

Kingston Health
Sciences Centre

Centre des sciences de
la santé de Kingston

A Patient and Family Guide to Heart Surgery



Hôpital
Hotel Dieu
Hospital

KGH

Hôpital Général de
Kingston General
Hospital

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Patient Name

If you have any change in your symptoms or other concerns while you're waiting for surgery, go to your local emergency department.

Please also call the number below to speak to the nursing coordinator after any visit to the emergency department.

**Nursing Cardiac Care Coordinator:
613-548-1399 X 1**

**Please complete the following
information:**

Family doctor

Cardiologist

Surgeon

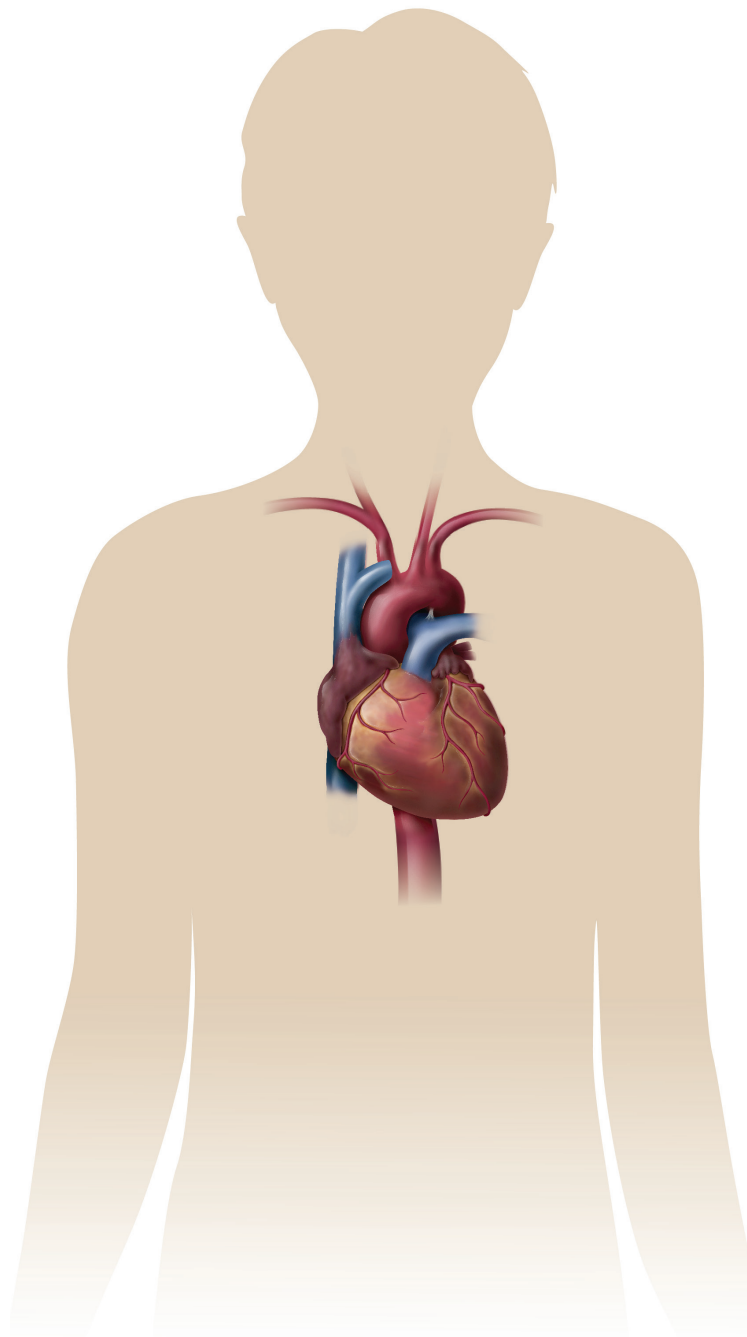
Pharmacy

Contact Person (relative, friend)

About Your Heart Surgery

Understanding Your Heart

Your heart is the strongest muscle in your body. Your heart is found in the middle of your chest, between your lungs. It is protected by your sternum (breast bone) and your ribs. It pumps blood through your body to bring food and oxygen to all of your cells (basic building blocks of all living things). Your heart speeds up or slows down to meet the demands placed on it.

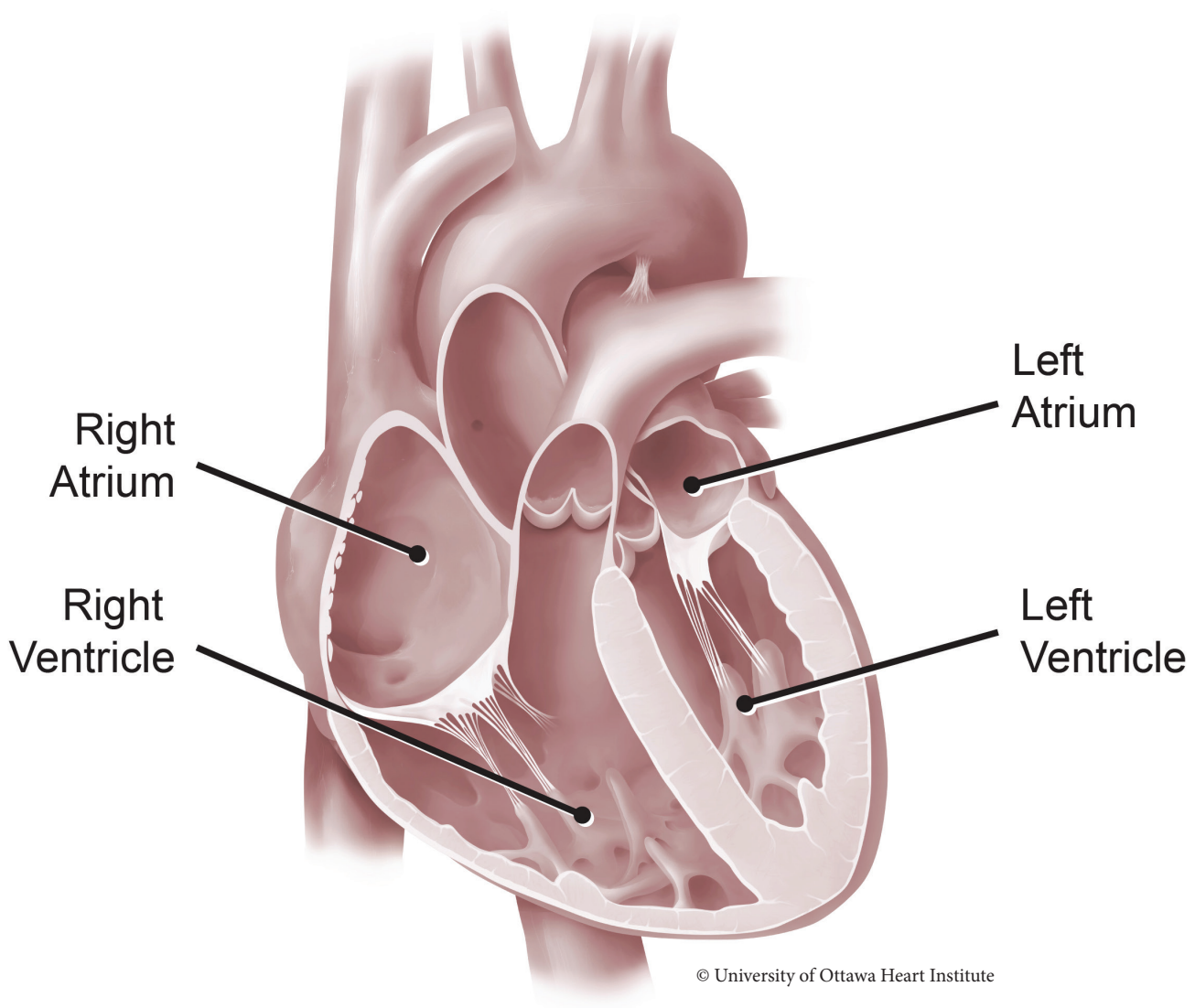


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Blood flow through the heart

Your heart is divided into four chambers. These are the left atrium and right atrium, and the left and right ventricles. When blood returns to your heart from your body, it's low in oxygen. Blood flows into the right atrium through two veins. From the right atrium, blood is pumped into the right ventricle. The right ventricle pumps the blood to your lungs through the pulmonary arteries. This is where your blood picks up oxygen.

