Heart Surgery

A Guide for Patients and Their Families





Your Surgery is Scheduled for:

Your surgeon has given you a date and time for your operation. Every effort will be made to keep your surgery date and testing on the original dates provided, however, due to unforeseen events, **your surgical date and/or testing may be delayed** or we may have to reschedule for another date. If this occurs, everything possible will be done to reschedule you to the earliest available date. We apologize for any inconvenience this may cause.

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Welcome to Michigan Medicine

As one of the nation's leading hospitals, we perform more than 1,400 adult heart operations annually. Our highly trained team of caregivers work together to offer the expertise and resources required to make your operation and hospital stay successful.

All of the faculty and staff at the Samuel and Jean Frankel Cardiovascular Center are committed to ensuring your care is patient and family centered. You are a valued patient and a very important member of your health care team. We understand you and your family will have questions and concerns about your diagnosis and treatment. This booklet is designed to answer many of them. However, we encourage you to ask for further information or assistance at any time.



Understanding Your Heart Surgery

This teaching booklet has been designed to prepare you for heart surgery. It provides you and you family with useful information about heart disease, surgical procedures, and care before and after surgery.

Take your time reading each section of the booklet before your surgery.

> Bring this booklet with you to **all** appointments and when you come to the hospital for your surgery.

Having someone guide you from first evaluation to recovery not only makes it easier to understand the process of cardiac surgery and eases your stress knowing there is a friendly, familiar face you can count on. That person is your Clinical Care Coordinator (CCC). This nurse helps you navigate the system, get scheduled for tests, provides education about the process and makes sure you get to all the right places at the right time. Your Coordinator will also be your contact once you are discharged and will call you at home during recovery.

Your Clinical Care Coordinator is:

You can reach your Clinical Care Coordinator by calling the Call Center at **888-287-1082**.

Phone numbers

| Billing | | | | |
|--|------------------------|--|--|--|
| | 734-615-0863 | | | |
| Call Center | | | | |
| Cardiac Surgery (use Call Center) | | | | |
| CVC Check-in Desk | 734-232-4547 | | | |
| Office of Clinical Safety (comments) | | | | |
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| Guest Assistance Program (GAP) (accommodations). | 800-888-9825 | | | |
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| known) | | | | |
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How Your Heart Works

Your heart is a muscular pump about the size of your fist, located slightly to the left and behind your breastbone. Its function is to pump blood throughout your body. As your heart beats, the walls of the heart squeeze, sending nearly 12 pints of blood throughout your body every minute. In a normal heart, it takes less than one minute for blood to travel from your heart to your big toe and back. In that minute, your heart will beat 60 to 80 times.

The illustration below shows the body's circulation. The heart pumps oxygen-rich blood throughout the body via arteries (shown in red); veins (shown in blue) bring blood back to the heart.



Circulation Throughout Your Body

Heart Anatomy

The heart has two sides, separated by an inner wall called the **septum**. The right side of the heart pumps blood to the lungs to pick up oxygen. The left side of the heart receives the oxygen-rich blood from the lungs and pumps it to the body.

The heart has four chambers and four valves and is connected to various blood vessels. **Veins** are blood vessels that carry blood from the body to the heart. **Arteries** are blood vessels that carry blood away from the heart to the body.

The illustration shows a cross-section of a healthy heart with its inside structures. The explanations of these structures are listed on the next page.



| Heart Chambers | | The heart has four chambers. | |
|----------------|------------|--|--|
| | | The two upper chambers are called atria (left atrium and right atrium) and the two lower chambers are called ventricles (left ventricle and right ventricle). | |
| Heart Valves | | Four valves control the flow of blood from the atria to the ventricles and from the ventricles into the two large arteries connected to the heart. These one-way valves have either two or three tissue flaps called leaflets that act as doors that open and close to ensure that blood flows only in the proper direction. | |
| | Right Side | The tricuspid valve allows blood to move from the right atrium into the right ventricle. | |
| | | The pulmonary valve allows blood to move from the right ventricle to the lungs to get oxygen. | |
| | Left Side | The mitral valve allows blood to move from the left atrium into the left ventricle. | |
| | | The aortic valve allows blood to move out of the left ventricle into the aorta and then to the rest of the body. | |
| Veins | | The veins are major blood vessels connected to your heart. | |
| | | The superior and inferior vena cavae are large veins that carry oxygen- poor blood from the body back to the heart. | |
| | | The pulmonary veins carry oxygen-rich blood from the lungs to the left side of the heart so it can be pumped to the body. | |
| Arteries | | The arteries are major blood vessels connected to your heart. | |
| | | The pulmonary artery carries blood from the right side of the heart to the lungs to pick up a fresh supply of oxygen. | |
| | | The aorta is the main artery that carries oxygen-rich blood from your heart to the rest of your body. | |
| | | The coronary arteries are the other important arteries attached to the heart. They carry oxygen-rich blood from the aorta to the heart muscle, which must have its own blood supply to function. | |
| | | | |

Coronary Arteries of The Heart

The illustration shows the largest of the coronary arteries.



Heart Function

A. The Right Side of Your Heart The right heart takes in oxygen-poor blood (blue) from the body and pumps it into the lungs to receive oxygen. Blue arrows show the path of the oxygen-poor blood through the right atrium, tricuspid valve, right ventricle and pulmonary valve to the lungs where the blood will receive



B. The Left Side of Your Heart

The left heart takes in **oxygen-rich blood (red)** from the lungs and pumps it out to the body. Red arrows show the path of the oxygen-rich blood through the left atrium, mitral valve, left ventricle and aortic valve to the aorta. The aorta delivers this oxygen-rich blood to the rest of your body.



Types of Heart Problems and Surgical Procedures

The following descriptions are of some common heart problems and the surgical procedures used to correct them.

Atherosclerosis or Coronary Artery Disease

Coronary arteries are small vessels on the outside of the heart. These arteries supply blood to your heart muscle. If fatty deposits build up inside these arteries, they may narrow and lose their ability to deliver blood and oxygen to your heart. This condition is called atherosclerosis, hardening of the arteries, or coronary artery disease.

Your heart muscle needs blood to function. If the coronary arteries are blocked, the heart muscle beyond the blockage doesn't get oxygen. That part of the heart muscle dies. If the muscle dies, the result is what we commonly refer to as a heart attack. Chest pain, or angina, may also occur when the heart muscle does not receive enough blood.

Heart Damage from a Blocked Coronary Artery

A. Location of the heart in the body.

B. Shows a section of the coronary artery with plaque buildup and a blood clot.



Adapted from http://www.nhlbi.nih.gov/health

Coronary Artery Bypass Graft Surgery

Coronary artery bypass grafting (CABG) is done to bring new blood supply to the heart muscle. The bypasses go around the blocked artery (or arteries) to create new pathways for oxygen-rich blood to flow to the heart muscle.

To perform the operation, the heart may be stopped and you will be placed on circulatory support, called cardiopulmonary bypass or the heart-lung machine. This support works in place of your heart and lungs to circulate blood to your body and provide oxygen.

In some patients, coronary artery bypass grafting is performed on a beating heart. The heart is not stopped during the operation and the patient is not placed on cardiopulmonary bypass. This technique is not for all patients, so please discuss the options with your surgeon.

You may need one or more of your arteries to be bypassed. The grafts used to make a bypass usually come from the **internal mammary artery** (in the chest wall), the **greater saphenous vein** (in the legs), or the **radial artery** (in the arms). The location and size of your blockage and your other medical conditions determines which graft is most appropriate.

There are several systems of veins in your legs. If the greater saphenous vein is used, the other systems take over to provide adequate blood return from the legs. Blood flow into the leg is not changed by the removal of the vein. When used, one end of the removed vein is sewn onto the aorta and the other end is sewn or grafted onto the coronary artery below the blockage.

If the mammary artery is used, one end may remain attached at its origin and the other end is sewn onto the coronary artery below the blockage.

Coronary Artery Bypass Grafting

A. Location of the heart



Heart Valve Disease

Heart valve disease occurs when one or more of your heart valves does not open or close properly. Valve problems that exist from birth are called congenital malformations. Other valve deformities may occur later in life when conditions, such as an infection, can damage the valve leaflets. The natural aging process may also weaken already damaged valve leaflets or harden normal valve tissue.

Valve problems produce many symptoms. Faulty heart valves can cause dizziness, shortness of breath, fatigue, irregular heartbeats, fluid buildup, strokes and heart attacks. Tests such as an echocardiogram or a cardiac catheterization can show if heart valves are not functioning properly.

Heart Valves



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Heart Valve Diseases and Operations

Mitral Valve Disease

The mitral valve is located between the left-sided filling chamber (atrium) and the pumping chamber (ventricle). This valve has two leaflets that allow blood to flow from the lungs to the heart. The most common problems affecting the mitral valve are the inability of the valve to completely open (**stenosis**) or close (**insufficiency**).



Injury to your mitral valve leaflets or chordae (small muscles that support the valve) can be caused by a heart attack, infection or illnesses such as rheumatic or scarlet fever. When blood flows backward through the mitral valve (**regurgitation**), it is pushed into the lungs, greatly increasing the workload of the heart often causing shortness of breath.

B. Mitral Valve Stenosis When mitral valve leaflets do not open properly blood flow can be restricted. Diseased mitral valve Blood flow is restricted

C. Mitral Valve Insufficiency

When mitral valve leaflets do not close properly blood may flow backwards (regurgitate).

Backward blood flow (yellow arrows) _____

Diseased mitral valve

Normal direction of blood flow _____



Mitral Valve Surgery

Your surgeon will decide whether your mitral valve should be repaired or replaced. A repair consists of reconstruction of the leaflets and/or the chordae. A reinforcing ring may be placed around the edge of the valve to help maintain proper size and shape while correcting the flow of blood. If the mitral valve cannot be repaired, the surgeon will replace your valve with an artificial one made from either synthetic mechanical or bioprosthetic tissue (see page 22).

Choosing between a mechanical or bioprosthetic (tissue) valve is a personal decision and should be given careful consideration. Conversation with your cardiologist and surgeon will be helpful in determining valve choice. Occasionally, medical or anatomic issues may not enable patient choice, and could require placement of a specific valve type.

Your cardiac surgeon will discuss these options with you, and together you'll decide which procedure is best for you.

Pulmonary Valve Disease

The pulmonary valve is located between the heart's lower-right chamber (right ventricle) and the pulmonary artery. This valve opens to allow blood to be pumped from the heart to the lungs (through the pulmonary artery) where the blood will receive oxygen.

Disorders of the pulmonary valve are much less common than problems with the heart's other valves. The two most common forms of pulmonary valve disease are regurgitation (also known as insufficiency or incompetence) and stenosis.

Pulmonary valve regurgitation occurs when the valve is leaky and allows blood to flow backward into the right ventricle. Pulmonary regurgitation is most often caused by pulmonary hypertension (high blood pressure in the lungs) or a congenital heart defect. Other causes of pulmonary regurgitation are endocarditis (infection), pulmonary artery dilation (enlargement of the artery that runs from the heart to the lungs) and rheumatic fever (infection).

Pulmonary valve stenosis is a narrowing of the pulmonary valve opening. Pulmonary stenosis restricts blood flow from the heart's lower-right chamber into the lungs. It is most commonly the result of a congenital heart defect. Later in life, pulmonary stenosis can develop as a result of rheumatic fever (infection), endocarditis (infection) or carcinoid tumors.

Pulmonary Valve Surgery

Surgical replacement of the pulmonary valve is the standard treatment for pulmonary valve disease. Your surgeon will replace the damaged valve with a tissue (bioprosthetic) or mechanical valve (see page 22).

Choosing between a mechanical or bioprosthetic (tissue) valve is a personal decision and requires careful consideration. We encourage you to speak with both your cardiologist and surgeon to help you decide which type of valve is right for you. Occasionally a patient's medical condition or anatomy may not allow for patient choice. In this situation, your surgeon will determine the valve type that is safest for you.

Triscupid Valve Disease

The tricuspid valve is located on the right side of the heart, between the right side filling chamber (atrium) and the pumping chamber (ventricle). This valve has three leaflets and its function is to prevent blood from leaking back into the right atrium. The two most common forms of tricuspid valve disease are regurgitation (also known as insufficiency) and stenosis.



Tricuspid regurgitation – the valve is leaking because the leaflets do not close properly. Instead of blood being pushed to the lungs, some blood leaks backward into the major veins of the body. The most common cause of tricuspid regurgitation is enlargement of the right ventricle due to high pressures in the lungs (pulmonary hypertension) or due to problems with the valves on the left side of the heart (mitral and/or aortic valves). As the right ventricle enlarges, the leaflets of the tricuspid valve are pulled apart and some blood leaks back into the right atrium. Other causes of tricuspid regurgitation are endocarditis (infection), congenital defects such as Ebstein's anomaly, and carcinoid tumors.



Tricuspid stenosis – the valve is unable to open properly because the leaflets are stiff and do not open wide enough. Over time the right atrium becomes enlarged from trying to push the blood through an opening that is too small. Rheumatic fever is the most common cause of tricuspid stenosis.



Triscupid Valve Surgery

Your surgeon will discuss with you whether your tricuspid valve should be repaired or replaced. Tricuspid valve repair consists of repairing the leaflets so that the valve opens and closes correctly and putting a reinforcing ring around the edge of the valve to help it maintain the proper size and shape. Tricuspid valve repair is often done in combination with other valve surgery (mitral and/or aortic). If the tricuspid valve cannot be repaired, your surgeon will replace the valve with an artificial tissue valve or, less often, a mechanical valve (see page 22).

Choosing between a mechanical or bioprosthetic (tissue) valve is a personal decision and requires careful consideration. We encourage you to speak with both your cardiologist and surgeon to help you decide which type of valve is right for you. Occasionally a patient's medical condition or anatomy may not allow for patient choice. In this situation, your surgeon will determine the valve type that is safest for you.

The decision as to whether your tricuspid valve will be repaired or replaced is dependent on many factors. Your cardiac surgeon will discuss these options with you, and together you'll decide which procedure is best for you.

