

SYDNEY  
HEART & LUNG SURGEONS

# Cardiac Surgery Handbook

continuity  
OF care



# Welcome

to Sydney Heart and Lung Surgeons.  
The Practice is at the forefront of cardiothoracic surgery.  
We are committed to restoring patients to active lives  
as quickly as possible.

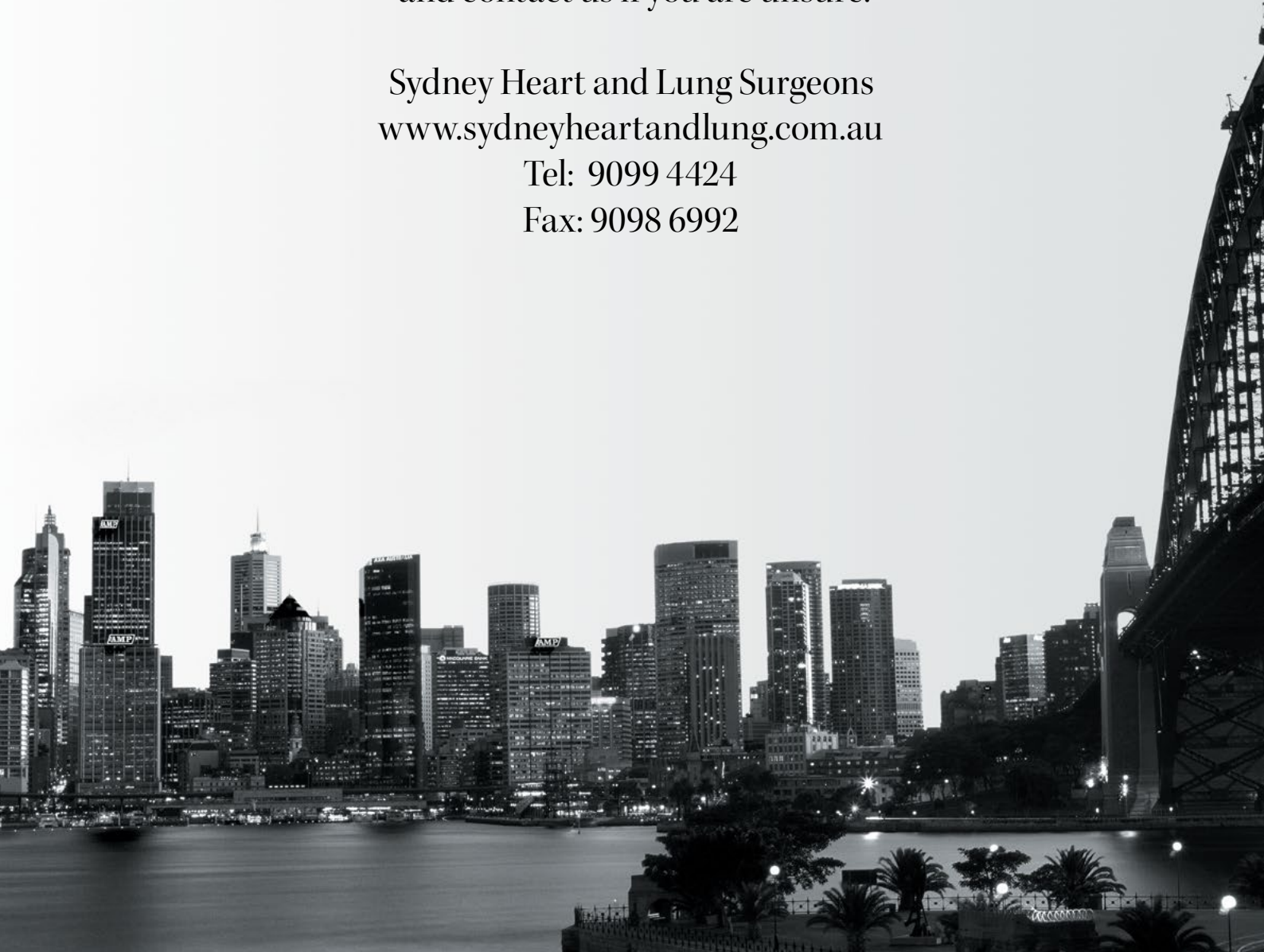
This booklet will provide you with information to make  
your hospital stay and recovery at home  
as easy as possible.

