Heart Disease and Heart Surgery

What is Coronary Artery Disease?
Healthy coronary arteries are flexible and smooth inside. Over time, the coronary arteries may become stiff, narrowed, or clogged. When this happens, the blood supply to the heart muscle can be partly or entirely blocked.

Other names for Coronary Artery Disease
- Atherosclerosis
- Coronary heart disease
- Hardening of the arteries
- Heart disease
- Ischemic (is-key-mik) heart disease
- Narrowing of the arteries

Plaque (plak)
Blockages in the arteries are caused by plaque. Plaque is fatty layers that build up inside the walls of the coronary arteries. Plaque can also build up in the arteries of the neck, brain, legs, or kidneys. Another term for these blockages is atherosclerosis. When blockages happen in the heart vessels, it is called coronary artery disease or CAD.

Vasospasm (vaze-oh-spaz-um)
Another form of blockage happens when the coronary arteries are irritated and squeeze together. This is called vasospasm. It is like a cramp of the artery. The irritation can be triggered by:
- Stress
- Caffeine
- Exposure to cold
- Tobacco use
- Use of illegal drugs

Do I have coronary artery disease?
If plaque has narrowed your arteries, you have coronary artery disease. There is no cure for CAD, but there is treatment. With surgery and a healthy lifestyle, many people go on to live a normal life.
Angina

When the heart muscle does not receive the oxygen it needs, it lets you know. The discomfort you feel is called angina. Angina can be caused by a narrowing of the coronary arteries by plaque or by vasospasm. The heart muscle is letting you know that it needs more blood and oxygen.

Angina may be felt as:
• Chest tightness, fullness, heaviness, numbness, squeezing, ache, or pain
• Ache in the jaw, neck, back in or between the shoulders or the arm
• Indigestion, heartburn, or nausea
• Sweatiness not related to weather or room temperature
What should I do when I have angina?
Each person may feel angina differently. Learn your own body’s messages. When you feel angina, take notice of what you are doing or how you are feeling.

Try things that will help your heart rest.
• Stop activity
• Rest
• Relax

Try things that will give your heart more oxygen.
• Take nitroglycerin – a medicine prescribed by a doctor that helps angina because it can help open the coronary arteries. Sometimes, it can be taken before activities to prevent angina.
• Breathe deeply
• Use extra oxygen if you have it prescribed

Remember, angina is your body’s way of telling you that your heart needs more blood and oxygen. Your doctor may order tests to see if your best treatment plan is to open or bypass the blockages in the arteries.
What is a Heart Attack?
A heart attack happens when the coronary artery becomes totally blocked by a blood clot. When the supply of blood is totally blocked, heart cells sicken and die.

Another name for a heart attack is a myocardial infarction. An infarct is an area of dead or dying tissue caused by a lack of blood supply to the area.

Heart muscle
The area of damage looks like a bad bruise. Once the heart attack is over, your body starts a healing process that may take 6 to 8 weeks. When fully healed, the area of injury will have a scar. The scar is stiffer and weaker than normal, healthy heart muscle.
Signs of a Heart Attack
Heart attack pain may feel like angina. The only difference may be that angina goes away.
Heart attack pain may:
• Not get better with nitroglycerin
• Last more than 10 to 20 minutes
• Be stronger
• Include cold, clammy sweats
• Cause you to feel fear and dread

Call 911
If you think you are having a heart attack, call 911 or an ambulance right away. Sometimes, family can get you to a hospital faster than an ambulance. But, if your heart should stop, your family cannot drive and do CPR at the same time.

Your best chance of survival is getting the help of skilled caregivers.

Do not waste time
It may take 4 to 6 hours for heart attack damage to occur. The faster you are able to get medical care, the less damage to your heart. In some cases, medicine can be given to dissolve the blood clot and open the artery so blood can flow again. In other cases, you may go directly to a heart procedure lab.

Denial
Very often, fear causes people to tell themselves they are not having heart problems. This is called denial. Denial may cost you precious time. No one will ever call you foolish for a false alarm. Fast action may save your life.
What is Coronary Artery Bypass Surgery?

Hearing that you need heart surgery can be frightening. You will be learning a lot of new information from the heart surgery team. It is okay to ask us questions. We want you to understand what is happening in your body and how surgery will help you.

