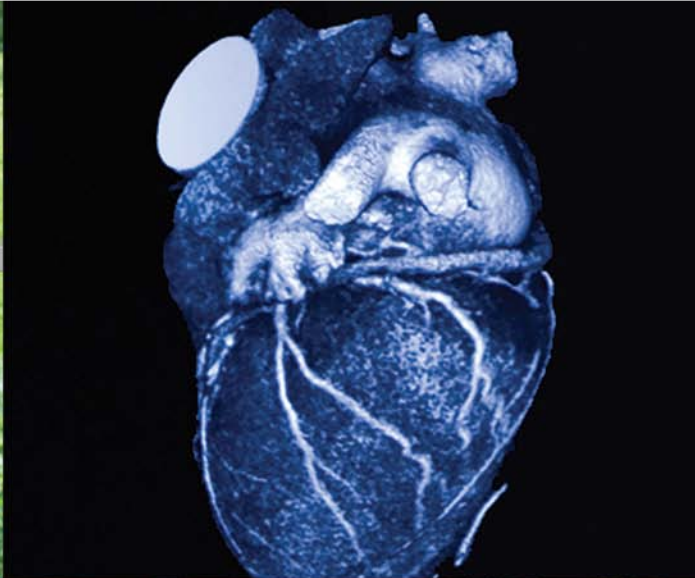


# GETTING READY FOR HEART SURGERY

UPMC Heart and Vascular Institute



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# Welcome

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When it comes to your heart, you deserve the very best.

The UPMC Department of Cardiothoracic Surgery is dedicated to caring for patients with diseases and disorders of the heart by using the latest diagnostic, surgical, and medical techniques available.

At UPMC, we offer a patient-centered, team approach to care delivery. Every day of your hospital stay, you will meet with members of your medical team who are committed to your continued recovery and return to home. YOU are the most important member of this team and our goal is to help you and your family better understand what to expect before, during and after your heart surgery.

This booklet contains valuable information for you and your family. In addition, we are always available for any specific concerns you may have about your surgical procedure. We hope this information in this booklet answers your questions about what to expect and helps to make your stay a positive one.

# Preparing for Your Surgery

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## MEETING YOUR HEALTH CARE TEAM

### Surgery Team

A member of the surgery team (doctor, nurse practitioner, or physician assistant) will talk with you and your family. He or she will go into detail about surgery and what is best for you. Before this meeting, think about any questions you may have. Write them down, and present them at the meeting. The surgery team will be happy to answer all of your questions.

At the meeting, your surgery team will ask you a number of questions about your health history. You also will be given a complete physical exam. Once there is an agreement on the procedure to be performed, you will be asked to sign a consent form for surgery.

### Anesthesia Team

Members of the anesthesia team will ask you more questions and also examine you physically. The doctor who will oversee your anesthesia is an anesthesiologist (anesstheezeehLOhjist). Be sure to tell him or her about all medicines and supplements you are taking as well as any side effects or reactions you have ever had to anesthesia or medicines. It is very important to tell all of your doctors and health care team about any allergic reactions you have ever had. This will help them to give you safe and appropriate care during and after surgery.

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## PRE-SURGERY TESTING

You will have many tests before your heart surgery. These tests enable us to give you the best care possible. The tests will include:

- **urine tests:** You will be asked to give a urine sample in a container.
- **blood tests:** You will have blood drawn from your arm.
- **blood type and crossmatch:** Some of the blood drawn from your arm is tested to learn your blood type. Your blood type is matched with blood in the blood bank. A band placed on your arm will identify your blood type. This is necessary in case you need a blood transfusion during or after surgery. We will ask you to sign a consent allowing blood to be given to you. (If you wish, you may ask for your blood type at the patient unit station the day after the blood draw.)
- **chest x-ray:** You will need to remove jewelry from your neck and put on a hospital gown. During the x-ray, you will be asked to take a deep breath and hold it. The x-ray gives the surgeon a picture of your heart and lungs.

- **EKG (electrocardiogram):** A technician will apply small, sticky patches (electrodes) to your chest, arms, and legs. Then a recording is made of your heart's rhythm (electrical activity).
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## **BREATHING AND COUGHING EXERCISES**

A **respiratory therapist** will teach you how to do breathing and coughing exercises. These exercises are important to help rid your lungs of mucus after surgery. Mucus makes it easier for bacteria to grow and for infections to develop. The exercises will help to reduce your chances for getting an infection. You will learn how to use a breathing exerciser to cough and deep breathe. This device is called an **incentive spirometer** (speerAHmehter).

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## **SUPPORT FROM THE SOCIAL WORKER**

A **social worker**, who is part of the health care team, may meet with you and your nurse. The social worker can provide support for you and your family during your hospital stay. In addition, the social worker will help you do the planning needed to leave the hospital and return to your home.

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## **QUITTING SMOKING**

If you smoke, please **STOP**. Continuing to smoke will make it much harder for your incisions to heal, increase your chance of an infection and slow your recovery. Smoking also places greater demands on your heart by increasing your heart rate and blood pressure.

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## **EVENING BEFORE SURGERY**

### **Personal Items**

On the evening before surgery or the morning of surgery, ask your family to take all of your personal belongings home. Tell your family to keep with them the few items you may need after surgery. These items may include your dentures, tooth brush, eyeglasses, and hearing aids. After your surgery is over, the nurse in the ICU (intensive care unit) will get these items from your family in the waiting room. **Remember:** Leave all other valuables at home.