Each patient is different and the information in the book  
may vary from your doctor's individual advice.  
Always follow the instructions given by your doctor  
and contact us if you are unsure.

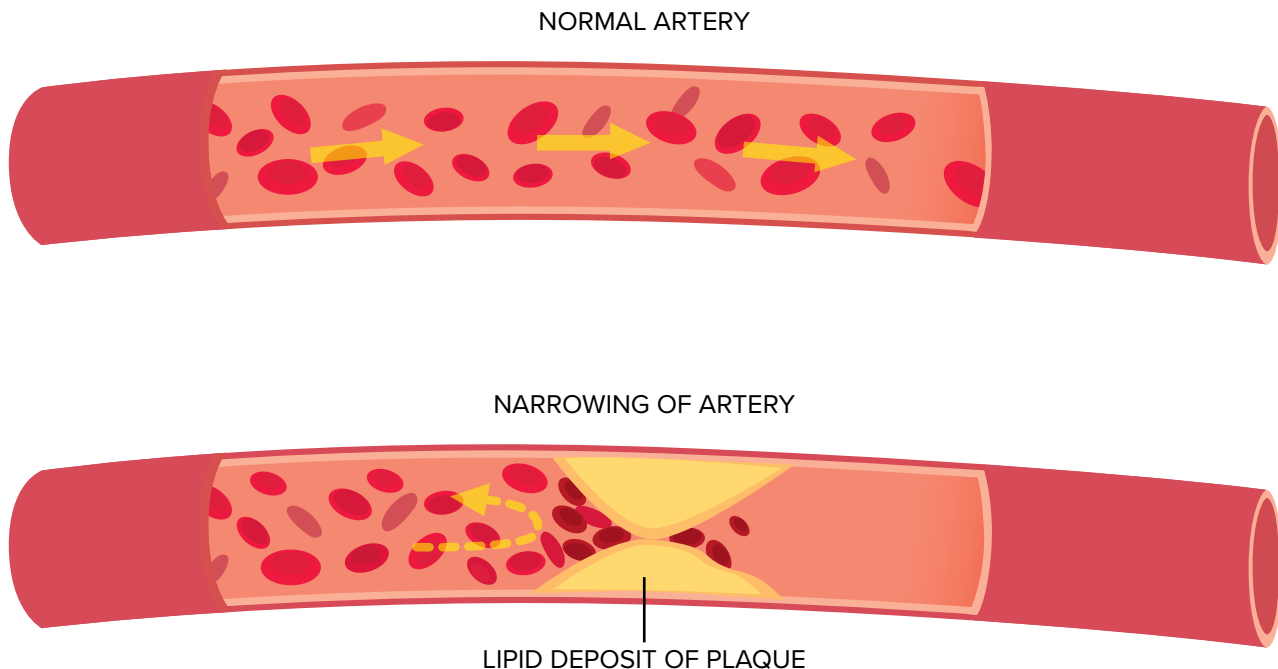
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# Coronary Arteries

