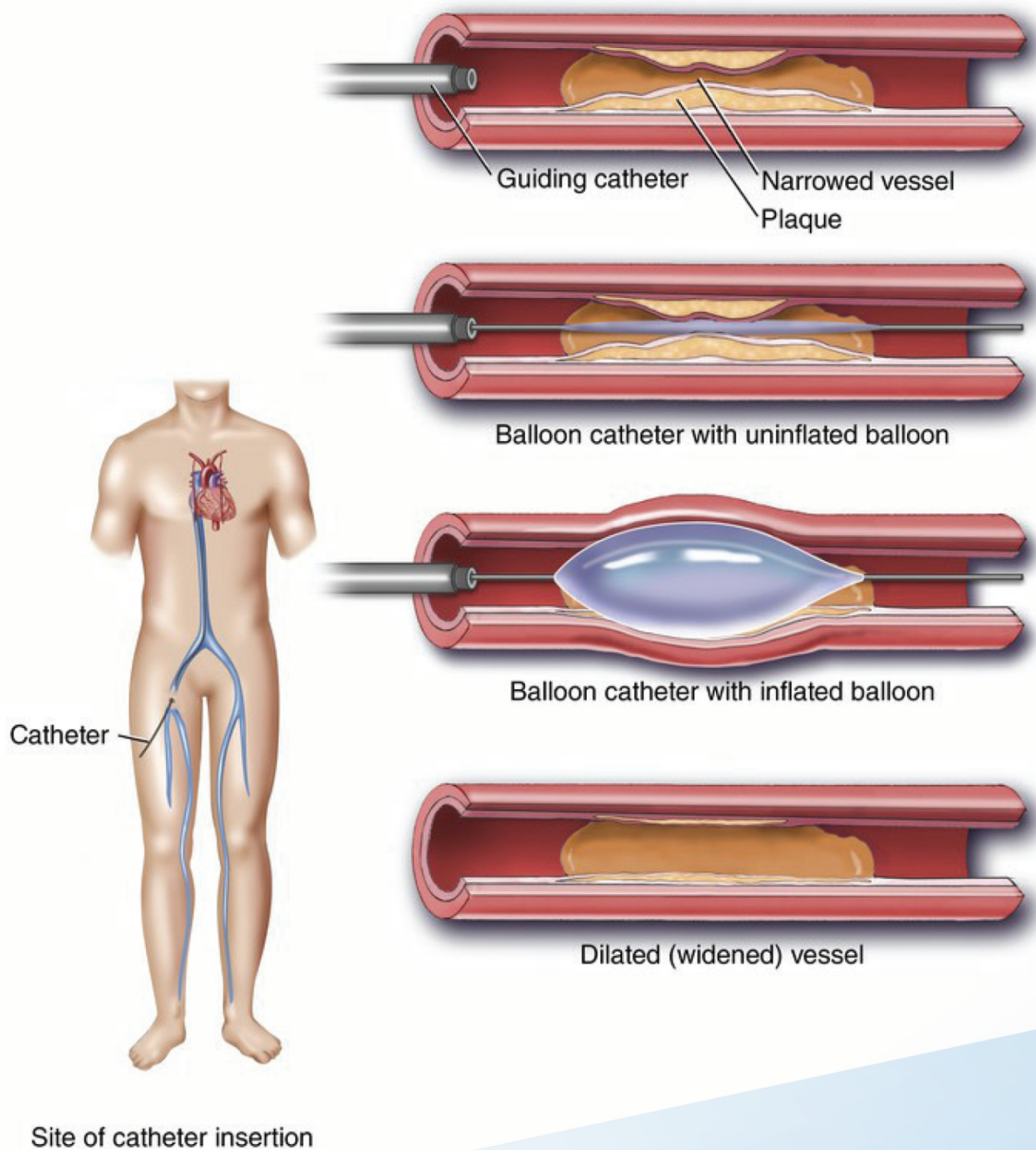
- Pain or numbness in your arm or leg
- Bleeding, excess bruising, or a lot of swelling where the catheter was inserted
- Chest pain that gets worse or happens more often