### **A Good Night's Sleep**

If you are at home on the evening before surgery, you may take a sleeping pill to help you sleep. If you feel anxious and have medicine for anxiety, you may take that medicine too. If you are in the hospital the evening before surgery, your nurse will offer support to lessen your fears and provide a restful atmosphere.

### **After Midnight**

At home or in the hospital during the night before surgery, you must **not** eat or drink anything after midnight. On the morning of surgery, if you were told to do so, you may take your medicines with a small sip of water. You also may brush your teeth and use mouth wash **without** swallowing.

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## **MORNING OF SURGERY**

### **Your Family**

Your family can be with you before you go to the Operating Room. They will have about 2 hours with you before surgery. If your surgery is scheduled for 7:30 a.m., they should arrive in your room at 5:30 a.m. If you come to the hospital from home, you and your family should arrive at 5 a.m.

### **Prepping**

A nurse will clip your hair from chin to ankles, including your groin area on both sides. This will help to prevent infections.

Be sure to remove all jewelry, including your wedding rings, and give it to your family. Give your dentures, tooth brush, hearing aids, eyeglasses, and any other valuables to your family. Nail polish will be removed if you did not remove it at home. Any socks, underwear, and pajama bottoms will be removed. You will put on a hospital gown.

### **Going to the Operating Room**

When your surgeon is ready, the Operating Room will call for you. We will ask you to empty your bladder. We will give you medicine by IV (intravenous) to make you drowsy and comfortable. This medicine may make your mouth and throat dry. You will be placed on a stretcher and taken to the Operating Room.

### **Waiting Room**

Your family will be directed to the ICU waiting room. This area has comfortable couches, televisions, vending machines, and pay phones.

It is important that your surgeon be able to reach your family at any time during surgery. If your family leaves the waiting room, they should tell the person at the desk where they are going, how long they will be gone, and a phone number to reach them.

# After Your Surgery

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As soon as surgery is over, the surgeon will talk to your family. Your family will learn how your surgery went and what your condition is. You will be taken to the ICU (intensive care unit) to recover for the next 24 hours.

## IN THE ICU

While you are in the ICU recovering, you will be watched very closely. The critical care physician and the critical care nurses will check on you often. This is routine care after heart surgery. It is not a sign of trouble.

### Breathing Tube and Oxygen

When you wake up, you will have a breathing tube in your mouth and throat. It is called an **endotracheal** (endohTRAYkeyol) tube, or **ET** tube. It goes into the trachea (TRAYkeyuh), which is the windpipe. While this breathing tube is in your mouth, you cannot speak. You will write on a sheet of paper to communicate with your nurses.

From time to time, a nurse will insert another very small tube (catheter) down your breathing tube. This suctioning out mucus from your lungs. You may feel uncomfortable and cough, but it lasts only a few seconds. Suctioning is important to keep your lungs clear.

When you are breathing well enough, the ET tube is removed. Then you will be given oxygen through a face mask. Your body will need extra oxygen, so it is important to try to keep the mask on. After the breathing tube is taken out, you may have a sore throat, hoarse voice, or “blocked” ears. This discomfort should last only a few days.

### Drainage Tubes

During surgery, several types of tubes are inserted into your body to help drain excess fluids.

- **Chest Tubes** - Drainage tubes are inserted into your chest near your heart and lungs. These tubes drain the extra air and fluids that collect in your chest cavity during surgery. When the drainage decreases, the tubes will be removed. Removal of these tubes can cause some discomfort. Consider asking your nurse for pain medicine before your chest tubes are pulled out.
- **NG Tube** - You will have another, small drainage tube up through your nose and down into your stomach to help prevent nausea and vomiting. The tube is called a **nasogastric (NG) tube**. You cannot eat until the NG tube is removed. Then you will be allowed to sip clear liquids.

- **Foley Catheter** - Another drainage tube will be inserted into your bladder to empty out the urine. This tube is called a **Foley catheter**. You may feel like you have to pass urine, but urine will be flowing constantly through the tube into a bag. When you are able to walk to the bathroom or stand at the bedside, the catheter will be removed. Then you will be able to pass urine on your own.  
**Intravenous Lines (IVs)** - You also will have several IV (intravenous) lines in your arms and neck. These IV lines help us to monitor your vital signs, give you medicine, draw blood for tests, and replace the fluids and blood you lost during the surgery.
  - **Heart Monitor** - From the time that you leave the Operating Room until the time you go home, your heart will be monitored. Small sticky discs, called electrodes, are placed on your chest and connected to the monitor. The monitor records all heart activity. Your doctors and nurses can watch the pattern of your heart beat at all times and can note any changes quickly.
  - **Pacer Wires** -Several little wires will be sticking out of your chest. The wires will be folded into a small tube and taped to your abdomen. These are pacer wires, which let us pace your heart rate if it becomes too slow. The wires will be inserted into your chest during surgery and are temporary. They will be removed before you go home.
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## RECOVERING IN THE HOSPITAL

After about 24 hours in the ICU, you will be moved to a step-down unit, where your recovery will continue.