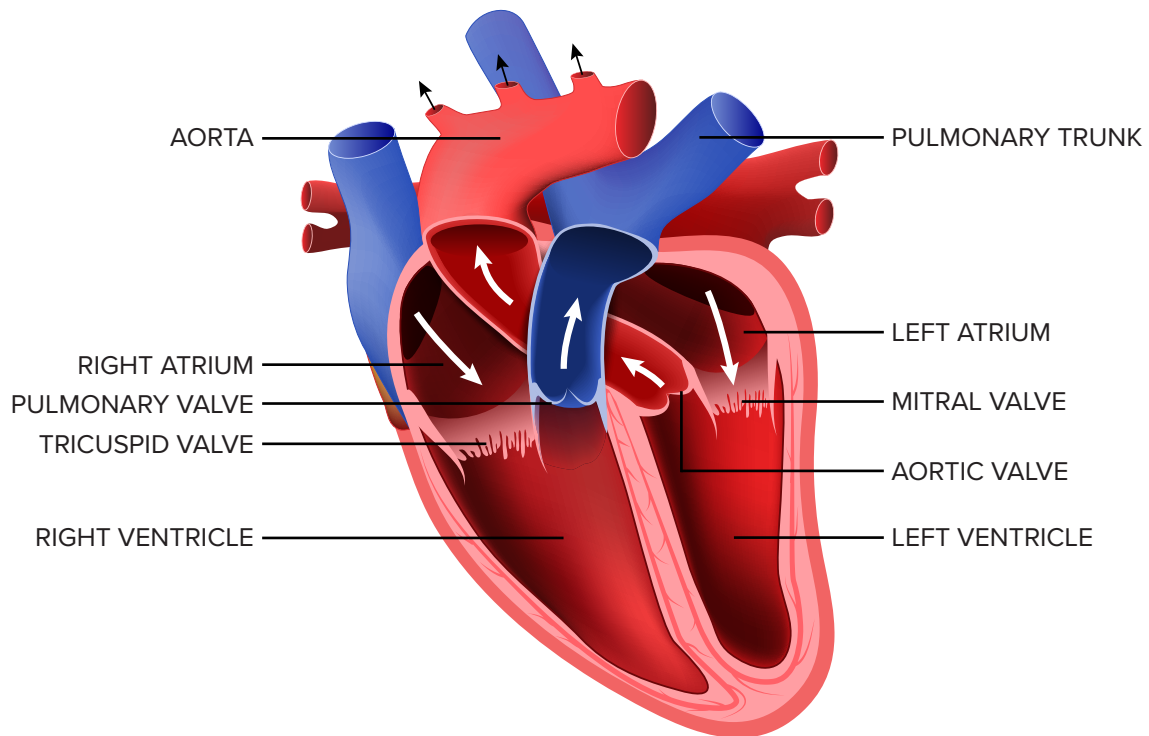


## CORONARY ARTERY DISEASE

The heart is a muscle that pumps oxygenated blood to your body. The heart muscle is supplied with oxygen rich blood through the coronary arteries.

Over many years, factors such as lifestyle and genetic disposition can cause damage to the coronary arteries. Fatty plaques build up on the wall of the coronary arteries and they become narrowed and sometimes blocked. This narrowing can cause pain and may lead to a heart attack. A heart attack can be life threatening and cause permanent damage to the heart muscle.

# Heart Valve Disease



Within the heart are four one-way valves. The valves keep blood flowing in the right direction through the heart and then to either the lungs or to the body.

## THE FOUR VALVES

**TRISCUSPID VALVE:** Right side of the heart between the right atrium and the right ventricle.

**PULMONARY VALVE:** Right side of the heart between the right ventricle and the artery that takes blood to the lungs (pulmonary artery).

**MITRAL VALVE:** Left side of the heart between the left atrium and the left ventricle.

**AORTIC VALVE:** Left side of the heart between the left ventricle and the artery that takes blood away from the heart towards the body (aorta).

These valves can become loose and floppy or tight and narrowed. Sometimes there may have been a defect present since birth. Valvular heart disease can cause symptoms such as angina, shortness of breath and dizziness.

# Pathologies

## STENOSIS

Stenosis is a narrowing or stiffness of the heart valve. This restricts blood flow through the valve.

## REGURGITATION OR INCOMPETENCE

Regurgitation or incompetence is when the heart valve cusps or leaflets do not close completely. This allows blood to backflow through the heart valve.

## CAUSES OF VALVE IMPAIRMENT

- The valve cusps or leaflets become stretched
- The annulus – where the valve attaches to the heart - becomes weak and stretched
- The valve leaflets are fused together
- The valve leaflets are thickened and calcified
- A congenital defect
- Damage to the valve due to Rheumatic fever
- An infection of the heart valves (endocarditis)

## ATRIAL SEPTAL DEFECT (ASD)

ASD is a 'hole' in the wall that separates the two upper chambers of the heart. This defect allows oxygen rich blood to leak in to the oxygen poor blood chambers in the heart. ASD is a defect in the septum (wall) between the hearts' two upper chambers (atria). The septum separates the hearts' left and right sides.

The decision to repair the ASD is based on clinical and echocardiographic assessment.