Aortic Valve Disease

The aortic valve is one of the main valves on the left side of your heart. The aortic valve is located between the left ventricle and the aorta. Normally, the aortic valve has three leaflets that regulate blood flow by opening widely and closing securely, allowing blood to flow from the heart to the body and preventing blood from flowing backwards into the heart.

In bicuspid aortic valve disease, the aortic valve has only two leaflets. The actual cause of bicuspid aortic valve disease is unclear. We do know the two-leaflet valve develops during the early weeks of pregnancy, and the defect is present at birth (congenital). About 2% of the population has bicuspid aortic valve disease, and it is twice as common in males as in females.

Aortic valve disease occurs when the aortic valve doesn't work properly. There are two main types of aortic valve disease:

Aortic Valve Stenosis occurs when the aortic valve opening is narrowed. This narrowing prevents the valve from opening fully, which obstructs blood flow from your heart into your aorta and the rest of your body.

Aortic Valve Insufficiency occurs when the aortic valve does not completely close, causing blood to flow backward from the aorta into the heart (also known as "regurgitation").

B. Aortic Valve Stenosis

The restricted opening of the aortic valve makes it hard to pump blood from the heart

A. Normal Blood Flow

(through open aortic valve)



Diseased aortic valve Blood flow is restricted

C. Aortic Valve Insufficiency

When the aortic valve does not close properly, blood may flow backwards (regurgitate) into the left ventricle.

Normal direction of blood flow ____

Diseased aortic valve-

Backward blood flow (yellow arrows)

Left

ventricle



Aortic Valve Surgery

Depending on the nature of your aortic valve disease, your surgeon will consider whether your valve can be repaired or must be replaced. While the aortic valve is usually replaced, repair may be an option in certain cases. Sometimes, aortic valves that are leaking (regurgitant) can be repaired. Your cardiac surgeon will discuss these options with you, and together you'll decide which procedure is best for you.

If your valve requires replacement, the two most common replacement valves are bioprosthetic (tissue) and mechanical valves (see page 22).

Types of Valve Replacements

Bioprosthetic (tissue) valves are sterilized for human use and do not require long term blood thinners such as warfarin. Stroke and bleeding problems rarely occur with this type of valve. However, the longevity of these valves (10 - 15 years)may be less than that of mechanical valves.

Mechanical valves, which last the longest, are synthetic and made of plastic, cloth and metal. The moving parts are coated to help prevent the formation of a blood clot on the valve. The blood thinner, warfarin (Coumadin[®]) must also be taken to prevent blood clots. Stroke or bleeding problems may occur with Coumadin[®], so strict follow up with a physician is needed to monitor blood-thinning medication.

Choosing between a mechanical or bioprosthetic (tissue) valve is a personal decision and requires careful consideration. We encourage you to speak with both your cardiologist and surgeon to help you decide which type of valve is right for you. Occasionally a patient's medical condition or anatomy may not allow for patient choice. In this situation, your surgeon will determine the valve type that is safest for you.

Types of Replacement Heart Valves



A. Annuloplasty ring A ring used to repair (reconstruct/ rebuild) the ring of your heart valve.



B. Stented valve A bioprosthetic heart valve.



C. Stentless valve A bioprosthetic heart valve without a sewing ring and stent.



D. Mechanical valve A valve made from man-made materials.



E. Homograft A valve taken from a human cadaver.

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Transcatheter Aortic Valve Replacement (TAVR)

TAVR Procedure The Transcatheter Aortic Valve Replacement (TAVR) is a minimally invasive procedure that is done to replace the aortic valve without open heart surgery. Its use is limited to specific conditions and your doctor will advise you if this is an option for you.

What is Involved in a TAVR Procedure?

Unlike surgical aortic valve replacement, which involves surgically opening the chest to replace a patient's aortic valve, the minimally invasive TAVR can be done through very small incisions.

The TAVR procedure uses a catheter to insert the new valve. This can be performed in a few ways, depending on the surgeon's recommendation. These include:

- **Transfemoral approach:** The surgeon enters via a needle puncture through a large artery in the groin (femoral artery).
- **Transapical approach:** The surgeon makes a small incision in the chest between the ribs and enters through a large artery in the chest or through the tip of the left ventricle (apex).
- **Transaortic approach:** The surgeon makes a small incision in the upper chest. The valve is delivered by a catheter through the ascending aorta.

Note: Staff will provide more TAVR information and education to patients evaluated for this procedure.

A. Transfemoral Catheter Placement

A catheter with a replacement valve is placed into an artery through a small incision in the groin. The valve is then guided up through the aorta to the heart.

B. Valve Deployment

Once the catheter is in place, the new valve is inserted within the diseased aortic valve.



Aortic Aneurysm

The aorta is the largest artery in the body. All of the arteries that carry blood to the body branch off from the aorta. These branches carry blood to the head, neck, arms, legs and vital organs such as the kidneys, liver and brain.





B. Branches of the Aortic Arch

The inset shows major blood vessels branching off the aortic arch.



An **aneurysm** is a weakening or ballooning of the wall of an artery. In an aortic aneurysm, the weakened area can leak or tear open, resulting in death. Aneurysm complications include rupture with severe bleeding, infection, and clot formation with emboli (clots that have broken free and entered the bloodstream). Tearing and separating of the layers of the aorta (**dissection**) can block the blood supply to major organs causing damage to vital organs such as the brain, kidney, liver and coronary arteries.

Open Repair

An operation is needed to replace the damaged part of the aorta. A piece of synthetic material (Dacron[®], Teflon[®] or Gortex[®]) or, in some cases, a piece of cryopreserved (freeze-dried) aorta from a human donor can be used for repairs.

For patients with dissection or aneurysm of the ascending aorta extending into the aortic arch, hypothermic circulatory arrest may be used. This surgical technique involves cooling the body to temperatures between 18-24° C (64-75° F) and stopping blood circulation. Blood is pumped to the brain through various techniques to protect the brain. Once the aortic repair is finished, circulation is restored.



Ascending Aortic Aneurysm Repair

Descending Thoracic Aortic Aneurysm Repair



Endovascular-Endograft Aortic Aneurysm Repair

For some patients, having traditional open surgery to repair a damaged aorta may not be the best option. In these cases, your surgeon may suggest a different procedure called a "**stent graft**" or "**endograft placement**" to treat your aortic aneurysm more safely. An **endograft** is a tube of strong synthetic material that is placed inside your aorta to strengthen and seal off the weak area, making a clear path for blood flow. Although this procedure is less invasive than traditional surgery, not all aortic aneurysms can be repaired this way.
Factors that help your surgeon determine the best treatment options for you include the size and location of your aneurysm, and the overall state of your health.

Endograft Repair of Aortic Aneurysm

A. Catheter Placement

Incision

A catheter is placed into an artery through a small incision in the groin. The endograft is then guided up through the artery to the location of the aneurysm



B. Aorta with Endograft

Aortic Dissection

What is an aortic dissection?

The aorta is the main blood vessel that carries blood out of your heart to supply the rest of your body. It comes out of the heart and curves around to the back and down into your abdomen. The wall of the aorta has 3 layers:

- The Intima or inner layer
- The Media or middle layer
- The Adventitia or outer layer



An aortic dissection happens when a tear in the inner layer of your aorta allows blood to leak into the middle layer. This creates two passages for blood: a true lumen, which is the normal passageway of blood, and a false lumen, the newly created passageway. A dissected aorta is shown in Figure 1.

The two major types of aortic dissection, Type A and Type B, are defined by the location of the tear.

Type A dissection—The tear begins in the upper aorta (ascending aorta) and progresses throughout the vessel, often extending as far as the arteries in the leg.

Type B dissection—The tear is located in the arch and/or the lower aorta (descending aorta), but may extend into the abdomen.

What causes an aortic dissection?

An injury or weakness can cause this tear. Sometimes the exact cause of the tear is not known.



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Risk factors for aortic dissection include:

- Uncontrolled high blood pressure.
- Atherosclerosis (deposits of plaque on inner walls of arteries).
- Blunt injury to your chest.
- History of an aneurysm.
- Born with a problem affecting your aorta or aortic valve (bicuspid aortic valve).
- Having a condition that causes inflammation of your blood vessels such as giant cell arteritis.
- Smoking.
- A Family history of aortic aneurysms or aortic dissection
- Connective Tissue Disorders:
 - Marfan Syndrome
 - Ehlers-Danlos Syndrome

How is an aortic dissection treated?

Treatment may include surgery or medications, depending on the area of the aorta involved.

Type A Aortic Dissections typically require emergent surgery to repair or replace the injured section of the aorta.

Type B Aortic Dissections are most often initially treated with aggressive control of your blood pressure. Your doctor will monitor your dissection with a CT scan or MRI to watch for growth over time. Your doctor will discuss surgical options with you should it become necessary.

Other Heart Procedures

Atrial Fibrillation Correction Surgery (Maze or Cox-Maze)

A trial fibrillation is the most common irregular heart rhythm. This rhythm starts at the top chambers of the heart (atria) and instead of traveling through the heart in an orderly fashion, many impulses are sent causing an irregular heart beat.

The Maze procedure can be done by itself or along with other open heart operations. During the Maze operation, incisions or lesions are created in the top chamber or chambers of the heart to interrupt the conduction of abnormal impulses. This creates a "maze" which makes only one path for the impulse to travel.

It can take up to 6 months for a patient to resume a normal heart rhythm after this operation. You may be on medication to help keep your heart beat regular. Your doctor will also prescribe a 'blood thinner' to prevent blood clots.

Septal Myectomy

In Hypertrophic Obstructive Cardiomyopathy, the heart muscle thickens abnormally (hypertrophy), usually in the ventricular septum (between the left and right ventricles).

This thickening interferes with the normal function of the heart by obstructing the outflow of blood from the left pumping chamber (left ventricle) to the rest of the body. It also reduces the ability of the mitral valve to close properly. If needed, surgical treatment options are available, including a septal myectomy, which removes the muscle thickening. A septal myectomy is an open-heart procedure in which your surgeon removes part of the thickened, overgrown septum between the ventricles. Removing part of this overgrown muscle improves blood flow and reduces mitral regurgitation. While this is open-heart surgery, the benefits are immediate, improving symptoms in 90% of patients.



Thickening of septum removed

Pulmonary Thromboendarterectomy

In Chronic Thromboembolic Pulmonary Hypertension, old blood clots obstruct the lungs. Patients may have breathlessness, fatigue, chest pain, and need home oxygen. Pulmonary thromboendarterectomy, a surgical treatment for this condition, requires open-heart surgery with support by the heart-lung bypass machine and an incision of the middle of your chest (breastbone or sternum). This surgery also requires cooling- deep hypothermic circulatory arrest with the body cooled to temperatures between 18-24° C (64- 75° F). While your blood circulation is intermittently stopped, obstructions are carefully removed from each of the branches of the lung and then blood flow is restored with the heart-lung machine. The entire procedure takes 6-8 hours to perform.

Most patients feel a significant improvement in their symptoms. Not only can they be more active, usually they can stop using home oxygen. Patients still need blood-thinning medications for life to prevent future clots.

Pulmonary Artery Thromboendarterectomy



Blood Transfusion and Surgery

Our team is dedicated to reducing the need for blood transfusions. However, you may need a blood transfusion during or after your surgery.

Before your heart surgery, you and your family may have questions about the use of blood transfusions. At the Frankel CVC, our team is dedicated to reducing the need for blood transfusions. However, you may need a blood transfusion during or after your surgery. Because of this, it is important to make sure you follow your surgeon's instructions regarding medications to stop before your surgery.

Your surgeon will discuss your risk and explain techniques that can minimize the need for blood transfusion. One helpful technique is eating a well-balanced, iron rich diet a few weeks/months before your surgery. This may boost your red blood count, reducing the need for a blood transfusion.

Prior to surgery, some patients ask about donating their own blood for their surgery. It is not recommend for the following reasons:

- It can potentially put you in an anemic (low blood count) state before surgery – increasing your risk for requiring a blood transfusion.
- It's expensive the cost varies and most health insurance companies do not cover it.

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Tests You May Need Prior to Surgery

Your surgeon will order pre-operative testing before you have surgery. These tests give your surgeon valuable information regarding your current health condition. Below is a list of some of the tests that may be done before you have surgery.

Dental Clearance

- What is it? A dental clearance is a letter from your dentist stating you have no dental infections. Schedule an appointment for a cleaning and dental evaluation if you have not had one within 6 months of your surgery date.
- **Special Instructions:** Any possible source of infection should be addressed and treated. You may need antibiotics prior to the treatment, so discuss with your surgeon.
- What is needed for surgery? You will be provided a clearance letter form to give to your dentist. Have your dentist fax the clearance letter to your surgeon at (734) 232-5021.

Lab Tests

- What are they? We will need to perform many lab tests before your surgery. Blood and urine samples will be taken.
- **Special Instructions:** These tests must be done at the UM Hospital within 30 days of your scheduled surgery. Please do not eat or drink for 6 hours before this test.
- What is needed for surgery? On the day of your surgery, please bring with you the Blue Sheet given to you at the blood draw.

Chest X-Ray

- **What is it?** A chest x-ray is a picture of the heart and lungs that is used to assess your heart and lungs.
- **What will happen?** When you have a chest x-ray, you will be asked to sit or stand in different positions while holding your breath so that picture can be taken.

Electrocardiogram (EKG)

What is it? An EKG records the electrical activity of your heart.

What will happen? You will have electrodes with wires put on your chest, arms, and legs. Electrodes feel like sticky patches and will connect you to the EKG machine which will graph the electrical activity of your heart.

Pulmonary Function Test (PFT)

What is it? A PFT measures how well your lungs take in and release air.What will happen? The test usually takes one hour. You will breathe into a mouthpiece that is connected to a spirometer. A spirometer records how well your lungs work.

Carotid Doppler/Ultrasound Study

- **What is it?** A carotid ultrasound checks for blockages or narrowing in the arteries of your neck that provide blood to your brain.
- What will happen? This test usually takes 30 minutes. Gel will be applied to your neck and then an ultrasound probe will be moved against your skin.

