Open heart or cardiac surgery refers to several different types of procedures. The most common are coronary artery bypass grafting and repair or replacement of one or more valves inside the heart. Our team of experts is dedicated to your care. This handout helps explain what to do before you arrive at the hospital, make sure you understand what to expect during your hospital stay, and help you to begin getting ready to go home.

**Coronary Artery Bypass Grafting**
The blood vessels that supply blood and other nutrients to the heart muscle are located on the outer surface of the heart and are called coronary arteries. If a coronary artery develops an area of blockage it may interfere with blood flow. This may result in chest pain or other symptoms.

When the pain and other symptoms cannot be managed by lifestyle changes and medication, surgery may be the only option. A healthy blood vessel from another part of the body can be used to restore blood flow past the area of blockage. Veins can be removed from your legs or arteries can be removed from your arm or chest to be used as the vessel that “bypasses” the area of blockage.

**Valve Surgery**
The heart contains 4 valves that work together to maintain the proper forward flow of blood through the heart and lungs. Sometimes valves do not open (stenosis) or close (insufficiency or regurgitation) properly and need to be repaired or replaced. This may occur as a result of the normal aging process, an abnormality that was present at birth, or by an illness such as rheumatic heart disease, lupus, heart attack, or an infection. The material used to repair the valve can be either mechanical or from tissue such as pig, cow, or human.

**Surgical Procedure**
The surgeon will make an incision through the breast bone (sternum). He may need to reroute your blood so it does not pass through the heart and lungs for a brief time during surgery. The normal activities of the heart and lungs are temporarily stopped and you would be placed on a heart-lung machine. This machine provides oxygen to the blood and pumps the blood through the rest of your body. This is also called cardiopulmonary bypass.
Preparing For Surgery
Before surgery all patients need to have blood work, EKG, and x-rays. To help decrease the risk of infection, you will need to shower and use a special antibacterial solution called chlorhexidine (CHG). You will shower with this the night before your surgery and the morning of your surgery. After you have showered, do **not** use any lotions, powders, creams, or fragrances.

You will not be allowed to eat or drink anything after midnight the night before surgery. Ask your surgeon if you should take your medications on the day of your surgery.

Leave all jewelry at home including any body piercings. Hearing aids can be given to your family to hold while you are in surgery.

If you are having surgery at Mount Carmel East, go to the Heart Center lobby at the specified time for registration.

If you are having surgery at Mount Carmel West, go to the 4th floor Registration Desk if your appointment is before 2 PM. If you were told to arrive after 2PM, go to the 2nd floor Testing Center.

After registration is completed, you will be taken to the pre-op holding area. You will be asked to use a special mouth rinse that will help decrease the risk of developing pneumonia. After speaking with an anesthesiologist, you will receive medicine to make you sleepy. When you go to surgery, your family will go to the Waiting Room.

After your surgery is finished, the surgeon will come to the waiting room to meet with your family. Surgery usually lasts about 3 to 4 hours.

Each patient receives a FIND Code. It is a 4-digit code that is unique to your admission. When family or friends call the hospital to get information about you, only those with this code will be given detailed information. Without the code, only your status such as critical, serious, or stable will be shared. You decide who receives this code.

After Surgery
All patients go directly from the operating room to the intensive care unit. It is called Cardiovascular Intensive Care Unit (CVICU) at West and Open Heart Recovery Unit (OHRU) at East. Family will be allowed a brief visit after the nurses have completed your admission. This takes about an hour. Your nurse will give your family information about visiting hours.
Family need to be aware that it is normal for you to look pale and puffy. Your skin will be cool to the touch and you will be attached to tubes and pieces of equipment. Your incision will begin at the top of your chest and go down to the top of your stomach with a dressing in place. If you had bypass grafts with veins, you may also have incisions on one or both of your legs. Your entire leg will be wrapped in an ace bandage. Your nurse will do check you often to make sure that your pain is managed.

**Tubes and Equipment**

**Breathing Tube, Ventilator**
The breathing tube or endotracheal tube (ET tube) is placed while you are asleep. It will be taped in place and connected to a machine called a ventilator. The ventilator will breathe for you until you are completely awake from the anesthesia. Because the tube goes through the vocal cords, you will not be able to speak. The ET tube will allow mucus that may be in your lungs to be removed until you can cough and clear it out by yourself. This tube remains in place until you are wake enough to breath on your own. To prevent the tube from accidentally coming out, your hands may need to be tied down. You may have a sore throat and be a little hoarse for a short time after the tube is removed.

**Nasogastric Tube**
The nasogastric tube (NG tube) is placed in your nose or down your throat to your stomach. It is also taped in place. The NG tube drains stomach acids to help prevent nausea and vomiting.

Once you are completely awake and able to follow instructions, the ET and NG tubes can be removed. You will be placed on oxygen and will be able to have ice chips and sips of water.