## CARDIAC TUMORS

Cardiac tumours are abnormal growths in the heart or heart valves. There are many types of cardiac tumours and in general they are rare. The most common type of cardiac tumour is called a myxoma. The tumours can be either cancerous (malignant) or noncancerous (benign). Most cardiac tumours are benign. A cardiac tumour can cause problems because of their size and location. Some of the problems include blocked blood flow, heart failure stroke, atrial fibrillation and blood clots. Surgery may be required to remove the tumour. Follow up after the surgery would include yearly echocardiogram to ensure there are no new growths and the tumour has not returned.

# Cardiac Surgery

Cardiac Surgery may be performed via different approaches:

## **Sternotomy:**

Traditional approach where the sternum is cut. The incision is approximately 8 – 10 cm.

## **Minimally Invasive:**

Incision via the top half of the sternum. Incision is approximately 5 cm.

## **Mini thoracotomy:**

Horizontal incision in right side of chest. Incision is approximately 5 cm. Used with Da Vinci Robot.

## DA VINCI ROBOT

The Da Vinci robot is a state-of-the-art surgical system that provides an effective and less invasive treatment option. The benefits of this system include:

- No Sternotomy.
- Lower risk of infection.
- Shorter hospital stay.
- Less pain and scarring.
- Faster recovery and return to normal activities.



## CORONARY ARTERY BYPASS GRAFT SURGERY

Coronary Artery Bypass Graft Surgery is an operation to improve blood supply to the heart. This aims to increase the blood and oxygen supply to the heart muscle to relieve angina and reduce the risk of a heart attack.

Blood vessels from your body are used to form a bridge over the narrowed coronary artery. This blood vessel used can be a vein from a leg, or an artery from your arm or chest. One end of the vessel is joined to the coronary artery below the narrowing and the other end is either left attached to your chest or is attached to the large blood vessel that leaves the heart (the aorta). A new blood supply is now available to the heart muscle. The fatty plaque is not removed.

## CORONARY ARTERY BYPASS GRAFT SURGERY USING CARDIOPULMONARY BYPASS

The heart-lung bypass machine is used to deliver oxygen rich blood to your body while the blood vessels are being attached to the coronary arteries. By diverting the blood away from the heart it allows the heart to be stopped and the lungs rested. This allows good access to all arteries on the heart.

## OFF-PUMP CORONARY ARTERY BYPASS SURGERY

Off pump Coronary Artery Bypass Surgery is performed without the use of the heart-lung bypass machine and while the heart is beating. There are many benefits of using this technique, especially in patients with complex medical conditions and elderly patients. Importantly off pump surgery greatly reduces the risk of stroke. Professors Michael Vallely and Michael Wilson of Sydney Heart and Lung Surgeons routinely perform coronary artery bypass surgery without the heart lung machine (off-pump), without touching the aorta (anaortic) using all arterial grafts. This technique has been shown to have many short and long term benefits for patients.

Your surgeon will advise whether this is the best approach for you. Access to the heart is through a cut in the sternum in most cases, however in selected patients the procedure can be performed through a smaller incision with the assistance of the Da Vinci Robot.

## VALVE SURGERY

Valve surgery involves replacing or repairing one or more of your valves. The operation takes approximately 4 hours. A heart-lung or bypass machine is required. The blood flow is bypassed from the heart and lung through a machine and then delivered to the body. By diverting the blood away from the heart it allows the heart to be stopped. The affected valve is then replaced or repaired. Valve repair may involve:

- Removing excess tissue from the cusps or leaflets and to modify the valve and allow the leaflets to close.
- Inserting a ring or band to tighten the annulus.
- Separating leaflets where they are fused together.

If a valve cannot be repaired, it has to be removed and replaced with a prosthetic valve. Two types of artificial valves can be used. One is a mechanical device made of metal or similar substance. The other is a valve consisting of animal tissue such as a pig's aortic valve or a valve formed out of a cow's pericardium. The valve is processed to reduce the risk of rejection.

The main difference with artificial valves is the mechanical metallic valves last much longer than the tissue valves but have a higher likelihood of promoting small blood clots. Although this likelihood is very slight, it does influence the decision on which valve to use. Your surgeon will have discussed this with you.

## SURGERY OF THE AORTA

The aorta is the large artery that takes blood away from the heart. The aorta starts at the left ventricle and ends in the abdomen. It consists of several sections:

- Aortic Valve (including a fibrous ring called an annulus).
- Aortic root.
- Ascending aorta.
- Aortic arch.
- Descending aorta.
- Thoracic/abdominal aorta.