Ankle-Brachial Index (ABI)

- What is it? An ABI test checks for decreased blood flow to your arms and legs.
- **What will happen?** This test usually takes 1 hour. You will have your blood pressure measured at your ankles and your arms.

Vein Mapping

- **What is it?** A vein mapping test will create a map of your leg veins for the surgeon.
- **What will happen?** This test usually takes 30 minutes. A gel is put on your legs and an ultrasound probe is moved around your skin while pictures are taken.

Surface Echocardiogram (Echo)

- What is it? An Echo uses sound waves to measure your heart's size and shape, how well the valves are working, and how well your heart fills and pumps blood.
- What will happen? This test usually takes 30 minutes. A gel is put on your chest and an ultrasound probe is moved around your chest while pictures are taken.

Trans-esophageal Echocardiogram (TEE)

What is it? A TEE provides a more detailed picture of your heart valves, chambers, aorta, and heart function.

What will happen?

- This test usually takes 1 hour to do and 2-3 hours recovery time.
- You cannot eat or drink 6 hours prior to the procedure and you will need someone to drive you home.
- A technician sprays your throat with a medicine to numb it.
- A nurse puts an intravenous line (IV) in your arm, and gives you medicine to help you relax.
- The doctor then gently guides a thin, flexible tube (probe) into your mouth and down your throat, and asks you to swallow as it goes down.
- The probe captures pictures of your heart.

ECG-gated SPECT Myocardial Perfusion Imaging (Stress Test)

- **What is it?** A stress test is used to measure the amount of blood in your heart at rest and during exercise. It can detect coronary artery disease or damage to the heart.
- **What will happen?** This test may take 3-6 hours to complete. During the scan, a camera takes pictures of the heart after a special test medicine (radioactive tracer) is injected into a vein in your arm.
 - You will have an IV for this test.
 - You can not eat or drink 4 hours prior to the test.
 - You cannot have caffeine or tobacco 24 hours prior to this test.
 - Certain medications cannot be taken prior to this test. The scheduler will discuss specific medications with you.

Coronary Angiogram (heart catheterization)

What is it? A coronary arteriogram is a procedure where contrast material is injected into your coronary arteries and pictures are taken of your coronary arteries (located on the outside of your heart). It shows if you have any blockages in your coronary arteries and how well your heart muscle and valves are working.

This test takes 1 hour to complete and 4-6 hours to recover.

What will happen?

- You cannot eat or drink for 6 hours prior to this procedure and you will need someone to drive you home.
- The nurse will give you medications through your IV line to help you relax and make you drowsy.
- Next, the site of the procedure (either your wrist or groin) will be numbed with a local anesthetic, similar to what your dentist may use.
- A catheter is placed in your blood vessel while a camera captures images.

Right Heart Catheterization

What is it? A test that measures the blood pressure and fluid levels in your heart and lungs.

This test takes 30 minutes – 1 hour to complete.

What will happen?

- You cannot eat or drink 6 hours prior to the procedure and you will need someone to drive you home.
- You will have an IV placed before the procedure.
- A small catheter is placed in your neck vein and guided through the vessel to the heart.
- You will have a chest x-ray performed after the procedure.

Computed Tomography Scan (CT)

What is it? A "CT" or "CAT" scan is a special x-ray that can see parts of your body that cannot be seen on regular x-rays. This test will take 1 hour to complete.

What will happen?

- You cannot eat 6 hours prior or drink 2 hours prior to this procedure.
- You will have an IV placed before the procedure.
- During the scan, you will lie on your back inside the machine while pictures are taken.
- A contrast material is injected through an intravenous (IV) line into a vein in your hand or arm IV to allow your doctor to see parts of your body more clearly.

Cardiac Magnetic Resonance Imaging (MRI)

What is it? An MRI provides detailed pictures of the heart and vessels. It also reveals how well your heart is functioning.

You will need to complete a questionnaire prior to your appointment.

What will happen?

- Metal and electronic objects are not allowed in the exam room because they interfere with the magnetic field of the MRI machine.
- Be sure to tell your physician if you have a history of metal implants, shrapnel and/or claustrophobia.
- You will be asked to wear a hospital gown during the MRI scan.
- The machine looks like a long metal tube. You lie down on a movable table that slides into the opening of the tube.
- There will be technologist who monitors you from another room. You can talk with this person by microphone.
- During the MRI scan, the magnet produces repetitive tapping, thumping and other noises. Earplugs or music may be provided to help block the noise.
- In some cases, a contrast material may be injected through an intravenous (IV) line into a vein in your hand or arm to allow your doctor to see parts of your body more clearly.
- You must hold very still because movement can blur the test results.



If you are worried about feeling claustrophobic inside the MRI machine, talk to your doctor beforehand. You may receive a sedative before the scan.

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Preparing for Your Surgery

Your History and Physical Exam

Before your operation, you may have an appointment for a "pre-operative history and physical exam". This appointment will take between 2-6 hours, depending on the tests you need. It may be helpful to bring a list of questions with you to the appointment.

At this appointment you will meet with a Physician Assistant (PA) or Nurse Practitioner (NP) who:

- Reviews your medical history including allergies, current medications, and previous surgeries
- Performs a physical examination
- Reviews the results of your preoperative tests
- Answers your questions about the surgery
- Reviews the consent for surgery
- Reviews what your family can expect
- Explains what you can expect during your hosptal stay

At this appointment you will meet with a Medical Assistant who:

- Provides you all of your pre-operative instructions
- Reviews all of your medications (Please bring a list of everything you take: prescription, over-the-counter, vitamins or herbal supplements)
- Shows you how to use an incentive spirometer (breathing machine) and gives you one so you can practice at home
- Reviews the tentative date/time of your surgery
- Explains where to go and when to arrive
- Explains where your family checks-in and waits while you are in surgery

Medications:

Please bring a list of everything you take: prescription, over-the-counter, vitamins or herbal supplements.

Staphylococcus Aureus Infection Prevention before Cardiac Surgery

What is Staphylococcus aureus?

Staphylococcus aureus or, "Staph", is a germ that lives on the skin and in the noses of many healthy people. Staph germs do not cause any problems for most people, but sometimes these germs can cause serious infections including surgical wound infections.

To reduce the risk of Staph infections, you will need to bathe or shower with a special anti-bacterial soap called Chlorhexidine (CHG). The solution will help remove germs from your skin. Wash with this soap for 5 days before your surgery. Use the soap from your neck down only. Do not use it on your face.



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Preparing for Your Surgery A Checklist to Guide You

In the time leading up to your surgery, be sure to follow these simple tips to ensure the best possible outcome and prepare for a successful recovery. Use the checklist below to help you get ready.

□ If you smoke, STOP!

The SINGLE most important thing you can do for your heart is to stop smoking. Smoking increases your chances of having complications such as pneumonia after surgery. Non-smokers also heal faster than people who smoke.

Stop smoking now so there is no need to cancel your surgery!

For more information, read the *"How to Quit Using Tobacco"* section in this booklet.

If you want assistance to quit smoking prior to surgery, ask for a referral to the UM Tobacco Consultation Service or call them yourself. **Call: 734-998-6222**

□ Review Your medications

The following medications may increase the risk of bleeding with surgery:

- No aspirin or aspirin- containing products (Bayer[®], Excedrin[®], Bufferin[®], Anacin[®] or Alka-Seltzer[®])
- No nonsteroidal anti-inflammatory (NSAIDs) products such as ibuprofen (Advil[®], Motrin[®] or other) or naproxen (Aleve[®], Naprosyn[®] or other)
- No vitamins or supplements

Your surgeon will give you specific directions for when to stop taking these medications.

□ When is blood thinner medication stopped before surgery?

You tend to bleed more easily when you take blood-thinning medication. Your surgeon will give you specific directions for when to stop taking your blood thinners before surgery.

The following is a list of blood-thinning medications:

- Warfarin (Coumadin[®])
- Enoxaparin (Lovenox[®])
- Dabigatran (Pradaxa®)
- Apixaban (Eliquis®)
- Fondaparinux (Arixtra[®])
- Rivaroxaban (Xarelto)
- Clopidogrel (Plavix[®])
- Dipyridamole (Persantine[®])
- Prasugrel (Effient[®])
- Ticagrelor (Brilinta®)

Review when to stop drinking alcohol before surgery

Please **do not drink** any alcoholic beverages for **48 hours** before your operation. If you are having an aortic aneurysm repair, we ask that you refrain from alcohol consumption for 30 days prior to surgery.



For any questions about medicines, call your surgeon's office (via the Call Center).

Call Center: 888-287-1082

Be sure your surgeon and anesthesiologist know your usual amount of alcohol intake.

□ Do I need any vaccinations before surgery?

Ask your surgeon or primary care provider about which vaccines you may need prior to your surgery.

□ Set up a pre-surgery dental evaluation

- Please see a dentist prior to your operation. Your dentist will make sure your teeth and gums are in good condition before surgery. This is important to prevent any infection after surgery. If you are undergoing surgery for a heart valve, you will need to take an antibiotic one hour prior to your dental appointment.
- Please ask your dentist to sign and fax the provided dental clearance letter.

• After your heart valve or aortic surgery, you will need to take an antibiotic before any dental or invasive procedures. Please ask your nurse if you have any questions.

Develop a plan for recovery

To maximize support for your recovery, pick a friend or family member to be your personal support coach. Your support coach will be educated by your providers on how to support and encourage you during your recovery.

Your support coach will:

- Accompany you to your history and physical appointment.
- Accompany you to the hospital on the day of your surgery.
- Be the primary person to talk with your doctors and nurses. Your coach can then relay information back to your family and friends.
- Receive education from your health care team on how to provide the best care and support for you at home.
- Be present as you receive your discharge instructions at 9:30am on the day of discharge and drive you home.
- Stay with you for the first 7 days after you are discharged from the hospital; this includes at night, too.
- Be available to help you with certain tasks in your recovery after you leave the hospital:
 - Help you monitor your temperature, blood pressure, heart rate, weight, and check your incisions
 - Assist you with your medications
 - Assist you with daily activities and exercise
- Accompany you to follow-up appointments and blood draws.

You will receive a call 72 hours after discharge from one of the Medical Assistant Specialists. If you or your support coach have questions or concerns, they will be able to assist you.

If you cannot identify a support coach prior to your History and Physical appointment, please notify your Clinical Care Coordinator:

My Clinical Care Coordinator_____

Contact Number_____

They will either help you identify a coach or outline a safe alternative care plan.

My Support Coach is: _____

What is the difference between recovering at home and recovering at a skilled nursing facility?

Your surgeon expects you to go home after surgery with the support of your coach. People who go directly home after surgery often achieve a faster recovery. There are times when it is appropriate for a patient to go to a skilled nursing facility. This decision will be made by your team including your surgeon, physical/occupational therapists, and care manager.

Note: If you return home, your medical care will be directed by your cardiac surgeon. If you discharge to a skilled nursing facility, your medical care will be directed by the providers at the facility.

The benefits of returning home after your hospital stay include:

- You are at lower risk of complications, such as infection, wound healing problems and readmission to the hospital
- You will spend your recovery in the familiarity and comfort of the home environment.
- You will return to your daily routine faster, including bathing and meal preparation.
- You and your support coach will make your daily walking and exercise program part of your daily routine.
- Your friends and family will be able to visit and support you at any time of day.

□ Purchase the necessary equipment:

- Oral thermometer
- Weight Scale
- Home Blood Pressure Cuff

We prefer the OMRON devices as they have been validated by independent societies to be accurate. These can be purchased at many stores or on the Omron website. For any home blood pressure device you purchase, make sure that it has been validated to be accurate (the manufacturer will attest that the device passed validation by the AAMI, BHS, or the AHA).



□ Practice your pre-operation exercises

Practicing your exercises before and after your operation is important and will allow you to take an active role in your recovery. Performing these exercises will play an important role in getting yourself well and home. See the section on **Physical Therapy** in this chapter.

Practice the following exercises several times each day:

Exercises for your lungs

The following breathing exercises are designed to assist in keeping your lungs fully expanded and clear of extra secretions so that you do not develop pneumonia. Remember, no one can breathe or cough for you. Be sure that you are comfortable, relaxed and able to concentrate before you begin a practice session. Place your hand on your stomach or ribs, so that you emphasize expansion of the correct area.



Incentive spirometer

Incentive spirometer (breathing machine)

Before your operation, you will receive an incentive spirometer. Staff will teach you how to use it properly. You should practice using your breathing machine (incentive spirometer) several times each day. Your breaths should be slow and deep.

- You should have your incentive spirometer at your bedside immediately after your operation so that you can use it as soon as you wake up. You should use your incentive spirometer 10 breaths every (1) hour while you are awake.
- Do not compare your results to those of other people.
- Many factors can change the volume a person can achieve when using this machine.
- Use your incentive spirometer when you go home to help keep your lungs clear while you recover. Continue to use it until you return to clinic.

How to use the incentive spirometer

1. Sit on the edge of your bed if possible, or sit up as far as you can in bed.





 Place the mouthpiece in your mouth and seal your lips tightly around it.



4. Breathe in slowly and as deeply as possible.





- 5. Hold your breath as long as possible. Then exhale slowly and allow the piston to fall to the bottom of the column.
- Rest for a few seconds and repeat steps one to five at least 10 times every hour.





- 7. Position the yellow indicator on the side of the spirometer to show your best effort. Use the indicator as a goal to work toward during each slow deep breath.
- 8. After each set of 10 deep breaths, cough to be sure your lungs are clear. If you have an incision, support your incision when coughing by placing a pillow firmly against it.
- 9. Once you are able to get out of bed safely, take frequent walks and practice the cough.







Deep breathing and coughing

One of the most important factors that will speed your recovery is your ability to breathe deeply and cough effectively. Practice each step below several times each day.

- Take two deep breaths in through your nose and out through your mouth.
- On the third breath, breathe in deeply and then give two or three sharp coughs before taking another breath.
- You should feel your abdominal muscles tighten each time you cough. Be sure to spit out any mucus your cough produces.
- After your surgery, you will want to support your incision with your hands, a pillow, or a folded blanket when coughing.

After your surgery, you will want to support your incision with your hands, a pillow, or a folded blanket when coughing.