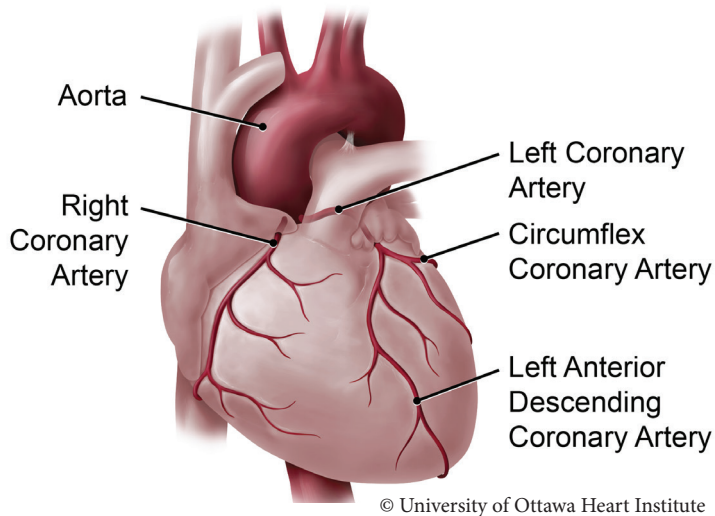
The pulmonary veins bring blood that is high in oxygen back to your heart (left atrium). This blood is pumped from the left atrium to the left ventricle. The left ventricle is the largest and strongest chamber of the heart. It pumps the blood into your largest main blood vessel, the aorta. This supplies the rest of your body with blood and oxygen.



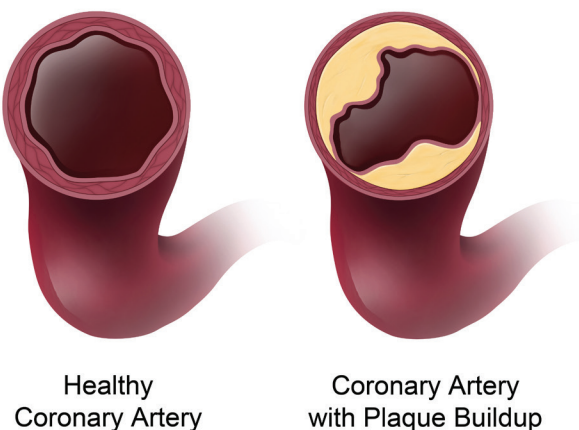
Reasons for Heart Surgery

Coronary Artery Disease (CAD)

The coronary arteries are blood vessels which go around your heart. They supply your heart with blood and oxygen. These arteries branch off of the aorta.



CAD is usually caused by atherosclerosis, or “hardening of the arteries”. Atherosclerosis happens when plaque (fatty deposits) build up on the inside of the artery. This narrows the opening through which your blood flows.



Risk factors

There are several risk factors that may lead to CAD. You can modify (change) certain risk factors in order to lower your risk of plaque build-up in your arteries. However, some risk factors are considered unmodifiable and therefore nothing can be done to change them.

Modifiable Risk Factors (things you can change)

- Cigarette smoking
- High blood pressure
- High blood sugars
- High blood cholesterol
- Too much animal fat (saturated fat) in your diet
- Obesity
- Low physical activity levels
- Chronic stress or tension
- Depression

Unmodifiable Risk Factors (things you can't change)

- Family history
- Aging

Angina

CAD causes decreased blood flow through the arteries that go to your heart. That means your heart doesn't get enough blood and oxygen. This may cause chest pain, also known as angina. You may need treatment of your CAD if your disease worsens or symptoms can't be managed.

The pain of angina is often described as a tightness or pressure in your chest. Angina often happens after activities such as exercise or eating a large meal. Your body needs more oxygen for these activities and your heart works harder to supply it.

As CAD gets worse, your pain can increase and may start to happen when you're at rest.

Angina can often be controlled with medications and by reducing activity levels. A medication called nitroglycerin quickly helps the symptoms of angina by relaxing all of the blood vessels. You can use Nitroglycerin spray every 5 minutes until your angina pain is gone or you have taken a maximum of 3 sprays in a row. If you still have angina pain after 3 sprays get medical help immediately by calling 911.

Coronary Artery Bypass Graft (CABG) surgery

When your coronary artery is blocked you may need a surgery called a Coronary Artery Bypass Graft (CABG). During a CABG a section of one of your veins or arteries (called a graft) is used to go around (bypass) the blockage in your coronary artery. This allows blood to flow around the blockage to the heart muscle.

Grafts can be taken from different places in your body:

- Part of the saphenous vein in your leg (*figure 1*),
- the mammary artery (left usually but can use both left and right) taken from inside your chest wall (*figure 2*),
- the radial artery in your arm (*figure 3*).

The graft is put on your heart to bypass the blockage(s). The removal of the vein for grafting doesn't reduce the blood flow to or from your leg or change your ability to walk. The use of the chest wall artery or arm artery does not reduce blood flow to your chest or arm. It doesn't reduce arm strength or affect your breathing.

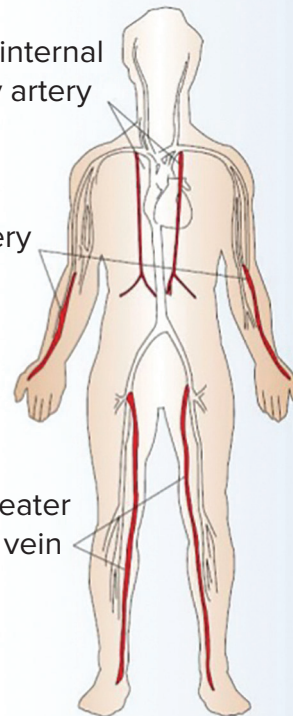
The type of graft used depends on the number of blockages and how easily the artery can be reached. The bypass graft(s) increase blood supply and decrease or relieve the angina pain felt before your surgery. This is because the blood that is high in oxygen is now able to flow from the aorta to the heart muscle through the graft(s). This also lowers your risk of another heart attack and may allow you to live longer.

Coronary artery bypass graft harvest sites

Figure 2: internal mammary artery

Figure 3: radial artery

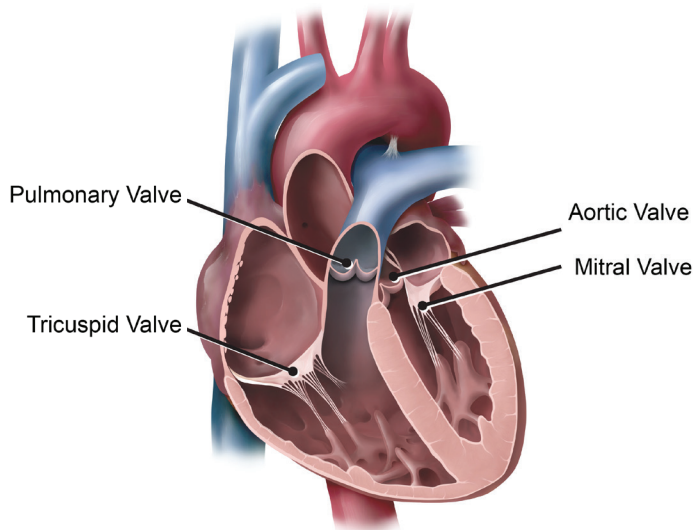
Figure 1: greater saphenous vein



Heart Valves

In your heart there are four valves: tricuspid, pulmonary, mitral and aortic.

Valves are thin, smooth flaps that open and close with each heartbeat. These valves normally allow the blood to flow forward easily through your heart and prevent blood from flowing or leaking backward.



© University of Ottawa Heart Institute

Heart valves may not develop normally (before birth). They could be damaged by aging or diseases such as rheumatic fever, scarlet fever or endocarditis. Changes in the valve tissues can cause stenosis (narrowing). When you have stenosis your valve gets stiff. This makes it hard for the valve to open. Other changes in valve tissues can cause the valve to leak because it doesn't close well. These conditions are called valve insufficiency or valve regurgitation.

Valves that don't work well force your heart to work harder to pump enough blood through your body. In time, your heart isn't able to continue to work as hard and so it starts to work less efficiently. This can result in what is called Congestive Heart Failure (CHF). Surgery may be needed to prevent or treat CHF.

There are symptoms to watch for if your valves aren't working well: fainting, a pounding heart, angina, shortness of breath and increasing tiredness.

The valves on the left side of your heart are the mitral and aortic valves. They can cause the most problems. They need surgery more often than other valve types. During valve surgery, your valve will be repaired or replaced.

Heart Valve Repair

Your heart valve can be repaired (fixed) in different ways. Sometimes a valve narrows because the flaps stick together (fuse). This is repaired by 'splitting' the fused parts open. Sometimes a valve leaks because the flaps are too loose or because the opening (annulus) has stretched. This is repaired by removing the extra tissue and tightening the opening with an annuloplasty ring.



Annuloplasty ring

Heart Valve Replacement

If a heart valve can't be repaired, the valve is removed and replaced with an artificial valve. There are two types of artificial valves used for replacement – mechanical and tissue (biological).

