Health
Northern Sydney
Local Health District

You and your heart surgery

An education booklet for patients, families and friends

Royal North Shore & Ryde Health Service 5th Edition

Acknowledgements

This education booklet is a collaborative project; we would like to acknowledge the contributions to the current edition from the following departments of RNSH:

North Shore Cardiovascular Education Centre
Occupational Therapy Department
Pharmacy Department
Physiotherapy Department
Nutrition and Dietetics Department
Social Work Department
Department of Cardiothoracic Surgery
Cardiothoracic Case Manager
Dr David Marshman, Head Dept Cardiothoracic Surgery

Thank you to all who have contributed for your knowledge, time and patience in writing and editingthis book.

This booklet is the Fifth revised edition of a booklet introduced in early 1998.

Thankyou to everyone who has contributed to the previous editions.

Thank you to The Heart Foundation for allowing the use of their diagrams.

You and your heart surgery

This book provides information about your condition and should be used in conjunction with specific medical advice from your cardiologist, cardiac surgeon or hospital healthcare team.

You will be able to take this book home with you when you leave hospital. It's important that it remains with you while you are in hospital. Your health care team will use the booklet with you throughout your hospital stay, so even though we know it is interesting to read, please ask your family and friends not to remove it until you go home.

Forward to the fifth edition

This booklet "You & Your Heart Surgery" has been providing reliable information to patients undergoing cardiac surgery at Royal North Shore Hospital for over 20 years. It will inform you about your surgery and what to expect before and after your operation. Please use it as a guide for your surgery and recovery but also feel free to ask questions of any staff.

The Surgeons in the Department of Cardiothoracic Surgery at Royal North Shore Hospital strive to deliver surgical excellence and achieve the best health outcomes for our patients. We have developed a database which records the key clinical data of every patient having heart surgery in our hospital and we regularly contribute to the Australian and New Zealand Society of Cardiac and Thoracic Surgeons (ANZSCTS) Cardiac Surgery Database Program. The aim of gathering and analysing this data is to continually assess and refine and thus improve our surgery. We will also use this data for current and future research projects. Please refer to the Patient Information sheet/s at the back of this booklet for further information.

I thoroughly recommend this booklet to all patients undergoing cardiac surgery in our Department and to their families. I would also like to thank everyone involved with this recent edition.

Dr David Marshman,
Head of Department of Cardiothoracic Surgery, RNSH

Welcome to Royal North Shore Hospital/North Shore Private Hospital

Royal North Shore Hospital (RNSH) and North Shore Private Hospital (NSP) are one of the largest teaching and specialist referral hospitals in Australia. RNSH is affiliated with the University of Sydney and the University of Technology Sydney, and a considerable quantity of medical and scientific research takes place on the hospital campus.

During your stay with us you will be looked after by a large health care team consisting of doctors, nurses, specialists and allied health professionals.

This book 'You and Your Heart Surgery' will provide you with all of the necessary information about your heart surgery, hospitalisation and going home. It should be kept with you in hospital along with any other information sheets you may be given.

Remember, it is normal to have questions about your condition. Please ask staff about any concerns you have.

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Your healthcare team

During your hospital stay you will be cared for by a multidisciplinary healthcare team. Each health care professional that visits you has a specific role to play in your care and recovery. Some members of your health care team will visit you automatically, some you will only see if you request them. Please ask your Nurse or the Ward Clerk if you would like to see any of the health care team.

Doctors

You will be looked after by a team of doctors during your stay in hospital. This team will include your cardiologist, surgeon, registrar and resident doctors as well as other specialists such as the anaesthetist.

Case Manager

Your cardiothoracic case manager will provide education, and monitor your progress while you are in hospital. They will also liaise with you, your medical team and your family to assist your progress throughout your stay, and your transition home.

Nurses

The nursing staff will care for you during your stay and assist you with self-care. Your nursing team will take regular observations to monitor your progress and administer your medications.

Dietitian

Adequate nutrition is important to your recovery. The dietitian is available to you individually for further information and advice.

Occupational Therapist

The occupational therapist will advise you on return to activities of daily living, including work and home duties.

Exercise Physiologist

The exercise physiologist will visit you after your surgery to discuss return to physical activity and exercise once home.

Cardiac Rehabilitation Officer

Your cardiac rehabilitation officer will provide information on cardiac rehabilitation programs in your local area.

Physiotherapist

The physiotherapist will help you 'get moving' after your heart surgery. Physiotherapy in hospital will include mobility and chest physio.

Pharmacist

The pharmacist will explain your medications and answer questions.

Social worker

The social worker is available to you for advice and assistance regarding personal, family and financial concerns.

Discharge planner

The discharge planning nurse will assist you in planning for nursing/ assistance needs following your discharge.

Chaplains/pastoral care

Chaplains and pastoral care staff are available to spend time with you and are happy to contact any religious person with whom you would like to speak.

Ward clerk

The ward clerk provides administrative support to the clinical team and can assist with follow up appointments and discharge paperwork.

Social and emotional impact of cardiac surgery

Diagnosis and preparing for surgery

It may be distressing to discover that you require surgery for a heart condition. Many people have described this discovery as a "time of crisis". There can be a wide range of emotional responses during this time, which may include:

- Shock, disbelief and numbness
- Grief, loss and anger
- Guilt (e.g. feeling of being a burden, or having "failed" to look after one's health)
- Fear and anxiety – of surgical complications; death; what the future looks like; scarring.

These emotional responses are normal, and it is important to acknowledge them. Allow yourself to seek support from both your loved ones and treating team as needed. You are encouraged to discuss your feelings with your nurse, and can also request emotional support from the chaplain or social worker.

After surgery

Your body and your mind have a lot to cope with after heart surgery. Most of your energy and attention tends to be focused on your physical recovery.

While still in hospital, many people report being relieved that they 'made it' through surgery and then feel a little numb. Some describe it as feeling 'out of touch' or 'disconnected'. It's as though your emotions are on hold for a while.

Heart surgery is not a "regular" experience and may give rise to a type of shock reaction where a person's emotions appear to be disconnected for a period of time. Emotions may seem to fluctuate.

As days go by and as you become accustomed to the fact that you

have had surgery you may find that emotions begin to surface such as fear, loss, sadness or guilt. When this happens it can come in waves. This can happen more frequently at first, then less frequently over time. Often it's not until you're back at home that you begin to experience these waves of emotions.

Be assured these are all common experiences.

Returning home

Leaving the hospital can sometimes be a frightening experience as it means professional help is no longer at hand. However, you will not be sent home until the medical and nursing staff are confident you can manage.

Upon returning home, you may find yourself grappling with emotions such as fear or sadness, or sometimes dramatic mood changes. This can affect your confidence, self-esteem and behaviours. You might start seeing yourself in a very different light. Routine activities like taking out the garbage or going to the shops may suddenly seem arduous or overwhelming. You may also find that your relationships with family and friends can be affected.

Such experiences are common after cardiac surgery. Emotional recovery from cardiac surgery often takes longer than the physical recovery, as it is at home where the longer-term emotional impacts become apparent. It is also at home where you will grapple with any subsequent changes to finances or lifestyle, and re-engage with your previous activities and routines. Furthermore, there may be misunderstandings or disagreements with family about the support they provide – what type of support, how it is provided, how much and for how long.

For many people, it takes some time to come to terms with the emotional challenges that arise while recovering from cardiac surgery. Be fair and patient with yourself and your family throughout the recovery process. Over time, you will work through your emotions and regain your confidence. You will also reach new understandings with your family, re-establish a routine and make any necessary adjustments to your lifestyle.

Some suggestions that you may find helpful include:

- **Recognise that your emotional responses and behavioural changes are a normal part of recovery.**
- **Allow yourself to express your feelings to others.**

  Do not deny your feelings or bottle them up. Seek emotional support from your family and loved ones as needed. You can also see your GP for a referral to a psychologist. Your cardiac rehabilitation program offers the opportunity to meet with others who have recently had a cardiac diagnosis and surgery – this shared experience can lead to supportive and understanding friendships, as well as assist with your physical and emotional recovery.

- **Set goals for your recovery**

  Consider your routines, responsibilities and activities. Decide on lifestyle changes you can work on that are beneficial to your health and happiness, and are realistic and sustainable. These changes may include dietary changes, cessation of smoking, weight loss, altered daily routines, a change in employment or work responsibilities, altered work-life balance, improved stress management and greater focus on one's relationships.

- **Establish a routine for yourself after leaving the hospital**

  Wake up at a regular time and perform activities that are in line with your goals for recovery, and suitable for your condition. This may include light work in the home, regular outings, hobby activities, and cardiac rehabilitation sessions.

  Allow yourself sufficient amounts of rest within your routine, and refer to later sections of this handbook for guidelines on resuming various everyday activities

such as housework, exercise, sports and sexual activity. There is also a 12-week home program in this handbook for a gradual return to physical activity, which is recommended as a reference point in establishing your own routine.

Support for the carer

The discovery of a heart condition and the need to have surgery may also be distressing and confusing for your family and loved ones. There may be the initial shock of the diagnosis and surgery. There may be changes in routines, household responsibilities or finances. There can often be confusion and disagreement about how best to support you. In short, there are many ways in which your relationships can be affected or changed. This in turn can lead to increased tension and conflict as well as grief and longing for the past.

It is important to remember that your loved ones are working through the challenges of your cardiac surgery in their own way. Their fears, strategies, timing and beliefs may not match yours and this can lead to frustration and conflict even when all parties are well-meaning. These differences are best managed through open and empathic discussions. Remember that they too need time and support while coming to terms with what has happened, and the changes they may be adjusting to. Be patient and understanding with both yourself and them.

Practical considerations

- When you are admitted to hospital for your surgery, you may need to arrange for others to take care of your responsibilities and affairs (people you may care for; pets; prior appointments; mail and bills etc.). Make arrangements with your family and friends. Otherwise local community services or private service providers are options.
- Upon discharge from hospital, some individuals benefit from a period of respite or supported convalescence in a residential care facility or private hospital. If this is an option that you would like to pursue, ask to see the hospital social worker to discuss what would be available to you.

- It is also possible that you may be able to return home after discharge but will require some additional services to support you for a short period of time. Cardiac surgery will result in some temporary restrictions on driving. There are also restrictions on certain physical activities and exertion. You may find yourself unprepared to resume essential tasks such food preparation and shopping. Friends and family may be able to assist. Private services are another option. Individuals who have previously been approved for home services by the Department of Veteran Affairs or My Aged Care have the option of arranging for services to commence after discharge. Useful services may include:
  - personal care (assistance with showering, toileting)
  - respite care
  - domestic services

You can ask the hospital social worker to assist you with organising home services prior to discharge.

- If you are a country patient there may be some added difficulties regarding transport, accommodation and finances. We are aware of these difficulties and will do everything we can to assist you.

  Country patients who have travelled more than 100km to hospital can apply for a reimbursement of their accommodation and travel costs through the Isolated Patients Travel and Accommodation Assistance Scheme (IPTAAS). Please ask to see the social worker for information and assistance with this application.
- If you are concerned about returning to work or taking leave, please discuss this with your doctor, social worker or occupational therapist
- Enrol in your local cardiac rehab program. Cardiac rehab offers support from specialised staff and other patients, as well as opportunities for further information and supervised exercise.

Questions / notes

How the heart works

The heart

The heart pumps to deliver blood, carrying oxygen and other nutrients to the organs and cells of the body. Your heart is about the size of your clenched fist and is a hollow organ situated in the middle of your chest located directly behind your breast bone.

Your heart is made of muscle. This muscle is supplied with blood by arteries called the **coronary arteries**. These arteries are designed to feed oxygen and other nutrients to the heart muscle.

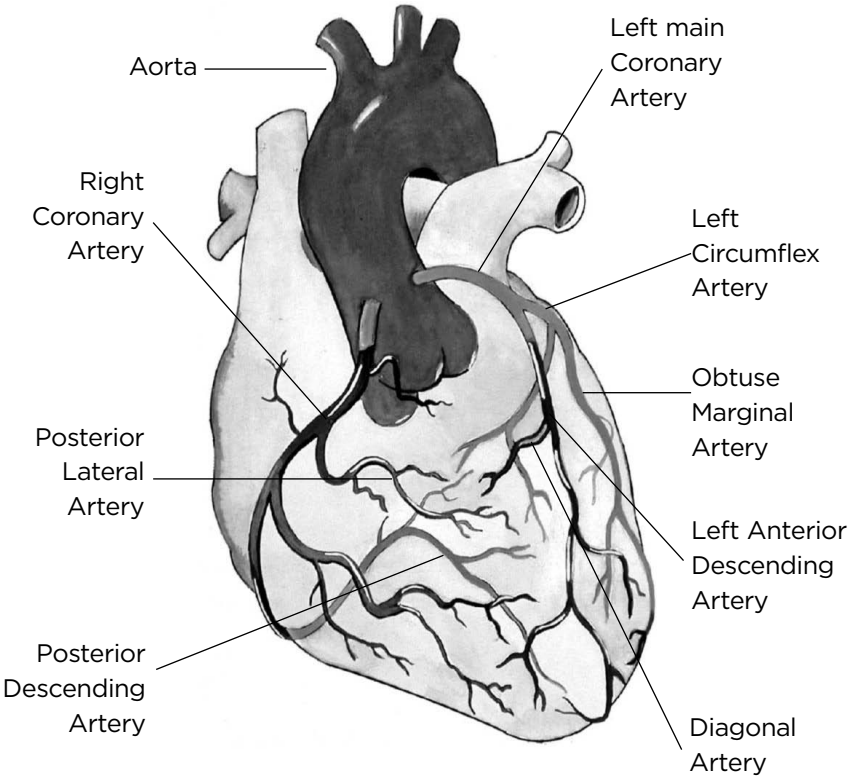


Diagram 1. The Coronary arteries of the heart

Inside the heart, there are four chambers - two smaller chambers at the top, **atria**, and two larger chambers at the bottom, **ventricles**. The wall between the right and left sides is called the **septum**.

The blood that has circulated through the body is pumped into the **right atrium**, the blood then passes through the **tricuspid valve** into the **right ventricle**.

The **right ventricle** pumps the blood through the **pulmonary valve** to the lungs to receive a fresh supply of oxygen. The blood returns to the heart via the **left atrium**. It then passes through the **mitral valve** into the **left ventricle**.

The **left ventricle** then pumps the blood through the **aortic valve** into the **aorta** which takes the blood rich with oxygen to the rest of the body.