Physical therapy exercises before open heart surgery

Exercises for your legs

In addition to your breathing exercises, there are a few simple exercises you can do in bed or sitting in a chair to keep muscle tone, promote good circulation in your legs, and decrease swelling in your legs. Practice each exercise at least twice a day. Repeat each exercise 10 times and increase to 25 as able. After your operation, the following exercises should be performed every hour while you are awake until you are walking frequently.



Upright posture:

Look straight ahead with your chin tucked and shoulders pulled back. Use this posture with all exercises below.



Ankle pumps:

Move your ankle up and down (like pressing and releasing a gas pedal). You may perform this exercise sitting or lying down.



Leg kicks:

Sitting with an upright posture in a chair or in the bed, kick your leg out straight and slowly. Hold for 3 seconds, and then repeat with the other leg.



Seated marching:

Sitting with upright posture in a chair or in the bed, lift your knee up towards the ceiling without leaning backwards. Repeat with the other leg.

Tips to Ensure a Safe Hospital Stay



Michigan Medicine faculty and staff are working with patients and families to become the safest hospital in the world. Please review the following safety tips.

Speak up! If you have voiced a concern to staff that your or your family member's condition is rapidly getting worse, but feel it has not been adequately addressed, pick up any hospital phone and and call **FIRST** by dialing 141-The Family Initiated Rapid Safety Team.

Dial 141 for FIRST = The Family Initiated Rapid Safety Team

Be informed

Speak up if you have any questions or concerns. You have the right to question anyone who is involved with your care.

Know who is in charge of your care.

Many people may be involved in your care. Also, doctors can change during your stay. You can encourage your care providers to write their names and roles on the whiteboard in your inpatient room to help you understand who is on your care team.

Ask about test results.

Do not assume "no news is good news"; ask your doctor about your test results.

Be informed of any invasive procedures, such as surgery.

Make sure you and your doctors all agree on exactly what will be done.

When you are unable to speak up (sedated or breathing tube prevents you from speaking), a trusted family member or friend can be your advocate. Identify that person before you are admitted to the hospital. Read more in the Advance Directive.

- Fall preventionPrevent falls by wearing slip-resistant socks and asking for help before
getting out of bed. Avoid using unsteady items (such as IV poles and
bedside tables) when getting out of bed. Be aware of how you are feel-
ing. Some medications can cause dizziness or drowsiness. Families are
encouraged to stay if a patient is at risk of a fall.
- Hand hygiene Patients in the hospital can get infections, called healthcare-associated infections, from the spread of bacteria on the hands of caregivers and other staff. Studies show that proper hand hygiene (soap and water or hand sanitizer) reduces the occurrence of these infections. In other words, health care providers can prevent the spread of bacteria by simply washing their hands. At Michigan Medicine, staff are required to wash their hands (with soap and water or hand sanitizer) upon entering and leaving a patient room as well as before and after each patient contact. If you ever notice anyone forgetting to clean their hands, please remind them to do so.
- Identification (ID)When you arrive, an ID band with your name and medical record num-
ber (MRN) is put on your wrist. Staff will check your identity by looking
at this ID bracelet. Please do not remove the bracelet until after you are
discharged to home.
- MedicationWhile in the hospital, you can expect staff to give you the right medi-
cations. Your doctor may order new medications when you are in the
hospital.

Be sure you know:

- what medication you are taking and why why you are taking it
- what the medication looks like
- the dose (amount)
- how often you take it and what time of day
- side effects that may occur

We want you to feel comfortable voicing concerns if you feel that any medication being given to you is not correct.

For questions or concerns about medication, alert your doctor or nurse.

The Day Before Your Surgery



Confirming your arrival and surgery time You will need to confirm the time of your surgery so that you know what time to arrive at the hospital. It is important for you to follow these steps:

- □ The day before your surgery, please call **866-983-9090** between 8:00am and 11:00am.
- □ If your surgery is on a Monday, please call the Friday before.
- □ Leave your name and phone number with the clerk or on the answering machine.
- □ A pre-op nurse will call you back between 1:00-4:00pm to confirm the time of your surgery and the time you should arrive on the day of your surgery.
- Be sure to give your surgeon a phone number where we can reach you the night before and the morning of surgery. It is important to know how to reach you.



The day before your surgery, please call

866-983-9090

Who do I contact if I am not feeling well the day before my surgery?

How should I prepare for my surgery?

Report any symptoms of flu, cold or infections to your surgeon. It is important that you be in your best possible health for surgery.

- □ Call (888) 287-1082, Monday-Friday before 4:30pm to report these symptoms. Ask to speak to the clinic nurse. Call (866) 983-9090 after 4:30pm and leave a message.
- You will be asked to shower using the chlorhexidine (CHG) 4% antiseptic soap the night before and the morning of your surgery. This special soap reduces the amount of germs on your skin.
- □ Use the Chlorhexidine body wash from the neck down.

Use the Chlorhexidine soap only from the neck down.

Do not use it on your face, eyes, ears, nose or mouth

- Do not shave the hair on your chest, arms or legs! Shaving your skin with a razor blade can actually increase your risk of infection. We will prepare your skin by removing the hair with a special clipper the morning of surgery.
- □ **Do not** apply make-up, deodorant, lotions, sprays, gels, creams, ointments or powders after showering with the special body wash the night before and the morning of your surgery.
- **Remove** nail polish from your hands and feet.
- **Do** brush your teeth the morning of surgery.
- The day before surgery you should practice the coughing, deep breathing, and physical therapy exercises you have learned. You should also practice with your breathing machine (incentive spirometer) several times that day.
- □ Review this booklet

What activities should I avoid the night before my surgery?

- □ **Do not eat** gum, hard candy or food of any kind after midnight the night before your surgery.
- Do not drink anything after midnight the night before your surgery. This includes water, coffee, milk, or juice. You may have a sip of water with your morning medications up to 2 hours before arrival time.



- □ Plan on bringing any special equipment that you use at home:
 - Glasses, dentures and hearing aids with storage cases. Be sure to label these items with your name.
 - CPAP machine if you have sleep apnea.
 - Walker or a cane, labeled with your name.
- Pack a suitcase with these items for your family/friends to bring to you after your surgery. You will not need your suitcase until you are transferred to the stepdown unit.
 - Women only: Make sure you have a loose-fitting and preferably front closure bra with no underwire to wear after surgery.
 - Loose fitting clothes. Button down shirts are preferred.
 - Robe
 - Tennis shoes
 - Toiletry articles: toothbrush, comb, etc.
 - A list of the medications you are currently taking including vitamins and herbal supplements. Do not bring actual medications with you to the hospital.

How can I prepare for my hospital stay?

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 - Robe
 - Tennis shoes
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 - A list of the medications you are currently taking including vitamins and herbal supplements. Do not bring actual medications with you to the hospital.

How can I prepare for my hospital stay?

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The Day of Your Surgery



What do I need to do the day of surgery?

- □ Take the medications the clinic nurse told you to take **with a small sip of water**.
- □ Brush your teeth or rinse your mouth but spit out all of the water.
- □ Shower using the chlorhexidine (CHG) 4% anti-bacterial soap given to you in clinic. (see page 44 for use)
- □ **Do not** use any deodorant, powder, lotion, perfume, aftershave, or makeup.
- □ Dress in loose, comfortable clothing and flat shoes. Button down shirts are preferred.
- □ Remove all jewelry and leave it at home. This includes earrings, watches, wedding bands, hair clips, and body piercings.
- □ Remove all types of contact lenses. Bring your glasses and contact case with you to the hospital.
- □ Remove dentures and/or wigs. Give them to your family.

The Morning of Your Surgery

Do not eat or drink anything after midnight.

You may have a sip of water with your morning medications up to 2 hours before arrival time.



Please bring the following items with you:

What should I bring to the hospital the day of my surgery?

- □ The Blue Blood Bank Form
- □ Cardiac Surgery Education Book. Please be sure to review this booklet prior to your surgery.

Incentive spirometer: Bring this with you.

- Your breathing machine (incentive spirometer). Your family should give the breathing machine to the intensive care unit nurse.
- □ Completed Inpatient Family and Friends form.



- □ Advance Directive/Durable Power of Attorney form. (Completion is optional)
- □ You can bring a suitcase with you to the hospital. You may not have your suitcase in the ICU. Your family can bring your suitcase to the Step-Down Unit when you are transferred out of the ICU.

| What items should I leave at | Please leave the following items at home: | | |
|---------------------------------|---|--|--|
| home? | □ Do not wear contact lenses or jewelry to the hospital. You cannot wear these in the operating room. | | |
| | Do not bring valuables such as credit cards, money or jewelry. | | |
| | Do not bring your medications to the hospital. | | |

At the Hospital



What happens when I arrive at the hospital?

Please park in the Cardiovascular Center Visitor Parking Structure (P5).

Address to use in GPS: 1425 E. Ann St. Ann Arbor, MI 48109

Valet parking is available Monday-Friday 5:30am to 7:00pm.

Follow these instructions to get to the **"Surgery Check In**" area:

- 1. Enter the Cardiovascular Center on Level 3 from the parking structure.
- 2. Take the Elevators to Level 4.
- 3. "Surgery Check In" is on the right after you exit the elevators.







When you arrive at the "Surgery Check In" area, your family will receive a pager. The surgical waiting area staff will use this pager to let your family know when your surgery is over. When the pager lights up, your family should check back in with the clerk. The clerk will escort them to a consult room where your Surgeon will talk with them.

Cell phones can be used in the waiting areas but **not** in the pre-op and recovery areas.



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After I am checked in what can I expect?

Pre-Operative Holding Area

A fter you have checked in to the hospital you will be directed to the preoperative "Holding Area", where you will be prepared for surgery. You will be asked to change into a hospital gown and assigned a bed in the Holding Area. A tech will bathe your chest, groin and legs to cleanse your skin before surgery. You will also have the hair on your chest, groin and legs clipped at this time. A nurse will take vital signs, do a nursing assessment, review your medications and when you took them last. Your nurse will also place an intravenous line (commonly referred to as an 'IV') to give you medications during your operation.

You will be connected to various monitors that keep track of your vital signs.

Special pads will be placed on your chest to monitor your heartbeat.



A clip will be placed on your finger to measure the oxygen level in your blood, as well as your breathing.





A cuff will be placed on your arm. The cuff will gently squeeze on and off as it monitors your blood pressure.

Meeting your Anesthesiologist



You will meet your anesthesiologist, who will review your medical records, paying special attention to your past anesthetic experiences. He/ she will also thoroughly review all previous tests.

You may be given a mild sedative that will make you feel quite drowsy and comfortable.

General anesthesia uses medications given through an IV to put you to sleep during the operation, and gases to keep you asleep.

Operating Room Once you have talked with your surgical care team, you will be moved to the operating room. Here you will notice it is cool, brightly lit, and has many complex pieces of equipment.

At this point, preparations will be made to deliver the anesthetic that will allow you to tolerate your heart operation in a safe and comfortable manner.

You will be asked to breathe oxygen by a mask. The general anesthesia you receive before surgery will allow you to sleep during the operation. After you receive this medication, you will be completely unconscious and pain-free during your surgery.

Once you're asleep (anesthetized), a breathing tube is inserted through your mouth. This tube attaches to a ventilator, which breathes for you during and immediately after the surgery.

A urinary catheter will be placed after you have been deeply anesthetized to drain your urine from your bladder.

Your Hospital Stay



The Intensive Care Unit (ICU)

After Your Surgery A fter surgery, your cardiac surgeon will provide your family with an update. After this, there will be a delay before your family can come see you in the Intensive Care Unit (ICU). Your family can wait in the ICU family/visitors lounge during this time. Typically, the Unit Host will greet your family in the lounge.

After your surgery is completed, you will be brought to the Cardiovascular Intensive Care Unit (CV-ICU), an area designed for patients who have undergone open-heart surgery. During this time, the ICU nurse will receive important information about your care.

Once your nurse finishes settling you in, your family will be welcomed into the ICU to see you.

Visitation Policy

- In alignment with Michigan Medicine, the Cardiovascular Intensive Care unit welcomes the presence of loved ones.
- "Family" members are welcome at your bedside 24 hours/day. We want you to feel supported, not only by the care we provide, but by your loved one's presence as well.
- Family, for purposes of visitation, is defined by you and is usually one or more individuals who play a significant role in your life. "Family" members may be related in any way—biologically, legally, or emotionally. Thus, a patient's family member may include a person(s) who is not legally related to the individual.
- At times, we may ask your family members to step out of the room if procedures or other necessary patient interventions need to be done. Your family will be welcomed back as soon as possible.

We welcome the presence of loved ones.

Cardiac Surgery: Post-Operative Care Progression

| ICU Status | |
|---|---|
| OR Move to ICU Off breathing tube Up in chair Incentive spirometer every hour while away | Decrease supplemental oxygen Up in chair 3x/day Walking 4x/day Incentive spirometer every hour while awake Start Eating |

| Your Care Team | | | | |
|--------------------|--|--|--|--|
| Intensivists Staff | Intensivists are doctors who care for you during your ICU stay and work closely with your surgeon to decide your plan of care. They meet several times a day to review your changing conditions and needs. Starting around 8:00 a.m., the ICU doctors and other team members begin making "rounds" to see how you are doing. This is a good time to discuss your medical care, progress and steps toward discharge. The doctors will also "round" on you in the afternoon beginning around 3:00 p.m. | | | |
| Provider Team | The Provider Team is made up of Nurse Practitioners, Physician Assistants, and Residents who coordinate your care with your surgeon. | | | |

We encourage you and your family to participate and ask questions.

Stepdown Care



Nursing Staff Nurses who specialize in the care of cardiac surgery patients will care for you during your hospital stay.

- Nurse to Nurse bedside report is performed every shift.
 - During report, your outgoing nurse discusses with the oncoming nurse how you are doing. They will discuss the plan for the day or any test you are scheduled for during that shift. This helps us to provide consistent care.
 - We encourage patients and families to listen and participate.
 - Questions are welcomed and encouraged.
- Care Managment
 Nurse Case Manager (discharge planner): Our case managers help to ensure a smooth transition between your inpatient stay and home care needs. They will visit you during your stay and arrange any medical needs you may have after discharge. You and your family will be given their contact information.
 - **Social Work:** If needed, a social worker will meet with you and your family to ensure that the proper support system is in place at home to assist in your recovery.