- Dizziness or lightheadedness
- Inability to do your normal daily activities
- Feeling like your heart is beating too fast, too slow, or skipping beats
- Signs of infection around your surgical wound. These include:
 - The area around your wound is more red or painful
 - Your wound area is very warm to touch
 - You have blood, pus, or other fluid coming from the wound area
 - You have a fever higher than 101.5° F (38.6° C)
 - You have chills or muscle aches
- Signs of a problem when you are taking blood thinners, such as:
 - Unusual bruising
 - Red or black bowel movements
 - Cuts that do not stop bleeding

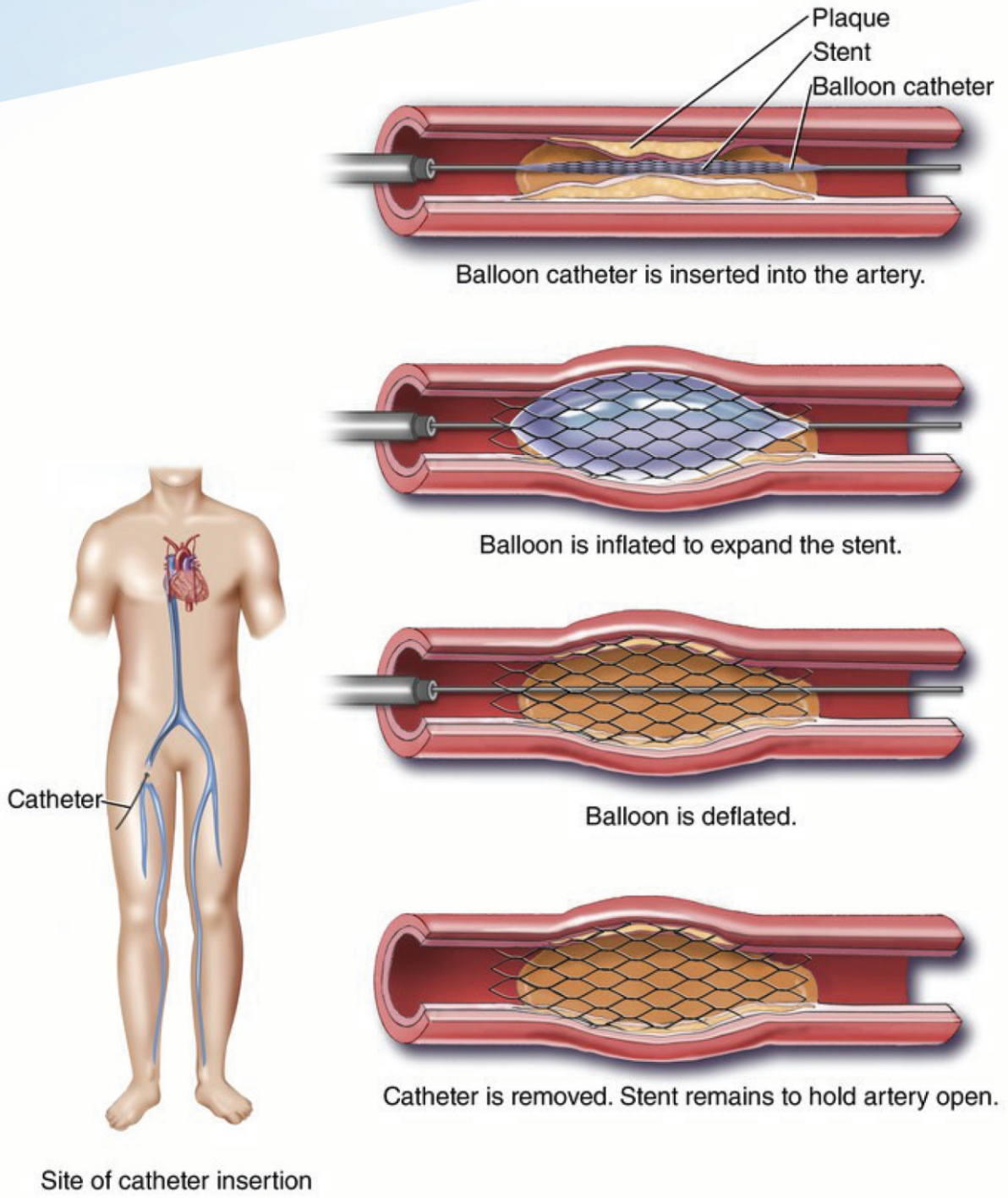
Ask your healthcare provider about any medicine, treatment, or information that you do not understand.

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Blood Vessel Dilation with Balloon Catheter



Coronary Artery Stent



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