

**A Patients' Guide to  
Cardiac Surgery**



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## Introduction: Patient Information for Cardiac Surgery

Once you have been advised that you require cardiac surgery, preparation is essential. It is important for both you and your family to understand your condition and what to expect before, during and after heart surgery.

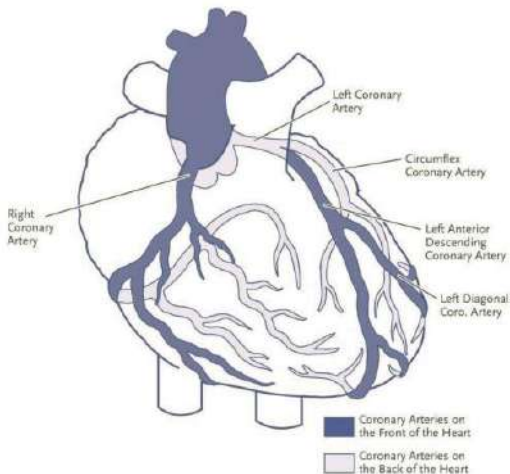
This is undoubtedly a stressful period, but many patients have told us that education and sharing their feelings eases their anxiety.

It is important to develop *a personal plan* prior to surgery in order to assist you to prepare for the operation. A *support structure* is key to the successful outcome of the operation.

Recovery continues following discharge and normal activity usually resumes after 8-12 weeks. Cardiac rehabilitation may also be an important adjunct to surgery.

## Heart function

The heart is a muscle that pumps blood throughout your body and is responsible for driving the circulatory system. Heart valves ensure that blood moves in a forward direction. The heartbeat is controlled by an electrical system which dictates the timing of each heartbeat. A poorly functioning heart results in insufficient blood being pumped throughout the body resulting in ineffectively functioning organs.



## Coronary Artery Disease

This is the commonest form of heart disease and occurs when fatty materials, calcium and plaque, build up in the arteries. This causes narrowing of the arteries and inadequate blood supply to the heart which may result in fatigue, chest pain and dizziness. Angina which may be experienced as a heaviness, tightening or burning sensation within the chest, radiating to the arm, neck, jaw and back may also occur. Shortness of breath and a feeling similar to indigestion are also symptoms. Untreated CAD may lead to a heart attack and possible death.



Normal or Clear Artery



Plaque Forming in Occluded Artery



Normal  
Artery

10%  
Blocked

40%  
Blocked

90%  
Blocked

### Risk Factors of CAD Modifiable (Controllable)

- Smoking
- Obesity
- Diabetes
- High Blood Pressure
- Increased Cholesterol
- No Exercise
- Hormone replacement therapy

### Non-Modifiable (Uncontrollable)

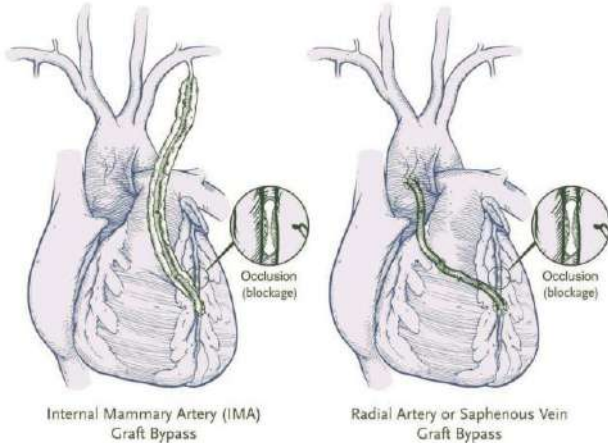
- Gender
- Age
- Family History
- Ethnicity

## Types of Heart Surgery

### Coronary Artery Bypass Graft (CABG) Surgery

This is the commonest type of heart surgery and is necessary when other methods of treatment are not suitable. Guidelines used world-wide, indicate when surgery is deemed necessary to improve blood flow to your heart. An artery or vein is used to “bypass” the narrowed or blocked part of the heart artery in order to re-establish blood supply to the heart thereby improving oxygen and nutrients to the heart muscle. This will alleviate symptoms of angina and shortness of breath and in some instances, increase life expectancy.