Your Care Team



A doctor "makes rounds" by visiting all of his/her patients at the bedside.

| Patient Care Technicians (Tech) | • The Patient Care Staff will assist your nurse with your daily care. |
|---------------------------------------|---|
| Inpatient Diabetes Management Team | The Inpatient Diabetes Management Team will monitor your blood sugar levels. They make recommendations to your Surgeon to help keep your blood sugar under control. |
| Dietician | • A dietitian is available to answer questions about your dietary needs and preferences. Information about specific diets is available in the hospital. |

Recovering in the ICU



Keep in mind: You may not remember a lot of what happens while in the ICU.

This is normal!

An intensive care unit (ICU) can often be an overwhelming place, both for the patient and their families. The sights and sounds of the ICU can be intimidating. The following information is important for you to review with your family to help prepare them for what they will see and hear.

What will my family experience when they first come to visit?

When your family visits for the first time it can be quite a shock. You will have lots of tubes and drains attached to surrounding equipment. Your skin often looks pale and feels cool to the touch. Your face and hands may appear puffy or swollen. *Sometimes* soft wrist restraints are necessary for your safety until you are fully awake. These restraints are tied loosely to the bed to prevent you from accidentally pulling out your tubes. This is all normal after open heart surgery.

Delirium

What does delirium look like?

- Confusion, may not know familiar people's names
- Inattention
- Quiet and withdrawn
- Flat emotions
- Unusually tired
- Agitation or restless
- Personality changes
- Saying things that do not make sense

Who is at risk?

- Delirium affects ~82% of patients in the intensive care unit
- Anyone greater than 70 years old
- Recent surgery
- Anyone in the ICU
- People in pain
- Malnutrition
- Impaired vision or hearing

How to prevent it

- Be aware of the signs and symptoms and tell the nurse if you notice them
- Bring your glasses, hearing aids, and dentures
- Bring familiar objects from home such as family pictures
- Have a family member stay with you during your stay as much as possible
- If able, eat and drink regularly

Incisions In cardiac surgery, the routinely used incisions are the **midline sternotomy** and **thoracotomy**.



What are all these tubes around me?

What types of tubes, wires and equipment will be attached to me after surgery?

After surgery, you will wake up to a team of health care professionals and lots of equipment. It's normal to have tubes and wires attached to your body. They help staff check your vital signs, take blood, give medications

or fluids, and drain body fluids.

The following is a brief description of some of these tubes, wires and what you can expect upon awakening. If you have any questions, the medical team is here to help explain.



What are all these tubes around me?



Endotracheal Tube (Breathing Tube):

At first you will be too sleepy to breathe on your own. There will be a breathing machine helping you. There will be a tube placed through your mouth into your windpipe. This tube is attached to the breathing machine (ventilator).

There may be alarms that sound when you are on the ventilator. The alarms may be distracting, but they don't always mean that something is wrong. The respiratory therapist and your nurse will answer these alarms and explain the cause.

Our goal is to remove the breathing tube as soon as it's safe.

Pulmonary Artery Catheter (Swan-Ganz Catheter):

The pulmonary artery catheter is a long, thin tube that is inserted into a large vein in your neck. It is used by your medical team to monitor how well your heart is pumping and to give you medications. It is usually removed 1-2 days after your surgery.





Urinary Catheter:

In the operating room, you will have a catheter placed into your bladder to drain urine. During this time, you will not need to worry about using the toilet.

It helps the medical team measure the amount of urine you make and monitor how well your kidneys are working.

The catheter usually stays in for 1-2 days.

Oral-Gastric Tube (OG Tube):

The Oral-Gastric Tube is in place when you have the breathing tube. It is placed in your mouth and passed down to your stomach. Its job is to make sure your stomach is empty.

The Oral-Gastric Tube is removed when the breathing tube is removed.

Insulin Infusion

While you are in the operating room, your blood sugar is being checked regularly. This is continued during your entire hospital stay. The stress of surgery can make your blood sugar go up even if you do not have diabetes. We watch your blood sugar levels closely to reduce your chance of getting an infection and having other complications.

Typically you will be placed on a continuous intravenous (IV) infusion of insulin to keep your blood sugar levels less than 150. You will also receive a shot of insulin with each meal and at bedtime.

What sounds will I hear?

Unique alarms are set on each monitor and machine. You will hear different noises like alarms and beeping. Most alarms do not signal an emergency. The heart monitor and/or the breathing machine (ventilator) will alarm when a patient moves or coughs. These new sounds may be concerning, but they are normal. Please see a staff member with any concerns.



What are all these tubes around me?

Arterial Line:

The arterial line is a catheter that is placed in your wrist or groin. The arterial line allows the medical team to continually see your blood pressure. It also allows for your blood to be drawn without having to be poked.

The arterial line stays in place until you are ready to move to the step down unit.

Pulse Oximeter: Pulse oximetry is a way to measure how much oxygen your blood is carrying. A clip-like device called a probe is placed on a body part, such as a finger or ear lobe. The probe

uses light to measure how much oxygen is in your blood. This information helps your health care provider decide if you need extra oxygen.



Chest Tube:

After your operation, it is normal for some fluid or blood to drain from your chest into the area around your heart and lungs. During your surgery, thick tubes are put in to drain any extra blood or fluid that may collect. The chest tubes come out of your chest and drain into a box.

The tubes are removed when the fluid has decreased – the specific time will vary person to person. Typically 1-2 days after surgery.

Dressing that covers incision





Heart Monitor:

Following your operation, a heart monitor will be placed on you to provide a constant recording of your heart's activity. It is used by your doctors and nurses to determine if your heart is beating normally.

The monitor screens will be located at your bedside and at the nurses' station.

Our highly trained nurses will watch the heart monitor at all times. If an alarm sounds, it does not necessarily mean there is a problem with your heart.

Sequential Compression Device (SCDs):

SCDs are placed on your calves and squeeze your legs intermittently to help prevent a blood clot from forming.



Epicardial Pacemaker:

While you are in surgery, your surgeon places temporary pacemaker wires onto your heart. These wires exit the body through your skin and are attached to a pacemaker. A pacemaker is an electronic device that provides an electrical signal to help your heart beat if needed.

The pacemaker wires are temporary and will be removed just a few days before you are discharged from the hospital.

Support Stockings (TEDs):

These stockings are used to prevent blood clots from forming in your legs. You will keep them on during your hospital stay and when you return home.

See the discharge instruction for more information about your home use of TEDs.

What to Expect in the ICU

In the ICU, our goal is help you recovery from surgery and get back on your feet. The following are descriptions of the activities that will help you get home more quickly.

What will my diet be in the ICU?

Once your breathing tube comes out and your stomach wakes up, you may be able to start slowly drinking and eating. At first, you will be given clear liquids such as ice, Jell-O[®], juice, popsicles, or broth.

Once you can tolerate clear liquids, you will be given solid foods that are low in fat, cholesterol, and no added salt.

You will likely not have an appetite while you are in the hospital. You may feel nauseated, or just have no desire to eat. This is normal. When you eat, you may notice you have lost your sense of taste. However, it is very important for you to eat to support the healing process.

Room service is available at any time of the day. Your nurse will bring you a menu so you can choose what you would like to eat. It is fine for your family to bring food from home, but it should be low in salt and low to moderate in fat.

It is very important for you to eat to improve the healing process.

Pain and Discomfort after Heart Surgery

What kind of pain can I expect to feel after surgery?

It is normal to experience pain after your surgery. You may be surprised to feel pain in places other than your incision site, especially as you begin to be more active. Please tell a member of your healthcare team about the pain you have after surgery, which can include:

Muscle pain: You may feel muscle pain in your chest, back, neck, shoulders or legs. This is from lying on your back on the operating table and in the intensive care unit.

Pain from chest tubes: You may have some discomfort from the chest tubes that were placed in your chest to drain fluid, blood and air during heart surgery.

Incision pain: You may feel pressure or burning at the incision site(s).

Who is going to help manage my pain in the hospital?

Your doctor will order pain medication for you to take. Your nurse will ask you about your pain at regular intervals throughout your recovery, but do not hesitate to ask for pain medication if needed. Throughout your hospital stay, the nurses will monitor your need for pain medication. You should ask for pain medication when you need it.

The Numeric Pain Rating Scale is a helpful tool you can use to describe how much pain you are feeling and to measure how well treatments are relieving your pain. You will be asked to rate your pain using a 0-to-10 pain scale. Zero means "no pain". Ten means the "worst possible pain".

Zero means no pain. Ten means the worst possible pain.



Why is pain management so important?

Having good pain control not only helps you feel more comfortable, but also helps you recover faster and may reduce your risk of developing certain complications, such as pneumonia and blood clots. If your pain is well managed, it will make it easier to sit up, walk, cough, deep breathe, and eat.

Cough and Deep Breathing

Use your breathing machine (Incentive Spirometer) 10 times every hour while you are awake. For example, if you like watching TV, you should be using your Incentive Spirometer 2-3 times during each commercial break.



How to Use an Incentive Spirometer

Other Tips When Using the Incentive Spirometer

- Since you have an incision on your chest from surgery, you will need to hold a pillow or folded blanket firmly against your incision. This will provide support and decrease the pain you may feel when you cough.
- If you do not reach the number you did before, do not get discouraged. This will improve with practice and as your body heals.
- If you start to feel dizzy or light-headed, remove the mouthpiece from your mouth and take some normal breaths. Then continue using the incentive spirometer.

Walking:

Beginning the first day after your surgery, you will have exercise goals:

- 4 walks each day
- up to the chair 3 times a day

Your Nurse, Physical Therapist and Occupational Therapist will be there to help you.

Begin by walking multiple times daily to build your endurance. Walk at a comfortable speed, timing yourself as you walk so you can continue to walk the same amount of time once you return home. Each day, add another minute to your walk. When you make it to 30 continuous minutes, increase your pace. Continue walking for 30 minutes 4-6 days a week.



Repositioning Position changes are key in preventing bed sores. The following recommendations will help you reposition yourself.

- Change body position every 2 hours
- Adjust the head of your bed

Step-Down Unit

When you are doing well enough, you can leave the ICU and move to the Step-Down Unit for the rest of your stay. The transition out of the ICU means you are improving and moving towards recovery.

Please note: patients will be given preference for private rooms based on their medical condition.

On the Step-Down Unit, our team will continue to help you recover from cardiac surgery, and prepare you and your family to successfully care for yourself after discharge. Your family will be notified by the ICU staff before you are transferred to the Step-Down Unit. When you arrive to the Step-Down Unit, your nurse and patient care technician will meet you. They will orient you and your family to the unit.

What can I expect on the Step-down Unit?

Visitation Policy

Just like the ICU, "Family" members are welcome to visit anytime. Keep in mind that you need to rest and heal. You may not feel up to entertaining a large number of people.

We do encourage "Quiet Time" during the day from 1pm-3pm and 9pm -5am at night. This is a designated time dedicated to promoting your rest and healing. We may ask your family to use the lounge to visit during this time.

How do I regain my independence after surgery?

The staff will provide you and your family with the skills needed to prepare you for discharge. They will encourage you to do as much for yourself as you can. This independence helps you to take control of your recovery. Some people may need more of a guiding hand than others. The nursing staff will be there to assist you and reassure you as needed.

What type of monitoring will I need on the Stepdown Unit?

Once you leave the ICU, you will still need continued monitoring. When you arrive on the Step-Down Unit a portable heart monitor, called a telemetry unit, will be attached to your chest. This unit will transmit your heart rate and rhythm to monitors located at your bedside and at the nursing station. This portable monitor allows you to walk in the halls freely.

- The nurses and techs will regularly check your blood pressure, heart rate, and temperature.
- You will have your blood drawn for lab tests and chest x-rays taken if needed.
- We will measure how much you drink and urinate. We will provide a container for you to urinate into for measurement. We will also ask you to keep track of the amount of fluid you drink and report it to your nurse or tech.
- You will be weighed daily.
- A staff member (either a nurse or tech) will enter your room to assess your needs on a regular basis.

How will my pain be controlled on the Stepdown Unit?

Managing your pain after surgery continues to be a priority on the Step-Down Unit. The nurses will monitor your need for pain medication using the 0-to-10 Pain Scale. You should ask for pain medication when you need it. When your pain is well managed, you will be better prepared and able to walk and do your deep breathing exercises.

Zero means no pain. Ten means the worst possible pain.



What will my diet be after surgery?

Your food on the Step-Down Unit will be low in fat and cholesterol and will not have any added salt or sugar. It may taste different than what you are used to eating at home. It is very important for you to eat to improve the healing process.

Healthy food choices play a key role in the healing process. Eating a balanced diet of carbohydrate-rich foods high in fiber, along with a variety of fruits and vegetables, low-fat dairy products and lean meats are good guidelines to follow. Eating protein-rich foods is very important for wound healing. Good sources of protein include fish, eggs, dairy, beans, and nuts.

Room service is available at any time of the day. Your nurse will bring you a menu so you can choose what you would like to eat. Your nurse will check to see if you ordered food and will assist you if needed.

If you are diabetic or insulin dependent, your nurse will ask you to call him/her before you eat so she/he can check your blood sugar. It is fine for your family to bring food from home but it should be low in salt and low to moderate in fat.

It is not uncommon to become constipated after surgery due to inactivity and pain medication. Eating a diet rich in fiber, drinking enough fluids, walking the halls, and taking a stool softener will help your bowels move. Sometimes a suppository or laxative is needed to help this process along.

Our Registered Dieticians are food and nutrition experts who are available to discuss heart healthy choices and salt alternatives or reduction. They provide sound, easy-to-follow nutrition advice. If you are interested in speaking to a Dietician, ask your nurse to arrange a visit.

How will I care for myself while in the hospital?

- Wash your hands frequently or use the hand sanitizer/saniwipes that we provide to assist you. Hand hygiene is very important to decrease the risk of infection.
- Bathe daily with the assistance of a staff or family member.