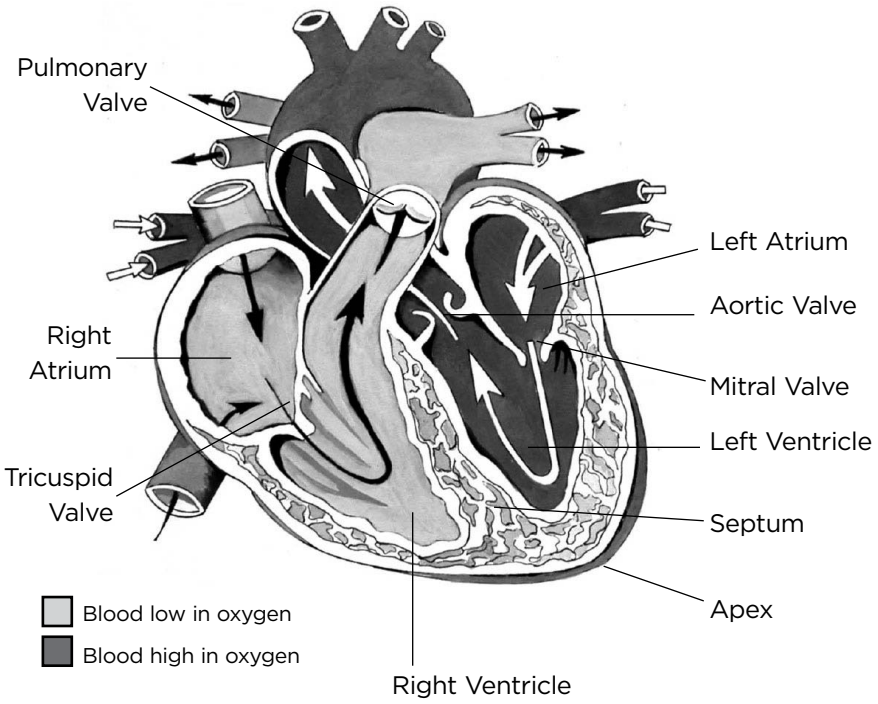


Diagram 2. Blood flow through the heart

Electrical conduction

To achieve its pumping action the heart is equipped with a specialised area that acts as the natural pacemaker. The natural pacemaker is called the Sino-Atrial (SA) Node and is located in the right upper chamber of the heart.

The SA Node initiates an electrical signal or pulse that is first carried through the atria of the heart to a node called the Atrioventricular (AV) Node and then through the ventricles of the heart.

The electrical impulses delivered by the heart's natural pacemaker triggers the heart's muscle cells to cause the heart muscle to contract

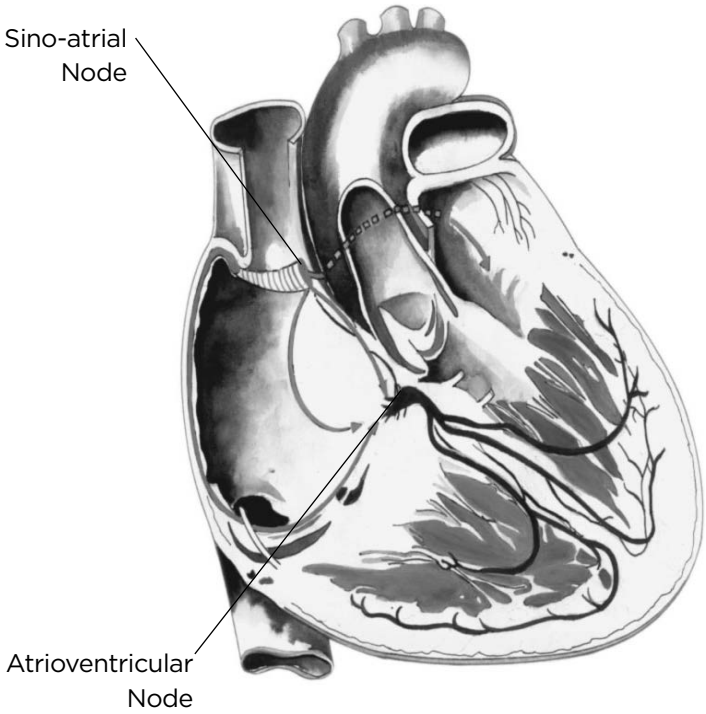


Diagram 3. The electrical pathway of the heart

in a regular rhythm. Through this two part sequence, the heart maintains a rhythmic contraction.

The heart beats at a rate of approximately 60 to 100 beats per minute at rest. This rate does vary depending on the level of activity.

For example, during exercise the rate will increase to provide the body (especially muscles) with the increased blood supply required. To cope with this change of demand, the SA Node will automatically speed up, thus increasing the heart rate and delivering more blood to the body.

Questions / notes

What can go wrong with the heart?

Arrhythmias

Arrhythmias occur when the heart stops beating in a regular rhythm or beats too fast or too slow. This happens when there is a malfunction in some part of the heart's electrical system. As explained previously, this system transfers electrical impulses around the heart causing the heart muscle to contract (i.e. heartbeat). Arrhythmias can be felt in different ways. Some of the feelings associated with arrhythmias include:

- Skipping a heartbeat
- Occasional extra heartbeats and
- Rapid heartbeat or pounding in the chest.

Some arrhythmias are not serious and may occur in healthy hearts. Other arrhythmias may need medical treatment. Common terms associated with arrhythmia are:

- Tachycardia is when your heart beats too quickly, usually more than 100 beats per minute.
- Bradycardia is when the heart beats too slowly, usually less than 50 beats per minute.
- Atrial Fibrillation (AF) is a common disturbance of the electrical system in the heart. It is an abnormal heart rhythm originating in the atria (top chambers of the heart). Instead of the impulse travelling in an orderly fashion through the heart, many impulses begin and spread through the atria causing a rapid and disorganised heartbeat.
- Your doctor will explain your particular arrhythmia to you in more detail including its cause and treatment and answer any questions you may have.

For more information on pacemakers or implantable cardioverter defibrillators (ICD's), additional factsheets are available on request.

Heart valve disease

The heart is a pump with four valves (see diagram 2). They act like "doors" that open and close to ensure that the blood flows in one

direction through the heart, to the lungs and out to the body. If the heart valves are damaged this can reduce the amount of blood pumped out of the heart; it can also lead to a weakened and enlarged heart. Common causes of heart valve disease are: infection, rheumatic fever, congenital (something you are born with) and "wear and tear."

Problems that can affect the valves:

Stenosis: a narrowing or stiffness, which restricts blood flow through the valve.

Regurgitation: in this situation the valve does not close properly leading to "regurgitation" or back-flow of the blood. Also known an "incompetent" or "leaking" valve.

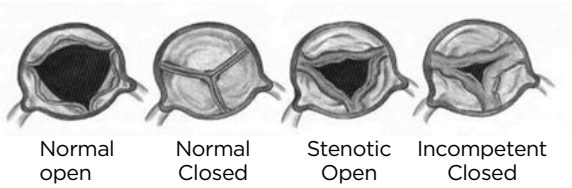


Diagram 4: Normal and faulty heart valves

Initially the heart may be able to compensate for a faulty valve. The development of symptoms (such as: shortness of breath, lethargy, light headedness or chest pain etc.) may be an indication that further intervention is required. Your cardiologist will monitor your condition and may refer you to a cardiothoracic surgeon if a valve repair or replacement is required.

Coronary artery disease

Coronary artery disease is the narrowing of the blood vessels (coronary arteries) that supply oxygen and other nutrients to the heart muscle. The disease causing the narrowing or blockage is called atherosclerosis and is caused by the long term build-up of substances such as cholesterol. This is often called a plaque or lesion.

Often people live for many years with atherosclerosis increasing and have no symptoms or indication that the coronary artery disease is progressing.

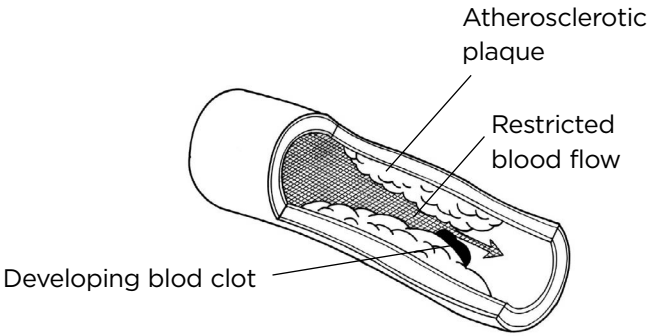


Diagram 5: Formation of atherosclerosis in a coronary artery

The build-up of these blockages is caused by a number of factors acting on their own or in combination. These factors are called risk factors. Some risk factors are modifiable, which means that you can do something to reduce your risk of further developing atherosclerosis. The other risk factors are non-modifiable risk factors, meaning that you are unable to change these as risk factors. Please refer to section 'Long Term Lifestyle Changes' for more detail on risk factors.

If the doctor suspects that you may have coronary artery disease, a number of tests may be performed to help the doctor make a diagnosis. These are outlined in the "Tests and Procedures" section of this book.

Coronary artery disease does not go away, so it is treated according to how bad the symptoms are, as well as where and how serious the blockages are. The various treatments available to you are detailed in the "Tests and Procedures" section of this booklet.

Your doctors will advise the type of treatment that best suits your condition and will explain your particular treatment to you. Remember, any treatment should complement changes you make to your lifestyle in order to reduce your risk factors.

Angina

Angina is a symptom that you may experience if your heart is not getting enough blood and oxygen as it requires. This may be caused by a narrowing of the coronary arteries. Each person may have very different symptoms so it is important that you try to recognise your symptoms and seek medical attention.

Common symptoms

- Dull pain, tightness or heaviness in the centre of your chest
- A squeezing or choking sensation
- Shortness of breath
- Pain in shoulders and/or arms
- Discomfort into your neck or jaw

Less common symptoms

- Pain through from the chest to the back
- Sweating
- Fainting
- Can be mistaken for heartburn

Many people live very successful and full lives even though they have angina. You can achieve this by following these steps:

Always

- Know what brings on your angina
- Learn how to manage an angina attack
- Live a healthy lifestyle
- Take the medications prescribed by your doctor

If you experience angina during physical activity, slow down, stop and use angina medications if necessary. (See “Nitrates” in the Heart Medicines chapter for the administration of anginine). If angina does not subside after 10 minutes treat it as a heart attack and ring 000 for an ambulance. They will decide whether you should go to hospital.

If you are having to limit yourself to avoid angina attacks, you must report this to your local doctor.

Heart attack

If the narrowing in the artery becomes completely blocked, the heart muscle beyond the blockage is starved of vital oxygen and a heart attack (myocardial infarction or coronary occlusion) will result.

The symptoms of a heart attack can be similar to those for angina, with the addition of any or all of the following:

- Feeling sick in the stomach
- Sweating
- Dull pain, chest tightness or discomfort that becomes more severe and does not go away
- Fainting
- Jaw and neck pain
- Severe pain (often described as “crushing”)

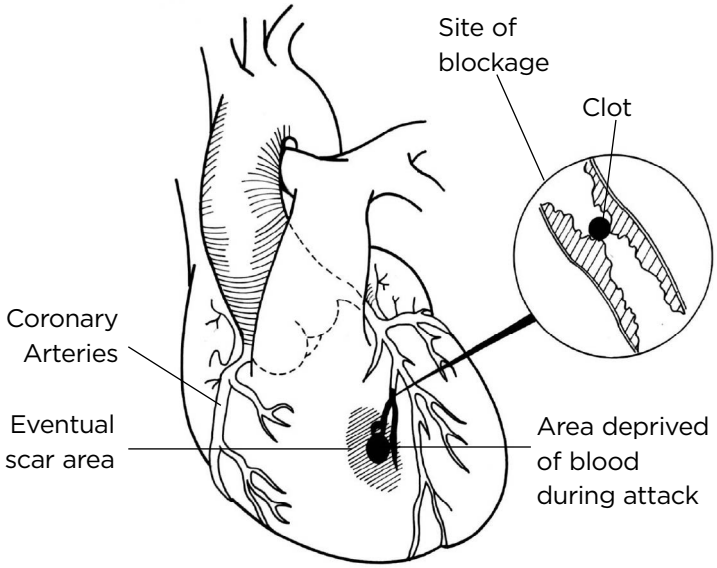


Diagram 6. Heart attack

If you have coronary artery disease and if you experience any of these symptoms that do not go away within 10-15 minutes, it is possible that you may be having a heart attack. An ambulance should be called immediately.

Remember, the quicker you get to the hospital the sooner you can receive treatment to re-open the blocked artery that is causing the heart attack. This helps to prevent/reduce permanent damage to your heart muscle.

Do you know how to do cardiopulmonary resuscitation (CPR)?

Cardiac arrest is the condition in which the heart stops beating. Performing CPR on someone who has suffered a cardiac arrest can save their life.

CPR involves chest compressions, and where possible ventilation (breaths). This helps to circulate oxygen and prevent damage to the brain and other organs until help arrives.

The NSW Ambulance service recommends that everyone should learn CPR. To find a certified CPR training course in your area search online for "Certified CPR Training" or visit the NSW Ambulance service website for more information.

www.ambulance.nsw.gov.au/Community-Info/First-Aid/CPR.html

The following CPR chart is a guide to be used in emergency situations and does not replace certified training.

This chart is reprinted with kind permission of the NSW Ambulance service.

CPR chart

Cardio Pulmonary Resuscitation

Ambulance Service of New South Wales

D Check for danger	**Check for danger** eg electrical cords, petrol or other hazards
R Responsive	**Check for responsiveness** **If no signs of life:** > Unconscious > Unresponsive > Not breathing normally 
SHOUT FOR HELP!	> Get someone to **dial Triple Zero (000) immediately** > Ask for **AMBULANCE** 
A Clear airway	> Place person on their back > Tilt head back (not for infants or injured) > Remove foreign matter from mouth (and nose of baby) > Place on side if there is a lot of foreign matter 

B Check breathing

> Look, listen and feel for breathing

> **If normal breathing is present** leave or place patient on their side

> **If normal breathing is absent commence CPR 2 breaths to 30 compressions at 100 compressions/min**

– Place patient on their back
– Tilt head back (not for infants or injured)
– Lift jaw and pinch nostrils

C Circulation

(at 100 compressions/min)

CHILD & ADULT:

> Place hands over the centre of the chest (sternum).