#### Two Types of Graft Bypasses



## **Heart Valve Surgery**

This usually requires a dental examination prior to surgery. Heart valve dysfunction usually occurs in the adult years and may require replacement or repair.

### **Types of Heart Valve Disease Stenosis**

Occurs when the valve opening is narrowed resulting in insufficient blood flow through the valve.

### **Regurgitation/Insufficiency**

Occurs when the valve does not completely close resulting in back flow of blood causing increased strain on the heart resulting in decreased blood flow to the rest of the body.

### **Types of Valves used for Heart Valve Replacement Mechanical Valves**

Consists of metal and synthetic material and requires lifelong blood-thinning medication (warfarin) to prevent blood clots on the valve.

### **Tissue/Biological Valves**

Consists of animal heart tissue treated with chemicals to avoid rejection and does not require lifelong use of blood thinners (warfarin). Usually used in older adults (>55years). The valve eventually degenerates in about 15-20 years and may require replacement.

## **Preparing for Heart Surgery**

### **Activity**

Remain as active as possible whilst ensuring that this activity does not result in symptoms of angina and coronary artery disease. This will ensure improved breathing and circulation and also promotes easier recovery following surgery.

### **Smoking**

Quit immediately! You have many reasons to do so. Smoking increases the risk of developing health problems especially after surgery.

### **Healthy Eating**

Important for your upcoming surgery and should include a variety of low fat and low salt foods. This may help with a quick recovery. If you are on a special diet this should continue during your admission. *Diabetic patients should ensure blood sugar is well controlled to promote healing and decrease the risk of infection following surgery.*

## Rest

You should be well rested prior to surgery.

## Alcohol

It is advised not to drink alcohol for a week prior to surgery. Contact your surgeon should you be concerned.

## Changing condition whilst awaiting surgery

Occasionally patients await surgery especially after having a heart attack. Some patients remain in hospital due to the severity of their disease and symptoms. It is important that if you have been discharged and preparing for surgery at home and develop worsening symptoms, we should be notified immediately.

Changing symptoms include:

- Increasing severity and/or frequency of chest pain
- No relief of chest pain with rest or medication
- New or worsening shortness of breath
- New onset of swelling of feet and ankles
- New onset of irregular heartbeat
- Cold, fever, cough productive of green/yellow mucoid sputum which all may indicate a new/ worsening infection.
- Other changes in general condition like altered stool colour.

## Cancellation of Surgery

Though this rarely occurs, surgery may be cancelled as a consequence of infection or another patient requiring emergency surgery. You will be notified in the event thereof.

## Patient admission

Authorisation for admission for the surgery and the procedure will be undertaken by ourselves once provisionally confirmed.

## Pre-op Visit

The objective of meeting with us is to assist preparing you both mentally and physically for surgery and more importantly to answer questions you may have. We encourage family members to accompany you.

*You will be informed as to what **medication** you may continue to take prior to surgery. Certain blood thinners (except aspirin) are usually stopped 5 to 7 days prior to the date of cardiac surgery.*

We suggest you nominate a next of kin in order to facilitate communication between us and your family and friends. This is especially important following surgery. The next of kin will be called by us prior to surgery, following surgery and day one and two following surgery to provide an update on your condition. You and your next of kin will be given our mobile contact details in order to clarify any questions. Discussions will only be undertaken with you and the nominated next of kin.

Familiarise yourself with regards to visiting hours. Please clarify any questions you have regarding medical aid rates.

*(Members of the cardiac team: Anaesthetist and physiotherapist will visit you once you are admitted)*

### **Days leading up to your Surgery.**

#### **Two Days before surgery**

- You may call our office to confirm time of admission and confirm medical aid authorisation for the procedure.
- Shower as usual
- Do not shave or use hair removal products to remove hair from your chest and legs prior to surgery as this could increase risk of infection. This will be done once you are admitted.

#### **One Day before surgery**

- Pack all the necessary items including medication. Leave all valuables at home. Remove nail polish. Expect to stay in hospital for about 7 days.
- Once in the cardiac ward you will be advised on having a shower the night before and the morning of surgery. You will be given an antiseptic wash (Bioscrub).
- You will also be assisted with hair removal with an electric shaving device.
- Do not eat solid foods or drink any liquids after midnight on the night before surgery. You may have a light snack at about 10.pm.
- Try to get a good night's sleep. A sleeping pill usually prescribed to help you relax and sleep.