Mechanical Valve

The mechanical valve works like a natural heart valve. It opens and closes with each heartbeat. The mechanical valve is very durable and will probably last a lifetime. You'll need to take a blood-thinner, called Warfarin (Coumadin®) once a day, every day for the rest of your life. This medication helps to prevent clots and to keep the valve working smoothly. Your doctor or Nurse Practitioner checks the effect of the medication with a blood test. If the Warfarin level in your blood is too high, it can cause bleeding problems. If the level is too low, your blood can clot and make the valve stick or cause a stroke or other problems.



Mechanical Valve

Tissue Valve

The tissue valve often comes from the aortic valve of a pig or it can be made from the sac surrounding the heart of a cow. Your body does not reject the valve because the valve has no blood supply. This valve usually lasts anywhere from 5 to 15 years. When it wears out, it can cause problems and will then need to be replaced.

Mechanical and tissue valves come in many sizes. They are matched to your heart in the operating room. There is a long-term risk of infection with both types of valves. Bacteria can enter the blood stream during dental and certain surgical procedures. This causes an infection in the tissue around the artificial valve, known as bacterial endocarditis. Although the chance of this type of infection is low, you should take antibiotics before medical and dental procedures. Talk to your family doctor or nurse practitioner about how to avoid this type of infection.

You'll need to get a Medic Alert® bracelet if you have valve replacement surgery. Make sure all of your healthcare providers know that you have an artificial valve.



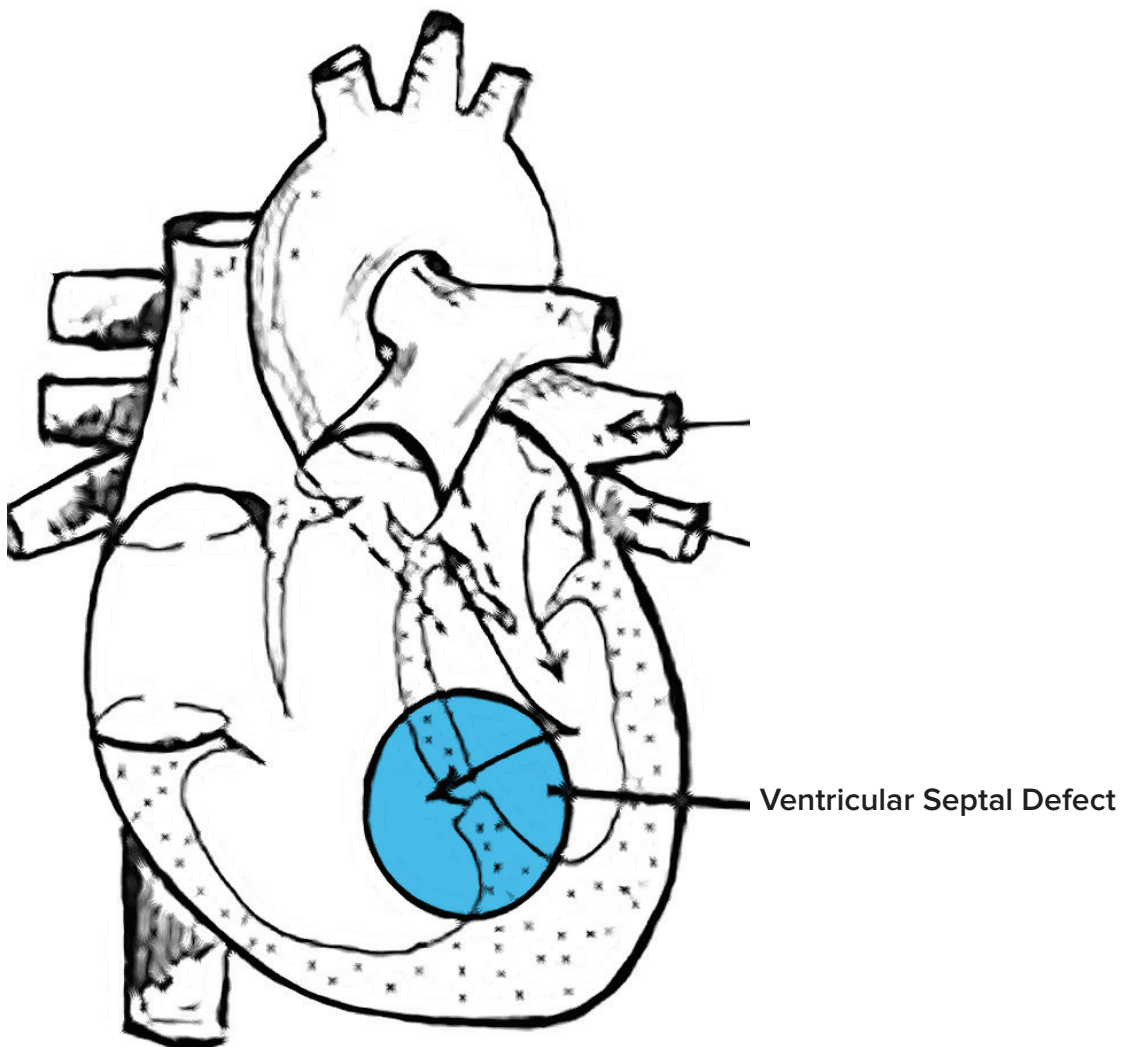
Tissue Valve

Congenital Heart Defects

Before birth a defect (flaw) can develop in the heart or a major blood vessel near the heart. This is called a congenital heart defect. A septal defect is pictured below and is most commonly found in adults.

A septal defect occurs when there is an opening in the wall between the right and left side of the heart. This type of defect occurs between the two atria or between the two ventricles. If the opening is large enough, blood from the left side is forced into the right side of the heart, then back to the lungs. Not enough blood goes through the aorta to supply the entire body with blood. This causes the heart to constantly work harder to make up for the shortage.

Sometimes surgery is needed to fix the overworked heart. During surgery the hole is either sewn closed or covered. It can be covered with man-made material or a piece of the sac from around the heart. After surgery, the blood follows the normal path through the heart's chambers. If you have surgery before there is permanent damage to your heart and/or lung tissue your heart will recover from being overworked.



Preparing for Your Heart Surgery

1. Referral to cardiac surgery

You'll need a referral to the cardiac surgery office. This referral can come from your family doctor or nurse practitioner, cardiologist or from a cardiac interventionalist (doctors that perform coronary angiograms) after your cardiac catheterization. You can also be referred if you come to the hospital with a heart attack and have an angiogram which shows that surgery would help.

2. Your visit with the surgeon

Next you'll meet with your heart surgeon. The clinic will send you a notice in the mail with the date and time of your appointment. Your cardiac surgeon will do a number of things:

- explain your need for surgery
- describe the proposed surgical options
- perform a physical examination
- listen to your concerns and
- answer your questions.

If surgery is an option for you and you agree to the surgery, you'll be asked to sign a consent form. If your surgeon thinks you need more tests, they will be arranged and you'll be contacted about results and follow up appointments.

3. Pre-surgical services

Once surgery is agreed upon, you'll need to go to an appointment at Hotel Dieu Hospital (HDH). This is called the pre-surgical screening appointment. This will be scheduled for some time before your surgery. You'll meet with an anesthesiologist, pharmacist and nursing staff. They'll go through your medical history and talk to you about your readiness for surgery. You'll have some tests, including: blood work, a chest x-ray, and an electrocardiogram (ECG). You'll also be asked to stay for a cardiac surgery class. **Pre-surgical screening appointments are always on Tuesday.**

Meeting with the pharmacist: Please bring all of your medications with you in their original containers, and be ready to talk about your allergies.

Meeting with the anesthesiologist:

The anesthesiologist will talk about your general health and any previous problems with anesthetics. If the anesthesiologist feels that you need further testing, they'll arrange this and notify the surgical office of their recommendations. If they feel that you're ready for surgery, they'll make this recommendation to the surgical office. You may be told to stop taking certain medications before your surgery. If so, the cardiac coordinator will make sure that you know which day to stop your medication before your surgery.

If you are taking a blood thinner the anesthesiologist may recommend that you take a medication called Dalteparin instead. This will be arranged for you by the cardiac co-ordinator. Dalteparin is an injectable medication (given by a needle.) If you haven't given yourself injections before, we will arrange for a nurse to come to your home to show you how to do this and help you if needed. Keep taking all of your other medications up to the day of your surgery, unless your anesthesiologist told you not to.

Once the anesthesiologist says that you're ready for surgery, the surgical coordinator will book you in for surgery when a date becomes available.

You're encouraged to stay and attend the cardiac surgery class. This class is taught by one of our cardiac nursing coordinators or nurse practitioner. This class runs from 12-1pm on the day of your pre-surgical screening appointment.