> Compress sternum one third the depth of the chest **30 times**

> **Continue with 2 breaths to 30 compressions**

> Do not interrupt compressions for more than 10 seconds

INFANT:

> Position 2 fingers on lower half of the sternum

> Depress sternum approximately **one third the depth of the chest**

> **Continue with 2 breaths to 30 compressions**

D Defibrillation

If Automated External Defibrillator (AED) is available

CONTINUE CPR UNTIL PARAMEDICS ARRIVE OR SIGNS OF LIFE RETURN

Beware of rescuer fatigue, if help is available swap rescuers every few minutes

This chart is not a substitute for attending a first aid course. LEARN CPR NOW!

This CPR chart is provided free of charge and must not be sold. The chart is available to download from the Ambulance website at: www.ambulance.nsw.gov.au.

For enquiries about this chart:
Ambulance Service of NSW
Locked Bag 105
Rozelle, NSW 2039
Tel: (02) 9320 7796

This chart conforms to the Australian Resuscitation Council's guidelines on effective CPR as at September 2011. For more information visit: www.resus.org.au

Will you recognise your heart attack?

Heart Foundation

Do you feel any

pain | pressure | heaviness | tightness

In one or more of your

chest | neck | jaw | arm/s | back | shoulder/s

You may also feel

nauseous | a cold sweat | dizzy | short of breath

Yes

1 STOP and rest now

2 TALK tell someone how you feel

If you take angina medicine

- Take a dose of your medicine.
- Wait 5 minutes. Still have symptoms? Take another dose of your medicine.
- Wait 5 minutes. Symptoms won't go away?

Are your symptoms severe or getting worse?

or

Have your symptoms lasted 10 minutes?

Yes

3 CALL 000* and chew 300mg aspirin, unless you have an allergy to aspirin or your doctor has told you not to take it

*Triple Zero

- Ask for an ambulance.
- Don't hang up.
- Wait for the operator's instructions.

*If calling Triple Zero (000) does not work on your mobile phone, try 112.

Types of heart surgery

The following section is a summary of the different types of surgery.
Read only about the treatment or procedure that is relevant to you.

Coronary artery bypass surgery (CABG)

Coronary artery bypass grafting (CABG) restores blood flow to the heart muscle. The surgery does not remove the blockages but creates a new pathway around the blockage - a bypass.

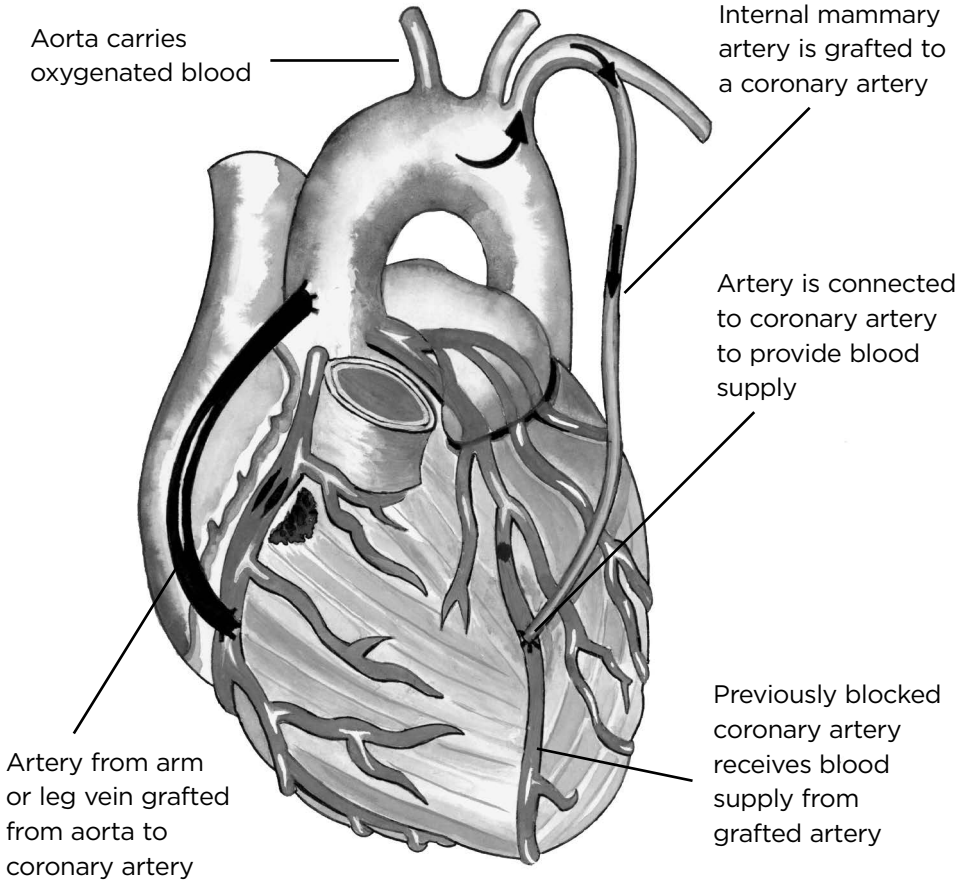


Diagram 7. The heart with a coronary artery bypass graft

A blood vessel from either the leg (saphenous vein), the arm (radial artery) or inside the chest (internal mammary artery) can be used as a bypass graft.

Coronary bypass surgery is performed under general anesthetic, usually through an incision down the middle of the breastbone (sternum) to expose the heart; this is also known as a sternotomy. The patient may be connected to a heart-lung machine which pumps blood through the body whilst the heart is stopped to perform the bypasses.

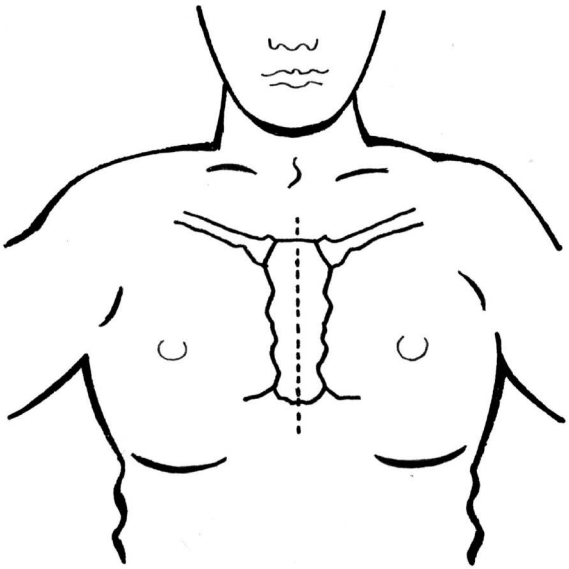


Diagram 8. Sternotomy Incision

‘Off pump’ heart surgery

The heart-lung machine is not used in off pump coronary artery bypass surgery and the surgeon performs the grafting while the heart remains beating.

The coronary arteries are held still using a stabilizing device. The grafting is then performed in exactly the same way as before except that your body is kept warm.

Heart valve surgery

Heart valve surgery is performed to either repair or replace a valve that is no longer functioning correctly. Of the 4 heart valves the aortic and mitral valves are most commonly affected because they are subject to higher pressures. The tricuspid and pulmonary valves are less commonly involved.

When a valve replacement is required there are two types of artificial valve that may be used:

- Mechanical
- Tissue (e.g. bovine)

The choice of valve will depend on your individual circumstances; your surgeon will discuss this with you prior to your procedure.

The most common procedure for valve operation is very similar to coronary artery bypass surgery, with a sternotomy incision.

Aneurysm repair

Aortic surgery is necessary for patients who have an aneurysm (enlargement) of the aorta, to prevent the vessel from bursting or tearing. The aorta is replaced with a synthetic Dacron tube graft.

Aneurysm repair is performed via sternotomy. Preparation and recovery is similar to that for CABG.

Atrial and ventricular septal defect repair

A septal defect is an abnormal opening in the heart muscle wall between the left and right sides of the heart. This opening allows some of the blood from the right side (which is lower in oxygen) to mix with the blood on the left side.

A defect can be repaired either by using a patch to cover the opening, or by direct closure with stitches. There are 2 options for closure:

- Percutaneous, a minimally invasive procedure where a special catheter is inserted via the groin to repair the defect
- Surgical via sternotomy incision – recovery is similar to that for CABG.

Your medical team will discuss with you which procedure would be best for your individual circumstances.

Minimally invasive heart surgery

Minimally invasive surgery can be performed via one or more, small incisions either through the chest wall (thoracotomy) or via the breast bone (sternotomy). If you are a suitable candidate for minimally invasive surgery, your medical team will discuss this with you and answer any questions you may have.

Minimally Invasive Direct Coronary Artery Bypass (MIDCAB)

MIDCAB is a surgical procedure for the treatment of coronary heart disease that is a less invasive than traditional coronary artery bypass surgery (CABG). The surgeon enters the chest cavity through a "mini-thoracotomy" incision (approximately 5cm) between the ribs on the left side of the chest. Patients who have a blockage in only one coronary artery (LAD) may be a candidate for MIDCAB surgery. It is performed "off-pump" - without the use of cardiopulmonary bypass (the heart-lung machine).

Minimally invasive heart valve surgery

In some cases the surgeon may be able to repair or replace the aortic or mitral valve through smaller incisions. The mitral valve may be repaired or replaced through a smaller incision located on the right side of the chest between the ribs. The aortic valve may also be repaired or replaced through "mini-sternotomy" (access through the sternum/ breastbone) where a 10-15cm incision is made through the upper portion of the chest.

Transcatheter Aortic Valve Implantation (TAVI)

TAVI is a minimally invasive aortic valve replacement procedure that is used to treat a damaged aortic valve. It is a relatively new procedure where the aortic valve is accessed via the femoral artery in the groin or a small opening in the chest. A new aortic valve is then implanted directly on top of the damaged one.

Minimally invasive surgery may lead to a faster recovery and a shorter stay in hospital; however this type of surgery or procedure is only suitable for some patients.

A decision regarding the best treatment option for you is made in

conjunction with your healthcare team who will assess your symptoms and overall health and be able to answer any questions or concerns you may have.

Complications during or after surgery

Complications can potentially occur with any surgery. Your medical team will discuss any potential complications with you prior to your procedure.

Your admission to hospital

The following section contains information regarding your hospital admission and what will happen, before, during and following surgery.

The health care team will explain what is happening throughout your hospital stay. If there are any questions or concerns, please ask.

Before your admission to hospital

Medicines

It is important to bring all of your medicines with you when you are admitted to hospital. This includes prescription medications, herbal medicines and vitamins.

Some medications thin your blood (anticoagulants and anti-inflammatories) including aspirin, warfarin, Indocid, and fish oil. You will be advised by your surgeon and Case Manager when to stop taking medication prior to surgery.

If you have any questions with regard to your medication please call the

Cardiothoracic Case Manager (02) 9463 2625

Preparing your skin for surgery

Cleaning your skin reduces the number of skin bacteria and therefore decreases the risk of wound infection.

We ask that you therefore wash your body thoroughly (including your hair) with an **antiseptic** soap (e.g. Sapoderm) under the shower the night before and the morning of your surgery.

Talcum powders, body sprays and moisturiser should not be used after showering.

Travel assistance

The NSW Isolated Patients Travel and Assisted Accommodation Scheme (IPTAAS) provide some financial assistance to patients that need to travel more than 100km to hospital.

There are motels/hotels within walking distance from the hospital, for information please contact the booking clerk on 94632432 or cardiothoracic Case manager on 9463 2625.

Cancellation

Occasionally due to unforeseen circumstances, surgical cases are cancelled at short notice. If this does occur, a new date will be arranged as soon as possible. It is for this reason that travel insurance is recommended if flying to Sydney. Mobile phones should be charged and remain on prior to travelling to Sydney so that the admissions office can advise of any change of plans.

Pre-Surgery tests and investigations

There are a number of tests and investigations that need to performed before your surgery. These are organised by your surgeon, GP or at the Pre Admission clinic.

The tests are:

- Blood tests, including:
  - Full Blood Count,
  - Liver and kidney function,
  - Hepatitis B,C and Human Immunodeficiency virus status
  - Coagulation studies
- Electrocardiogram (ECG)
- Echocardiogram (Echo)
- Carotid Doppler: A scan of the blood vessels in your neck to detect any narrowing, or blockages, of the carotid artery.

Tests and investigations

This section contains information on tests and procedures that you may undergo before or during your stay in hospital.

Please read only about the tests that are relevant to you. Your doctor will provide you with the results and more information following the various tests you have undergone.

Chest x-ray

An x-ray of the chest is useful to detect lung disorders (e.g. chest infections) and is also helpful for detecting signs of heart disease. If you are having heart surgery, a chest x-ray is routinely performed beforehand and is often referred to during surgery.

Electrocardiogram (ECG)

An ECG is used to detect abnormal heart rhythms as well as sick or damaged heart muscle. The ECG is a simple, painless and common investigation, which takes about 5 minutes. During the ECG, electrodes will be placed on your chest, wrists and ankles. These electrodes will record the electrical activity of the heart. The ECG produces a “picture of the heartbeat” showing how the electrical pathway is working.

Echocardiogram (Echo)

This is a painless and very useful test on the heart. Echocardiography uses ultrasound (sound waves) to create a picture of your heart. This test is performed for a variety of reasons such as: to evaluate heart sounds, heart size and to assess how well the heart and valves are functioning.

Coronary angiogram

A coronary angiogram is used to determine if your coronary arteries are narrowed or blocked. Under the guidance of x-ray, wires and small catheters are inserted through the arteries and a contrast dye is injected to create a clear image of the coronary arteries.

Exercise stress test

Exercise stress testing is used to evaluate how well your heart copes with the extra demands placed on it during physical activity, whereas a routine ECG is done with the heart at rest.

Stress sestamibi heart scan (with or without Persantin)

This test is performed to assess blood flow to the heart muscle. The scan is performed in two parts- at rest (part 1) and during stress (part 2). The 'Stress' (exercise) component increases your heart rate and the coronary blood vessels then expand increasing blood flow and oxygen to the heart muscle. If you are unable to exercise on a treadmill the doctor may use a drug called Persantin, which has a similar effect and opens up the coronary arteries as if you were exercising.

Cardiac Magnetic Resonance Imaging (Cardiac MRI)

Cardiac MRI is a non-invasive medical test that helps to evaluate and diagnose conditions related to your heart, including coronary artery disease, damaged muscle caused by a heart attack, heart failure, heart valve problems or conditions that may affect your heart muscle.