#### **Morning of the Surgery**

- No make-up or perfumed skin products.
- No rings or jewellery of any kind in hospital.
- Only take prescribed medications. Do not take any medication you were previously taking at home.



## **The Operating Room**

You will be transferred to the operating room on a stretcher from the ward or ICU by nursing staff. The heart surgery theatre team is a fairly large one consisting of heart surgeons, anaesthetist, perfusionists and nursing staff.

Theatre is cool with many bright lights, machines, and instruments. Intravenous lines will be inserted into veins in your arms in order to administer medication and fluids.

The anaesthesiologist will administer medication to help you feel relaxed and sleepy. He will also ask you to breathe into a mask. Other lines and monitoring devices will be inserted whilst you are asleep.

## **The Cardiac ICU (CICU)**

Our CICU is a restricted area mainly to ensure infection control. Access to patients is not permitted on the day of surgery unless circumstances warrant a change of protocol. Only two visitors at a time are permitted during visiting hours. Visitors should be kept to an absolute minimum and should only include immediate family. The hospital staff are not able to disclose any information to any person/s other than the nominated next of kin.

## **Expectations Immediately After Surgery**

### **Recovery**

- You will be asleep for at least 10-12 hours following surgery.
- Do not be alarmed when you awake from the anaesthetic.
- You might feel that there is a lot of activity around you which is normal.
- There are monitors and devices recording your heart rate, blood pressure, urine output and oxygenation.
- A breathing machine will assist you with breathing until you are capable of doing so on your own. A breathing tube will be placed in your airway.
- An ICU qualified nurse will be by your side at all times.
- You may be in a little discomfort initially, but this will soon pass with medication.

### **Breathing tube**

- You will be unable to speak, eat or drink when the breathing tube is still inside your airway.
- Your throat may be a little sore for a few days after the breathing tube is removed.
- Once it has been removed, oxygen will be placed over your face.

### **Heart Monitor**

- There will be electrodes (square stickers) attached to your chest which monitors your heart rate and rhythm.

## Intravenous Lines

- These are inserted into your forearm and neck to allow monitoring and administration of medication and fluids. **Arterial Lines**
- These are small cannulas inserted into your arteries in your forearm and groin in order to monitor blood pressure, oxygenation, and the chemical balance in your blood.

## Chest tubes

- There are usually up to 3 chest tubes placed just below the surgical incision site.
- It drains excess fluid from the surgical site.
- It usually remains in situ for about 48 hours.
- There may also be a smaller drain from the vein harvest site from your lower limb, which is also removed after about 48 hours.

## Incision

- You may have an incision on your chest, leg and possibly forearm depending on the operation.
- Dressings will usually be changed on the second day, then daily thereafter.

## Pacemaker wires

- These are temporary wires routinely placed on your heart, during surgery which may be required to assist with your heartbeat.
- It is attached to a pacemaker box.
- These wires will be removed in the ward prior to discharge.

## Foley catheter

- This drains urine from your bladder and removed after about 48 hours after surgery.

## Pain Management

- We work with you to ensure that you are comfortable as possible.
- Pain management is individualised.
- The pain you may experience will be different from that of angina.
- The surgical pain will gradually decrease over time as you recover from surgery.
- ***Pain should never be intolerable.*** Your pain medication will be adjusted accordingly.

## In-Patient Recovery after Surgery

Daily Goals will be discussed.

- Pain management
- Chest protection
- Breathing and coughing
- Mood changes
- Bowel function
- Activity, sleep, and rest

### **Day 1**

- You will be awake, and the breathing tube removed.
- Oxygen will be placed on your face.
- The chest drains are also usually removed and a CXR undertaken thereafter.
- Blood investigations and an ECG is done.
- Food consumption will be guided by your general well-being and your tolerance. This will gradually increase to your discharge diet.
- You will be assisted to sit at the bed side and later to the chair if possible.
- Our physiotherapist and nursing staff will assist you.
- Your family will be contacted by us and talked about visiting times.

### **Day 2**

- You may use the bathroom for daily activities. You will be assisted.
- You will be given pain medication regularly and accordingly.
- You will sit in a chair for all meals as tolerated.
- You may walk in the halls as tolerated.
- Continue with prescribed exercises.