### **Incisions and Discomfort**

You will have an incision on your chest. Usually the incision goes from the top of your breastbone (sternum) to the bottom of your breastbone. You may have some muscle aches and soreness at the incision site. When you cough or turn in bed, the chest incision may cause discomfort. We will give you a pillow to hold against your chest when you cough or turn in bed. The pillow will support your sternum and reduce discomfort. You can have pain medicine whenever you need it. Remember to ask your nurse for pain medicine.

If you had CABG (coronary artery bypass graft) surgery, you will have several small incisions on your leg(s) too. You may have swelling, bruising, or hardness around these incisions. All of this is normal. It should disappear within a few weeks after surgery. Be sure to tell your nurse if you have pain or discomfort. The nurse can give you medicine for relief.

## **Breathing Treatments**

The respiratory therapist will give you breathing treatments several times a day. These drug aerosol treatments help loosen the mucus in your lungs so that you can breathe deeply.

## **Breathing Exercises**

The respiratory therapist will help you practice using the incentive spirometer every 2 to 3 hours. You must keep doing your deep breathing and coughing exercises, even after you go home. You must do these exercises until most of the mucus in your lungs is removed.

Some patients are afraid to cough, they think a cough will open up their chest incisions. This should not happen. Chest incisions are closed with sutures (stitches). The suture material is very strong and will not come apart. We will give you medicine for any incision pain. We will show you how to hold a pillow firmly to your chest when you cough. The support from the pillow will help ease discomfort in your chest or incision.

## **Showering**

When all the tubes and pacer wires are removed, you can take a shower. Ask your nurse to assist you. You will not be able to stoop to reach your toes or reach high with your arms. These positions will cause pain and may injure your breastbone. The nurse will help you wash what you cannot reach.

## **Regular Tests**

During your hospital stay, you will have regular blood tests, chest x-rays, and EKGs. Regular testing helps us to track your progress and detect any problems. It allows us to take steps to correct problems as early as possible.

## **Move Early and Move Often**

It is very important to your recovery to move early and often. The cardiac rehab staff will be there to assist you. You will start by sitting up in a chair and progress quickly to walking. You may start walking even while you have an IV and chest tubes in. Each day you will increase the distance you walk. You should expect to walk 3-5 times per day. As you become steadier you will be walking on your own or with family. **Remember** to tell your nurse **immediately** of any chest pain or shortness of breath.

## **The “Blues”**

Some patients get the “blues” after open heart surgery. Some have strange dreams or feel tearful. In the ICU setting, some patients become confused or depressed. As you transfer to the step-down unit and move toward recovery, these feelings will lessen and eventually go away.

**Remember** these feelings are normal and temporary. Express your feelings openly to your health care team. They will help you understand that these feelings are OK. This will be of great benefit to you.

## PREPARING TO LEAVE THE HOSPITAL

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**Most patients have a hospital stay of 4 to 5 days. Some patients may have medical issues that need attention. They will stay a few more days for observation and any treatment required.**

After you leave the hospital, your recovery will continue at home. In this section, you will find some guidelines for your first few weeks at home. Before you leave the hospital, your nurse and cardiac rehab specialist will tell you in more detail about dos and don'ts, your medicine, and your follow-up care. The social worker can assist you with arrangements for your return home.

### When You Are at Home

- For the first week at least, you should have 24-hour support at home.
- For 4 to 6 weeks, **do not** drive. Your doctor will tell you when you may drive.
- For 4 to 6 weeks, maintain **sternal precautions**. This means taking special care to protect your breastbone
  - For 4 to 6 weeks, **do not** lift anything heavier than 5 pounds for 2 weeks and then progressively more weight up to 20 pounds week 6 or until you see your surgeon.
- You may take a sponge bath or a shower if your doctor says you may. Your sternum and incision must heal enough first. This usually takes 4 to 6 weeks.
  - Each day check your incision when you bathe or shower.
  - If you notice redness, swelling, drainage, or odor, call your doctor.
  - For the first few days, your chest incision may have drainage that is clear, watery, and pink or reddish. This is normal.
  - Gently wash your incisions with soap and water each day.
  - If you have leg incisions, keep your legs raised (elevated). This will help prevent swelling.
  - For the first few days, your leg incisions may have drainage that is clear, watery, and pink or reddish. This is normal.
- Weigh yourself every morning at the same time. Wear the same amount of clothing each time. If you gain 3 to 5 pounds in less than 1 week, you must call your doctor. You could be retaining fluid.
- The Cardiac Rehab staff will give you detailed instructions for your activity at home. For most patients there will be a specific amount of walking that will need to be done each day. This will be clearly written and communicated.
- Allow plenty of time for rest periods during the day. Your energy level will improve each week. It takes about 6 to 8 weeks to feel fully recovered.

## **When to Call Your Doctor**

Call your doctor **right away** if you have any of the following:

- fever of 101 F or higher
- more redness, swelling, tenderness, or drainage at incision site
- drainage that is cloudy or has a foul smell
- shortness of breath not relieved by rest
- chest discomfort not relieved by rest and not from the incision
- weight gain of 3 to 5 pounds or more in less than 1 week
- any other questions that concern you

## About Your Condition

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This section will help you to understand the parts of the heart and how the blood flows through a healthy heart and blood vessels.