Surgical shower

Before surgery, you'll take a shower with one of the surgical sponges that you got during your clinic visit with the surgeon. We ask that you don't shave your chest or groin prior to surgery. Antiseptic solutions decrease the number of bacteria and germs on the skin. This reduces your chance of infection. You only need one surgical sponge for the shower. However, we'll give you two in case your surgery is cancelled after you've completed the shower. Instructions for the shower can be found below:

Remove any makeup and nail polish before your surgery. Remove all rings, jewelry and piercings and leave them with your family. It's important to remove your contact lenses before your surgery.

This pre-surgical shower can be done either the night before or the morning of your surgery

- Take a hot, soapy shower and rinse off as usual
- Open one of the cellophane packages and remove the sponge. Remove the hard plastic stick from the center of the sponge and throw it away.
- There is a spongy side and a bristled side to the sponge, use only the spongy side.
- Get the spongy side wet, and wash following the order in the picture:

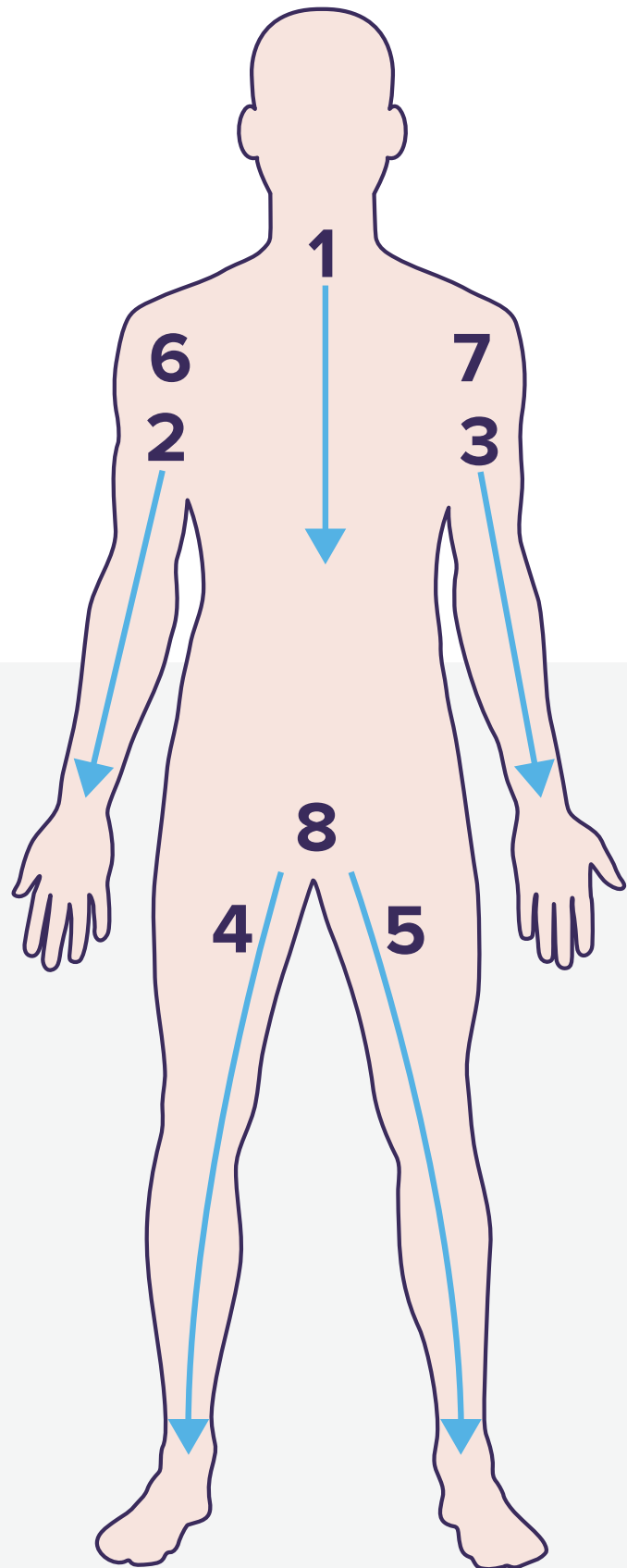
1: Chest: one swipe down your breast bone (sternum)

2 & 3: Arms: one swipe from bottom of armpit down to inner wrist on both arms

4 & 5: Legs: one swipe from upper, inner thigh down to inner ankle on both legs

6 & 7: Armpits: swipe each armpit with sponge

8: Groin area: cleanse groin area with sponge



Surgical shower diagram

Confirmation Phone Call

Between the hours of **2 and 8 PM** the day before your surgery, the hospital operating room staff will call you to confirm your surgery. They will tell you what time to come to the hospital, and explain how to get to the SDAC (Same Day Admission Centre) when you arrive.

If you don't receive a phone call the day before your surgery, this means that your surgery has been **cancelled**. You don't need to phone the hospital to confirm this. The cardiac coordinator will contact you about another surgery date once one is available. The cardiac coordinator will also advise you about any medications that you may have stopped and how to manage this.

Fasting Guidelines

It is important to have an empty stomach before surgery to decrease the risk of aspiration (breathing food or fluids into your lungs). Your anesthesiologist will give you guidelines for eating at your appointment. The cardiac coordinator will remind you of these instructions when they call to book your surgery. You'll be asked to fast (go without food or drink) as of midnight the night before your surgery.

Same Day Admission Centre (KGH)

If you're waiting at home for your surgery, you'll register at the Same Day Admission Centre (SDAC) on the day of your surgery. SDAC is on Connell 2.

Belongings

When you come to KGH, please bring these things with you:

- ☐ OHIP card
- ☐ Any private or semi-private insurance coverage cards
- ☐ A housecoat and slippers in a plastic bag

Please leave all of your other belongings in your vehicle until your surgery is completed. We don't have anywhere to secure them while you're in surgery.

Pack the following items and leave them in your vehicle until you're done your surgery:

- ☐ Pajamas
- ☐ Comb/brush
- ☐ Toothbrush
- ☐ Toothpaste
- ☐ Other unscented toiletries
- ☐ Night time breathing equipment that you use on a regular basis at home (CPAP, BiPAP)
- ☐ Regular clothes (button up shirts and loose fitting pants are easiest)
- ☐ Footwear that has a firm sole, closed toe and heel that is appropriate for walking
- ☐ Women are encouraged to wear bras following surgery. We recommend that you wear a bra with a front clasp that is one size larger than you normally wear, with no underwire.

Valuables

Please give wallets, eyeglasses, contact lenses, dentures and jewelry, including wedding rings to your family for safekeeping. These can't be taken into the operating room (OR). If you can't hear without your hearing aid, please let the nurses know and your hearing aid can be left in when you go to the OR. KGH is not responsible for any lost items and so it is best to leave valuables at home or leave them with a family member.

Advance Care Plan

Advance care plans are a way to make clear how you wish to be cared for in the event that you're unable to make your own decisions about your care. Telling people you trust about your values and wishes will guide them in making decisions on your behalf. It will give you peace of mind knowing that your wishes are known and will be followed. Your wishes can be **written, verbal, or taped**—it is up to you.

You can give someone you trust the authority and information to act on your wishes if the need arises by completing a *'Power of Attorney for Personal Care'*. Even if you don't complete a Power of Attorney form, the law provides a list of family members who can act as substitute decision makers for you. So, tell your family, close friends, and family doctor what your wishes are so if a time comes when you're unable to make your own treatment decisions, your family and health care providers will know what you would want. If you don't wish to be resuscitated speak to your surgeon. If you require further information or assistance about advance care planning, ask to speak to the team social worker.

Pre-admission Checklist

The following checklist will help you prepare for your admission:

- ☐ Identify one family member or support individual to act as your contact person while you're in hospital. This person will be contacted after surgery and in the event of an emergency. All family members should know who the contact person is and to call that person for information about your progress.
- ☐ Arrange for a ride home from the hospital. You won't be able to drive for six weeks after surgery.
- ☐ Arrange for someone to stay with you for the first week after you're discharged home.
- ☐ You'll be instructed as to which medications to take on the morning of surgery. You can take them with a small sip of water.
- ☐ Don't bring valuables to the hospital with you (this includes jewelry). KGH will not be responsible for the loss or damage of such items.
- ☐ Remove nail polish and don't apply makeup.
- ☐ Don't use any fragranced skin products. KGH is a scent free environment.
- ☐ Don't eat or drink as of midnight the night before surgery (with the exception of the small amount of water required to take your morning pills).

In the Operating Room

After you're in the operating room and asleep, the following things are done:

Skin preparation

The hair on your chest, legs and/or arms is clipped very short and then painted with an antiseptic solution. If you're having a CABG, and a vein is taken from your leg, one or both of your legs may be shaved.

Incisions

Your chest incision (cut) extends from your collar bone to below the end of the breast bone. If a vein graft is needed, an incision is made in one or both legs. If an artery is taken from your arm, an incision is made between your wrist and your elbow.