Your incisions will be observed and cared for each day. They will be kept clean and dry. Your chest incision may be covered with the OR dressing until the day of discharge or post-operative day 7.

• Continue to wear your compression stockings (sometimes referred to as TED hose); these will help with swollen and achy legs. They should be removed at night and when you bathe.

What can I expect on the day of discharge?

All of the staff on the step down unit is here to promote, assist and educate you and your family to prepare you for discharge.



How will I know I am ready for discharge?

- Make sure you have a ride home.
- Ask a family member or friend to arrive at 9:30 a.m. to review final discharge instructions with you and your nurse.
- Your case manager nurse will be in contact with you to explain your final discharge plans.
- Your nurse will review all discharge instructions with you. During this time, ask any questions you may have about your care after discharge.
- Be sure you understand:
 - □ Your medications and prescriptions
 - □ Incision Care
 - □ Activity/Restrictions
 - Diet
 - □ Reasons to call your doctor
 - □ Follow up appointment information
- If you need to have sutures removed after discharge, your nurse will give you a suture removal kit. Your nurse will tell you which sutures need to be removed and when they can be safely removed.

Discharge Tips:

Please make sure all items that you brought with you to the hospital are taken home. Some examples may be:

- Glasses, dentures and hearing aids.
- CPAP machine
- Walker or cane
- □ All technology devices and chargers
- □ All medication

Required home essentials:

- □ Blood Pressure Cuff
- □ Working Thermometer
- □ Scale
- At home, you will need to monitor your blood pressure, heart rate, temperature, and weight until your follow up visit. Please make sure that you have the proper equipment to do so prior to discharge.
- Your clinic nurse will call you the first few days after discharge to see how you are doing. Phone numbers to contact the clinic will be listed on your discharge education sheet.
- If you have a long drive home, it is important to get up and stretch your legs at least once per hour. This helps to prevent blood clots.

Your clinic nurse will call you the first few days after discharge to see how you are doing. Phone numbers to contact the clinic will be listed on your discharge education sheet.

Commonly Prescribed Medications



Your prescriptions can be filled by your home pharmacy or by the Michigan Medicine Taubman outpatient pharmacy.

When you are discharged, your nurse will provide you a medication list along with prescriptions for these medications. It is very important to learn about all your medications: why you are taking them, potential side effects, the dose and when you should take them. The list given to you will include:

- □ The name of the medication
- □ The times you should take it

Medications are prescribed on an individual basis. Some medications will be necessary during your immediate recovery period and others will be needed indefinitely. When you go home, take only the medications your cardiac surgeon has prescribed for you.

Your surgeon will send a letter to all of your doctors advising them of your medications. In the first month of your recovery, your surgeon and his/her nurse will monitor your medications. You may receive a phone call from the nurse with instructions from your surgeon to change one of your medications. After your return visit with the surgeon, your local cardiologist or primary care doctor will review your medicines and may make updates.

Where can I get my prescriptions filled?

Your prescriptions can be filled by your home pharmacy or by the Michigan Medicine outpatient pharmacy located on the first floor of the Taubman Center. Discuss with your nurse where you will be filling your prescriptions. If you wish to fill them at the hospital, be sure to remind staff to send your prescriptions to the pharmacy the day you go home. A family member or friend must go down to pick them up for you. Prescriptions may take up to three hours to be filled. Please be prepared for this delay.

□ I have a reliable pharmacy.

Name:

Location:

□ My Care Team knows where to send my prescription.

| What do I need to know about each type of medication? | | | |
|---|---|--|---|
| Medication | How does this medicine work? | What are the side effects? | How do I take this medicine? |
| Antiplatelet medicines | ; | | |
| • Aspirin | Aspirin make your blood less sticky which helps to prevent heart attacks and stroke. | This medicine may increase your chance of bleeding. If aspirin upsets your stomach, take with food. Tell your doctor if you have any planned sur- geries or dental work. | Take aspirin (81mg tablet or "baby aspirin") once daily. Do not stop taking this medicine unless your doctor tells you to do so. |
| • Clopidogrel (Plavix®) | This medicine makes your blood less sticky which helps to prevent heart attack and stroke. | This medicine may increase your chance of bleeding. Tell your doctor if you have any planned sur- geries or dental work. | Do not stop taking this medicine unless your doctor tells you to do so. |
| Cholesterol lowering r | nedicines | | |
| Atorvastatin (Lipitor[®]) Rosuvastatin (Crestor[®]) Pravastatin (Pravachol[®]) | These medicines not only lower your cho- lesterol but also reduce inflammation in your blood vessels. | Muscle pain may occur with this medicine. If this happens, talk to your doctor. | This medicine works best when you take it at night. |

Tip: Read and save written information that comes with your prescriptions and over-the-counter medications.

| Medication | How does this medicine work? | What are the side effects? | How do I take this medicine? |
|--|--|--|---|
| Beta blockers | | | |
| Metoprolol (Lopressor[®] or Toprol XL[®]) Carvedilol (Coreg[®]) Atenolol | Beta blockers act by slowing your heart rate and lowering your blood pressure, reduc- ing the amount of work the heart has to do. | These medicines may lower your heart rate and blood pressure. If you feel lightheaded or dizzy, tell your doctor. | You may feel tired and weak when you start taking this medicine. This will stop if you continue to take this medicine. |
| (Tenormin [®]) | | | |
| ACE inhibitors | | | |
| Lisinopril (Prinivil[®], Zestril[®]) Enalapril (Vasotec[®]) Ramipril (Altace[®]) | These medicines lower your blood pressure by making your blood vessels wider. This helps blood flow away from your heart easier. | A side effect of these medicines is dry cough. If this happens, you can talk to your doctor about switching to an- other medicine called an ARB. You may have low blood pressure with these medicines. If you feel lightheaded or dizzy, talk to your | When you get up from a sitting or ly- ing position, please do so slowly to prevent lightheadedness or dizziness. |

| Medication | How does this medicine work? | What are the side effects? | How do I take this medicine? |
|---|--|---|---|
| Diuretics or "water pil | lls" | | |
| Furosemide (Lasix[®]) Bumetanide (Bumex[®]) Torsemide (Demadex[®]) | Diuretics or "water pills" help you to lose extra fluid. It is com- mon to gain up to 20 pounds after heart sur- gery. This medication will help you return to your preoperative weight. | Low blood pressure may happen with these medicines. If you start to feel dizzy or lightheaded, call your doctor. | It is best to take these medicines in the morning. Do not take your diuretic before going to bed. Take these medicines in the morning. Do not take your diuretic before going to bed If you take a diuretic twice per day: Take your first dose early in the morning Take your second dose around 2pm or 3pm to prevent you from waking up in the night to use the bathroom. |
| Medicines to treat electrolyte imbalances | | | |
| • Potassium chloride (Klor-Con®) | If you are on a di- uretic or "water pill" medicine, you will lose extra fluid which can lead to a loss of potas- sium. This medicine will replace the lost potassium. | You may experience nausea, vomiting, diarrhea, or abdominal pain. | Take potassium with food to avoid nausea. |

| Medication | How does this medicine work? | What are the side effects? | How do I take this medicine? |
|---|---|--|--|
| Medicines to treat elec | trolyte imbalances | | |
| Antiarrhythmic | | | |
| Amiodarone (Pacerone[®]) | Antiarrhythmic medi- cations prevent or reverse irregular heart rhythms. | This medication makes you sensitive to the sun. You may have nausea. | Please take with food to avoid nausea. Use sunscreen when out- doors. Do not stop using this medication suddenly without ask- ing your doctor. |
| Anticoagulant | | | |
| • Warfarin (Coumadin®) | Anticoagulant medica- tions help to prevent blood clots from forming. | Major bleeding you cannot control. | Take your pill at the same time each day, usually in the evening. Eat the same amount of vitamin K foods each week. |

Tip: A Pharmacist from our Anticoagulation Team will provide you with education about your anticoagulation medications while you are in the hospital.

DO:

- □ Learn both the generic and brand names of all your drugs.
- Keep a list of all your prescription and over-the-counter drugs, dosages, and purposes.
- □ Keep this list up to date and carry with you at all times.
- Take this list to all of your appointments and show it to your healthcare providers.
- Take your medicines exactly as directed. Using them the wrong way can make you feel worse instead of better.
- □ Take only what is prescribed for you.
- Refill your prescriptions on time. If your prescription is running low, call your physician for a refill.
- Call your healthcare provider or pharmacist right away if you have any medication questions.
- Read and save written information that comes with your prescriptions and over-the-counter medications. This written information will tell you what kind of side effects may occur.

DON'T:

- Don't take medications you were taking before surgery without first talking to your surgeon. This includes herbal supplements or other nonprescription drugs.
- Don't stop taking your prescribed medicine just because you are feeling better.
- Don't stop, skip or take an extra dose of your medication without checking with your physician.
- Don't drink alcohol while taking a medicine unless your doctor says it's okay.
- Don't be afraid to contact your healthcare provider or pharmacist if you have any questions!

Don't stop taking your prescribed medicine just because you are feeling better.

Exercises for Patients After Open Heart Surgery

You may begin these exercises in the Intensive Care Unit. Complete the exercises in a sitting position. Sit upright looking straight ahead with your chin tucked and shoulders pulled back. Make sure that you are relaxed and rested before starting. These exercises are not intended to be a difficult workout for your heart. These exercises will speed your recovery. They will prevent pain from developing in your shoulders and trunk. They will also help you with your breathing. It is important you begin these exercises the day after your surgery and do them daily during your recovery.

Posture hints:

Stand in front of a full-length mirror and check that your head and chin are tall and back. Your shoulders should be back and level with each other. Do not hunch your shoulders forward.



Perform the exercises twice a day. Repeat each exercise 10 times.

1) **Shoulder Shrugs** - Bring your shoulders up to your ears, then relax your shoulders down. Repeat.



2) Shoulder Circles - Sitting upright, roll your shoulders in a smooth motion up, back and down in a circle. Repeat in the reverse direction.


3) Trunk Twists -

Slowly rotate your trunk to the right, looking over your shoulder. Hold and stretch. Then rotate your trunk to the left, hold and stretch. Repeat sequence.

4) Trunk Sidebending -

Hold your arms relaxed at your sides and maintain your trunk upright. Lean to your right side slowly. Hold and stretch. Then lean to your left side, hold and stretch. Repeat sequence.





5) Chest Stretch -

Place your hands behind your head while sitting upright. Move your elbows back until you feel a stretch, hold. Relax elbows forward to rest, then repeat.

6) Forward Arm Raise - Sitting with upright posture, straighten your arm with your thumb facing up. Raise your arm up to the front over your head. Your elbow should be next to your ear. Repeat with your other arm.



7) Side Arm Raise

Hold your arm straight out to your side with your thumb up. Raise your arm up to the side over your head, hold and stretch. Repeat with your other arm. 8) Backward Reach → With your arms relaxed at your side, elbows straight, reach your arms straight backwards. Hold and stretch. Then repeat.





9) Hands behind your back and reach -Grasp your hands together behind the small of your back. Slowly lift your hands off your back. Hold and stretch. Then repeat.

10) Coughing and Breathing Exercises: Remember to use your incentive spirometer 10 times per hour when you are awake. You may use a pillow or blanket to hold over your incision when you cough. This will provide support and decrease pain.



Activity Precautions: (until otherwise stated by your doctor) No lifting, pushing or pulling greater than 5-10 pounds with your involved arm(s). This applies when you are climbing stairs, standing up from a chair or getting out of bed. You should roll onto your side before sitting when getting out of bed.

Strengthening Exercises: After you have gained full motion in your shoulder(s), progress exercises 6 and 7 by performing them with a light weight in your hand. Start with 1 pound and slowly progress as tolerated. Many objects around the house can be used as weights: a can of soup, tools, a plastic bottle filled with rice or pennies, etc.

Important Note: The exercises described in this section should be continued until you:

- no longer feel tight, stiff or weak in your muscles.
- \cdot have fully regained the mobility in your shoulders and trunk
- · are walking thirty minutes each day

Once you have achieved these goals, ask your doctor if it is acceptable for you to participate in a regular aerobic exercise program or a cardiac rehabilitation program

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After You Leave the Hospital



Resuming Activities after your Heart Surgery

What are my activity restrictions?

- Do not lift any objects over 10 pounds after surgery. As a reference, a gallon of milk weighs about 8 pounds.
- Do not push or pull heavy objects such as a vacuum cleaner, lawn mower or furniture.
- Do not drive until cleared by your physician.

Driving

- Your Doctor will decide when you can drive again. You will be given specific instructions at your follow up clinic visit.
- You can ride as a passenger in a car at any time.
- Short trips are best at first (wear your seatbelt).
- You may cushion your incision with a towel or small blanket if necessary.

What activities should I do?

Activities

- Use your breathing machine four times a day (ten breaths each time) until you return for your clinic visit.
- Walk every day (find an indoor setting during bad weather).
- You may climb stairs limit the number of times until you are feeling well.
- Wear your support stockings (TEDS) during the day. You may remove them at night. You may stop wearing those four to six weeks after your operation.
- Elevate your feet as high as possible when sitting (toes higher than nose).
- Continue with the mobility exercises given to you and demonstrated by physical therapy in the hospital.

What steps should I take to monitor my health at home?

- Take your temperature each morning before eating or drinking and at any time you think you may have a fever. Keep a record of your daily temperature.
- Weigh yourself at the same time each morning, after you urinate but before you eat breakfast. Use the same scale every day. Keep a record of your daily weight.
- Check your blood pressure and heart rate in the morning after you have taken your morning medications.
- Monitor your incisions daily for signs of infection (increasing redness, tenderness, swelling, warmth or drainage).