For some people the wall of the aorta can enlarge or dilate making them potentially thin and weak. This weakness is called an aneurysm. An aneurysm has the potential to overstretch and rupture and should be closely monitored or repaired. Common causes include:

- Congenital heart defect.
- Marfan Syndrome.
- Familial aneurysm.
- Bicuspid aortic valve.

Surgery involves replacing the affected area of the aorta and commonly the aortic valve with either a tissue or mechanical/synthetic prosthesis.

Aortic root replacement involves the aortic valve plus the lower portion of the aorta. The coronary arteries are connected to the side of the new prosthesis.



## PREVENTION OF INFECTION IN THE HEART OR AORTIC VALVE

Guarding against infection is important for everyone, particularly for those having heart valve or aortic surgery. Bacteria that may cause infection and seriously damage the valves or other structures of the heart can enter the blood stream in several ways. If you have an artificial heart valve or aortic prosthesis you will always require antibiotic medication prior to any operations or dental work.

It is recommended that you wear a Medic Alert ID to notify people of your medical condition. In an emergency situation where you may be unable to speak, medical services need to be notified that you have an artificial heart valve or have had your heart repaired and that you may be taking Warfarin medication. The Medic Alert will help ensure you receive appropriate treatment.

WARFARIN is anticoagulant medication. It helps prevent clots from forming by “thinning out” the blood. If you need to take Warfarin you will receive an information booklet and receive education before you leave hospital.

### IMPORTANT POINTS TO REMEMBER AFTER VALVE SURGERY

- Have routine check ups with your dentist and physician.
- Wait 6 weeks after surgery before having a dental, diagnostic or surgical procedure performed.
- Notify each doctor caring for you that you have had a heart valve operation.
- Make an appointment to see your doctor if you experience fevers, chills, weight loss/loss of appetite, significant weight gain, or if you develop a cold, sore throat, influenza or local infection.
- Brush your teeth and gums with a soft bristled toothbrush several times a day.

# Preparing for Surgery

After consultation with your surgeon several procedures need to take place. You will need to complete paperwork for the hospital and some further testing or procedures may be required. Some medications, particularly blood thinners, may need to be ceased prior to surgery. You will be advised by your surgeon what is required prior to surgery.

You will be admitted to hospital the afternoon prior to your operation to undergo several pre-operative procedures.

## PRE-OPERATIVE PROCEDURES

- Consultations with the doctors and other health professionals who will be involved in your care.
- Routine blood tests.
- An electrocardiogram (ECG).
- Chest x-ray.
- Clipping of your body hair and antiseptic wash the night before your surgery.

## AFTER YOUR SURGERY

After your cardiac surgery you will be transferred to the Intensive Care Unit where you will be closely monitored. Because you are sedated and asleep for some time, your breathing is assisted by a ventilator via a breathing tube. Whilst you are on the ventilator you will not be able to talk but you will be able to communicate by nodding your head or using your hands. Once you are awake enough the breathing tube will be removed and replaced with an oxygen mask. Generally, this is 6-12 hours after the operation.

You will have other tubes and lines attached to you in the intensive care unit. These include chest drains, pacing wires, intravenous lines, arterial line, urinary catheter and monitors. The length of time spent in Intensive Care varies but generally you are transferred out of the unit on day 2.

You will receive regular pain relief after your operation. Initially it is through an intravenous drip. Then you will be given tablets. It is important to control your pain so that you are able to move around and breathe deeply. Physiotherapy exercises are essential to your recovery.

If your breast bone (sternum) was cut during this procedure, it will take approximately 6 weeks to heal. It is important to protect the sternum during the healing process. You should not use your arms to move yourself around the bed or in/out of a chair. Use a pillow or towel to help support your chest when moving in or out of bed, coughing or sneezing. If the surgical approach was via mini thoracotomy, you are able to use your arm on the unaffected side whilst bracing your wound with the other arm. A rolled up towel or small pillow is suitable to use for both type of wounds. You will be provided with these in hospital.

You will be given elastic stockings to help reduce the risk of blood clots and to support the swelling in your legs. You should wear the stockings for at least 2 weeks after surgery.