Intravenous (IV)

Intravenous (IV) lines are needed to give you fluids, medication, and blood during your surgery. The IVs are started in your arms and your neck during your surgery. They are removed when they are no longer needed, usually two to four days after your surgery.

Breathing tube

A tube is put in through your mouth down into your windpipe. This allows air to be pumped into your lungs by a breathing machine during your surgery. The tube stays in place until you're able to breathe normally, usually one to two hours after surgery. Because the tube passes through your voice box (vocal cords), you can't talk while it is in place. The nurse suctions fluid from your lungs using this tube which helps to prevent infection.

Oxygen

Once the breathing tube is out, you'll receive oxygen by face mask or nasal prongs. This will increase oxygen to your heart and decrease the work your heart must do to pump oxygen to the rest of your body. The oxygen level in your blood is monitored and the oxygen you receive is decreased and then eventually stopped, once the levels are fine. This usually takes one to three days.

Urinary Catheter

You'll have a urinary catheter for a day or two after your surgery. This is a soft tube that goes into your bladder to drain urine from your bladder into a collection bag. The nurse measures the amount of urine that you pass. Your catheter is removed when you're passing an adequate amount of urine and your kidneys are working well. This is usually within a few days of your surgery.

Chest tubes

Chest tubes are inserted to drain blood and fluid that collect after your surgery. These are removed when drainage stops, usually one to two days after your surgery.

Pacemaker wires

Temporary pacemaker wires are placed onto the heart during your surgery. They are small wires which you won't feel. These wires may be connected to a small exterior pacemaker to help your heart if it is beating too slowly. Pacemaker wires are usually removed three to four days after your surgery.

Blood Transfusion

During your surgery you can expect to lose some blood. Your body must have the right amount of each blood part to be healthy. A transfusion puts some of the blood or blood product back into your body. This helps you recover. You may or may not require a transfusion of blood products during or after your surgery.

After Your Heart Surgery

After surgery, you'll be moved to the Cardiac Sciences Unit (CSU) on Davies 3.

When you arrive in the CSU your nurse takes blood and attaches the necessary equipment to check your progress.

Your surgeon will speak to your family when your surgery is done. Your family should wait for the surgeon in the Davies 3 waiting area (family lounge). After speaking with the surgeon, they may be able to visit you once you are settled into CSU.

Family and friends are welcome to visit you in the CSU after surgery. We ask that families and friends use the lift phone outside of the CSU before entering the unit.

Family members should tell the nursing staff the telephone number where they may be reached when they leave the hospital. The phone number for the CSU is (613) 549-6666, ext. 2325.

From the CSU you'll move to Kidd 3 or Davies 3.

Once on Kidd 3 you'll be visited by the Nurse Practitioners (NPs), physiotherapists, nurses, and your surgeon every day.

The 'Team'

During your stay you may hear about the 'team'. This means the team of professionals who are involved with your care. Your team includes surgeons, nurses, nurse practitioners (NPs), physiotherapists, patient care assistants, dietitians, and pharmacists.

Nurse Practitioners

During your stay you'll be followed everyday by a Nurse Practitioner (NP). The NP will assess your progress, manage your care, and assess your readiness for discharge. The NP works alongside the surgeons, and can order tests, investigations and medications that you may need. They can also perform procedures, provide education, and make any referrals you need.

Physiotherapy

A physiotherapist sees you after your surgery to assess your mobility and how frequently you're moving. The physiotherapist also starts you on an exercise and walking program before you go home.

Additional Support

Social Work, Spiritual Care, and Nutrition Services are support services available to help you in the hospital. If you want one of these services, please let the staff know.

Restrictions after your surgery

Sternal Precautions

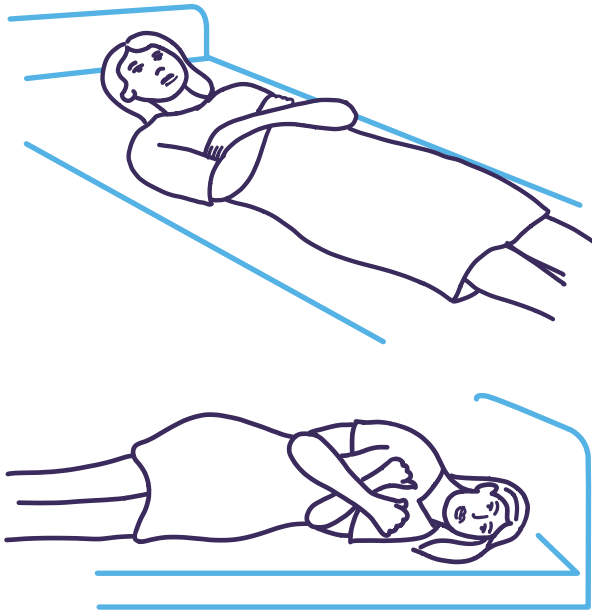
In order to operate on your heart, an incision is made through your skin and your breast bone (sternum). Your sternum is wired together after your surgery. It needs at least eight weeks to heal. During this recovery period there are several restrictions that you must follow. **Don't lift, push or pull any object weighing over 10 pounds.** Stress on your sternum (by doing more than you should) while healing, can make your recovery period longer or can result in serious injury (such as re-opening of the sternum). You'll be given a "huggie pillow" after surgery. You'll use it when you need to cough, sneeze or transfer from one position to another (sitting to standing, getting into bed).

It is very important that you **don't** use your arms to help move or shift your body weight, even to get into or out of a chair or bed. It's a good idea before your surgery to practice getting into and out of bed and your furniture without using your arms.



To get out of bed: place your arms across your chest, roll onto your side, swing your legs over the side of the bed and, using your leg and abdominal muscles, pull yourself into a sitting position. Don't use your arms to get out of bed. At first, you may need to ask for help from someone. They can help you by placing their hands on your back over your shoulder blades and providing support as you sit up on the count of three. Those helping you should not place their hands on your neck or pull on your arms when assisting you out of bed.

To get into bed: put your arms across your chest (over your huggie pillow) and sit on the side of the bed. Lower yourself onto your side while swinging your legs up onto the bed. Don't use your arms when getting into bed. You'll be shown how to get into and out of bed while you're in hospital.



Your lungs

After your surgery your lungs are at risk of developing areas of collapse and infection. The physiotherapist and nurses show you the best ways to breathe deeply and cough to reduce the chance of problems. **You should complete your deep breathing and coughing exercises at least 5 times every hour.** If you smoke, stopping **before** your surgery will make it easier for your lungs to recover **after** surgery.

Activity

You can expect to feel stiff and sore after your surgery. The earlier you start to move, the more quickly these feelings will go away.

Increase your activity as you feel stronger. You'll sit on the side of the bed and get up in the chair while in the CSU. Once you move to Kidd 3, you'll begin to walk longer distances each day.

Sleeping

It is common to have some difficulty sleeping at night after your surgery. It's important not to sleep too much during the day; otherwise you won't be able to sleep at night. You can have an hour rest period in the morning and an hour rest period in the afternoon. Once you're home and in your own bed, you should be able to sleep more soundly.

Atrial fibrillation

About 30-40% of patients (3-4 out of 10) will experience atrial fibrillation (A-fib) after heart surgery. This is a heart rhythm that is NOT life threatening and can usually be managed with medications. Typically, atrial fibrillation resolves within a few months of surgery if you have no pre-existing history of this condition.

Delirium

Delirium is a sudden confused state of mind. It may occur during an illness or after surgery.

People with delirium can act confused and may be:

- Restless and upset
- Slur their speech
- See and hear imaginary things
- Not make sense
- Mix up days and nights
- Be forgetful and have trouble concentrating
- Drift between sleep and wakefulness

Causes of Delirium

- Medication
- Infection
- Being in the hospital environment

Delirium is more likely if you have trouble with your vision or hearing and memory or thinking problems. Delirium often clears in a few days in many people. Each person is different.

Your health care team will try to prevent delirium by:

- Making sure you get enough rest and sleep
- Promoting physical activity
- Monitoring for infection
- Controlling pain
- Encouraging use of hearing aids and glasses

Pain Management

Pain is an unpleasant sensation, such as soreness or discomfort that varies with each person. Surgery causes pain for most people because tissues are moved and/or cut. It's important that you don't have a lot of pain during your recovery. You should be able to breathe deeply, cough and perform your usual activities of daily living (bathing, dressing, eating) without having a lot of pain.