Monitor your health by using the Care Pathway document that is included with this booklet.

| | | Examples: | Day 1 | Day 2 | Day 3 | Day 4 | Day 5 | Day 6 | Day 7 | | |
|------------------------------------|--|-------------------|---------|---------|---------|---------|---------|---------|---------|---|--|
| We Recommend that you: Date | | June 15 | / | 1 | 1 | / | 1 | / | / | Call your doctor if you have | |
| lake your temperature temp) | Take your temperature before eating every morning. | Temp: 98.6 | Temp: | Temp: | Temp | Temp: | Temp: | Tamp: | Temp: | A temperature above 100. | 5 F |
| Veigh yourself | Weigh yourself every morning before eating and after going to the bathroom. | weight: 165 | Weight: | Weight: | Waight: | Weight: | Weight: | Weight: | Weight: | Weight gain of 5 pounds or more in 3 days | Weight loss of 7 pounds or more before your clinic visit |
| Take Pulse/Blood Pressure (BP) | Take your pulse and blood pressure daily, or ask the visiting nurse to write it down for you. | вр. 120/70 | BP: | Palpitations or an irregular heart beat | |
| xercises | See the "Exercises" chapter in your booklet | PULSE 72 | PULSE: | POLOE: | PULCE: | PULDE: | POLOE | POLOE: | POLOE | Shortness of breath worse than in the hospital | |
| Incision Care | Shower daily with soap and water. Do not use any creams, lotions or powders on your incisions. NO Tub Baths. | 1 | | | | | | | | Bleeding, redness, swelling, increased pain or drainage near your incision | Incision that opens up after you leave the hospital |
| Elevate your legs | Bevate your legs while sitting. | 1 | | | | | | | | Increased swelling in your | legs or ankles |
| Wear Support Hose | Wear daily. Remove at night. | | | | | | | | | Nausea, vomiting or diamh | 103 |
| Walk Increase the time you walk | Increase time you walk every day. Don't worry about distance. Walking to the bathroom does not count! Walking up and down stairs is | Time 9 minutes | Time: | | |
| | | Time: 10 minutes | Time: |] | |
| | encouraged. | Time: 12 minutes | Time: | Restrictions: | |
| Use Incentive Spirometer 4 | See the page on Incentive Spirometer in your booklet. Use incentive spirometer during TV commercials. | 1: 🖌 | | 1: | 1: | 1: | 1: | 1: | 1: | No lifting greater than | - |
| imes each day | | 2 🖌 | 2: | 2 | 2: | 2: | 2 | 2 | 2 | 10 pounds. | |
| | | a 🖌 | 3: | 3 | 3: | 3: | 3. | 3: | 3 | | ~ |
| | | 4: 🗸 | 4: | 4: | 4: | 4: | 4: | 4 | 4: | Do not push or pull | A D |
| Take Pain medication | Take pain medication as directed by your surgeon for the first few days. Begin to reduce your pain meds after 4 or 5 days as tolerated. (Decrease the number of pills or increase the time between pills.) | 1 | | | | | | | | Do not drive. | |
| Avoid Constipation | Take stool softener while taking pain medications. Increase activity. Eat more fruits and vegetables. | 1 | | | | | | | |] | U |
| Take your medication | Take medication as directed by your surgeon | 1 | | | | | | | | | |



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What do I do if I have concerns?

Call 9-1-1 immediately if you develop:

When do I need to seek emergency care?

- Sudden onset of chest pain
- · Shortness of breath not relieved by rest
- If your legs feel numb, tingly, cold or look blue
- You believe you are experiencing a true emergency

Common Signs of Stroke:

- Sudden confusion or trouble speaking or understanding others
- Sudden trouble seeing in one or both eyes
- Sudden numbness or weakness of the face, arm, or leg, usually on one side of your body
- Sudden trouble walking, dizziness, or loss of balance or coordination
- Sudden or severe headache with no known cause

When do I need to seek medical attention?

Call Cardiac Surgery if you develop any of the following signs and symptoms:

- Under the tongue temperature above 100.5° F
- Bleeding, redness, swelling, increased pain or foul smelling drainage near your incision site
- Incisions that open up after you leave the hospital
- Increased swelling in your legs or ankles
- Weight gain of more than 5 pounds in 3 days or weight loss of 7 pounds or more before your follow up clinic visit
- Increased shortness of breath/difficulty breathing
- Trouble urinating
- Nausea, vomiting or diarrhea
- Stomach pain or bloating
- Chills or excessive sweating
- A vague feeling that something is wrong

What is the number to call?

Monday through Friday from 8am to 5pm: Call 888-287-1082

Ask to speak to the Cardiac Surgery Nurse if you have any of the signs or symptoms above.

After 5pm or on weekends or holidays: **Call 734-936-6267** Ask to speak with the Cardiac Surgery resident on call.

After You Leave the Hospital • 104

How do I care for my incisions?

- Shower or sponge bathe every day. Do not soak in a bathtub or get into a swimming pool for the next 4 weeks.
- Allow the water to hit your back and roll over your shoulders.
- Wash your incision with your usual bath soap and water. Pat dry and leave open to air. Use a clean towel each time you shower.
- Do not put any creams, lotions, powders or ointments on your incision until your incision is completely healed.

Useful information after your surgery

Returning to work and everyday activities

At your first clinic appointment following your discharge from the hospital, your surgeon will be able to approximate a date for your return to work. Everyone recovers from an operation at a different pace. Your first priority is to take care of yourself and recover completely.

Household chores

You are encouraged to do light household activities in the four weeks following surgery. These activities include dusting, meal preparation, washing clothes with an automatic washer and dryer (avoid lifting a heavy laundry basket) and washing dishes. Pace yourself and gradually increase the amount of activity as your energy builds.

Sexual activity

It is normal for both partners to be worried about resuming sexual activity after heart surgery. Most people worry about sexual intercourse because they are afraid it may cause discomfort and/or strain on the heart. The exertion needed to perform sexual intercourse is similar to climbing stairs or walking around the block at a brisk pace. If these activities are not difficult for you, you may resume sexual activities whenever you feel ready. Your best indicator is how you feel-both physically and mentally. Some medications may interfere with sexual functioning. If you have any problems, discuss them with your surgeon or nurse.

Some general guidelines to help you resume sexual relations include:

- For the first eight weeks, avoid positions that cause pressure on your breastbone or tension in your arms and chest.
- Pick a time when you are content, relaxed, and happy.
- Wait two hours after eating a full meal or drinking alcohol.
- Remember that it is normal for your breathing and heart rate to increase during sex and that these should return to normal shortly afterward. If you experience shortness of breath, chest pain and/or palpitations, stop, and rest.
- Let your doctor know if you experience any abnormal symptoms.

Precautions for heart valve surgery patients

If you have an artificial (prosthetic) heart valve replacement, repair or prosthetic graft material, you must be protected from infection for the rest of your life. You need to take an antibiotic prior to any medical or dental procedure. This includes dental work, all operations, obstetrical/gynecological and urological procedures. Do not have any dental work for at least 6 months after surgery unless it is an emergency.

You should contact your physician **one week** before any medical or dental procedures to obtain the appropriate antibiotic prescription. If you have any known allergies to medications, inform your physician when you call.

Report any signs or symptoms of infection to your physician immediately. Do not wait for these symptoms to disappear. You can have an infection even if you are taking an antibiotic.

The signs and symptoms of infection include: temperature is 100.5° F or greater, chills, night sweats, joint aches, redness, warmth or drainage containing pus from a wound. If an infection is present, your doctor will likely prescribe antibiotics and/or hospitalization.

What can I expect when I get home?

- Difficulty sleeping
- Lack of appetite
- Post-operative constipation
- Feelings of depression or mood changes

DifficultyMany people complain of having trouble sleeping for some time after
heart surgery. You may experience insomnia (an inability to sleep) be-
cause of:

- The effects of anesthesia
- Discomfort related to healing
- Changes in your daily routine
- Stress from personal concerns

You should return to normal sleeping patterns within 2-3 weeks. Try these tips to help you sleep:

- Make sure you take enough rest breaks in between your normal daily activities, but avoid a nap longer than 15 to 20 minutes during the day.
- If you have pain, take your pain medication about 30 minutes before bedtime.
- Arrange the pillows so you can maintain a comfortable position and decrease muscle strain.
- If you feel anxious or nervous, talk to your spouse, partner, or a trusted friend. Get your troubles off your mind.
- Avoid caffeine in the evenings (such as chocolate, coffee, tea, and colas).
- Listen to relaxing music or a guided imagery audio program.
- Ask your partner to give you a back rub.
- Take a relaxing shower.
- Follow a bedtime routine. Follow the same rituals to let your body know it is time to relax and get to sleep.
- It is okay to sleep on your back, side, or stomach. You will not hurt your incisions.



You should return to normal sleeping patterns within 2-3 weeks.

Night Sweats:

- Patients often complain of night sweats for the first few weeks.
- Should you experience this, check your temperature to make sure you do not have a fever. If your temperature is 100.5° F or greater, call your doctor.

Disturbed Sleep

- Following surgery, some patients experience disturbing dreams or insomnia. This will also disappear with time.
- To help you sleep better, try shortening your naps during the day and/or increasing your afternoon activities so that you will feel tired in the evenings.
- It is OK to sleep on your back, side or stomach. You will not hurt your incisions.

Call your doctor if:

- You are feeling sad, hopeless, fatigued, irritable or lonely most days following your surgery. These could be signs of depression.
- A lack of sleep is causing problems for you such as an inability to participate in your recovery or an inability to stay awake during the day.
- Normal sleep patterns have not returned within 2-3 weeks after surgery.



Lack of appetite

You may notice after surgery you have lost your appetite for food or just feel too tired to eat. This is very common so be patient. Your appetite will soon be back to normal.

Proper Nutrition

We suggest you try eating frequent, small meals throughout the day. You do need proper nutrition to enable your body to heal and get stronger. You should follow a diet low in fat, cholesterol and sodium that includes protein-rich foods.

Good sources of protein include fish, eggs, dairy, beans, and nuts. Please limit the total amount of salt in your diet to 2,000 mg a day. Foods known to be high in salt include restaurant food, soups, pizza, bacon, and other processed meats.

Post-operative
constipationConstipation is a common side affect after your opera-
tion. Several factors may contribute to constipation
after surgery. These include: decreased activity, pain
medication, or changes to your diet. Increasing your
activity and eating more fresh fruit, vegetable and high
fiber foods may help you. You should continue to take
a stool softener such as Colace® while taking pain med-
ication. A fiber laxative such as Psyllium (Metamucil®)
may also be helpful. Start walking around as soon as
you can and increase the distance.

The Emotional Aspects of Recovery



Feelings of depression or mood changes

R ecovering from open heart surgery also involves your emotional healing. The recovery process uses emotional and physical energy. If you feel upset or emotional in the days and weeks after your operation, don't worry - this is a perfectly normal reaction which many patients experience. Many patients report these feelings up to three months after their operation.

It is common for people who have had surgery to:

- Experience mood swings
- Feel depressed or gloomy
- Cry easily for no apparent reason
- Feel afraid, nervous or anxious
- Feel helpless
- Feel lonely
- Lack energy or motivation
- Get easily frustrated
- Be irritable or angry
- Not be unable to concentrate
- Have good days and bad days
- Feel more emotional or sentimental than normal



If you have thoughts of hurting yourself or someone else, be sure to call the CVC Social Worker at **(734) 232-1559.**





Once you are home, even though you may feel drained physically and emotionally, it is important you follow guidelines for good self-care.

Here are some things you can do to help yourself recover:

- Get dressed every day.
- □ Walk daily within your limits.
- □ Get plenty of rest.
- □ Resume hobbies and social activities you enjoy.
- □ Visit with others.
- Ensure you have a support system in place that can help with your physical and emotional needs. Discussing your fears, frustrations, pain, concerns and successes with someone is an important part of the healing process.
- □ Join a support group.



As you resume your normal activities, you will notice gradual improvement in your mood and outlook. How do I know when to seek help? If you find yourself still feeling unmotivated, unusually fatigued, weepy, angry, hopeless, or sad after 3 weeks, or if you have thoughts of hurting yourself or someone else, be sure to call the CVC Social Worker at 734-232-1559 or your Primary Care Doctor and make an appointment to talk about how you are feeling.



Your family and friends need to balance their own feelings while trying to support your recovery.

| Al Impact Heart surgery is stressful for all people involved, not just the patient. by and have the extra responsibilities of the caring role, as well as juggling th home and work life. Sometimes, patient needs are greater than antici- pated and can lead to stress. | | | |
|--|--|--|--|
| Your family and friends need to balance their own feelings while trying to support your recovery. It is important for your family and friends to take care of themselves physically and emotionally. | | | |
| If you're a family member or friend, here are some tips: | | | |
| Don't neglect your own needs. Eat well, stay active and get plenty of rest. Be patient- it is not unusual for your loved one to have good and bad days. Share your feelings with a close friend. Ask for help if you feel overwhelmed. Be specific about your needs such as meals, chores, pet-sitting, time alone, etc. Talk to your family doctor if you have feelings that are concerning. Do something you enjoy and find relaxing. | | | |
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Promoting a Healthy Lifestyle



Your lifestyle and eating habits influence how your heart and body work and how you feel overall. Below are some tips to get you started on the path to better health.

The SINGLE most important thing you can do for your heart is to **Stop Smoking.**

Smoking

- Decreases the oxygen supply to the heart muscle
- Causes artery wall damage
- Decreases HDL (good) cholesterol
- Increases heart rate and blood pressure
- Can contribute to problems with heart rhythm

You must decide to quit smoking. No one else can make you stop. You can gradually eliminate cigarettes or stop all at once.

Here are some tips to help:

- Set a date to quit.
- Get support from family and friends.
- Get support from your health care providers. For example, your physician can sometimes prescribe medications that will aid you in your efforts to quit.
- Use substitutes sugarless candy, crafts or even a short straw that you hold in your hand.
- Avoid using high fat, high calorie foods for substitutes.
- Try a smoking cessation program your cardiologist or local lung and heart associations can recommend one. Call the UM Tobacco Consultation Service for help 734-998-6222. The Michigan Tobacco Quit Line 1-800-784-8669 is free to Michigan residents.
- If you fail to quit, try again YOU CAN DO IT!

Blood Pressure Control

High blood pressure can put added stress on your heart and arteries and speed up the process of atherosclerosis. It is important to have your blood pressure checked on a regular basis and take your blood pressure medication as directed.