Effective physiotherapy is an extremely important aspect of your post operative recovery. This can sometimes feel like very hard work, and some days you may not feel like working. You will be encouraged to perform breathing exercises, arm exercises and walking (once you are stable). It is normal for cardiac surgery patients to sit out of bed the day following your operation.

Fever and night sweats are common following cardiac surgery. These may continue for some weeks following your operation. You will be monitored for temperatures whilst you are in hospital. Appropriate treatment will be initiated if required.

Generally the expected hospital stay is 5-7 days. You will be discharged from hospital when you are ready and it is safe to do so.

### ONE THIRD OF CARDIAC SURGERY PATIENTS EXPERIENCE ONE OR MORE OF THE FOLLOWING POST OPERATIVELY

- **Rhythm Disturbances** - this may include atrial fibrillation (AF) or bradycardia. A combination of therapy may be used to correct these disturbances including medications and supplements such as potassium and magnesium. Your heart rate and rhythm will be normal on discharge from hospital.
- **Pleural or epicardial effusions** - this is excess fluid that collect around the heart or the lungs. Regular X-Rays are taken and examined daily. Intervention such as drainage will be undertaken if required.
- **The Cardiac Blues** - can occur 2 - 3 days following your surgery or sometimes a few weeks afterwards. It is important to talk about your feelings with others. Regular exercise, eating well and support from friends and family can assist you through this time. Attending a cardiac rehabilitation programme, after clearance from your cardiologist, will also be beneficial.

### IMPORTANT POINTS

- **SMOKING** - You are strongly advised to stop smoking. Smoking damages your heart and blood vessels and greatly increases your risk of further heart problems. Passive smoking can also affect your health so avoid smokey environments as much as you can. Ask your local doctor or ring the QUIT line for information on 131 848.
- Do not drive until you have consulted your surgeon at your 6 week appointment.
- Avoid heavy lifting (>5kg) for at least 6 weeks post surgery.
- Avoid activities that cause significant shortness of breath. Ensure you are able to speak easily during exercise.

### CORONARY RISK FACTORS GUIDE

The risk factors you **can** change are:

- SMOKING
- HIGH BLOOD PRESSURE
- PHYSICAL INACTIVITY
- STRESS
- CHOLESTEROL
- BEING OVERWEIGHT
- DIABETES

The risk factors you **can't** change are:

- Family History
- Increasing age
- Gender

Cardiac rehabilitation provides patients and their families with invaluable information and support to aid full recovery and is strongly recommended for all patients following heart surgery.

# Going Home

It is important to remember you will be discharged when you are ready and it is safe to do so. If you need or wish to attend a rehabilitation facility before going home, this will be organised for you while you are in hospital. On discharge you will need to follow up with health professionals. Your appointments to see the cardiologist and surgeon will be made for you.

## REMEMBER TO

- Visit your GP 1 week following discharge.
- Cardiologist 3 – 4 weeks post discharge.
- Surgeon 6 weeks after surgery.

**Please note for our rural patients, follow up may be arranged through your local cardiologist. Sydney Heart and Lung Surgeons will always be available if needed via telephone. Please contact the office or a Nurse Case Manager for assistance.**

### PAIN

Your breastbone will take several weeks to heal. Muscular pain in your neck, back and shoulders is also common and may be eased by attending arm and neck exercises or massage therapy. By the time of discharge your pain should be well controlled. It is important to take regular pain relief for as long as you need it. As your pain improves, try taking your pain relievers in the morning and at night and reducing the number during the day. Remember to support your wound with your small pillow.

If your pain is not well controlled see your local doctor.

If you experience chest pain similar to angina pain go to your nearest emergency department.

### WOUNDS

Do not use soap directly on your wounds. Continue to shower daily and let the water run over the wound. You should not bath, swim or use creams or powders until the wounds are healed. Use a clean towel to pat dry your wounds first. If you notice increased redness, swelling, pain or ooze you should see your local doctor.

### MEDICATIONS

Before you go home the pharmacist will give you your medications with a list which will explain the dosages as prescribed by your Doctor and the actions of your medications. IF you are on Warfarin you will need to have regular blood tests which will be discussed with you.

### STOCKINGS

Stockings are worn to facilitate your circulation and reduce the risk of clot formation. Wear your stockings day and night for **2 weeks** after your operation. If the swelling persists the stockings may be worn for longer. They are hand wash or machine washable on gentle.