### **Day 3**

- Request pain medication daily.
- You may be transferred to the ward.
- Sit in the chair for all meals as tolerated.
- Continue with your exercises as guided by our physiotherapist.

### **Day 4**

- Repeated blood work, ECG, CXR.
- Pacemaker wires will be removed.
- Daily incisional dressings still undertaken.
- Pain and your heart medication will continue to be adjusted.
- Continue with your exercises as guided by our physiotherapist.
- Start planning your discharge.
- Ensure you have had a bowel movement. If not, stool softeners and or a laxative will be given to you.
- You will be able to shower and undertake daily hygiene activities independently.

### **Discharge Day 5-Day 7**

- Be able to get out of bed alone.
- Be able to walk in the hall alone or with a walking aid and down a flight of stairs.
- Comfortable with pain medication.
- IV lines and monitors removed.
- Ensure you review your discharge summary and medication.

- **Only take the prescribed discharge medication.**
- Discuss wound care.
- Discuss diet plan.
- Discuss follow up appointments.

### Activity after Surgery (guided by our physiotherapist) Breathing Exercises

- Breathing exercises and getting up out of bed assists in preventing complications like chest infections.
- Breathing exercises will start as soon as you are awake.
- Inhale slowly, allowing your abdomen to rise, hold for a second, relax then blow the air out. This should be repeated about 5-10 times hourly whilst you are awake.

### Coughing

- After the breathing exercises it is important to cough to get rid of the mucous that may be in your lungs.
- Ensure that you are holding your pillow against your chest when doing so.
- Take a deep breath and cough strongly about 2-3 times, spitting out any mucous that may be brought up.
- You will be assisted by the nurse in attendance as well as the physiotherapist.

## In-patient Activity

### Activity Guidelines

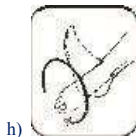
- Exercises are best performed sitting in a firm chair. Do not hold your breath.
- a) Slowly turn your head to the right, then the middle, then to left. Repeat 5 times.
- b) Slowly lift both shoulders upward, roll them forward, downward, and back. Repeat 10x then do so in the opposite direction.
- c) Raise one arm forward and upward until the arm is next to your ear. Slowly lower one arm then the other. Repeat 5 times. If you are able and progress, you may do so with both arms at the same time.



- Keeping your hips and buttocks still, slowly turn your upper body to the right. Hold for 5 seconds then relax. Repeat 5 times. Repeat in the opposite direction.
- Slowly lift one knee up, then lower it down. Repeat 10 times with each leg.
- Straighten one leg by lifting off the floor. Keep thighs parallel, hold for 5 seconds. Repeat 10 times with each leg.



- Slowly bend and straighten your ankles through their full movement. Again do 10 repetitions with each ankle.
- Make circles with your ankle and foot. Do 10 repetitions with each foot.
- Posture: stand against a wall keeping your buttocks, shoulder blades and head against the wall, whilst looking straight ahead. Breathe normally whilst maintaining this position for 20 seconds. Then repeat.



## In-patient Activity Log

The progress you make following surgery will be recorded and the recommended activities are usually accomplished after about 4 days. ***This must be guided by your body.*** Our physiotherapist will assist you with a plan.

STEP	ACTIVITY	COMMENTS	DATE
1	-Sit on side of bed -Hourly ankle circles - Hourly breathing exercises and coughing - Getting out of bed and sitting on chair		
2	- Getting out of bed and sitting on chair -Short walks with staff assistance -Arm and leg exercises - Hourly deep breathing exercises		
3	-Short walks with staff assistance -Twice daily arm, leg and breathing exercises -Sit in chair for all meals - Brush teeth, wash face and grooming at bedside		
4	-Slowly walk in hall every few hours -Arm, leg and breathing exercises -Independent washing at bedside -Independent dressing -Going to toilet independently		
5	-Increase walking as tolerated to 6 times daily - Arm, leg and breathing exercises -Stair's training with physiotherapist		

## Post-Surgery Medication

- After surgery, your medication dosage and administration times may be changed.
- You are advised to ask questions about your medication.
- Know the names of your medication, their purpose, dosage, effects, and duration you will have to take them.
- You will be given a prescription on discharge.