Computerised Tomography (CT) coronary angiogram

A CT coronary angiogram is a special test that looks at the coronary arteries that supply your heart muscle with blood. It is primarily used to evaluate your coronary arteries for coronary artery disease.

The day of admission to hospital

If your admission is a day prior to surgery please register at the Admission Centre (take orange lift to level 4). Paperwork will be completed and you will be directed to the appropriate ward.

On arrival at the ward the doctor will record your medical history and order any tests that are required. These may already have been attended in the Pre Admission clinic. Nurses will record your observations. An anaesthetist will also see you and take a history to ensure safety during anaesthesia.

If your admission is on the day of surgery please arrive at the main entrance of the hospital and take the orange lifts to level 4 and proceed to the Short Stay Surgical Unit SSSU reception desk. Patients first on the list will be asked to come to hospital between 5.30am – 6am. At 5.30am there is no one at reception desk. Please press intercom button by the door of the waiting lounge reception.

What to bring to hospital

- Loose pyjamas/nightdress
- Non slip shoes/slippers
- Toiletries
- Glasses hearing aids and dentures if applicable
- Small amount of money for TV, newspaper etc.
- All medication you are taking including herbal medicine
- Computer/mobile phones can be bought in after surgery for your use

Accommodation

The majority of wards at Royal North Shore Hospital consist of rooms with four beds or single rooms. If you are a private patient, the ward will try to accommodate a request for a single room, however, RNSH is a public hospital and any patients that require isolation due to infection or any other medical reason will always take priority.

Visiting hours

Visiting hours are generally 11am to 1pm and 3pm to 8pm in the ward. Preferably rest period between 1pm and 3pm.

The Cardiothoracic Ward (6B) phone number is 9463 2620.

In Intensive care visiting hours are 10am to 8pm; visiting outside these times is permitted only in extenuating circumstances.

Visitors are limited to two at the bedside. Children are allowed at the discretion of the parents.

The Cardiothoracic Intensive Care (6E) phone number is 9463 2650.

The day before surgery

Informed consent

The Doctor will ask you to sign a consent form (this is not completed in advance). This consent gives permission for the operation to be performed and for the administration of the anaesthetic and blood transfusions. It is important that patients have a clear understanding of any proposed procedure as well as any risks that may be associated with it. Please feel free to use the opportunity to discuss with the team any questions or concerns you may have.

Body shave preparation

On the evening prior to surgery a surgical dresser will use a special hair clipper to remove chest/leg hair. You will be asked to shower with anti-bacterial soap after this shave.

Diet

It is essential that your stomach is empty for surgery. The staff will inform you when you are placed on 'Nil by Mouth'.

Leg stockings

Your legs will be measured for some firm leg stockings. You will wear these leg stockings after your surgery to help blood circulation in the legs. These are removed before discharge from hospital.

Anaesthetist

The anaesthetist will explain how you will be put to sleep during the operation and describe your care during and after the operation.

Physiotherapy

A physiotherapist will assess your lung function and teach you the exercises you will be doing after your surgery.

The day of surgery

Shower

On the morning of surgery you will be asked to shower with antibacterial soap. Your nurse will supply you with a gown to wear to the operating theatre. All makeup, nail polish, jewellery, hair pins and contact lens are to be removed.

Personal items

Your belongings will be sent to Intensive Care. We encourage patients to send valuables and excess luggage home with family or friends and brought back in when you return to the postoperative ward. The hospital security can also look after valuables if required.

Premedication

You will be given a pre-medication prior to surgery which is ordered by the anaesthetist. It is given as an injection or tablets. The pre-medication will dry your mouth and make you drowsy.

You must remain in bed after receiving your pre-medication so you should empty your bladder (pass urine) first. You will be required to wear an oxygen mask after receiving the injection or tablets. A nurse and porter will escort you to the operating theatre.

Your family can stay with you during this time on the ward and accompany you to the theatre suite entrance.

Operating theatre

An anaesthetic nurse will meet you at the operating theatre and ask you your name and will check the type of operation that is to be performed. This nurse will escort you to the anaesthetic room, where your blood pressure will be taken and an intravenous (IV) drip will be placed in your arm.

You will then be transferred to the operating room. The staff will lift you onto the theatre table. The anaesthetist will give you an injection to put you to sleep.

Your family

We understand that this is a very stressful time for your family. There is a waiting room outside the Intensive Care Unit for relatives, which is located on Level 6. The surgery usually takes 3-5 hours. We suggest it is less stressful for family if they organise to do something away from the hospital during this time.

While you are in Intensive Care please ask only one family member to telephone to enquire of your condition. That family member can then contact your family and friends to update them on your progress.

After your surgery

Intensive Care Unit (ICU)

After your operation you will be transferred to the Cardio-thoracic Intensive Care Unit. You will remain in Intensive Care for 24-48 hours or until you are no longer in need of intensive care treatment.

Many types of equipment are used to monitor and assist you after the surgery:

Breathing (endotracheal) tube

During your surgery an 'endotracheal' or breathing tube will be placed via your mouth into your windpipe. You will be unable to speak while this tube is in place.

The tube is attached to a ventilator which helps you breathe. Ventilation allows you to rest, decreases the workload of the heart, and maintains a good supply of oxygen to the tissues. A nurse will be with you at all times.

When you first wake the tube may feel a little uncomfortable. It will help if you relax and not 'fight' the ventilator. For the staff to communicate with you, they will ask 'yes' and 'no' questions so that you can nod and shake your head to answer.

On a few occasions the nurse will need to remove secretions normally cleared by coughing. This procedure can make you cough but is performed quickly.

Once your condition is stable the tube will be removed.

Heart monitor

Monitor leads are connected to your chest to allow a continuous reading of your heart rhythm and rate.

Intravenous lines

These lines are inserted by the anaesthetist to allow you to receive fluids and medication and monitor your heart pressure. Another line is placed in your wrist. It is used to monitor your blood pressure continually. Blood samples can be taken from this site.

Draining tubes

You will have two or three tubes in your chest after your operation. The tubes prevent any accumulation of blood and fluid around the heart. The tubes are usually removed 1-2 days after surgery.

Urinary catheter

The urinary catheter is a small tube inserted into your bladder. Sometimes the tube can make you feel as if you want to pass urine. The catheter is usually removed 1-2 days after surgery.

Pain relief

Everyone experiences pain after surgery. The first few days are the most uncomfortable. You will receive pain relieving medication continually via the central line in Intensive Care. Usually after the first 2 days you will be given tablets. In order to perform your deep breathing and coughing exercises effectively after the operation and to prevent chest infection, it is essential that you receive sufficient pain killers.

Transfer to ward

You will be transferred to the cardiothoracic ward, when you no longer need intensive care.

Wound management

You will have a special type of dressing called a ‘comfeel’ over your sternal wound. This dressing is waterproof and will be changed prior to discharge.

You may notice slight puffiness or swelling around the wound. The swelling decreases gradually and disappears completely in 6-8 weeks.

Diet

Once on the ward, you will be on a well-balanced diet. You may find that you are not very hungry for a few days. This is a common response to heart surgery.

Nausea is common and the nurse can give you medication to help. Your appetite will gradually return to normal.

You may be on a fluid restriction whilst in hospital to limit post-operative swelling of your legs. You should drink when thirsty.

Bowel function

The medications given for pain relief, and decreased physical activities can lead to constipation. You will be given medication to help with your bowels.

Preventing blood clots

To prevent blood clots, you will be given a small injection twice a day after surgery. You will be given compression stockings to wear in hospital. Compression stockings improve circulation and decrease the risk of clot formation. Stockings are worn until you go home.

You may be asked to wear stockings for 2 weeks after discharge if your legs are still swollen.

Wires

Temporary pacemaker wires will be removed about four or five days after the surgery. Sometimes they may remain longer.

Pain or discomfort

It is normal to experience some wound, muscle and bone discomfort after cardiac surgery. You can do several things to help ease the tightness in your chest and shoulders:

- Use good posture when you sit and stand
- Frequent walks
- Exercise your arms and shoulders when you awaken in the morning and after you take a nap.

Please let the nurse know if you need pain medication. Most patients will need pain medication for at least two weeks.

Fever

It is not uncommon to have a fever for five to six days after surgery, until your lungs are cleared of mucus.

You may perspire during the day or more commonly experience “night sweats”. If this continues for several weeks after discharge from hospital please see your GP.

Delirium

Due to the stress of the operation and drugs given, some patients experience delirium, confusion, or hallucinations. Some have the occasional bad dream when sleeping. If this occurs it is important to remember that this problem usually lasts only a short period of time.

If this occurs notify your nursing team or doctors.

Physiotherapy and activity in hospital

A physiotherapist will see you when it is safe to begin exercising; usually the first day after your surgery. You may be provided a second information booklet **'Physiotherapy after heart surgery at RNSH'** detailing your physiotherapy protocol.

Your physiotherapy will include:

- Sitting out of bed in a chair
- A progressive walking program
- Deep breathing/coughing exercises
- Gentle limb movements
- Moving safely to protect your sternum

Deep breathing & coughing exercises

Deep breathing & coughing exercises are an essential part of recovery as they help to remove secretions from your lungs. A physiotherapist will teach you these exercises on the first day after surgery. These exercises should be performed every hour.

Walking

Walking is essential to your recovery. It helps lung and bowel functions and improves exercise tolerance. Your physiotherapist will advise you when it is safe to walk by yourself. You should gradually increase the distance and frequency of your walks.

You will follow an activity program that allows a daily increase in activities. Remember, it is normal to feel tired and weak for the first couple of weeks so be sure to rest between activities.

Preparing for discharge

Your health care team will assess you daily to determine your readiness for discharge.

Your healthcare team, including doctors, nurses and Allied health will ensure that arrangements have been made for services you may require on discharge home. These may include assistance with shopping, cleaning or transport if required.

A member of the cardiac rehab team will visit to discuss your recovery exercises and refer you to a cardiac rehabilitation program close to your home.

A nurse will check your wounds and discuss general care for the next couple of weeks and your appointments will be explained to you. It is a good idea to write down any questions as you think of them so that you remember to ask before you leave hospital.

The day of discharge

On the day of discharge the nurse will check you have your discharge medications, letters and appointments.

Travelling home

It is important to organise someone to transport you home on your day of discharge. You must not drive home or take public transport. Your family/friends can collect you by lunchtime. You may wait in a comfortable 'transit lounge' until your transport arrives.

When travelling longer distances it is best to stretch your legs for a few minutes every hour to relax your muscles and increase your circulation. A seat belt should be worn and a pillow placed between the belt and your chest.

Rest

In your daily activity plan, include a nap or rest period mid-morning and/or mid-afternoon. Additionally – rest for a short while after eating.

While rest is important you should avoid excessive sleeping and sitting. Prolonged periods of inactivity can result in increased muscle and bone discomfort and poor circulation to the rest of the body.

Follow up appointments

Surgeon

Most patients are to see their surgeon for a follow up visit between four and six weeks after discharge, depending upon where you live and travel requirements.

GP

Make an appointment to see your GP within 3-5 days of discharge. The GP will renew your prescriptions and remove your wound dressings.

Cardiologist

Your cardiologist will also want to see you approximately three to four weeks after discharge. Make an appointment once you go home.

Cardiac Rehabilitation

Contact your local cardiac rehabilitation program within the first few days of being home to arrange a timely assessment (see the chapter on Cardiac rehabilitation for further information).

Should it be necessary for you to have any medical/surgical or dental treatment, inform your doctor or dentist about your heart disease/ operation and current medications.

Heart medications

This section contains information on the most commonly prescribed medications, however it does not contain all of the available information about medications used to treat heart disease. If you have further queries or concerns about your medications ask your doctor or pharmacist. Always take your medications as prescribed by your doctor.

Many different medications are used to treat heart disease, all of which belong to a few main groups. Although the medications may be similar, within each group there are differences that may make a medication more suitable for some people. This enables your doctor to choose a medication that will suit you.

All medications have a “generic” name and a “brand” name. There may be several different brand names of the same medication therefore it is very important that you know the generic name as well as the strength of your medications.

In order to simplify your medications, some pharmaceutical companies create combined products to try and reduce the number of tablets you may need to take.

It is important to take your medications at the same time each day. Many medications can interact with other drugs, over the counter medications, alternate medicines, and herbal supplements. It is therefore important to check with your doctor or pharmacist before starting anything new.

To reduce the risk of medication errors between your G.P. and your specialist, you can help by keeping an up to date list of all your medications, including their dose and the frequency with which you take them. Visit the NPS Medicine Wise website for some information on creating your own “medicines list”, or ask your local pharmacist to help you create one.

Blood pressure lowering medications

ACE inhibitors

Angiotensin converting enzyme (ACE) inhibitors are very effective in treating heart failure, lowering blood pressure and can also benefit patients who have had a heart attack. They open up (dilate) your blood vessels helping your heart to pump more efficiently.

Generic name	Brand name examples
Captopril	Acenorm, Capoten
Enalapril	Auspril, Enahexal, Renitec
Fosinopril	Monopril, Fosinopril, Monace
Lisinopril	Fibsol, Prinivil, Zestril
Perindopril (arginine)	Coversyl
Perindopril (erbumine)	Perindo, Indopril, GenRx
Quinapril	Accupril, Acquin, Aquinafil
Ramipril	Ramace, Tritace, Tryzan
Trandolapril	Gopten, Tranalpha

Note: Some of the above medications can also be found in combination products. Perindopril arginine 2.5mg is equivalent to Perindopril erbumine 2mg.

Side effects and adverse reactions:

- Light-headedness or dizziness may occur if your blood pressure is too low. If affected, get up slowly from your chair or bed.
- Dry cough, headache, nausea and vomiting.
- High potassium level in the blood.
- Swollen face, lips, mouth or throat, or difficulty in breathing (seek immediate help from a doctor)

Angiotensin-2 Receptor Blockers (ARBs)

These medications have a similar action to the ACE inhibitors. They are usually better tolerated and usually used only if you are unable to tolerate an ACE inhibitor. These medications allow blood vessels to relax, thus lowering your blood pressure.

Generic name	Brand name examples
Candesartan	Atacand, Adesan
Eprosartan	Teveten
Irbesartan	Avapro, Karvea, Abisart, Irbestat
Losartan	Cozavan, Cozaar
Olmesartan	Olemetec
Telmisartan	Micardis, Pritor
Valsartan	Diovan

Note: Some of the above medications can also be found in combination products.