Take your first week at home quietly. You should be able to shower and dress yourself, but you may need help putting on your stockings. Follow the exercise and activity guide and get adequate rest. Remember not to lift more than 5 kg for the first 6 weeks while your breastbone is healing.



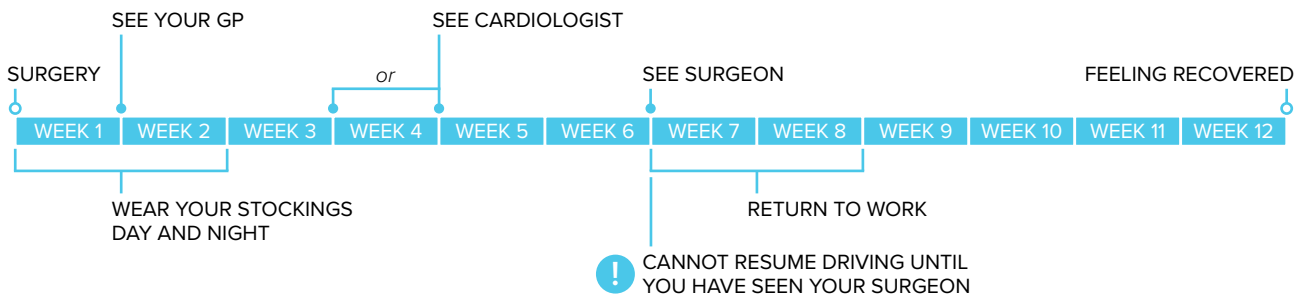
You cannot resume driving until you have seen your surgeons **6 weeks post surgery**.

You can resume your usual sexual activity as soon as you wish, being careful not to put too much pressure on your breastbone. It can take a few months for your usual sexual drive to return however you should consult your doctor if you continue to have problems after this time.

Usually, you are able to return to work approximately **6-8 weeks after discharge**. Sometimes, this is on a part-time basis and dependent upon your occupation. Your surgeon will advise you at your 6 week appointment.

It can take at least 3 months before you are feeling recovered. If you still have concerns after this time please discuss with your doctor.

# Recovery Timeline



# Diet and Nutrition

Following a healthy diet will assist in treating or preventing risk factors for heart disease. The Heart Foundation is a fantastic resource and provides information on a healthy balanced diet. You may also seek help from your GP or consult a dietitian for advice.

# Lifestyle Changes

To decrease your risk of future problems you may need to make lifestyle changes.

## SMOKING

- | Stop smoking! Smoking damages your heart and blood vessels.

## HIGH BLOOD PRESSURE

High blood pressure exerts too much pressure on the walls of the blood vessels and the heart.

To lower your blood pressure:

- Stop smoking! - It also contributes to high blood pressure.
- Keep your weight within normal range.
- Exercise regularly.
- Limit your alcohol intake.
- Limit salt intake.
- Manage stress effectively.
- Take your blood pressure medications as prescribed.

## PHYSICAL INACTIVITY

Regular exercise has a positive effect on all the other risk factors. It helps you lose weight, lowers blood pressure, improves cholesterol and can manage stress. Daily exercise for about 30 minutes should be your goal.

## CHOLESTEROL

A total cholesterol level of less than 4 is recommended by the Heart Foundation. It is important to follow a low saturated fat diet and take cholesterol lowering medications as prescribed.

## OVERWEIGHT

Being overweight puts extra strain on your heart and increases your chance of getting Diabetes. Physical activity and following a healthy diet will assist in weight control.

## DIABETES

Follow a diabetic diet and take medications as prescribed. Maintaining a healthy weight range and regular exercise will help keep your sugar level stable.

## STRESS

Stress can have a negative effect on your quality of life. Exercise, including yoga and relaxation classes can help.

# Contact Information

All public hospitals offer rehabilitation programmes as an outpatient. Contact your nearest public hospital for details.

Sydney Heart and Lung Surgeons wish you a speedy recovery. For assistance contact the rooms on: 9099 4424 or [contact@sydneyheartandlung.com.au](mailto:contact@sydneyheartandlung.com.au).

Please do not hesitate to contact the Nurses if you have any concerns regarding your treatment.



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