### Anatomy of Your Heart:

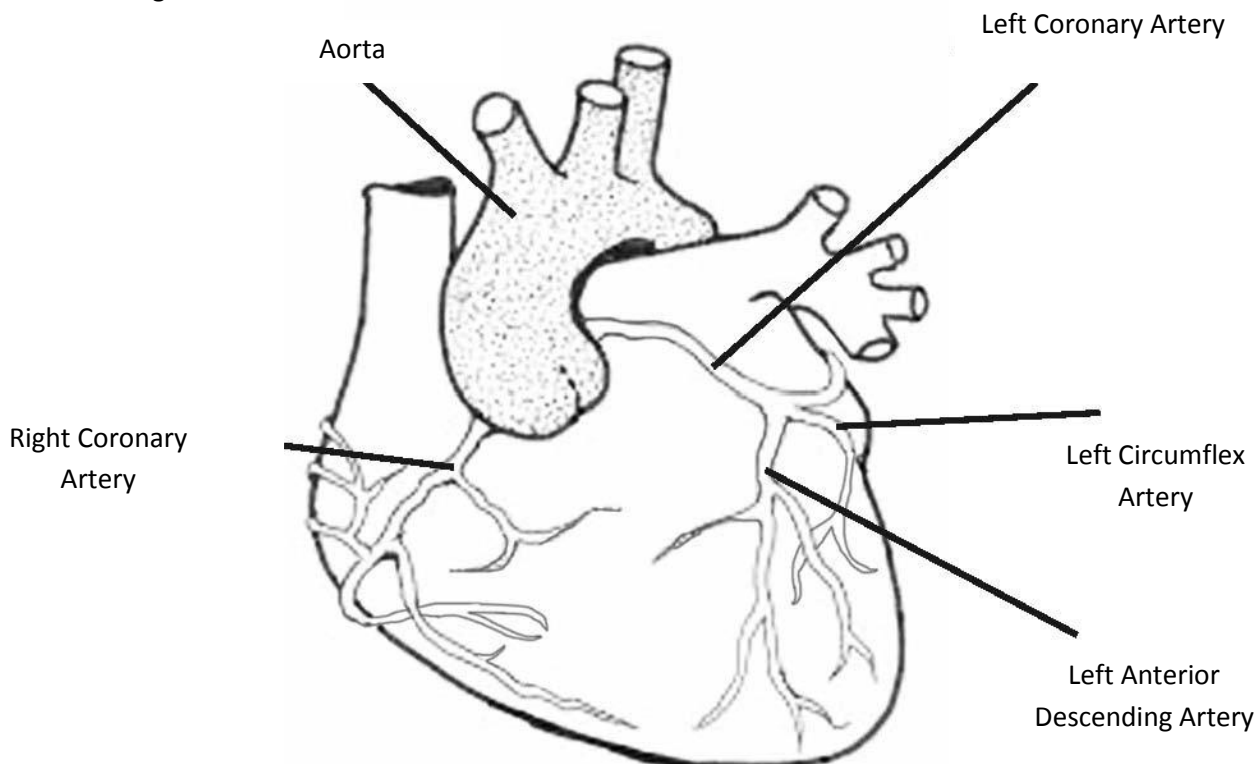
#### **CORONARY ARTERIES**

Your heart is a muscle. The arteries that carry blood to your heart muscle are the **coronary arteries**. They supply your heart with blood that is rich in oxygen and nutrients. This blood supply keeps your heart muscle healthy and pumping.

Figure 1 is a diagram of the heart. It shows the aorta, which is the body's largest artery, and the coronary arteries. The coronary arteries are on the outside of your heart. There are 2 main coronary arteries: the **right** coronary artery and the **left** coronary artery.

Your **right coronary artery** nourishes the right side and the back side of your heart. Your **left coronary artery** divides into 2 more coronary arteries: the **left anterior descending (LAD)** artery and the **left circumflex** artery. Your LAD artery nourishes the front of your heart muscle. Your left circumflex artery nourishes the left side and back side of your heart. The coronary arteries also subdivide into smaller and smaller branches. These branches surround the heart muscle, supplying it with blood.