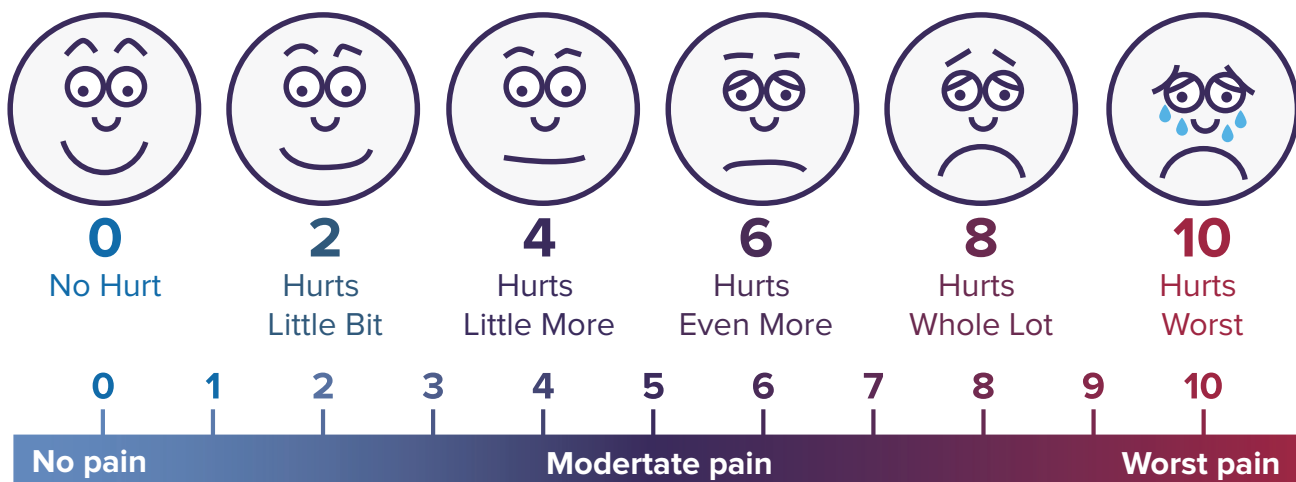
You're the only one who knows how your pain feels. To prevent your pain from becoming severe it's important to manage your pain. People recover faster if their pain is well-controlled after surgery. You'll move better and have fewer problems with your lungs.

You'll receive Tylenol every four hours but it may not take away all of your pain. Your nurse will ask about your pain using the scale below. You should also rate your pain regularly. If your pain is greater than 4 you should ask for pain medication.

Some people don't take their pain medication because they are afraid of:

- becoming addicted,
- becoming constipated, and
- having nausea

It's rare to become addicted to pain medication after heart surgery unless you already have a history of substance or drug abuse. You may have nausea when you first take your pain pills. Don't refuse to take the pain medication because of nausea; your health care team can give you medication to help take the nausea away.



Bowel Movements

It's common to have some constipation after your surgery. It is important that you don't strain to have a bowel movement because this will put additional pressure on your breastbone. You'll be given stool softeners to help prevent constipation. You may need to take a mild laxative to help you have a bowel movement for a short time after surgery.

Mood changes

Everyone reacts differently to having heart surgery. It is normal to experience some difficult feelings during the healing process. At times your physical and emotional recovery may even seem like a roller coaster ride. You may feel fine one moment and terrible the next. You may have times when you feel tearful for no reason at all. Anger, irritability, anxiety, fear, sadness, helplessness, and grief are some of the feelings you may have. Of course you may also feel relieved, grateful and happy. It is perfectly normal to have any (or all) of these feelings. Some of the reasons for these feelings are exhaustion and physical weakness, uncertainty about your ability to heal, and fear about the future.

Within six to eight weeks, the road to recovery should begin to feel a little smoother. It is important to give yourself and your loved ones time to adjust. Family members may also be struggling to cope with worries related to your surgery and your recovery. Accepting and expressing your feelings to each other is an important part of the healing process.

Although feeling blue is a common reaction to the challenge of recovery, these feelings should begin to lift as time goes on. If you continue to feel down and hopeless, you may have a more serious form of depression that requires treatment. This form of depression can be diagnosed and treated by your family doctor, a psychologist, or a psychiatrist. It is very important that you seek help for ongoing depression as this can affect your ability to recover well.

Things to remember

- Everyone heals at a different pace. Be patient with the recovery process.
- Try not to be discouraged if you're having trouble coping.
- Find the support you need to learn new ways of coping.
- When you're feeling good, try not to overdo it.
- Set small goals and learn to pace yourself.
- Talk about your concerns with others.
- Learn a relaxation technique that you're comfortable with and practice it.
- Practice letting go of what you don't have control over.
- Recognize that change takes time.
- Have faith in yourself and your ability to heal.

Post-operative Exercise Program

We have included a few gentle exercises to help keep your head, neck and shoulder muscles from becoming stiff. Start with doing each exercise 5 times and then increase to 10 times as you're able. The entire routine is to be done 2 to 3 times daily. Do exercises sitting in a chair with your feet resting on the floor. Don't hold your breath when doing the exercises.

1. Neck tilts

While looking straight ahead, slowly side-bend your neck so that your left ear moves toward your left shoulder. Repeat to your right side.



2. Neck rotation

Turn your head slowly and look over your left shoulder. Repeat for the right side.



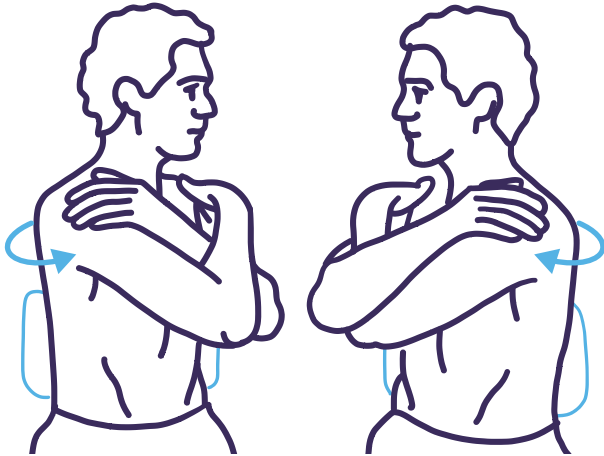
3. Elbow Circles

Touch your shoulders with your hands. Raise your elbow to shoulder level. Draw a large circle slowly with your elbow, first forwards and then backwards.



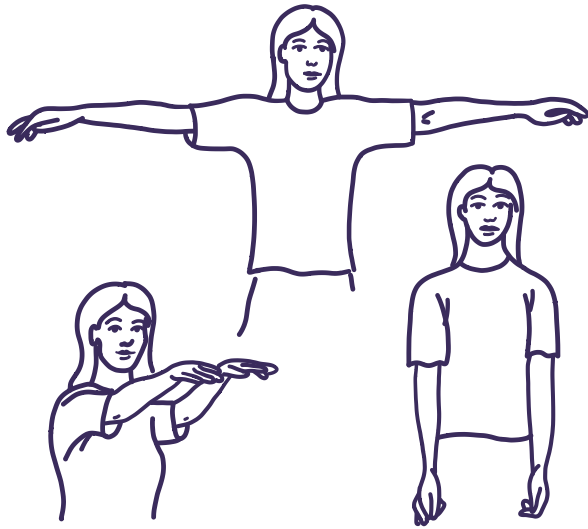
4. Trunk Twist Sitting

Put your hands across your chest. Twist at the waist to look over your right shoulder, then over your left shoulder.



5. Forward Arm Lifts

Raise your arms forward and above your head, then bring it back down to your side.



Walking

Walking is very good for your heart and your whole body. Walking helps to:

- Increase your confidence
- Increase your self-esteem
- Keep a healthy weight
- Improve your blood pressure
- Improve your blood sugars
- Improve your cholesterol (lipid) levels
- Improve your muscle strength
- Improve your coordination
- Enhance your sense of well-being

Start walking at home the day after your discharge. To avoid falling, don't walk on gravel or grass until your balance is improved and even then, use caution.

Use the FIT formula for your walking program.

Frequency—ideally most days of the week. At the least, you should walk 3 to 5 times/week.

Intensity—light intensity is recommended. Use The Talk Test to gauge the intensity of your walk; if you're walking at a light intensity level you should be able to sing while you walk. If you're walking at a moderate intensity level you should be able to talk while you walk. If you can't talk and walk, you're walking too fast.

Time— you should walk for 20 to 60 minutes a day. Most people have to start with 5 minute sessions and walk 4 times during the day. You can add up your walking sessions so that they total 20 minutes in one day. You'll have to rest in between your walks so that you don't get too tired.

Gradually, but not necessarily every time, increase the time that you walk. Try 7 minute walks three times a day, then 10 minute walks twice a day. Once you're walking continuously for 20 minutes, you can begin walking just once a day. If you have time, you can walk more. Eventually you should walk for 20-60 minutes per day. Walking needs to continue forever, not just until you think you've recovered.

Keep a record of your walking time in the pages provided in this booklet.

If you're not walking every day because it's too hard, decrease the speed and/or duration of your walk so that you walk every day. You may find that you need to rest more often in the first few weeks after your surgery.