Side effects and adverse reactions:

- Light-headedness or dizziness may occur if your blood pressure is too low. If affected, get up slowly from your chair or bed.
- Headache
- High potassium level in the blood.
- Skin rash or itchiness, aching muscles or joints, not caused by exercise (seek immediate help from a doctor)
- Yellowing of the skin and / or eyes (seek immediate help from a doctor)

Anti-Arrhythmic medications

Anti-arrhythmic drugs are used to control the rhythm of the heart. Other medications that also act as anti-arrythmics can be found under beta-blockers (e.g. sotalol), and some of the calcium channel blocker medications (e.g. diltiazem and verapamil).

Digoxin

Not only is digoxin an anti-arrhythmic, but it can also improve the function of the heart in heart failure.

Generic name	Brand name examples
Digoxin	Lanoxin, Sigmaxin

Side effects and adverse reactions:

- Loss of appetite, nausea, vomiting, diarrhoea, and tiredness.
- Visual disturbances or confusion (seek immediately help from a doctor)

Other information:

- Avoid taking antacids, e.g. Mylanta® or laxatives, e.g. Metamucil® within 2 hours of taking your digoxin tablets, since the absorption of digoxin into your body may be reduced.
- Take digoxin with or after food to reduce the chance of nausea.
- Your doctor may order a blood test to check your digoxin level, kidney function and potassium levels. If the digoxin level is too high it can mean that you are more likely to experience side effects and you may need a dose adjustment.

Remember to withhold the dose of digoxin on the day of the blood test (for more accurate results) – you may need to check with your doctor to obtain an earlier blood test time to avoid missing the dose.

Amiodorone

Generic name	Brand name examples
Amiodarone	Aratac, Cordarone X, Rithmik

Side effects and adverse reactions:

- Headache, nausea, vomiting, sleep disturbances, taste disturbances (metallic), numbness or tingling in fingers or toes, visual disturbances, and increased sensitivity to the sun.
- You will need to have regular thyroid, eye, and lung function tests
- Avoid grapefruit juice whilst taking amiodarone.
- Shortness of breath, cough or flu-like symptoms, weakness in walking, muscle cramps, loss of balance, disturbances in heartbeat. (seek immediate help from a doctor)

Flecainide

Generic name	Brand name examples
Flecainide	Flecatab, Tambocor

Side effects and adverse reactions:

- Palpitations, fatigue, chest pain, abdominal pain, constipation, rash, tremor, nervousness and numbness on the body.

Sore throat, flu-like illness, fatigue or anaemia within a few weeks of starting medication. (Seek immediate help from a doctor.)

Anticoagulant medications

Anticoagulant medications work by inhibiting blood clotting factors in order to prevent clots from forming in the body. Patients with atrial fibrillation/flutter may be on an anticoagulant in order to prevent a clot from forming in their heart. Patients with artificial heart valve may also be on an anticoagulant to prevent clots from forming on the valve.

Anticoagulants can also break down clots which have already formed, for example in the legs where it is known as a DVT (deep vein thrombosis), or in the lungs where it is known as a PE (Pulmonary embolism). If clots are left untreated they can travel to the brain and cause a stroke.

The main side effects of these medications include bleeding and bruising, and if you notice any severe bruising or bleeding (e.g. blood in urine/faeces, or coughing up of blood), notify your doctor straight away.

Many medications can interact with anticoagulants, so before starting anything new, be sure to check with your pharmacist or doctor. Avoid taking non-steroidal anti-inflammatory drugs like ibuprofen or diclofenac for pain. Paracetamol is the preferred choice for pain in people who are taking anti-coagulants. Remind other doctors and your dentist that you take warfarin, they will advise you about ceasing warfarin temporarily prior to any elective surgery or procedures.

There are a number of different types of anticoagulant medications. The original and most well-known is warfarin, however in the past couple of decades, another 3 have come on the market in Australia. These are known as Novel (and/or Direct) Oral Anticoagulants (NOACs).

Warfarin

Generic name	Brand name examples
Warfarin	Coumadin, Marevan (NOT interchangeable)

Note: If you usually take Marevan® please notify your doctor or nurse during any hospital admissions.

Side effects and adverse reactions:

- Increased risk of bleeding/bruising
- Coughing up blood, blood in urine/faeces, severe bruising/bleeding (seek immediate help from a doctor)

Other information:

- The INR is a measure of how long it takes your blood to clot. You will need regular blood tests to measure your INR so your doctor can tell you what dose of warfarin to take. This dose may constantly change.
- Be aware that many medications and some foods can change the INR or clotting time. Ask your doctor or pharmacist if in doubt.
- Limit alcohol where possible.

Other anticoagulant agents (NOACs)

Many of the general precautions outlined for warfarin above also apply to these agents; however as opposed to warfarin these agents do not require routine blood tests (INR) to guide dose adjustment.

Generic name	Brand name examples
Dabigatran	Pradaxa
Rivaroxaban	Xarelto
Apixaban	Eliquis

Side effects and adverse reactions:

- Increased risk of bleeding/bruising, diarrhoea, nausea, vomiting
- Severe bruising or bleeding, coughing up of blood, blood in urine/faeces (seek immediate help from a doctor)

Antiplatelet medications

Platelets are small blood cells which are important in helping the blood clot. Antiplatelet medications prevent clots from forming by making the surface of the platelet less sticky.

Aspirin

Generic name	Brand name examples
Aspirin	Astrix, Cartia, Cardiprin

Side effects and adverse reactions:

- Stomach irritation and discomfort, wheeze and difficulty breathing, increased risk of bleeding.
- Coughing up blood, blood in urine/faeces, severe bruising/bleeding (seek immediate help from a doctor)

Other information:

- Aspirin should be taken with food to prevent stomach irritation
- Effervescent tablets should be dispersed in water before taking

Other antiplatelet agents

Other antiplatelet agents are usually taken in addition to aspirin, they prevent blood clots in patients who have had a heart attack or have unstable angina, or from forming on newly implanted stents.

Clopidogrel may also be used in strokes and heart disease in patients who are allergic to or intolerant of aspirin.

Generic name	Brand name examples
Clopidogrel	Plavix, Iscover, Piax
Prasugrel	Effient
Ticagrelor	Brilinta

Note: Clopidogrel also comes as a combination product with aspirin: CoPlavix (aspirin 100mg + clopidogrel 75mg)

- After a stent, patients are usually put onto two anti-platelet agents. Usually, aspirin is continued lifelong, whereas the second anti-platelet (for example, clopidogrel, or ticagrelor), is usually only continued for

about 12 months, as this is the period in which you are most likely to develop a clot on your stent.

- Do not stop taking any of these medications without first consulting your cardiologist

Side effects and adverse reactions:

- Bleeding/bruising, indigestion, stomach pain, nausea, vomiting, diarrhoea, skin rash, shortness of breath, headache

Alert (your doctor) if you experience:

- Any sign of infection such as sore throat, fever and chills.
- Prolonged or abnormal bleeding or bruising occurs.
- Signs of jaundice; e.g. yellow eyes or skin, dark urine or light coloured stools.

Beta blockers

Beta blockers block the effects of adrenaline on your heart and blood vessels, reducing your heart's work. Beta blockers have a protective effect after a heart attack, and are also useful in preventing attacks of angina. They control blood pressure and heart rate. Some beta blockers can be used in heart failure to help the heart work more effectively.

Generic name	Brand name examples
Atenolol	Noten, Tenormin, Tensig
Bisoprolol	Bicor, Bispro
Carvedilol	Dilatrend
Labetalol	Presolol, Trandate
Metoprolol (tartrate)	Betaloc, Minax
Metoprolol (succinate)	Toprol XL (controlled release)
Nebivolol	Nebilet
Oxprenolol	Corbeton
Pindolol	Barbloc, Visken
Propranolol	Inderal, Deralin
Sotalol	Sotacor, Solavert

Side effects and adverse reactions:

- Tiredness when exercising, low blood pressure, dizziness, drowsiness, stomach upsets, nausea and vomiting, slow heartbeat, impotence, decreased concentration, cold hands or feet, nightmares, hallucinations, and sleeplessness.
- Very slow heart rate, cold hands and feet, breathing difficulties, visual disturbances (seek immediate help from a doctor)

Calcium channel blockers

Calcium channel blockers open up your blood vessels, resulting in an increase of blood supply to the heart and reducing the work the heart has to do to pump blood around the body.

Calcium channel blockers can be used to lower blood pressure and to prevent angina.

Generic name	Brand name examples
Amlodipine	Norvasc, Amlo, Nordip
Felodipine ER	Plendil ER, Felodur ER
Lercanidipine	Zanidip, Lercan, Zircol
Nifedipine	Adalat, Adefin, Nyefax
Nifedipine XL	Adalat Oros, Adefin XL
Diltiazem	Cardizem, Vasocardol
Diltiazem CD	Cardizem CD, Vasocardol CD
Verapamil	Anpec, Isoptin
Verapamil SR	Cordilox SR, Isoptin SR, Veracaps SR

Side effects and adverse reactions:

- Low blood pressure causing dizziness, light-headedness or faintness, headache, flushing, constipation especially with diltiazem and verapamil.
- Muscle cramps, slow heart rate, swelling of the ankles, shortness of breath (seek immediate help from a doctor)

Cholesterol (lipid) lowering agents

'Blood lipids' is the name given to all the fatty substances in the blood, including cholesterol and triglycerides. The overall aim of diet and drug treatment is to lower the amount of cholesterol in the blood. These medications should be taken in conjunction with a low fat diet.

Statins (HMG-CoA reductase inhibitors)

Generic name	Brand name examples
Atorvastatin	Lipitor, Trovas, Lorstat
Fluvastatin	Lescol, Vastin
Pravastatin	Pravachol, Lipostat
Rosuvastatin	Crestor, Cavstat
Simvastatin	Lipex, Zocor, Simvar

Statins not only lower bad cholesterol, but it also increases the level of good cholesterol. Statins can also reduce inflammation in the blood vessels and stabilise fatty plaques within the vessels. Grapefruit juice should be avoided as it can increase statin levels in the blood.

Side effects and adverse reactions:

- Constipation, diarrhoea, wind, stomach upset, nausea, headache, dizziness, inflammation of the liver, muscle ache.
- Muscle aches, tenderness or pain, unusual tiredness, fever (seek immediate help from a doctor)

Other medications used to reduce blood lipids:

- Ezetimibe (Ezetrol)
- Nicotine acid
- Fibrates (fenofibrate and gemfibrozil)
- Cholestyramine

Diuretics – fluid tablets

Diuretics cause your kidneys to remove excess water and salt from your body into your urine. This can reduce swelling and water retention (e.g. in your legs or in your lungs) often caused by heart disease, and can also be used to lower blood pressure.

Generic name	Brand name examples
Amiloride	Kaluril
Amiloride + Hydrochlorothiazide	Moduretic
Bumetanide	Burinex
Chlorthalidone	Hygroton
Eplerenone	Inspra
Ethacrynic acid	Edecrin
Frusemide	Lasix, Urex, Uremide, Frusid
Hydrochlorothiazide	Dithiazide
Indapamide	Dapa-tabs, Natrilix, Insig
Spironolactone	Aldactone, Spiractin
Triamterene + Hydrochlorothiazide	Hydrene

How to take these medications:

- If you are taking a diuretic twice daily and are affected by frequent urination during the night, take the second dose in the afternoon (before 2pm) rather than in the evening or at night.
- Weigh yourself regularly and report any rapid loss or increase in weight to your doctor.

Side effects and adverse reactions:

- Frequent need to pass urine, dry mouth, thirst, light-headedness, dizziness.
- Weakness, tiredness, drowsiness, muscle cramps, pains, gout, or a fast heartbeat (seek immediate help from a doctor)

Nitrates

You must not take sildenafil (Viagra®), Tadalafil (Cialis®), or vardenafil (Levitra®) if you are taking any nitrate medication. It may lead to a severe drop in your blood pressure, which may be difficult to treat.

Nitrates are called vasodilators. They dilate (open up) blood vessels, including the ones carrying blood and oxygen to your heart. They are very useful in relieving angina pain. Some preparations are used on an "as required" basis to control angina pain; other preparations are used regularly and deliver a continuous supply of drug over a longer period (e.g. patches and sustained release tablets).

Short acting nitrates

Note: It is best to take these medications whilst seated as they reduce blood pressure which can sometimes cause dizziness and fainting.

Generic name	Brand name examples
Glyceryl Trinitrate (GTN) (600 microgs)	Anginine, Lycinate Tablets
Glyceryl Trinitrate Spray (400 microgs)	Nitrolingual Pump Spray

How to take these medications:

- Use only when necessary for chest pain.
- After sitting down, place half to one tablet of Anginine®/Lycinate® under your tongue (or in the pouch of your cheek) and allow to dissolve, or use one spray of Nitrolingual Pump Spray® under your tongue.
- If after 5 minutes the pain is not relieved, place another tablet or spray another puff under the tongue. **If the pain continues after using up to 3 tablets or 3 sprays within 15 minutes, ring 000 for an ambulance**.
- After angina has been relieved, you may spit out or swallow what is left of the tablet to avoid adverse effects such as headaches.
- Write the date you opened your bottle of Anginine®/Lycinate® tablets on the bottle. Discard any remaining tablets after 3 months and obtain a fresh supply.

Long acting nitrates

Generic name	Brand name examples
Isosorbide mononitrate SR tablets	Duride, Imdur, Monodur
Glyceryl Trinitrate Patches	Nitrodur, Transiderm Nitro

How to take these medications:

- Do not cut the isosorbide mononitrate 120mg tablets – only the 60mg tablets may be halved.
- Apply the patches to the chest (best place) or upper arms. Avoid hairy areas because the patches do not stick well. Put your patch on a new position each day to prevent skin irritation.
- Do not leave the patch on all the time. Usually patches are applied for no more than 12 hours per 24-hour day. Otherwise the body becomes tolerant to the medication and it doesn't work as well.

Side effects and adverse reactions:

- Headache (usually last 1-2 weeks after starting treatment). If affected, using paracetamol 1g can be effective.
- Light-headedness, dizziness. If affected, get up slowly from your chair or bed.

Other medications used to treat angina

- Ivabradine
- Nicorandil
- Perhexiline

Where can I get more help on my medication?