Figure 1



## HEART CHAMBERS

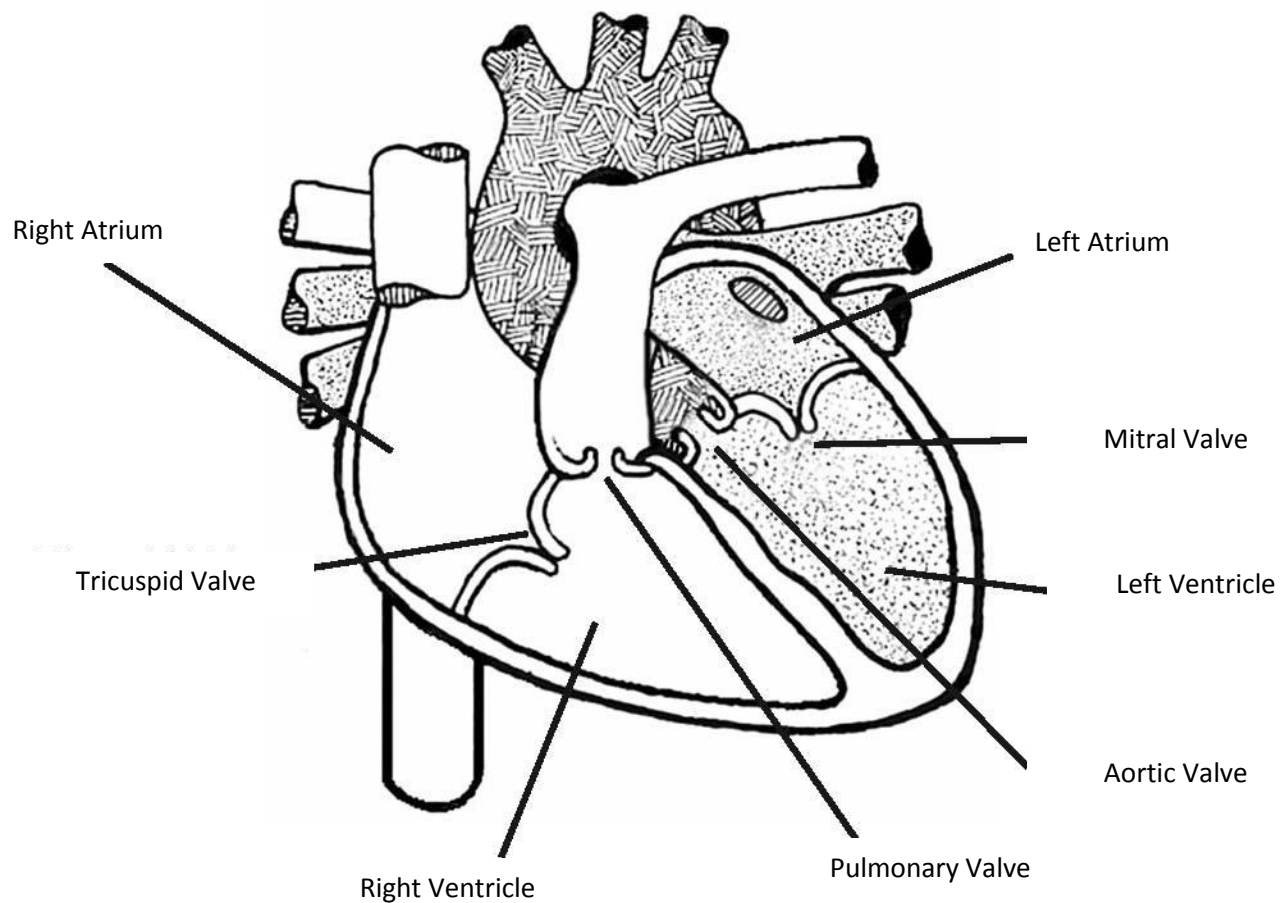
Figure 2 shows how the heart is divided into 4 **chambers**. The 2 upper chambers are the **right atrium** (Atrium) and the **left atrium**. The 2 lower chambers are the **right ventricle** (VENTricle) and the **left ventricle**.

## HEART VALVES

The heart's chambers are separated by 4 heart **valves** (see Figure 2). The valves control blood flow through the heart and the major blood vessels leaving the heart. The valves move the blood forward at all times. Figure 2 shows the location of the 4 valves:

- **aortic** (AORTik) valve
- **tricuspid** (tryKUSpid) valve
- **pulmonary** (PULLmunairee) valve
- **mitral** (MYtrol) valve