Coronary Artery Bypass Grafting means taking a blood vessel from another part of your body and moving it to supply blood to your heart. The new vessel will go around or bypass any narrowed or blocked arteries that should be giving blood to the heart muscle. The number of blood vessels that need to be bypassed may not be known until the surgery is complete.

Some people call Coronary Artery Bypass Graft surgery by other names:
• CABG – sometimes pronounced “cabbage”
• Bypass surgery – general name for CABG surgery

Why do I need bypass surgery?
If a build-up of plaque has narrowed your arteries, then you have coronary artery disease. Without treatment, you could have a heart attack. Your surgeon has decided that bypass surgery is the best way to improve the blood flow to your heart muscle. In your situation, other procedures such as stenting or angioplasty will not improve the blood flow enough. Heart surgery is needed.

Benefits of bypass surgery
Bypass surgery is major surgery but - the benefits of having the surgery are great. The 2 main benefits are:
• Improving blood flow to the heart
• Preventing a heart attack that could lead to serious health problems or death

The results of bypass surgery usually are excellent. The surgery improves or completely relieves angina symptoms in most patients. Although symptoms can come back, many people remain symptom-free for as long as 10 to 15 years. Bypass surgery also may lower your risk of having a heart attack and help you live longer.

Risks of bypass surgery
Your surgeon will talk to you more about the possible risks and problems caused by surgery. These may include:
• Bleeding too much
• Breathing problems
• Fast or irregular heartbeat
• Heart attack, stroke, or death
• Infection at the incision site
• Memory problems or confusion
• Nerve injury or muscle spasms
• Pneumonia (lung infection)
What does the bypass graft look like?
This picture shows 2 bypass grafts.
• The blue vein on the left was taken from a leg vein (saphenous vein). The top of the vein is sewn with special stitches to the aorta and to the coronary artery below the blocked area.
• The red artery on the right shows the use of an artery in the chest (internal mammary artery). This is taken from where it branches off the aorta and sewn with special stitches to the coronary artery below the blocked area. Arteries from the arm (radial artery) can also be used.
• The purple arrows show how the blood flows through the new pathway to the heart muscle.

What happens to the blockages?
The blockages you have in your arteries remain there. The bypass grafts direct blood flow around the blockage.

How long will the bypass grafts remain open?
The grafts often stay open for about 10-15 years. Eating a heart healthy diet and exercising helps prevent blockages in the grafts. Bypass surgery does not cure coronary artery disease. It is still important to make healthy lifestyle choices about diet, exercise, and smoking.
Types of Coronary Artery Bypass Grafting

Valve Disease and Valve Surgery
There are several types of coronary artery bypass grafting (CABG). Your doctor will recommend the best option for you based on your needs.

Traditional coronary artery bypass grafting
Traditional CABG is used when at least one major artery needs to be bypassed.
During the surgery:
• Your breastbone is opened to access the heart.
• The vein or artery that will be used as the graft is removed by part of the surgery team.
• Medicines may be given to stop or slow the heart.
• A heart-lung bypass machine keeps blood and oxygen moving throughout the body during surgery. This allows the surgeon to operate on a still heart.
• After surgery, blood flow to the heart is restored. Usually, the heart starts beating again on its own. Sometimes mild electric shocks are used to restart the heart.
• Your breastbone is put back together with special wire. The wire remains in place forever. It takes 6-12 weeks for your breastbone to heal.
• Your incision will have stitches below that skin that will dissolve. You will not see them.
• Sometimes people need extra blood during surgery or as they recover from surgery. The blood is carefully screened and safe.

Heart lung machine

![Heart Lung Machine Diagram]
Off-pump coronary artery bypass grafting
This type of bypass surgery is similar to traditional CABG because the chest bone is opened to access the heart. Sometimes, off-pump bypass surgery is called Beating Heart Bypass Grafting. The differences are:
- The heart is not stopped.
- A heart-lung bypass machine is not used.

Minimally invasive direct coronary artery bypass grafting
This type of surgery differs from traditional CABG because the chest bone is not opened to reach the heart. Instead:
- Several small cuts are made on the left side of the chest between the ribs.
- This type of surgery mainly is used to bypass blood vessels at the front of the heart.
- It is not right for everyone, especially if more than one or two coronary arteries need to be bypassed. Your surgeon will help decide the best procedure for you.