While in hospital:

- Your pharmacist
- Your doctor

When you get home:

- Your local community pharmacist
- Your GP
- NPS medication line: **1300 888 763**, or website **www.nps.org.au**

Long term lifestyle changes

Lifestyle (that is the way that you live) has an important role to play in reducing your risk factors for heart disease. This section contains information on lifestyle related risk factors and what you can do to make positive changes and reduce your risk. This information should be used as a guide along with any lifestyle advice provided by your healthcare team.

When you attend your local cardiac rehab program you will receive further education regarding lifestyle changes. Should you have any questions related to the information in this section please ask your healthcare team.

Risk factors for heart disease

Risk factors are attributes or elements that contribute to the likelihood of developing a condition. The risk factors that may increase your likelihood of developing heart disease include:

Risk factors you cannot change:

- A family history of heart disease
- Increasing age
- Gender (male)

Risk factors that you can change:

- Smoking
- High blood pressure
- Physical inactivity
- Overweight
- Abnormal blood cholesterol

Other factors:

- Diabetes
- Stress/depression

Eating for a healthy heart

Why do I need to follow a healthy diet?

Healthy eating and drinking is an important part of looking after your heart. Eating a healthy diet provides you with energy and can help reduce the risk of heart disease by maintaining your weight, blood and cholesterol levels.

What should I eat to help keep my heart healthy?

Eating a well-balanced diet is recommended to promote heart health. To achieve a well-balanced diet, the ***Australian Dietary Guidelines*** and ***Australian Guide to Healthy Eating*** provide advice on the amounts and types of foods to consume. More specifically, the Australian Dietary Guidelines recommends that you:

- Achieve and maintain a healthy weight
- Eat plenty of vegetables, and some fruit
- Choose wholegrain and high fibre bread/cereals/rice/pasta/noodles
- Aim for a diet low in saturated fat through choosing lean meats or meat alternatives (such as eggs, tofu, nuts, legumes) and reduced fat dairy or alternatives (such as cheese, yoghurt, soy and nut milks)
- Drink plenty of water, limit your alcohol consumption
- Limit your intake of foods containing saturated fat and added salt

We will discuss these topics and ideas to help you eat a heart healthy diet in more detail over the following pages.

Five key food groups

The guidelines include enjoying a wide variety of nutritious food from five key food groups, see Table 1.

Food group	Recommended serves/day	Standard serve sizes 1 serve =
Bread, cereals, rice, pasta, noodles	4 – 6 serves/day	• 1 slice of bread • ½ medium bread roll • ½ cup cooked rice or pasta or noodles • ½ cup porridge • 2/3 cup cereal flakes
Vegetables	5 serves/day	• ½ cup cooked vegetables (75g) • ½ cup cooked dried or canned beans, peas, lentils • 1 cup green leafy or raw salad vegetables • ½ medium potato or starchy vegetable
Fruit	2 serves/day	• 1 medium piece (150g) of fruit (apple, banana, orange) • 2 small pieces (150g) fruit (apricot, kiwifruit, plums) • 1 cup diced or canned fruit (150g) • 125 ml 100% fruit juice
Milk, yoghurt, cheese	2 – 4 serves/day	• 1 cup (250ml) milk • 2 slices (40g) cheese • 1 carton (200g) yoghurt • 1 cup (250ml) custard
Meat, fish, poultry, eggs, nuts, legumes	1 – 3 serves/day	• 65g cooked lean meat e.g. ½ cup lean mince, 2 small chops, 2 slices roast meat • 80g cooked poultry • 80-120g cooked fish fillet • ½ cup cooked dried beans, lentils, peas • 2 small eggs • 30g nuts, seeds and nut paste • 170g tofu

Table 1. Australian Guide to Healthy Eating for Adults

Cholesterol

Cholesterol is a fatty substance that is carried around the body in the blood. The body produces most cholesterol in the liver, and it is found in some foods. High levels of blood cholesterol can contribute to the build-up of fatty deposits on the arterial wall, this is known as atherosclerosis.

Cholesterol is carried around the blood by carrier proteins called lipoproteins. The two main types of lipoprotein include:

- Low-density lipoprotein (LDL) cholesterol – is referred to as the 'bad cholesterol' because it carries cholesterol to the arterial walls. High levels of LDL can increase the risk of heart disease.
- High-density lipoprotein (HDL) cholesterol – is referred to as the 'good cholesterol' because it helps keep cholesterol from building up in the arteries. A healthy HDL can decrease the risk of heart disease.

Dietary cholesterol

It was once believed that eating too many cholesterol-rich foods (e.g. eggs, offal, prawns) was the major dietary cause of high blood cholesterol. We now know that cholesterol in food only has a small effect on the level of cholesterol in the blood. You can include some cholesterol-rich foods, low in saturated fat, as part of a healthy balanced diet. The National Heart Foundation allows you to enjoy up to 6 eggs per week.

Dietary fat

Fats are an essential part of our diet and are important for good health. Fats are higher in energy (kilojoules) than any other nutrient and when eaten in large amounts, can contribute to weight gain.

There are different types of fats, with some fats being healthier than others. The main three types of dietary fat include:

Saturated fats

Saturated fats are solid at room temperature and are mostly found in animal foods such as full cream dairy products, meats and chicken, fried take-away foods, packaged cakes and biscuits, butter and palm oil. A diet high in saturated fat increases your blood cholesterol, particularly increasing the 'bad' (LDL) cholesterol.

What about coconut oil?

Coconut oil is 92% saturated fat. There is convincing research to show that replacing saturated fats with unsaturated fats decreases LDL cholesterol. For this reason the National Heart Foundation recommends the use of unsaturated oils, such as olive oil, in preference to high saturated fat oils like coconut oil.

Unsaturated fats

Unsaturated fats are liquid at room temperature and are mostly found in plant and seed oils, nuts, fish and avocado. Unsaturated fats help reduce the risk of heart disease by increasing the 'good' (HDL) cholesterol and lowering the 'bad' (LDL) cholesterol. There are two

main types of unsaturated fats; polyunsaturated and monounsaturated fats. Please see Figure 2 for more information.

Trans fats

Trans fats increase the risk of heart disease by increasing the bad (LDL) cholesterol and lowering the good (HDL) cholesterol in our blood. Trans fat is an unsaturated fat that has been processed via food manufacturing and, as a result, behaves like a saturated fat. It is important to lower the amounts of trans fat in your diet to maintain a healthy heart.

Replace unhealthy fats with healthy fats!

Replacing saturated and trans fat with unsaturated (polyunsaturated or monounsaturated) fats can reduce your risk of heart disease. See the table below for some examples of healthy and unhealthy fats.

Saturated fats	Polyunsaturated fats	Monounsaturated fats
Where do I find saturated fats?	Where do I find polyunsaturated fats?	Where do I find monounsaturated fats?
• Full cream dairy products • Meat products • Luncheon meats • Butter, lard, ghee • Solid frying fat • Copha, coconut cream/milk • Fried foods • Snack foods and takeaway foods • Commercial biscuits and cakes • Palm and coconut oil	• Sunflower seeds and oil • Safflower oil • Pumpkin seeds • Soy products and oil • Polyunsaturated margarines • Tahini and sesame • Walnuts and walnut oils • Wheatgerm and wholegrains • Fish • Pine nuts • Brazil nuts • Linseed (flaxseed)	• Olive oil and olive margarine • Canola oil and canola margarine • Sunflower oil • Mustard seed oils • Avocado and avocado oils • Peanuts and peanut butter • Cashews • Macadamia • Almonds • Pecans • Hazelnuts
How can I decrease my saturated fat intake?	How can I include polyunsaturated fats in my diet?	How can I include monounsaturated fats in my diet?
• Choose lean cuts of meat and poultry • Trim off visible fat and skin from meat • Swap to low fat dairy foods e.g. skim milk, low fat cheese • Use low fat cooking methods e.g. grilling, steaming, braising or microwaving • Limit intake of commercial cakes, most biscuits, pies/ pastries, chocolates, fried food, takeaway & coconut products e.g. oil and milk	• Use polyunsaturated margarines or oils instead of butter • Include 2-3 fish meals per week e.g. fresh, canned or frozen fish • Go nuts! Sprinkle linseeds and walnuts on breakfast cereal, yoghurt or salad • Use soy and linseed bread and crackers • Use tahini as an alternative spread to butter	• Use monounsaturated margarines or oils instead of butter • Use peanut or sesame oil in stir fries • Use avocado in salads or on sandwiches in place of butter • Have mixed nuts as a snack (in moderation!) • Use nuts in stir fries or sprinkled on salads

Table 2: Types of Dietary Fat

Sodium (Salt)

Salt is sodium chloride. When we talk about cutting down on "salt" we really mean cutting down on sodium. Eating too much sodium over time can increase your risk of high blood pressure which is a major risk factor for heart disease. For a healthy heart, it's important not to eat too much salt.

Salt is found in almost every food we eat, but the amount of salt varies. Foods such as meat, vegetables and fruit have naturally occurring salt present in very small quantities. In food manufacturing, salt is used for flavouring and as a preservative. 75% of our salt intake comes from packaged and processed foods, bread, breakfast cereals and cereal products, processed meats, soups, sauces and spreads.

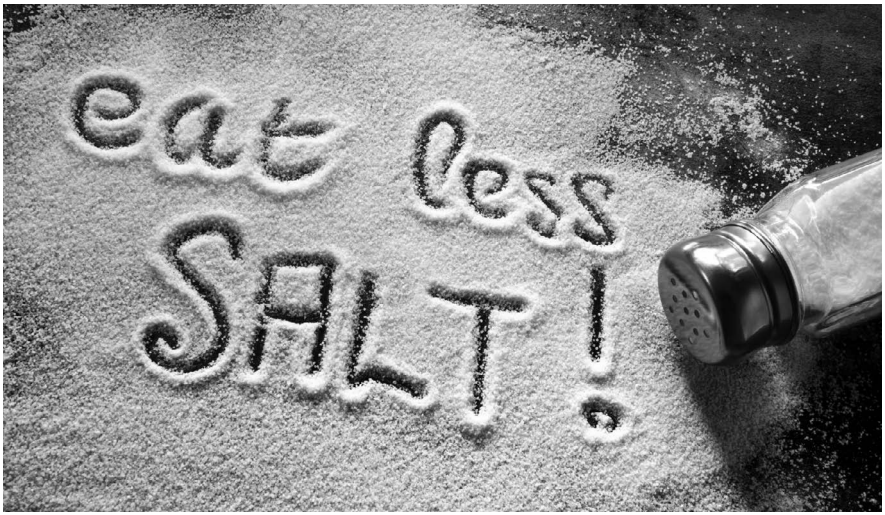
How much salt should I eat?

To reduce blood pressure and lower the risk of heart disease, the Heart Foundation recommends adults eat less than 5g of salt (2000mg of sodium) a day.

That's less than a teaspoon a day. (NRVANZ)

Tips to reduce salt intake:

1. Taste before you shake
2. Gradually reduce the quantity of salt you add at the table. Your taste buds adjust in 6-8 weeks!
3. Use herbs and spices to add flavour to your meals. Try ground pepper, lemon/lime, vinegar, dried/fresh herbs.
4. Limit your intake of take away and fast foods to no more than once per week.
5. Look for 'salt reduced' or 'no added salt' products
6. Read ingredient lists/ nutrition information panel (see figure 1)
    - Foods that contain < 120mg per 100g is considered a low sodium food, < 400-600mg per 100g is moderate and > 600mg high in sodium.
    - Sodium/salt may appear as monosodium glutamate (MSG), sodium bicarbonate, baking powder or soda.



7. Reduce intake of highly salted foods including:
    - Smoked meats and fish
    - Delicatessen meats (e.g. ham, mortadella, processed chicken)
    - Cheese
    - Spreads such as Vegemite, Marmite, peanut butter
    - Salty snacks such as nuts and potato crisps
    - Condiments including gravy mixes
    - Canned foods

Nutrition information		
Servings per package – 16 Serving size – 30g (2/3 cup)		
	Per serve	Per 100g
Energy	432kJ	1441kJ
Protein	2.8g	9.3g
Fat		
Total	0.4g	1.2g
Saturated	0.1g	0.3g
Carbohydrate		
Total sugars	18.9g	62.2g
Sugars	3.5g	11.8g
Fibre	6.4g	21.2g
Sodium	65mg	215mg
Cereals (76%) (wheat, oatbran, barley), psyllium husk (11%), sugar, rice, malt extract, honey, salt, vitamins.		

Figure 1: an example of a nutrition information food label. Note this food would not be classified as low in sodium as it has 215mg sodium/100g

Alcohol

Alcohol consumption increases an individual's risk of cardiovascular disease. Drinking above the recommended guideline can lead to increased heart rate, high blood pressure, weakened heart muscle and irregular heartbeat which can lead to a heart attack or stroke.

The National Health and Medical Research Council (NHMRC) alcohol guidelines include recommendations that:

- Healthy men and women should drink no more than 2 standard drinks per day
- Aim for at least 2 alcohol free days per week
- Drink no more than 4 standard drinks on a single occasion to reduce the risk of alcohol-related injury arising from that occasion.
- A standard drink is 100 mL of wine, 285 mL regular beer and 30 mL spirits.

To read the full guidelines and to find out how much a standard drink is, please review the NHMRC alcohol guidelines at www.nhmrc.gov.au/health-topics/alcohol-guidelines

Ways to reduce your alcohol intake?

- Make plans that include alcohol free nights
- Set limits for yourself and stick to them
- Start with non-alcoholic drinks and alternate with alcoholic drinks
- Drink slowly
- Eat before or while you are drinking
- If you participate in rounds of drinks try to include some non-alcoholic drinks

If you have a heart condition, talk to a medical practitioner for individual advice.

Eating for heart protection

Some additional nutrients in food can improve your heart health.

Soluble fibre

Fibre is found in plant foods.

The recommended daily intake of fibre is 25-30g/day

Soluble fibre is a type of fibre which reduces cholesterol absorption and can decrease total and "bad" (LDL) cholesterol levels. Sources of soluble fibre include; fruit, vegetables, legumes, beans, oat, barley, psyllium husk, flaxseeds (linseeds).

How to eat more soluble fibre:

- Eat breakfast cereals that contain barley, wheat or oats
- Switch to wholemeal or multigrain breads and brown rice.
- Add oat/barley bran, flax seeds or psyllium husks to cereals, soups, casseroles, yoghurt, cakes, muffins and biscuits
- Include peas, chickpeas, lentils and beans in salads, casseroles and soups – can be a substitute for meat
- Eat fruit with the skin on rather than drinking fruit juice
- Snack on raw vegetable sticks with legume dips e.g. hummus

Plant sterols

Plant sterols are a group of natural compounds found in plants that have a similar structure to cholesterol. This similarity allows them to compete for absorption in the small intestine and block the absorption of 'bad' (LDL) cholesterol. When eaten at the recommended amount (2-3g per day), plant sterols can reduce 'bad' (LDL) cholesterol levels in our blood by up to 9%.