Figure 2

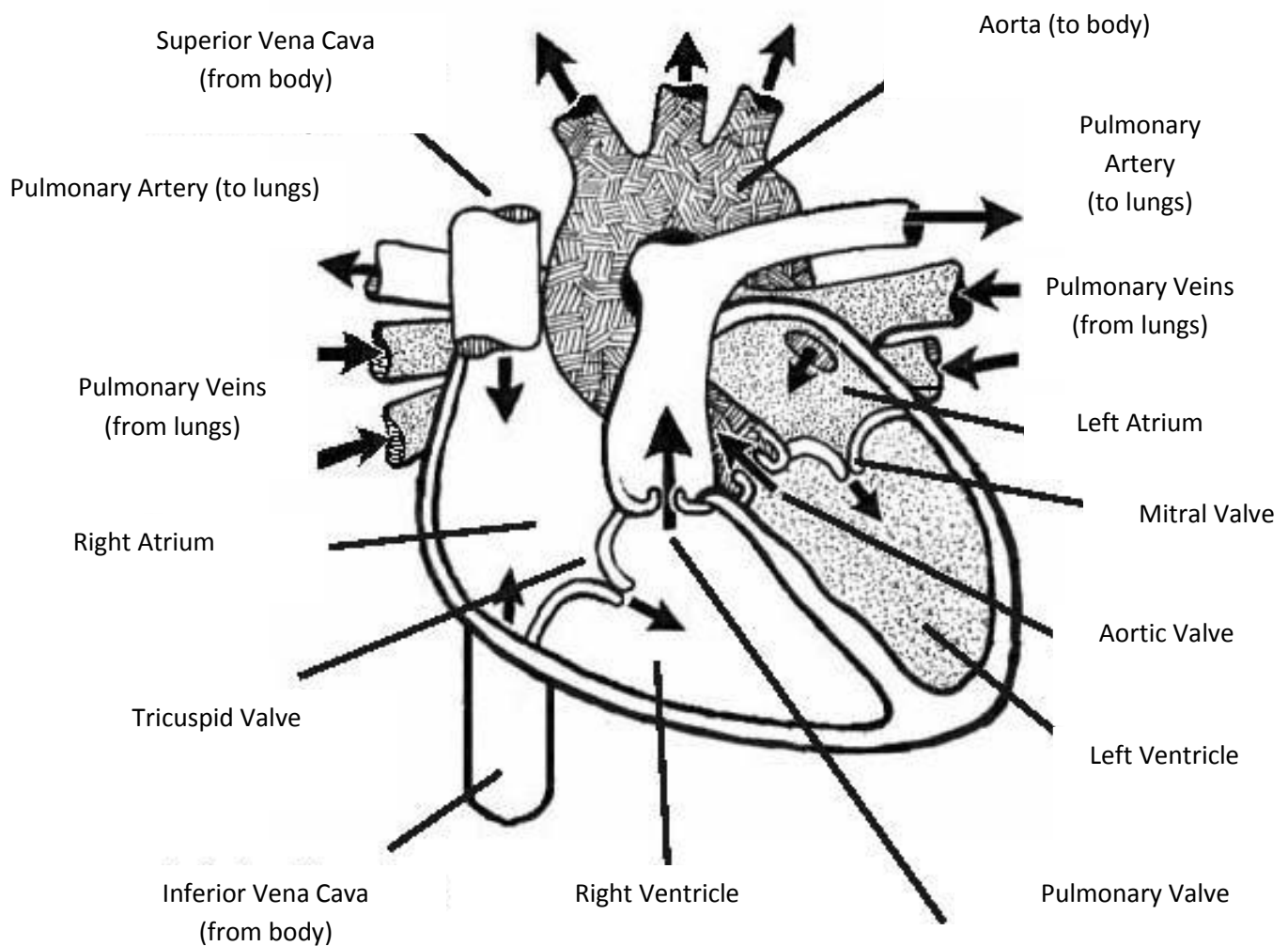


## BLOOD FLOW IN THE HEART

Figure 3 helps to show the flow of blood through the heart. Oxygen poor blood from your body flows to your heart through veins called the “superior vena cava” and “inferior vena cava.” The blood flows into the heart’s **right atrium**. The blood then goes through the **tricuspid valve** into the **right ventricle**. It is then pumped out of your heart through the **pulmonary valve** into the **pulmonary artery**. The blood flows into your lungs, where it receives oxygen and nourishment.

Once nourished, the oxygen rich blood leaves your lungs through the **pulmonary vein** and reenters your heart. It goes into the **left atrium**. The blood is then pumped through the **mitral valve** into the **left ventricle**. Then it passes through the **aortic valve** into the **aorta**, the body’s major artery. The aorta carries the blood, now rich with oxygen and nutrients, to the rest of your body.

Figure 3



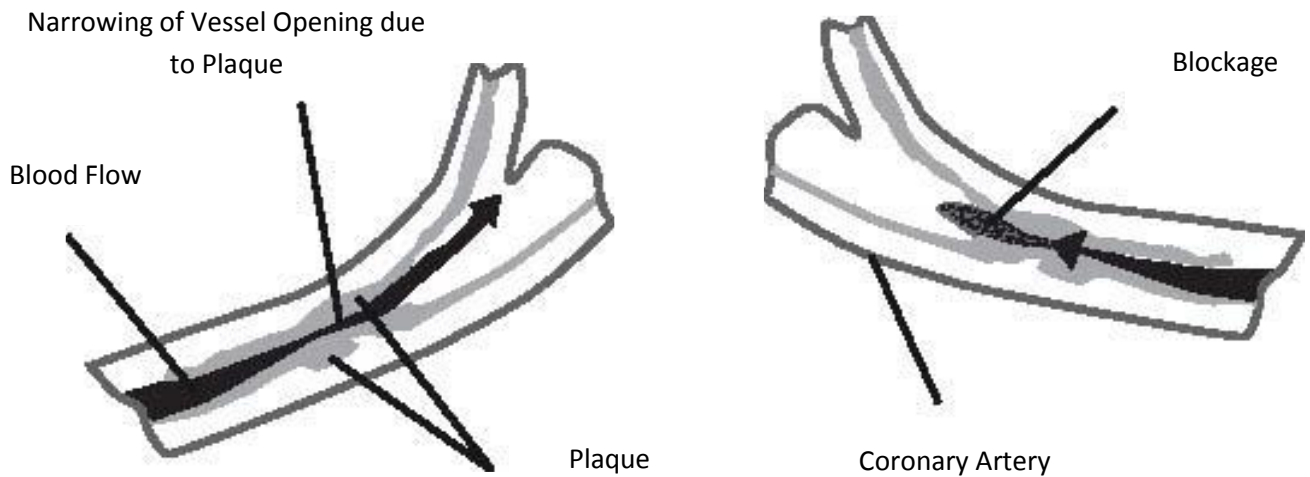
# Heart Disease and Your Surgery

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## CORONARY ARTERY DISEASE

The coronary arteries supply your heart muscle with blood. A condition of these arteries that interferes with blood flow is called **coronary artery disease**, or **CAD** for short. The most common cause of CAD is **atherosclerosis** (atherohsklerOHsis). This occurs when a fatty substance called plaque (PLAK) deposits on the walls of the coronary arteries. Plaque buildup can narrow the arteries, making it harder for blood to flow through them. Over time, the fatty deposits may get larger and completely block one or more arteries. Figure 4 shows two arteries. In one artery, plaque reduces the blood flow. In the other artery, plaque totally blocks the blood flow.

Figure 4



# Problems from Coronary Artery Disease

Tiredness and shortness of breath are some of the symptoms of plaque buildup in the coronary arteries.