### ***Blood thinning medication***

- This is given to patients following valve surgery using a metal valve or for an irregular heartbeat (atrial fibrillation).
- Ensure you observe for any abnormal bleeding propensity: easy bruising, bloody urine, altered stool colour, severe headaches, nose bleeds or severe abdominal pain.
- We suggest you wear a medic-alert bracelet stating you are taking blood thinners.
- Take the medication as prescribed.
- Ensure other health care professionals (e.g., dentists) are aware of you taking blood thinners.
- Prior to discharge you will be taught correct dosages and the frequency which your blood is tested to ensure the correct levels of blood thinners in your body.
- INR (international normalized ratio) is used to measure the level of the blood thinner called warfarin. High levels of the INR may place you at risk of excessive bleeding while low levels may place your valve at risk of clotting.
- We and your GP will help you adjust your warfarin dose.

## Travelling

- If you are travelling a long distance back home, ensure that you stop and stretch your legs every 1-2 hours. Travel with adequate leg room.
- You may resume driving after about 6 weeks following surgery.
- Wear a seat belt. A small pillow beneath your seat belt may assist you if there's any discomfort.
- Before 6 weeks, ensure that you sit in the back seat away from airbags.
- Consult us before undertaking air travel.

## Showering and Surgical Incision Care

- You will shower and resume normal hygiene habits prior to discharge.
- Your incision may itch, feel sore, tight, or numb for a few weeks. Occasional bruising over the area may also occur.
- Use warm water during showers.
- Incisions may be gently washed with soap and water. Do not rub the incision site.
- Dab incisions dry. No powders or lotion should be applied over the incisions.

## Follow-up Appointments

Upon discharge you will be given your appointments for review with us and your cardiologist.

## Recovering at home after Surgery

### Home Exercise programme

- Continue the hospital exercise programme.
- Your goal is to progress to 30 mins a day of walking.

Step No.	Walking time	No. of walks/day	Total Time
1	5 mins	6	30 mins
2	6 mins	5	30 mins
3	7-8 mins	4	30 mins
4	10 mins	3	30 mins
5	15 mins	2	30 mins
6	30 mins	1	30 mins

- Follow the **walk-talk rule**. Walking and talking simultaneously without being short of breath, means you are walking at a good pace. Slow down or stop if you're breathless. Walk inside or outside.
- At home you will be able to do light housework, reading, computer work, visit friends and family and continue the home exercise programme.
- Stairs should only be used to relocate yourself as needed and avoided for exercise purposes at this time.

### Lifting

Do not carry, lift, push or pull anything heavier than 4 kg for about 6-8 weeks following surgery. This allows the breastbone to heal.

### Activity Guidelines 6 to 12 weeks

After 6 weeks you can gradually increase housework, do light gardening, and resume recreational activities. Should you have a light duty job (desk job) it is possible to return to work after 6-8 weeks. Consult us prior to this.



### **Activity Guidelines after 12 weeks**

Continue the exercise programme. Wait 3 months following surgery and after your check up to engage heavy duty work and contact sports.

### **Special Instructions following Valve Surgery**

Protect the new valve from bacterial infection by taking a course of antibiotics prior to any dental work and other medical interventions (surgery-major and minor). Antibiotics will be prescribed before and after the procedure to decrease the risk of infecting the valve. Should you feel fatigue, general feeling of unwell, chills and sweating, contact us immediately.

## **What to Expect after Surgery following Discharge**

### **Diet**

It may take a few weeks before your appetite returns. Your sense of taste may be diminished but this will return. Eat smaller more frequent meals a day (5-6 smaller meals daily). Some patients may complain of nausea at the sight and smell of food for about 1-2 weeks after surgery. During this time, we suggest eating bland foods without a strong odour.

### **Swelling**

Generalised swelling may persist for 4-6 weeks following surgery. There will be swelling of the leg with incision site. Ensure you elevate your feet when resting, do not cross your legs and avoid socks with a tight band.

### **Sleeping**

Sleep will be erratic, and you may have insomnia for up to 2 weeks. Try to have 1-2 naps per day not longer than 45 minutes and not later than 3:30pm. Ensure adequate pain control prior to sleeping at night. Lie on your back until you are comfortable to lie on your side. This is usually for 2-3 weeks.