The recommended daily intake of plant sterols is 2-3g per day

Plant sterols are found in a variety of plant foods including grains, vegetables, fruit, legumes, nuts and seeds, but only in very small quantities. You can also include products that have been fortified with plant sterols; such as margarine (e.g. Pro-Activ), low fat milk (e.g. Heart Active), low fat yoghurt (e.g. Pro Heart) and breakfast cereals (e.g. Weet-Bix Cholesterol Lowering), in your diet. 2-3 serves of plant sterol enriched foods per day will provide the recommended daily amount.

Antioxidants

Antioxidants are naturally occurring molecules believed to fight against the action of free radicals which is thought to help prevent disease.

The Heart Foundation supports the consumption of fruit and vegetables, green or black tea and raw cocoa powder (when part of a healthy balanced diet) to provide the antioxidants beneficial for a healthy heart. It is not recommended to consume chocolate, coffee and red wine or take anti-oxidant supplements for the prevention or treatment of heart disease.

Maintaining a healthy weight

Reaching and maintaining a healthy weight is one of the best things you can do for your health and wellbeing. An increase in weight also increases the risk for heart disease, high blood cholesterol, high blood pressure and other lifestyle related diseases and conditions. Maintaining a healthy weight has many benefits, including feeling good about yourself and having more energy to enjoy life.

Body Mass Index (BMI)

BMI estimates your body mass based on your weight and height. A healthy weight is defined as having a BMI of between 18.5 and 25kg/m2. For those above the age of 65 years, a healthy BMI is between 22 and 27kg/m2.

You can work out your BMI by the following calculation below or using the BMI calculator on the National Heart Foundation of Australia website.

Weight (kg) / Height (m2)

NB: BMI is a useful measurement for most people over 18 years old however it does not take into account gender, age, ethnicity and body composition. We recommend you also check your waist circumference measurement, and other risk factors.

Waist circumference

A waist circumference of higher than 80 cm for women and 94 cm for men puts you at increased risk of heart disease. If your waist circumference is higher than this, you should aim to decrease your waist circumference by decreasing your weight.

Tips to reduce your weight:

- Start small: losing as little as 10% of your current body weight can make a difference to your heart health
- Get planning: plan well balanced meals and get in the habit of packing a healthy snack.

- Portion control: try using an entree size plate at main meals to reduce your portion size.
- Eat more fruit and vegetables.
- Cut back on foods which are high in energy e.g. confectionary foods (cakes and lollies), take-away foods (burgers, hot chips, pizza) and alcohol.
- Swap it: try soda/mineral water with mint and lemon or green tea in place of regular juices and soft drinks.
- Start moving everyday: walking is good for nearly everyone; you may also like to try swimming, aqua-aerobics or cycling. For more information on the most suitable exercise for you, see the "Exercise and Physical Activity" section in this booklet.

RNSH offers a Dietetic outpatient nutrition clinic for people who reside in the lower north shore local government area or who are currently being cared for by a RNSH medical specialist. The dietitian can assist you to learn more about making heart healthy food choices.

Please phone the **Department of Nutrition on (02) 9463 1666** if you would like to make an appointment (please note: you will be required to bring a referral letter from your GP or Cardiologist to your first appointment).

The Cardiac rehabilitation program at RNSH includes Cardiac Lifestyle information sessions on Eating for A Healthy Heart. Please see the Cardiac Rehabilitation section of this booklet for details or phone the NSCEC on 9463 1705 for more information.

Alternatively you may wish to contact your local hospital which can advise you of the services in your area.

Returning to activity guidelines

Gradually returning to physical activities will be an essential part of your recovery. It is important to note that everyone is different and activity capacity during recovery will vary from person to person.

Returning to certain activities may depend on individual variables such as your age, previous activity level, your underlying cardiovascular condition or surgical complications. Regardless of these individual factors there are some guidelines applicable to all post-surgery patients.

Your sternum (breast bone) will take at least 6 weeks to heal. Your cardiovascular system will also need time to heal, and progressively develop strength/fitness. Thus it is important to adapt your activities:

- **Eliminate lifting more than 5kg**
  - Be aware of the weight of day to day items e.g. toddlers, groceries, laundry, luggage, rubbish bin
  - Carry loads close to the body rather than with outstretched arms
  - Divide loads, i.e. take multiple trips
  - Delegate all or part of the task
- **Avoid straining action with the arms**
  - Avoid tasks that require repetitive arm action, arms outstretched or arms overhead, e.g. bed making, vacuuming, washing windows, hanging washing on the line
  - Delegate heavy straining tasks
  - If light force is required anchor your elbows against your body and use both hands
  - Use other parts of the body to move objects, e.g. opening a sliding door with your foot
  - Avoid reaching behind you with your arms or other actions that require twisting your torso
- **Minimise physical exertion**
- Reduce the duration of tasks

- Pace yourself- work at a steady rate, never rush
- Take seated rests throughout the day
- Sit while doing things, e.g. sitting at a table to cut vegetables
- Take stairs slowly, one at a time
- It is ok to delegate more strenuous tasks

As your recovery progresses and your sternum heals you will be able to slowly progress back to daily activities. It is important to seek clearance from your surgeon or physician before progressing back to heavier tasks.

Common activities – how and when to resume them

When re-introducing daily activities it is important to start slowly with adapted/lighter tasks and progress as your tolerance improves. The following advice for returning to common activities is a guideline only. You should discuss your individual circumstances with your doctor or healthcare team.

Housework (including cooking):

During the first 6 weeks while your sternum is healing you should delegate/seek help with heavier tasks such as vacuuming, hanging washing, changing the bed, cleaning the bathroom. You should begin to introduce lighter activities such as tidying, light dusting, peeling vegetables in the first three weeks. Once these lighter activities are well tolerated you may begin to introduce larger tasks such as light ironing, sweeping. Keep tasks simple and sit to rest if necessary.

Gardening:

You should not mow the lawn for at least 6 weeks while the sternum is healing. You may instead begin with light watering with a hose or tending pot plants in week 2-3. If well tolerated you may introduce light weeding or trimming with hand held clippers. Week 4 gentle raking. Week 6 digging in soft soil and planting. Weeks 8-12 mowing the lawn.

Work:

You can return to work related activities as soon as your concentration, physical ability, energy levels and confidence allow. As a general rule, people in light office work return to work after six weeks. Those involved in heavy physical work usually need to wait three months to return to full duties. Ideally you should begin work on restricted hours and light duties if possible and gradually increase your workload and hours as able. Always discuss return to work plans and current medical status with your specialist and/or your GP prior to returning to work.

Golf:

Beginning only after the sternum has healed; Keep it simple initially with putting practice at home from around six weeks after your surgery. Gradually include chipping and full swings and then introduce a nine-hole game. By 12 weeks a full game may be possible.

Bowls:

Due to the weight of the ball and the bowling motion you should not begin playing until six to eight weeks after your surgery. At eight weeks try roll-ups. Gradually upgrade the time you spend and you may be back to playing a normal game by 12 weeks.

Tennis:

You may begin practice with hitting the ball and gentle underarm serves at six to eight weeks after your surgery. A leisurely game of doubles may be appropriate after eight weeks and a full competition game after 12 weeks.

Swimming:

From six to eight weeks (after review by your cardiac surgeon) try using a gentle stroke and swim for a short period. Gradually increase the duration and by your 12th week, you should be able to manage more strenuous strokes. Ensure your wound has fully healed before entering the water.

Other sport/recerational activities:

Most high impact and competitive sports (e.g. squash, running, ball sports etc.) and higher risk activities (e.g. kayaking, sailing, skiing, bungee jumping, sky diving etc.) should be avoided unless cleared to return by your surgeon. If you do have medical clearance to return to these types of activity you should consult your cardiac rehab team for advice on activity specific precautions and progression.

Air travel:

Flying may be restricted or prohibited depending on your circumstances. You should seek medical clearance to fly from your doctor.

Returning to sexual activity

After heart surgery you need to allow your sternum approximately six weeks to heal, however, you may return to sexual activity after approximately two weeks. It is recommended that you do not assume positions that restrict breathing or require prolonged muscular support.

Returning to sexual activity and/or masturbation is an important part of most people's recovery. You will know when the time is right for you, usually when you are able to tolerate moderate intensity activity.

It is essential that you discuss any issues and concerns that you may have regarding returning to sexual activity with your partner. A familiar partner, comfortable surroundings and a comfortable position will help to reduce anxiety as well as the amount of physical effort required.

Normal responses to sexual activity include increased heart rate and breathlessness. Foreplay gradually prepares your heart for increased activity. If you are tired or tense, leave it until you are more relaxed. Wait an hour after meals. As for any physical activity, if you experience any pain or discomfort, slow down, stop and rest.

Viagra (Sildenafil)

Erectile dysfunction is defined as the inability to obtain and maintain an erection adequate to permit satisfactory sexual performance. There are certain products on the market to help to overcome this problem. If you are still worried or have any questions, speak to your GP or Cardiac Rehabilitation Team.

If you are experiencing erectile dysfunction please discuss any treatment options with your doctor before taking any medications such as Viagra or natural remedies as they may react with your heart medications. This combination could be dangerous or even life-threatening.

Reasons not to use Viagra:

- You use any form of nitrates
- You experience angina
- You have had a recent heart attack or stroke
- You have been diagnosed with heart failure
- You have high blood pressure that is not well controlled or requires complicated multi-drug therapy

Driving guidelines

Cardiovascular conditions may affect your ability to drive safely due to sudden incapacity, altered concentration, or inability to control a vehicle due to sudden onset of symptoms. In the event of cardiac surgery your heart and body will take several weeks to heal, during this time your concentration, reflexes and eyesight can be impacted. For these reasons the RMS does not permit driving, for at least 4 weeks post-surgery (see Table 1).

Please be aware that the timeframes in table 1 are guidelines only. The time frame for returning to driving is dependent on the nature of your underlying condition and whether it is well controlled, as well as your healing progress and rate of recovery. **Always consult your treating medical team (GP, Cardiologist, Cardiothoracic Surgeon) before returning to driving.** If you return to driving without medical consent you may find that your insurance will not cover you in the event of an accident.

Cardiac Procedure	Minimum non driving period	
	Private vehicle	Commercial vehicle
Aneurysm repair, CABG, Valve repair or replacement (including minimally invasive, TAVI or mitraclip)	4 weeks	3 months
Pacemaker	2 weeks	4 weeks
ICD	6 months after cardiac arrest	Ineligible

Table 1. Suggested non-driving periods post cardiovascular procedures

Table 1 adapted from 'Assessing Fitness to Drive: medical standards for licensing and clinical management guidelines' as amended up to August 2017. A joint publication of the National Transport Commission and Austroads, printed with kind permission of Austroads Inc.

Suggested 12 week activity program

The following is a suggested program to help guide you for the first 12 weeks at home. Please be aware that this is a guideline only and is designed to help you to progress your activity as you recover. When re-introducing new activities it is important to start lightly, and gradually increase in activity duration or intensity as your tolerance improves. It is important to always listen to your body and rest when needed.

Week 1

- Activity level as in hospital - light activities of short duration e.g.: reading, watching TV, listening to music, computing, light table-top activities
- Contact your local cardiac rehabilitation to book an appointment
- Visit your GP for a check-up
- Get up and dress daily
- Prepare yourself light snacks and a cup of tea/coffee
- Stroll around the house and garden
- Avoid stooping or bending if painful
- Limit the use of stairs, stop and rest half-way if needed
- Limit visitors and telephone calls as this may be tiring
- Have an afternoon rest
- Walking: in addition to your regular daily routine you should begin a structured walking routine (see 'exercise and physical activity' chapter of this book)

Week 2

- Activities from week one may be upgraded in both time and effort
- You may go for short outings of up to two hours
- New activities: preparing light meals, dishes, dusting, one hour of paperwork and use of a computer
- Walking: progress your walking routine

Week 3

- Continue to upgrade all the previous activities
- Start a cardiac rehabilitation program at your local hospital
- Outings may be longer in duration, up to half a day
- Stairs may be used as normal
- New activities: pottering in the garden - light weeding, bed making, normal meal preparation, light sweeping and light ironing
- Walking: continue to progress your daily walk

Week 4

- Continue upgrading all previous activities in effort and duration
- You may begin quiet social outings such as dinner or the movies
- You may begin to use public transport in non-peak periods
- See your cardiothoracic surgeon for a follow up appointment.
- You may begin driving a car if medically cleared by your GP or surgeon. It is recommended you begin with short trips in non-peak hour.
- Walking: continue to progress your daily walk

Week 5

- Continue upgrading all previous activities in effort and duration.
- Outings may be longer in duration, as tolerated
- New activities: Light handyman activities may begin provided they do not involve strenuous/repetitive arm action, e.g. varnishing, painting, or heavy lifting
- Walking: continue with daily walks and begin to introduce other light exercises as guided by your cardiac rehab team

Week 6

- Your sternum should be stronger, and you may start resuming more physical activity around the home and garden, gradually
- New activities: vacuuming, sweeping, raking leaves, shopping, light digging
- Work: If you were employed at light duties you may discuss with your

doctor regarding return to light duties, restricted hours

- Walking: continue daily walks and other exercises as guided by your cardiac rehab team

Week 7

- Drive car for longer periods
- New activities: Wash car in stages with rest breaks, carrying a maximum of half a bucket of water
- Walking: continue daily walks and other exercises as guided by your cardiac rehab team

Week 8

- New activities: Mow lawns in stages with rest breaks
- Work: If you are a tradesman you may discuss returning to light duties and restricted hours with your doctor
- Walking and exercise

Week 9-11

- Upgrade all activities to normal
- Continue daily walks and other exercise

Week 12

- You may return to heavier manual work after discussion with your doctor
- You may recommence driving a commercial vehicle after clearance by your GP.
- Continue daily walks and other exercise – for the rest of your life!

Week 13 onward

You may find that you are fitter than you were prior to surgery and have resumed most, if not all, of your previous activities. If you find that this is not the case, continue to progress activities as you are able and remember that all bodies are different and heal at different pace.