## Chest Pain

You can also feel chest pain when a narrowed coronary artery reduces the blood flow to your heart. The pain is your heart muscle's response to not getting enough oxygen. The common name for this heart pain or chest pain is **angina** (anjEYenuh).

Angina often occurs when the heart is working harder, such as during exercise, stress, or eating a large meal. Less often, angina can occur during rest. It is important to report heart pain to your doctor **at all times**.

Angina is not the same for every person who has it. Angina can be felt in a variety of ways:

- feeling indigestion
- tightness in the chest
- heaviness in the chest
- numbness, tingling, or pain in the left or right arm
- sensation of choking
- odd sensation in the throat
- pain in the jaw, teeth, or ear lobe
- discomfort in the neck, shoulders, or shoulder blades

## Heart Attack

If the coronary artery gets even narrower and your heart is too deprived of oxygen, a heart attack can occur. Your doctor may call it a **myocardial** (myohCARdeeol) **infarction** (inFARKshun), or **MI** for short. In a heart attack, part of the heart muscle dies because it did not get enough oxygen.

# CORONARY ARTERY BYPASS GRAFT SURGERY

Surgery called **coronary artery bypass grafting (CABG)** restores oxygen rich blood flow to the heart. CABG surgery reroutes blood flow around the narrowed or blocked part of your coronary arteries. This surgery may benefit you if you have had a heart attack or if you have serious symptoms from CAD, such as extreme fatigue, tiredness, and shortness of breath. CABG can enable you to return to a more active lifestyle. In addition, CABG greatly reduces your risk for a heart attack in the future.

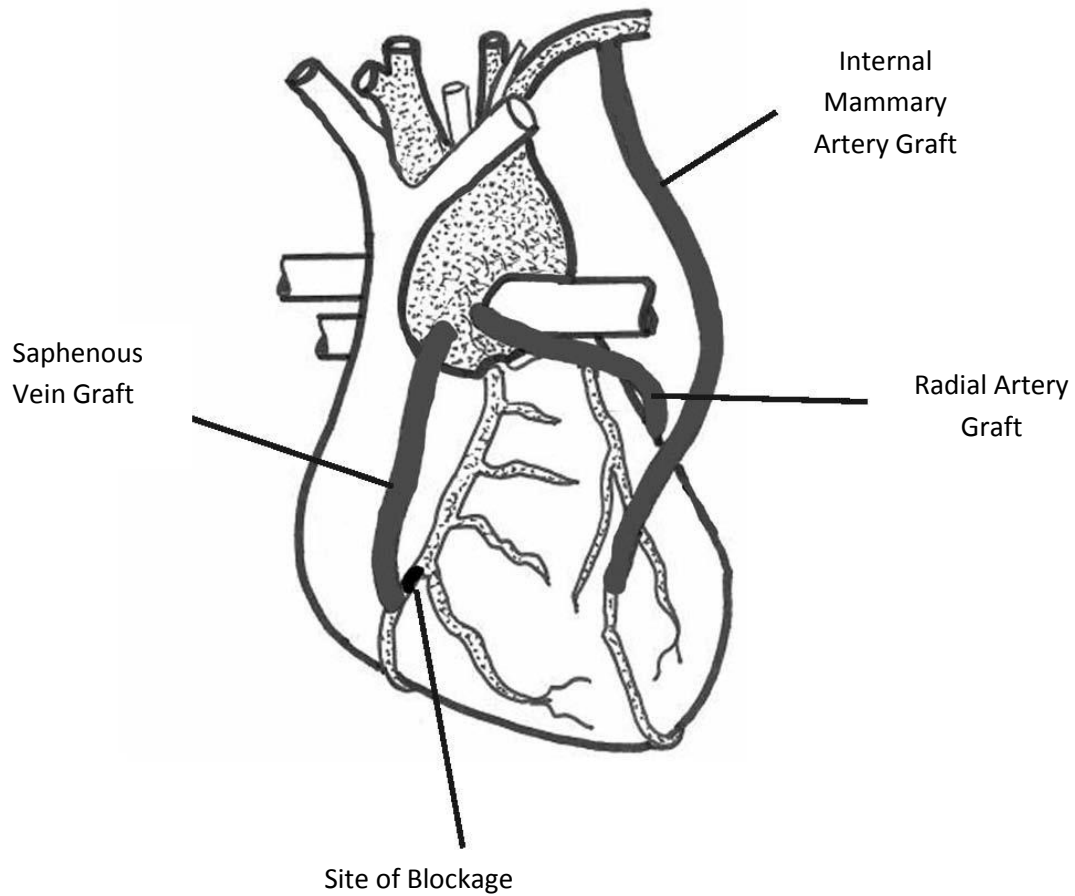
## How CABG Is Performed

CABG surgery takes sections of veins or arteries from other places in the body. The surgeon sews these grafts around the narrowed or blocked part of coronary arteries. This makes a new route for blood to flow. The surgery does **not** remove the diseased coronary arteries or the blocked sections of them. You can have one or more coronary arteries bypassed during the same surgery. The number of bypasses needed depends on the amount of coronary artery disease in your heart.

**Types of Graft** **Figure 5**, shows three types of grafts that may be used for CABG: the saphenous vein, the internal mammary artery, and the radial artery.