### **Constipation**

Pain medication may cause constipation. There are laxatives available. Do not go longer than 48 hours without a bowel movement. Adding fibre to your diet, such as fresh fruit and vegetables, high fibre breads and cereals may help. Drink adequate amounts of water. Continue the exercise routine.

### **Mood**

Mood swings and feeling depressed are common. This will certainly pass. Do not be discouraged. Ensure you communicate your feelings to your family and us.

## Healing

There may be a little lump at the top of your chest incision which will disappear. There may occasionally be a clicking noise when moving your chest. This will disappear within 2 weeks. It takes about 6-12 weeks for your breastbone to heal. Avoid lifting heavy objects as this puts a strain on your healing chest. Muscle pain or tightness between your shoulders and upper back may occur but will certainly resolve with time. Ensure that you take adequate pain medication. There may be numbness over the left side of your chest due the harvesting of the artery used for the surgery. This is normal and will disappear over time.

## Leg Care

There may be a slight yellow discharge from your leg incision. You may cover this with dry gauze to protect your clothing. Elevate your leg at rest. This discharge should regress in a week. If you are concerned contact us.

## When to seek help

- Persistent fever.
- Increased swelling of your ankles and weight gain of more than 1 kg over 2 days.
- Change in incision appearance and drainage.
- Severe bruising without an apparent cause especially if on blood thinners like warfarin.
- Blood in urine or stool.
- New onset palpitations.
- Worsening shortness of breath.
- Persistent nausea and vomiting.
- Dizziness, light-headedness, fainting or severe headache.

Re-evaluate your health and make beneficial lifestyle choices. Everything in moderation. Take the time to make these changes and set realistic goals.

## Healthy Eating Guidelines

Follow a balanced diet and maintain a healthy body weight. The diet should be high in fibre, low in sodium and correct fats in healthy amounts.

- ***Include at least 3 of the 4 food groups in each meal.***
- Balance energy in (food) with energy out (physical activity) to ***ensure a healthy body weight.***
- A simple way to ensure ***proper portion sizes*** is to follow the plate model.
- ***Use unsaturated fats*** called monounsaturated (MUFA) and polyunsaturated (PUFA) fatty acids, which can be found in olive oil, corn, and sunflower oil.
- ***Omega-3 fats: fish and walnut***
- ***Limit saturated fat*** from: animal products (trim fat and remove skin), dairy products, hydrogenated oils (palm and coconut oils).

- **Avoid trans fats** found in commercial baked and deep-fried goods.
- Choose avocado, nuts, and non-hydrogenated margarine.
- **Use lower fat milk** like, skim or 1% milk, low-fat yoghurt and low-fat cheese.
- **High fibre foods** at least 3 times a week from whole grain breads/cereals, beans, peas, fruit, and vegetables (fresh or frozen).
- **Eat a diet rich in plant sterols** (nuts, vegetables, and fruit) which can lower bad cholesterol (LDL)
- **To reduce cholesterol** do not eat more than 3 egg yolks every week, egg whites can be eaten daily. Limit shellfish and organ meats
- **Avoid foods high in salt** (sodium): limit salt intake to less than 1 teaspoon daily. Check food labels for items with less than 5% daily value of sodium per serving.
- **Tips to reduce salt intake:** remove saltshaker from the table; reduce salt in cooking and baking; limit sauces and condiments; avoid salt substitutes that contain potassium chloride; use herb spice mixes with no salt added to enhance flavour of various food.
- **Choose Healthy Cooking Methods:** Bake, broil, BBQ, roast or microwave your meats on a rack so the fat drips off.
- **Meat alternatives** like beans, lentils and tofu are excellent sources of fibre and low in saturated fat.
- Have **less sugar and sweets** to reach a healthy body weight.
- **Alcohol:** get advice before consumption as alcohol may interact with certain medication. Alcohol consumption may increase weight and blood pressure and negatively affect diabetic control.
- Limit caffeine consumption to no more than 2 cups of caffeinated coffee and 4 cups of caffeinated tea per day.

**Please note:**

*Recovery from heart surgery can take up to 3 months to ensure appropriate healing of your sternum. Be aware of your body and ensure everything is done in moderation. Ensure adequate rest especially if you are feeling tired. Tiredness is normal and energy levels may fluctuate on a daily basis. Be patient as recovery varies for each person.*



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