You'll need to stop your walk if you:

- Have pain or pressure in the center of your chest, arm or throat similar to the pain you had before surgery
- Feel palpitations or a 'fluttering heart'
- Feel dizzy, lightheaded or faint
- Have a sudden lack of coordination
- Feel confused
- Have cold sweats
- Feel nauseated
- Have extreme shortness of breath

If you still have these symptoms after a 10 minute rest, call 911 or go to your nearest emergency department.

Some people may have to modify their walking based on other health conditions. For example, if you have morning stiffness related to arthritis, you may have to walk in the late morning or early afternoon. If you have increased localized pain that lasts for more than 2 hours after your walk you'll have to reduce the intensity and/or time (duration) of your next walk.

Don't use a treadmill or stationary bike for eight weeks. It is not safe to do your walking exercises on a treadmill. Your breastbone needs to heal before starting other forms of exercise.

Add new activities slowly. During the initial eight week recovery period, you should avoid activities that involve your upper body to allow your breastbone to heal properly (for example: golf, tennis, swimming pool lengths, lifting).

After your follow-up appointment with your cardiologist or surgeon these activities can be added gradually.

Keep track of your recovery and activity in the Activity Log. It will help both you and your health care team see how much you have improved.

Activity LOG

Date	Morning Exercises ✓ When completed	Minutes Recommended per Walk	Walking Log (minutes) a.m./p.m.	Calf Stretch ✓ When completed	Comments or Problems
Day you go home	Rest Today				

Date	Morning Exercises ✓ When completed	Minutes Recommended per Walk	Walking Log (minutes) a.m./p.m.	Calf Stretch ✓ When completed	Comments or Problems

Stairs

You shouldn't use your arms to pull yourself up when you climb stairs. Rest your hand lightly on the rail for balance only. Put two feet on each step, take one step at a time making sure both feet are on the same step before going to the next. This prevents the risk of losing balance and then using your arms to regain balance. The physiotherapist may have you practice going up and down the stairs before you go home.

To prevent your neck and shoulders from getting stiff, keep your neck relaxed and your shoulders down and back. Swing your arms loosely at your sides when you walk.

Cardiac Rehabilitation

As part of your post-operative care, a referral will be sent to one of the regional cardiac rehabilitation centres. The centre that you are referred to will be determined based on your geographical location. After your referral is received you will be contacted with more information and to schedule appointments.

The local Cardiac Rehabilitation Centre in Kingston is located at the Hotel Dieu Hospital site of KHSC. The team is comprised of a cardiologist, a registered nurse, physiotherapists, a registered dietitian, and a social worker.

Cardiac rehabilitation aims to help you recover from your surgery and to improve your health as it pertains to your physical, nutritional, social, and emotional needs. The services offered at the centre include education sessions, a personalized exercise program, and counseling opportunities with a dietitian and/or social worker. This personalized approach will help you regain your strength and stamina, reduce anxiety, increase confidence, and reduce your risk of having future heart problems. The Kingston area program lasts **up to** 16-weeks.

Each regional cardiac rehabilitation program may vary in its duration and services provided.

Discharge from Hospital

You're going home! This section of the booklet contains guidelines to help you after discharge. They apply to all types of open heart surgery. If you have further questions, please ask your family doctor, Nurse Practitioner, cardiologist or cardiac surgeon.

Remember that although recovery usually takes three to six months, each person recovers differently. The length of time it takes for you to feel well again can't be predicted. Every patient is different. You'll be limited in your activities for the first six weeks while your breast bone heals. The doctors, nurses, and physiotherapists will help you and give you guidelines for your recovery.

Planning for Discharge

If you live alone, you need to make arrangements for discharge well before your surgery. You should stay with someone or have someone stay with you for the first week after you leave the hospital. If this is impossible, some patients choose to stay in a convalescent facility for a short period of time. Your family should help you arrange this prior to your surgery. Community Care (Homecare) IS NOT provided to everyone at hospital discharge. Convalescent care is not an option for all cardiac patients and depends on need and bed availability.

Discharge Day

- ☐ Have your family bring a full size pillow and a slippery garbage bag from home for your discharge day. The garbage bag will help you to move around on the seat of the vehicle you are going home in.
- ☐ You should be prepared to be discharged home by 11 a.m.
- ☐ Families are able to park near the front of the hospital for a short time while they pick you up.
- ☐ You'll get a prescription for your medications when you leave the hospital. You'll have to get the prescription filled on the day of your discharge. The NP and nurse will review your discharge summary (My Discharge Plan) and medications with you. Plan your morning so you have short rests in between your activities.
- ☐ Ask for and take your pain medication before you leave the hospital.
- ☐ Wear a seatbelt whenever you're in the car. Place a full-size pillow under the seat belt strap to prevent irritation of your incision. You can place your heart pillow on your lap.
- ☐ If you're going home in a sports utility vehicle or a large truck you may want your family to bring a step stool.
- ☐ Make frequent stops on your drive home. You should stop after every hour of driving to stretch your legs.

Nutrition, Weight Control, and Your Cardiovascular Health

Proper nutrition and weight control can help to....

- Improve blood lipids (HDL, LDL, triglycerides)
- Improve blood glucose control
- Improve blood pressure
- Increase energy levels

Your everyday meals and snacks should be....

- Rich in fiber
- Limited in refined carbohydrates such as white flour and sugar
- Trans-fat free and limited in saturated fats
- Include small amounts of healthy fats and oils
- Be low in sodium
- Portion controlled

Fiber

- Choose fresh or frozen vegetables with both lunch and supper
- Fresh fruit makes a great dessert or snack
- Choose whole grains such as barley, brown rice, quinoa, bulgur, whole grain pasta and breads.
- Choose high fiber breakfast cereals, such as rolled oats. Cold cereals should contain at least 4 grams of fiber and < 6 grams of sugar per serving.
- Try high fiber and low fat proteins such as kidney beans, lentils or chick peas instead of meat.

Fats

- Select canola oil, olive oil, non-hydrogenated margarine or butter in small amounts.
- Eat fatty fish (herring, mackerel, tuna, and sardines) at least two times a week to add Omega-3 fatty acids to your diet. Ground flax seed or walnuts will also provide some Omega-3.

- Limit saturated fat by choosing lean meats and poultry, cutting off visible fat and removing the skin. Prepare meat by baking, broiling or roasting.
- Avoid trans-fats; these are found in shortening, commercial baked goods and deep fried foods.
- Select lower fat milk products (skim/fat free or 1%).
- Limit cheese, keep portion sizes to about 1-1.5 oz (30-50g).

Sodium

- Limit sodium to less than 2000 mg per day (1 teaspoon of salt has 2300 mg of sodium).
- Don't add salt in cooking or at the table.
- Choose herbs, spices, vinegars, lemon juice or garlic for flavoring.
- Try Mrs. Dash or other spice mixtures that don't contain salt.
- Canned soups, boxed foods, deli meats, pickled foods and vegetable cocktails are generally very high in sodium.

Helpful Tips:

- Compare sodium in foods by reading the food label, but pay attention to the serving sizes on the label. Choose items with less than 5% daily value of sodium per serving.
- Choose products labelled as low sodium products (means 140 mg or less per serving).
- Reduced sodium generally means only a 25% reduction in sodium.

Portion sizes

- Follow Canada's Food Guide when preparing your plate: fill half of your plate with vegetables and fruit, $\frac{1}{4}$ with whole grains and $\frac{1}{4}$ with protein.

Alcohol

- If you have been told not to consume alcohol for any reason, don't drink.
- If you don't drink, don't start.
- Limit alcohol consumption to 2 drinks per day for men and 1 drink per day for women.
- Standard drinks include 12 oz of 5% beer, 1.5 oz. of liquor and 5 oz. of wine.

Beverages

- Have up to 3 glasses of low fat milk per day.
- Limit caffeine to four (6oz) caffeinated beverages per day. Some physicians may recommend no caffeine at all.
- Be aware of the high sugar content of pop, juice and coolers.

Weight

- Weight loss is important.
- Abdominal obesity (fat in the belly area) is linked to increased risk of heart disease and diabetes. If you're overweight, start with a small weight loss goal. Reduce weight by 5-10% (for someone who is 250 lbs this would mean losing 13-25 lbs).

Iron

- After surgery some patients may become iron deficient. It is important that foods rich in iron be included in the diet in the weeks following surgery.
- Iron comes in two forms in foods. **HEME** iron is found in food from animal flesh such as fish, chicken and beef. **NON-HEME** iron is found in plant and animal foods. Heme iron is better absorbed than non-heme iron. We can improve absorption of non-heme iron by including a source of vitamin C in our diet such as strawberries, citrus fruit or tomatoes. Including fish, chicken or lean meat with non-heme iron sources will also improve absorption of iron.

Where can I get more iron while following a heart healthy diet?