- **Saphenous Vein.** Figure 5 (next page) shows the vein of the leg that may be used for CABG. It is called the **saphenous (SAFinus) vein**. Removing it from your leg does **not** harm the blood flow in your leg. **Figure 5** shows how the vein is grafted. Your surgeon sews one end of the vein to the aorta and the other end to the diseased coronary artery past the blocked area. Once surgery is done, blood can flow from your heart, through the aorta, through the vein graft, and directly into your heart muscle to supply blood rich in oxygen and nutrients.
- **Internal Mammary Artery.** The surgeon may decide to use an artery from behind the chest wall as one of the bypasses. These arteries from behind the chest wall are called **right** and **left internal mammary arteries** (or **IMAs**). The **left** IMA often is used to bypass the coronary artery on the front of the heart (the LAD). Figure 5 shows where the IMA is grafted.
- **Radial Artery.** Your surgeon also has the option to use one of the arteries in your forearm for a bypass. This artery is called your **radial (RAYdeeol) artery**. **Figure 5** also shows this artery bypass.

Figure 5



## HEART VALVE DISEASE

Normal heart valves open and close completely with each heartbeat. They allow blood to flow smoothly between the heart's chambers and blood vessels. However, disease may damage the heart valves.

### What Causes Valve Disease

Valve disease has several causes that result in problems with how the valves work.

**Birth Defects** Some people can be born with defects in the heart. These are called **congenital** (konJENihtol) defects. Over time, congenital heart defects can lead to damaged valves.

### Infections

Bacteria can form and grow on or around a valve. The infection can scar the valve. Valve infection can occur with rheumatic fever and other diseases.

**Aging and Calcium Deposits** Heart valves have thin flaps of muscle tissue called **leaflets**. The leaflets open to allow blood to pass through the valves as the heart pumps. Over time, calcium can be deposited on leaflets, making them stiff. This is called **calcification** (kalsihfiH-KAYshun).

### **Heart Attack**

A heart attack can injure the tissues that support a valve. When this happens, the valve weakens.

## **Types of Heart Valve Problems**

Diseased valves can lose the ability to work properly in the following ways. Your doctor will discuss your specific valve problem with you.

### **Valve Stenosis**

A valve may become tight and not open wide enough for enough blood to flow through it. This is called **stenosis** (stenOHsis). The tightness occurs when the valve leaflets are stiff from calcium deposits or are scarred from infection. Any of your four valves can develop stenosis.

### **Valve Insufficiency or Regurgitation**

A valve may become unable to close completely. When this happens, some blood can flow backward instead of forward. This valve problem has two names: **insufficiency** (insuhFISHen-see) or **regurgitation** (reegerjihTAYshun). Any of your 4 valves can develop this problem. The valves most often affected are the **aortic** and **mitral** valves. These valves are on the left side of your heart, where there is high pressure.

# SURGERY FOR HEART VALVES

Heart valves with serious damage may need surgery to work properly again. The type of surgery needed for a diseased valve depends on the type of valve problem you may have. Surgery can be done to either repair or replace the damaged valve or valves.

## Valve Repair

Sometimes a valve is not severely damaged, and the valve can be repaired. A **ring** may be used to fix the existing valve instead of replacing it.

## Valve Replacement

More severely damaged valves may need to be entirely replaced. There are 2 types of **artificial** valves:

- **tissue:** A tissue valve is made from animal tissue (such as pig or cow). This type of valve does **not** require long term blood thinning medicine.
- **mechanical:** A mechanical valve is composed of manmade materials (metal). This type of valve can last forever. However, as long as you have this type of valve, you must take blood thinning medicine. A common blood thinner is warfarin (brand name Coumadin).

## Deciding on Surgery

Your surgeon will review your health history and your valve disease. Then he or she will explain valve repair or valve replacement and the types of valves. The surgeon will decide on the best option for you and if you will need blood thinner, and for how long. If Coumadin is prescribed, you will have a schedule of blood tests and diet restrictions to follow. It is **very important** that you follow these closely.

# ANTIBIOTICS AND VALVE DISEASE

Heart valve disease and valve surgery make it easier to get infections on your heart valves. Bacteria easily get into the blood stream and travel to the heart in the blood. As blood flows through the heart, it is very easy for bacteria to stick on valves that are diseased or fixed. The result is an infection called bacterial endocarditis (end-oh-car-DIE-tiss).

## Risks for Valve Infection

The following put you at high risk for an infection of diseased or fixed heart valves:

- any dental work (for example, teeth cleaning or dental surgery)
- urinary tract infections
- IV drug abuse with contaminated needles

## **When to Take Antibiotics**

Your primary care doctor (PCP) or your heart specialist (cardiologist) will prescribe an antibiotic for you. You will always need to take the antibiotic before you have any:

- dental work
- invasive medical procedures
- surgery

Be sure to tell your dentist that you have a heart valve problem. When you make a dental appointment, always remind the dental office that you have a heart valve problem. The dental office will make sure you take antibiotics before your dental work.

## Summary

This booklet tells you and your family about routine care for patients who have heart surgery at UPMC. Both before and after your surgery, your health care team — your surgeon, physician assistant, nurse practitioner, nurses, and others — are available to assist you and your family.

Please ask us any questions you may have. Tell us of any problems you think you may have after you leave the hospital. We will be very happy to assist you.

## **FOR QUESTIONS AND NOTES**

Please use this space to write a list of questions or concerns you may have. The list will help you remember issues you want to discuss. Take this list to your appointments and to the hospital.



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