**Incentive Spirometer**
The incentive spirometer (IS) is a device that helps you do breathing exercises to fully expand your lungs. This will help decrease your risk of developing pneumonia.

**Heart Monitor**
Small adhesive pads called electrodes are placed onto your chest. This allows the nurses to monitor your heart rate, rhythm, and blood pressure.

**Pulse Oximeter**
The pulse oximeter measures the amount of oxygen in your bloodstream. The probe is placed on one of your fingers. It is normal to see a red light on the probe.
**Temporary Pacemaker**
Temporary pacemaker wires may be attached to your heart during surgery. The wires can be connected to a temporary pacemaker generator if needed. This helps keep your heart rate normal while you are recovering and will be removed within a few days.

**Chest Tubes**
During surgery you will have 2 to 3 tubes placed into your chest cavity. The chest tubes drain excess fluid and blood that may pool there. Fluid that pools in the first 4 hours after surgery can be filtered and given back to you through your IV. This is called autotransfusion”. Chest tubes are usually in place for 24 to 48 hours.

**Arterial Line (A Line)**
The arterial line is a small catheter placed into an artery to read your blood pressure and allow for easy access to blood needed for lab work. The artery most often used is the one in your wrist.

**Central Venous Catheter**
You will have a large catheter placed in one of your large veins. It is most often placed in the jugular vein in the neck, but may also be in the subclavian vein just under your collarbone or in the femoral vein in the groin. This large catheter allows fluids and medications to be given and also monitors one type of heart pressure.

You may also have a special line called a pulmonary artery (PA) or swan ganz catheter placed through the central venous catheter. This catheter allows the nurse to monitor other heart pressures. The PA or swan catheter will be removed before you leave CVICU or OHRU, but the central venous catheter may remain in place a few more days.

**Foley Catheter**
The foley catheter is placed in your bladder to drain urine. This allows the nurse to closely monitor your fluid status and how well your kidneys are working. The catheter is usually removed 1-2 days after surgery.

**Blood Sugar**
It is quite common for patients who do not have diabetes to have increased blood sugar levels. Your level will be checked often and you may need some insulin for a few days to help manage it.

**Splint**
Using something to “splint” your chest incision when you move or cough is very important during your entire hospital stay and when you go home. Splinting is done by holding a pillow, folded towel or blanket as though you are giving yourself a hug. Using your splint/hugger will help decrease your discomfort as you move or cough.
Sternal Precautions
These precautions will help your chest incision heal better and will decrease the risk of breaking wires in your breast bone. Follow these for 6 to 8 weeks after your surgery.

- Do not use your arms to push or pull yourself out of a chair, bed, or car. Use your “hugger” to splint and rock yourself forward.
- Do not use your arms while going up and down stairs.
- Do not allow anyone to pull on your arms when helping you to move. They can place their arms around your waist. Placing a sheet or blanket in the chair may be a useful tool to provide help getting up and down.
- Do not reach over your head several times in a row.
- Try not to lift your elbows above your shoulders when washing or combing your hair.
- Keep your “hugger” nearby at all times.
- Use a pillow under the seat belt when riding in a car. It is very important that your family brings a pillow from home on the day of discharge.
- Do not lift more than 5 pounds until your surgeon allows you.

Recovery In Intensive Care
Most patients stay in CVICU/OHRU for about 24 hours.

- White stockings called TED hose are worn to decrease the chance of developing blood clots.
- You will be given clear liquids and your diet will be increased as you are able to tolerate food.
- To decrease the chance of pneumonia, your nurse will help you to turn, remind you to use the incentive spirometer, and to cough and deep breathe every 2 hours.
- You will be up in a chair at least once and most of the tubes will be removed before you transfer out of intensive care.
Recovery In Progressive Care
The step-down unit at MCE is called CPCU (Cardiac Progressive Care Unit) and CVPCU (Cardiovascular Progressive Care Unit) at MCW. The average stay in CPCU/CVPCU is 3 to 5 days. It is important to know:

- Your heart rate and rhythm will still be monitored.
- At times, the staff will place a pulse oximeter on your finger to check the oxygen level in your blood.
- Your diet will be advanced as you are able to eat food.
- Your activity level will be increased and carefully checked by nursing staff and physical therapy.
- Incisions are cleaned daily and left open to the air unless drainage is noted.
- To help reduce the risk of complications, you must continue doing breathing exercises with the incentive spirometer and cough and deep breathe every 2 hours.
- Use the hugger to splint your chest.
- Change positions while in bed and when you are up in the chair.
- You will continue to wear the TED hose as directed.
- Pain will be managed with pills. Tell your nurse when you need medication.
- You will still have some lab tests done, but not as often.
- It is common to gain weight after surgery so you will be weighed daily.

Discharge planning will begin the day of your surgery. If you have special needs or you will need help at home, Case Managers are can meet with you. Through a process called Phase 1 Cardiac Rehab, you and your family will be given information about modifying risk factors and managing your recovery once you are home.