Food	Possible Use
Dried peas, beans, lentils	Add to low sodium soups, salads or casseroles. Try chili with lots of beans and extra lean ground meat. The tomatoes and meat will help maximize iron absorption.
Seafood	Mussels, oysters, clams-prepared in a heart healthy way. Try garlic and a small amount of canola oil or olive oil.
Fish	Bake, broil or grill.
Extra lean beef	Try eye of round or inside round with fat trimmed off.
Dried Fruit	Bring a small amount of dried fruit with nuts for a midafternoon snack. Dried fruit is high in sugar and energy dense. A health portion size is ¼ cup.
Eggs	Choose an egg prepared in a heart healthy way. Try an omega 3 egg poached or boiled served on whole grain toast with tomato slices.
Cream of wheat or fortified whole grain cereals	For breakfast or a snack with vitamin C rich fruit such as bananas or berries.
Spinach	Add spinach to meat sandwiches or have spinach salad with strawberries and almonds.

Activity after discharge

Showering

You shouldn't sit in the bathtub to bathe until your breastbone and your incisions are healed. Showers are the best way to keep your incisions clean. The shower water should not be hot as heat and steam may make you feel weak or dizzy. You may find it easier to sit and have a shower using a shower bench or shower chair after surgery.

Shower for 5 – 10 minutes with warm water using a mild, unscented soap. Wash your incisions gently. Don't scrub them. Use a clean towel each time you shower to pat your incisions dry. Always use a separate cloth for your sternal incision and graft sites, for both washing and drying. Don't put anything on your incisions until they are healed. This includes powders, lotions, ointments and creams. Leave your incisions open to the air for 20 minutes to ensure complete drying.

Lifting

Don't lift, push or pull anything that weighs more than 10 pounds for the first six weeks. For example, don't:

- open heavy doors,
- carry groceries, heavy purses, suitcases, children, or pets,
- unscrew jar lids,
- push a vacuum or a broom,
- open stuck windows,
- shovel or snow blow your driveway,
- cut your grass with either a push or riding lawnmower, or
- golf.

After the first six weeks you can start lifting a little more weight, but increase this slowly and gradually.

Household Chores

You shouldn't expect to take over all the household chores, care of children, or make meals until after your six week recovery period. You should have someone at home with you during the first week. They can fix meals and help you to get in and out of bed. A couple of weeks after you're home, and feel stronger, you may prepare light meals, dust, set or clear the table, or peel potatoes or vegetables. You should avoid activities which require strength of over ten pounds.

Activities that cause stress or strain on the breastbone will increase your pain. If your pain is getting worse as you recover it may mean that you're doing things with your arms that you shouldn't be.

Sexual Activity

It is normal for you and your partner to worry about having sex after having heart surgery. Resume your sexual activity slowly. Work sexual activity back into your life at the same pace that you resume other activities.

If you can walk up two flights of stairs without panting, feeling exhausted, or experiencing pain, you won't have heart trouble during sex.

When you do feel ready for intercourse, you'll find that certain positions will ease the strain you might otherwise feel on your breastbone. Make sure you're well rested and that you have time to rest after. Wait two to three hours after eating before engaging in sexual activities.

If you were taking medications for erectile dysfunction prior to surgery we recommend that you discuss their use with you family doctor or nurse practitioner before resuming.

Leisure time

You'll want to do some less strenuous activities during the early part of your recovery. Your body will tell you when you need to rest. When you first go home you may enjoy these activities:

- reading,
- playing cards,
- needlework,
- oil painting,
- knitting,
- computer games or
- emailing friends.

Return to work

A number of people don't go back to work until after their follow up appointment with the cardiologist or surgeon. How soon you can return to work depends on the type of work you do, job demands, and the level of physical exertion involved. If your type of work involves a great deal of lifting or pushing heavy objects, you may have to wait a little longer before returning to work. Some employers have modified work programs. You should discuss your situation with your cardiologist or surgeon after surgery.

Managing Your Recovery at Home

Rest periods

You'll feel tired after your heart surgery. Activities such as showering, shaving, and getting dressed will tire you. Rest before and after any activity. This tiredness will slowly go away as you gain your strength after surgery.

Plan two – 30 minute rest periods each day for the first week or two at home. It's also important to space your activities with rest periods so you don't get overly tired. Listen to your body because it will tell you when to stop what you're doing and when you're ready to do more strenuous activities.

Don't sleep too much in the day or you may find you'll have trouble getting to sleep at night. If you have trouble sleeping avoid taking too long and too frequent naps during the day. Try to go to bed at the same time each night. Also, stop or reduce caffeine in your diet. This includes coffee, tea, cola and chocolate. If you continue to have difficulty falling asleep, talk to your family physician.

Visitors

Too many visitors can make you over tired. During the first 2 weeks at home, limit the number of visits from family and friends to two short visits a day. Let your visitors know that your rest is an important part of your recovery. If they don't seem to understand, excuse yourself and go to your bedroom for a rest.

Incisions

As you recover your incisions will look better. During the first few weeks after surgery your incisions may itch, look red, and be numb or sore. Changes in the weather, using your arms for heavy activities, and sleeping in one position too long make your incisions feel more sore. You may get a stiff neck, or a sore back or shoulders if you aren't using your arms for light activities. Try to maintain good posture and move your head and neck normally to prevent further stiffness.

You'll likely notice a lump at the top of your chest incision. This may take several months to disappear. Bruising along your incisions will fade and eventually disappear.

If your surgeon used an artery in your chest (the left and/or right internal mammary artery) for your bypass, you may have a numb or burning feeling on the side from which the artery was used. You may also have sharp, shooting pains that last briefly. These feelings may take 6 to 12 weeks to improve.

You may notice some clear yellow or slightly blood tinged drainage from your leg incision or your chest tube sites after discharge. This is normal. Keep the draining parts covered with dry gauze. .

Warning signs of infection include:

- thick yellow-green drainage from any incision or chest tube site
- a red, tender area in your incision that is warm to touch
- excessive swelling or a sharp pain in the affected area
- chills/sweats
- an elevated temperature.

Call your family doctor if you have signs of infection in your leg. Call the cardiac surgery nurse practitioner if you have signs of infection in your chest incision.

Fluid retention

You may have fluid retention (extra fluid in your body) after surgery. If you're discharged home on a diuretic (water pill) or if you've had problems with fluid retention since your surgery, you should weigh yourself daily. Weigh yourself every morning after you go to the bathroom, but before you eat breakfast. Wear the same amount of clothing each time you take your weight.

Keep track of your weight. A weight gain of 3 pounds in one day may be due to fluid retention. If you notice a steady weight gain over 2 to 3 days, unusual shortness of breath and/or swelling of your ankles, hands, or stomach notify your family doctor.

Venous Thromboembolism (VTE)

VTE is when blood clots form, most often, in the deep veins of your leg (known as deep vein thrombosis) or (DVT) or in the lungs (Pulmonary embolism or PE). People who have had recent surgery are at risk for VTE but this risk can be decreased by walking. Go to the emergency room if you have any signs or symptoms of DVT or PE.

DVT:

- redness,
- warmth,
- pain, tenderness, and/or swelling in one leg.

PE:

- sudden onset of unexplained chest pain,
- cough,
- shortness of breath,
- rapid heart rate, and/or
- dizziness.

Blood glucose levels

Diabetes is a serious condition that can contribute to heart disease. People living with diabetes are at a 4 time greater risk of developing heart disease.

Poorly controlled blood sugar:

- Can lengthen your hospital stay
- Increase your healing time
- Increase your risk of infection

If you're diabetic it's important to keep your blood sugar levels under control. Please monitor your blood sugar levels 2 to 4 times a day when you first go home. Report high blood sugar levels to your family doctor. High blood sugars can increase your risk of infection in your incisions.

Ideal Blood sugar Targets for Diabetes Before meals	4.0-7.0 mmol/L
2 hrs after meals	5.0-10 mmol/L

Hemoglobin A1C

All patients going for cardiac surgery are screened for diabetes with a blood test called Hemoglobin A1c (HgbA1c). This is a non-fasting test that measures the amount of sugar in your body.

Diagnosis

Normal	6.0% or less
Prediabetes	6.1%- 6.4%
Diabetes	6.5% or more
What is your HgbA1c	

Additional Information

The Heart and Stroke Foundation of Ontario provides other resources for people with heart disease. If you would like further information or materials visit them at heartandstroke.ca, or contact your local Heart and Stroke Foundation office.

If there are words or medical terms that you would like to know more about you can go to the "Glossary of Terms" on the KHSC website. Go to www.kingstonhsc.ca/glossary

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This image shows a single sheet of white paper with horizontal blue ruling lines. The lines are evenly spaced and run across the width of the page. There are no vertical margin lines or other markings present. The paper appears to be a standard sheet of notebook paper.

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