- DO NOT stop taking your medication unless your physician tells you to.
- DO follow a low salt diet and avoid adding salt to your foods.
- DO exercise regularly and lose weight if necessary.
- DO follow all doctor's orders.
- DO use relaxation techniques to decrease stress.

Less Fat and Cholesterol in Your Diet

A lifestyle that promotes a healthy weight includes moderate exercise and a nutritious diet, which reduces your risk of future heart disease.

This eating plan should include a diet which is:

- LOW in animal and dairy fat and tropical oils (saturated fat)
- LOW in foods containing "partially hydrogenated vegetable oil" (trans fat)
- LOWER in foods containing corn, safflower, and sunflower oils (omega-6 polyunsaturated fat)
- **HIGHER** in foods containing olive, canola, and peanut oils; nuts and avocados (mono-unsaturated fat); fish, flax seed, soybeans and some nuts like walnuts (omega-3 polyunsaturated fat)

*Recent studies show that foods rich in omega-3 polyunsaturated fats may help reduce the risk of coronary disease, sudden death, abnormal heart rhythms, high triglycerides, blood clotting and some inflammatory and autoimmune diseases. You may also wish to include foods that contain plant stanols or plant sterols to lower your LDL cholesterol. These include some margarines, some juices and other foods. Ask to talk to a dietitian to learn more about this.

A diet high in vegetables, whole fruits and whole grains (instead of juices, sweet and refined foods) provides additional vitamins, minerals, "plant chemicals" and fiber that protect your heart and arteries and promote weight control.

Regular Exercise

Regular exercise can strengthen your heart muscle and increase your body's ability to use oxygen.

- Brisk walking, jogging, swimming and bicycling are excellent forms of exercise.
- Your exercise program should start slowly in the hospital and gradually increase.

Exercise should be fun and should fit into your lifestyle. Everyone is different. Some people will be able to walk long distances and others will not. Simply do as much as you can, as often as you can.



Control Diabetes

Diabetes directly affects your heart and blood vessels. Good control of your blood sugar is important to help with wound healing and prevent infection. It is important to follow a strict diet to try to reduce the amount of damage to your vital organs. If you have any questions about a proper diabetic regimen, please ask your nurse or hospital dietitian for diabetic diet education materials. Dietitians can help you choose healthy foods and develop meal plans to promote blood sugar control.

Decrease Stress

Stress is present in everyone's life. How you react to stress can directly affect your health. Many books and methods are available to help you control stress. Ask your heart doctor or nurse to recommend stress reduction programs in your community, helpful books or other sources of information.

Control Weight

Excess weight puts added strain on your heart and raises your blood pressure. It is important to control your weight. However, do not begin a weight loss program without consulting with your doctor.

Hospital Services and Facilities



Michigan Medicine offers a variety of special amenities and services. If you have any questions about the following services and facilities, please ask your nurse for additional information.

Online Patient Portal (MyUofMHealth.org)

To create an account, visit www.myuofmhealth.org

Follow the instructions on the web site to set up an account. MyUofM-Health.org is a secure way to manage your health online, offering a 24/7connection to Michigan Medicine and important health information.

Our online patient portal gives you secure access to health information anywhere, at any time.

Guest Assistance Program (GAP)

The Guest Assistance Program (GAP) office offers help to patients and their families. If you have questions, problems or concerns with any aspect of your hospital stay, the staff will do everything possible to help. GAP staff is dedicated to making your hospital stay more pleasant. This office is available to assist with special financial concerns.

Contact the Guest Assistance Program at 800-888-9825.

Continuing Care (Care After You Leave the Hospital)

Prior to your hospital discharge, a discharge planner will be available to assist you with planning for your continuing care needs. Should you need visiting nurse follow-up, physical or speech therapy or services at home, this can be arranged for you.

Patient and Visitor Accommodations

The **Med-Inn** is a 30 room hotel connected to Michigan Medicine. Single and double units, suites and family units are available. Free cribs, cable television and continental breakfast are included. Microwaves and refrigerators are also available for an additional fee.

The UM has agreements with other hotels that provide shuttle service to UM. To learn more, contact the Guest Assistance Program at **800-888-9825**.

Mennonite Guest House: is a small Bed and Breakfast, only 3.5 miles from the hospital that is funded exclusively by contributions. There is no charge to stay but donations are greatly appreciated. The guest house provides private rooms, daily continental breakfast, a separate kitchen for guests to use, laundry facilities and shuttle services to and from the hospital. To check availability, please call **734-222-6233**.

Families and Visitation

Family, as designated by the patient, is welcome at all times throughout the recovery process.

Spiritual Care

Spiritual Care is available as needed, 24-hours a day, for spiritual ministry, prayer and sacraments for patients of all denominations. A chapel is also available. Catholic and Protestant services are available. Quiet Rooms for reflection or meditation are available in the CVC.

Mardigian Wellness Resource Center - Level 2, CVC

The Mardigian Wellness Resource Center (MWRC) is a resource for patients and families. The center offers a full-service library on cardiovas-cular health, fax/copier, wireless internet access as well as devices such as iPads and computers for checkout.

Dining Facilities

University Hospital (Level 2) options include a cafeteria, a vending area, and eateries located in front of the cafeteria. Atrium Healthy Heart Cafe´ is located in the Cardiovascular Center (Level 2).

FRIENDS Gift Shops

The gift shops are operated by the FRIENDS of Michigan Medicine. The shops sell candy, cosmetics, magazines, paperback books, toys, stuffed animals, apparel, gift items, games, greeting cards, writing supplies, jew-elry, accessories, infant items and much more.

For patients who are unable to go to the gift shop, a gift cart circulates around the patient floors on weekdays. A small gift shop is located within the Mardigian Wellness Resource Center on CVC Level 2.

Pharmacy

Prescriptions can be filled at the Patient/Visitor Pharmacy on the first floor of University Hospital. Non-prescription medications are also available. The Pharmacy accepts most credit cards and participates in many insurance programs. Prescriptions can be transferred to or from other pharmacies. Mail order prescription service is also available. Prescriptions may take up to three hours to fill. Please be prepared for this delay.

Electronic Equipment

Remember to bring chargers for your cell phones or other electronic devices.

Use of head phones/earbuds can reduce noise. You can ask your nurse for a set of headphones/earbuds or bring some from home.

To avoid loss, consider the security of any electronic devices that you bring to the hospital. Label all items you bring from home with your name and phone number.

Because of the complex and critical nature of the health system's electrical systems, and for safety reasons, we do not permit the use of personal TV sets or electric radios.

Billing

All billing correspondence will be mailed directly to your home address. Please feel free to ask any questions about your bill by calling the Patient Accounts office **855-855-0863** or the telephone number shown on your hospital bill.

How to Get To The University of Michigan Health System

Hospital Phone Number: 734-936-4000





www.uofmhealth.org/maps-directions



Directions to the Cardiovascular Center (CVC)

From the North

Take US-23 South, to the Plymouth Road exit (#41). Turn right and follow Plymouth Road approximately 2 miles until you reach Maiden Lane and turn left. (This is the light immediately after Broadway Blvd., a preschool with turrets is on the near left corner.) Continue on Maiden Lane. At the next raffic light, turn right onto Fuller/Glen Avenue. Follow Glen Avenue to the third traffic light and make a left onto East Ann Street. The round-about entrance to the Cardiovascular Center will be two blocks ahead.

From the South

Take US-23 North to the Washtenaw Ave./BR23 exit (#37B) toward Ann Arbor. Merge onto Washtenaw Ave. and follow it approximately 1 mile until you reach Huron Parkway and turn right. When you reach the second traffic light, turn left at Fuller Road. As you follow Fuller, you will pass the Veterans Hospital and be able to see the Medical Center on the hill to your left. At the traffic light at Fuller and Maiden Lane/ East Medical Center Drive, go straight. Follow Glen Avenue to the third traffic light and make a left onto East Ann Street. The round-about entrance to the Cardiovascular Center will be two blocks ahead.

From the East

Take I-94 West to US-23 North (exit 180B). Take the Washtenaw Ave./BR23 exit (#37B) toward Ann Arbor. Merge onto Washtenaw Ave. and follow it approximately 1 mile until you reach Huron Parkway and turn right. When you reach the second traffic light, turn left at Fuller Road. As you follow Fuller, you will pass the Veterans Hospital and be able to see the Medical Center on the hill to your left. At the traffic light at Fuller and Maiden Lane/ East Medical Center Drive, go straight. Follow Glen Avenue to the thirdd traffic light and make a left onto East Ann Street. The round-about entrance to the Cardiovascular Center will be two blocks ahead.

From the West

Take I-94 east to Ann Arbor (exit 172). This merges into Jackson Rd. (Eastbound). Remain on Jackson, which becomes Huron, and continue for 2.5 miles through downtown. At the traffic light at Glen and Huron, turn left onto Glen. After one block on Glen, turn right at the traffic light onto East Ann. The round-about entrance to the Cardiovascular Center will be two blocks ahead.

Parking Options

Valet services are available from 5:30 a.m.-7 p.m. M-F, and 8 a.m. to 6 p.m. on weekends, for \$5. Self parking is available 24 hours a day in the P5 underground garage for \$2. If you will be visiting for more than 4 hours, please have your ticket validated.

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Glossary of Terms

anesthesiologist

The doctor responsible for monitoring your vital signs and general well being and administering the medications that affect consciousness before and during your surgery.

aneurysm

A bulge or weakness in the walls of a blood vessel.

angina

Chest pain - often associated with blockage of the arteries that serve the heart.

aorta

The large artery that carries oxygen-rich blood from the left ventricle of the heart to the rest of the body.

aortic valve

The valve that controls blood flow between the left ventricle of the heart and the aorta (as blood exits the heart).

arterial line

A tube inserted into an artery, e.g., in the leg or wrist.

atria

The upper (filling) chambers of the heart.

autologous

The patient's own blood.

bioprosthetic valve

Also known as a tissue valve, it comes from an animal (usually pig or cow) or a human (deceased) donor.

CABG

An acronym for Coronary Artery Bypass Graft surgery, which is the surgery that reroutes the blood supply to the heart by bypassing blocked arteries.

coronary arteriogram *

A medical procedure used to diagnose and treat some heart conditions. A long, thin, flexible tube called a catheter is put into a blood vessel in your arm, groin (upper thigh), or neck and threaded to your heart. Through the catheter, your doctor can do diagnostic tests and treatments on your heart.

* http://www.nhlbi.nih.gov/health

cardiopulmonary bypass

Equipment that works in place of heart and lungs during surgery to circulate blood to the body.

catheter

A thin flexible tube placed into the body.

chest tube

Drainage tube placed around the heart and lungs to drain blood or fluid.

cholesterol

Found in cell walls throughout the body; used to make hormones, bile acids, vitamin D and other substances.

chordae

Tendon-like cords which connect the edges of heart valves to the papillary muscle thereby restricting how far the valve leaflets can open or close.

coronary arteries

The large blood vessels that supply the heart with oxygen-rich blood.

Coumadin®

The commonly used trade name for the drug warfarin, an anti-coagulant (blood thinner) often prescribed to reduce the chances of stroke.

diabetes

A metabolic disease that prevents the body from producing insulin (necessary to break down glucose) and regulating glucose levels in the blood.

echocardiogram*

A painless test that uses sound waves to create moving pictures of your heart. The pictures show the size and shape of your heart. They also show how well your heart's chambers and valves are working.

endotracheal tube

A tube inserted into the lungs (via the mouth and throat) and attached to a respirator to supply oxygen when the lungs are unable to operate on their own.

endovascular

Within a blood vessel. Describes a type of surgery done through a blood vessel, rather than open surgery (cutting through the chest).

HDL *

High density lipoprotein (or "good" cholesterol) takes cholesterol from the tissues to the liver, which removes it from the body. A low level of HDL cholesterol increases your risk for heart disease.

intra-aortic balloon pump

A device placed in the aorta and used to temporarily reduce the workload on the heart and allow it to recover.

* http://www.nhlbi.nih.gov/health

IV

Abbreviation for intravenous - a catheter inserted into the veins used to dispense medications and fluids.

LDL *

Low density lipoprotein (or "bad" cholesterol) carries cholesterol to tissues, including the arteries. Most of the cholesterol in the blood is the LDL form. The higher the level of LDL cholesterol in the blood, the greater your risk for heart disease.

* http://www.nhlbi.nih.gov/health

leaflets

The small flaps on the valves of the heart which serve as "doors," allowing or preventing the passage of blood.

mechanical valve

An artificial device implanted in the heart to take the place of a natural valve.

mitral valve

The valve between the left atrium and left ventricle.

monounsaturated fats

Fats that tend to be liquid at room temperature and can lower LDL (low density lipoprotein, or bad) cholesterol when used in place of saturated fats in the diet; good sources are olive, canola and peanut oils.

nasogastric tube

A tube inserted into the stomach (via the nose) to drain the stomach contents.

pacemaker

An electrical device, sometimes temporary and sometimes permanently implanted, with the purpose of regulating the heart beat.

pneumonia

The condition of having an infection inside the lungs.

polyunsaturated fats

Much the same as monounsaturated fats, as they can also lower LDL; good sources are corn, soybean and safflower oils; fish and flax.

pulmonic valve

The heart valve between the right ventricle and the blood vessels that lead to the lungs (where blood is pumped to pick up oxygen).

saturated fats

Fats that tend to be solid at room temperature and can contribute to elevated levels of LDL; taken mostly from animal sources.

stenosis

Narrowing or blockage of an artery or heart valve opening.

Swan-Ganz catheter (PA line)

A large and long intravenous catheter inserted through the neck used to monitor the blood pressure in the heart; also called a pulmonary artery (PA) line.

trans fat

Fats that are made during a process called hydrogenation, which turns a liquid oil into a solid or semi-solid fat at room temperature; these fats can increase LDL and decrease HDL; avoid foods with partially-hydrogenated or hydrogenated oils.

tricuspid valve

The heart valve between the right atrium and the right ventricle.

urinary catheter

A drainage tube inserted into the bladder to drain urine.

ventricle

A lower (pumping) chamber of the heart.

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