Exercise and physical activity

Exercise is an essential part of an effective recovery after cardiac surgery. Regular exercise will improve the efficiency of the heart muscle and blood circulation, as well as improve muscle strength and promote healing.

Your allied health team will discuss your exercise program with you before you leave hospital. Your exercise program consists of two stages

- Convalescence stage (0-6 weeks)
- Maintenance stage (7 weeks onwards)

Convalescence stage (0 – 6 weeks)

The convalescence stage is a period of healing that begins once you are discharged from hospital and lasts for approximately six weeks. During this stage you will be restricted from heavy lifting and vigorous activity, however you should engage in an active recovery by starting a walking program that allows you to progress your activity tolerance.

It is also advised that you start a cardiac rehabilitation exercise program at your nearest hospital or health centre soon after discharge from hospital. See the 'Cardiac Rehabilitation' section of this booklet for details.

Walking program

The following walking program is a guide only. If you cannot progress as quickly as the program suggests you may vary your progress at your own rate. Please follow this program in conjunction with the 12 week home activity program provided in this booklet.

If you would like to progress more quickly, please do so with the guidance of your local doctor and/or cardiac rehabilitation team.

Guidelines for a walking program

Stage	Time (minutes)	Times/ day	Intensity / pace	RPE
1	10-15	2	Light, slowly on flat ground	2
2	15-20	2	Light	2
3	20-25	1-2	Light to moderate, increase walking pace	2-3
4	25-30	1-2	Moderate	3
5	35-40	1-2	Moderate to somewhat strong	3-4
6	Up to 60	1	Moderate to strong, faster pace, add hills	3-4

Exercise should never feel uncomfortable, painful, produce unusual symptoms or severe symptoms of angina. If it does, slow down, stop and see your local doctor before continuing with your exercise program.

Intensity – how hard should I exercise?

When you are walking, it is important that you consider how hard you are working (your level of intensity). Level of intensity varies from person to person – what is easy for some may be difficult for others.

A simple "talk test" will help you to gauge how hard you are working. Breathing heavily, or a slight huff & puff, is a normal response to exercise and is to be expected, however you should not be exercising so hard that you cannot easily carry a conversation.

For the first 4 weeks you should exercise at a light to moderate intensity, gradually increasing to a moderate intensity from 4 weeks onwards. You should not be exercising at a strong to very strong intensity. You may determine your intensity using a Rating of Perceived Exertion (RPE) scale.

Rating of Perceived Exertion Scale (RPE)

RPE	Perceived effort	Feels like
0	Nothing at all	
0.5	Extremely weak	
1	Very weak	Just noticeable
2	Weak/light	An aerobic activity that does not cause a noticeable change in breathing rate
3	Moderate	An aerobic activity that is able to be conducted whilst maintaining a conversation uninterrupted. An intensity that may last between 30 and 60 minutes
4	Somewhat strong	
5	Strong/heavy	An aerobic activity in which a conversation cannot be maintained uninterrupted. An intensity that may last up to 30 minutes
6		

RPE	Perceived effort	Feels like
7	Very strong	An intensity that generally cannot be sustained for longer than 10 mins
8	Very strong	
9	Very very strong	
10	Maximal	The absolute maximum effort you could possibly reach

Adapted from (Borg G., Borg's Perceived Exertion and Position statement on physical activity and exercise intensity terminology 2009)

Initially you should aim for an RPE of 2-3, progressing to a 3-4 as your exercise tolerance improves.

You should not exercise at an RPE of 6 or higher in the first six weeks after surgery. Resuming higher intensity or more vigorous exercise at a later stage should only be attempted if you have clearance to do so from your doctor.

Warm up and cool down

A warm up is an essential part of an exercise routine. By gradually increasing activity you increase blood flow to your heart and muscles, allowing them to slowly adjust to the extra demands being placed on them by exercise.

A warm up should be of 5 - 10 minutes duration and should begin with gentle repetitions of the exercises you will be doing, e.g. slow walking and arm movements.

Following your exercise or activity, you should spend 10 - 15 minutes cooling down. This prevents pooling of blood in your limbs, increases the return of blood to the heart, speeds your rate of recovery and decreases the chance of stiff, sore muscles and cramps.

A cool down should consist of gradually slowing the activity and keeping limbs moving until your breathing rate has returned to normal. Slow comfortable stretches, focusing on those muscles involved in the exercise should be included.

Stretching

Regular stretching will improve muscle flexibility, joint range of motion, help prevent muscle soreness after exercise and reduce the risk of injury. When stretching remember:

- The best time to stretch is after exercise when the muscle is warm and receptive to the stretch
- Each stretch should be held for 20-30 seconds
- All stretches should be slow and static (Do not bounce)
- Make sure you stretch all major body parts
- All stretches should be comfortable (not painful)
- Ensure you are breathing normally while holding a stretch (do not hold your breath)

Long term maintenance exercise – 'exercise for life'

After the convalescence stage you will have noticed an improvement in your fitness and exercise tolerance. By now you will have established an exercise routine and be achieving daily exercise. Be sure to vary your activities as you become more comfortable exercising and your fitness improves. Variety is often important to ensure you remain motivated and continue to challenge yourself.

Your exercise program should be something you enjoy and will maintain as an important part of your lifestyle, for the rest of your life.

Australian Physical Activity Guidelines recommend:

- aerobic exercises such as walking, swimming, cycling, exercise classes, at a moderate intensity for minimum of 30 minutes, on most if not all days of the week

- strength exercises such as light weights/elastic resistance, 2-3 times per week
- Be active most, preferably all, days of the week
- Reduce sitting time – minimise the amount of time spent in prolonged sitting and break up long periods of sitting wherever possible
- Increase incidental activity wherever possible. Be as active as you can in your daily activities. Doing any physical activity is better than doing none at all

For more information on the 'Australian physical activity and sedentary behaviour guidelines' visit the website www.health.gov.au.

Sample exercise session

	Time (mins)	Activity	RPE
Warm Up	10	Slow walking + gentle arm movements without resistance	1-2
Aerobic Exercise	30	Walking at a moderate pace	3-5
Strength Exercise	10	3 sets of 10 repetitions, of 8 different exercises using light hand weights	2-3
Cool Down	10	Slow walking + gentle arm movements without resistance	1-2
Stretches	5	Stretching major muscle groups including legs and upper body	1

Recreational activities

Many people are eager to return to their previous sports and activities (e.g. golf, swimming and tennis). It is very important to return to sport slowly, initially in a non-competitive setting where you can stop if required. A warm up and cool down is essential.

If you are concerned about when it is appropriate for you to return to your recreational activities you should check with your doctor, an exercise physiologist or your cardiac rehab team.

Gradually progress your sport or activity as you feel comfortable. For most people we suggest starting recreational activities at the beginning of the seventh week home.

Recreational activities are great supplements to your exercise program.

It is important that you remember that some recreational activities often do not exercise you at an intensity that will improve your aerobic fitness, although they will keep you active and mobile (e.g. golf).

Alternatively, some activities require a reasonable amount of fitness to be done safely (e.g. singles tennis, kayaking). Remember, get fit to do your recreational activities don't use your recreational activities to keep fit! See the section "common activities – How and when to resume them" for more information.

For more information on Exercise and Physical Activity speak to an exercise physiologist or your cardiac rehabilitation team.

Tips for exercising safely

- Drink plenty of water before, during and after exercise
- Avoid exercising immediately after meals
- Wear loose comfortable clothing of breathable fabrics
- Wear supportive shoes
- Avoid exercising in extremes of temperature or in strong winds
- Do not exercise when feeling unwell with a fever or bad cold
- Avoid caffeine immediately before and after exercise
- If you are diabetic: know your BGL and do not exercise if it is low, always carry a fast acting carbohydrate (e.g. a juice box) in case your BGL drops low while exercising
- If exercising in a remote location (e.g. bushwalking) always take someone with you, and never swim alone
- If you feel unwell while exercising (e.g. become light headed) slow down/decrease intensity, if symptoms do not subside stop exercising and see your GP
- Always carry anginine or ventolin (if prescribed)
- If you experience angina (chest pain)
  - Decrease intensity/cease level of activity
  - Use angina medication (e.g. anginine) if appropriate. If symptoms do not subside or you feel unwell, call 000
  - If symptoms persist for more than a few minutes, stop all activity
  - See your GP as soon as possible

For more information on managing your angina appropriately see the chest pain management plan in the “What can go wrong with the heart” chapter of this book.

Managing stress & wellbeing

Understanding stress and how to manage it is often important to those with heart disease. The events surrounding admission to hospital and the resulting changes and disruptions to daily work and family routines can be traumatic.

For some people, the diagnosis of a heart condition or living with ongoing health problems may be a continual strain. While stress on its own has not been shown to cause heart disease, stress can accelerate the progress if you already have underlying coronary artery disease; i.e. it is a secondary risk factor.

What is stress?

Stress is a demand or pressure that makes you feel tense, unhappy or uncomfortable. This demand or pressure is often called the stressor. Writing exams, conflict with others, meeting deadlines, moving house, and health problems are all examples of situations that many people find stressful.

Positive stress

Stress can be positive. It can help you achieve what you want to do. It brings anticipation and excitement into your life as with a holiday or family celebration. It helps you to grow and change, to avoid danger, and to strive for a goal.

Negative stress

Stress can also be negative and this is when we must use stress management skills. When stresses are so big, occur so often and last so long that you are unable to handle them well or when you have been overstressed for some time and can notice effects like nervousness, headaches or insomnia, you must act.

What can you do?

Many different techniques can be utilised to manage stress effectively. Many of us have already developed our own ways of dealing with stress

such as taking a bath, exercising, listening to music, or learning how to say “no”. Management of stress and the use of relaxation strategies are vital in ensuring good mental health and adjustment to the stresses and strains we face in life.

Management of stress

There are three possible approaches to dealing with stress:

Addressing the cause of the stressful event

Reorganise your time or environment better so a stressful situation does not arise, e.g. saying “no”, adding/subtracting from your routine or lifestyle.

Brainstorm and problem solve possible solutions or ways to deal with the problem causing you stress.

Adjusting the way you see a stressful situation/event

Sometimes, it is not possible to eliminate a stressful situation. This is when you may need to alter the way you see and respond to the problem, ultimately reaching some equilibrium in time.

Some of the strategies below may be helpful - they may need practice.

- Ask yourself, “does it matter?”
- Avoid blaming or labelling yourself
- Avoid “must” and “should” thoughts
- Talk it out with someone trusted
- Get counselling to help you recover from a loss or trauma
- Write it out
- Distance it - will it matter in 10 years?
- Laugh it off - smile frequently, use humour to ease your tension
- Avoid focusing on possible threats in a situation - think positively
- Avoid competitiveness
- Slow down
- Accept yourself. Nobody is perfect!

Using relaxation strategies

Sometimes you simply need “time out” from a stress. A relaxation strategy may help.

Remember, they are not going to remove the stress or problem but simply give you some time out to relax. Relaxation strategies are a personal thing - what suits you may not suit someone else. They also need practice.

Listening to music, laughter, hobbies, relaxation techniques, meditation, massage and time out for yourself, are all popular relaxation strategies.

Relaxation techniques

These techniques are quick and simple and can be done just about anywhere to help cope with specific stressful situations:

- Breathing
  - Tell yourself mentally to “relax” on the out breath
  - Lengthen the “out” breath, then relax
  - Slow, deep, rhythmic breathing
- Progressive muscular relaxation
  - Work your way around each part of the body (usually starting at the feet) introduce tension then release, until your whole body is relaxed.
- Visual imagery
  - Visualise a personally relaxing and pleasant scene, e.g. floating on a cloud, lying on a tropical beach.
- Relaxation techniques require practice
- Relaxation techniques may be guided by special tapes to talk you through
- It may be trial and error to find a relaxation technique that suits you

Finding help for relaxation and stress management

- Explore smartphone apps, web based resources or podcasts – use search words such as “calm”, “wellbeing”, “meditation”
- Consult your public library or local bookstore for books, DVDs, or audio CDs
- Consult your local Community Health Centre for courses on stress management, assertiveness, and communication skills
- Discuss with your GP, counsellor, cardiac rehab team or other healthcare providers
- Use trusted friends, mentors, and peer support groups

High blood pressure

What is blood pressure?

Blood pressure (BP) is the pressure of the blood in the arteries as the heart pumps blood around the body. Blood needs to be pumped by the heart under pressure in the arteries in order to reach all parts of the body. Refer to the "How the Heart works" chapter of this book for more information regarding circulation/blood flow.

How is blood pressure measured?

BP is recorded as two numbers Systole/Diastole e.g. 120/70 mmHg.

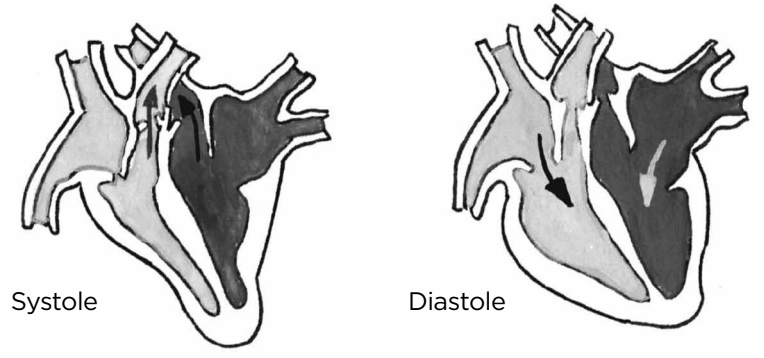


Diagram 9: The heart during systole and diastole.

Systole is the highest number, it is the pressure in the arteries as the heart squeezes blood out during contraction.

Diastole is the lower number, it is the pressure in the arteries as the heart relaxes before the next beat.

Acceptable blood pressure falls within a range rather than being a particular pair of numbers. Normal, or 'healthy' blood pressure ranges are between 100/60 to 130/80. Blood pressure varies throughout the day according to the body's needs and activities.

High blood pressure

The medical term high blood pressure is hypertension. Hypertension means that the pressure of blood in the arteries is too high. This causes strain on the heart, as it is forced to pump harder to get blood around the body.

Hypertension also increases the stress on the artery walls. This causes the walls to thicken and increases the rate of atherosclerosis and coronary artery disease.

If your blood pressure remains high it can increase your risk of:

- Heart attack
- Heart disease
- Heart failure
- Stroke
- Kidney problems

You may not be aware that you have hypertension as often there are no warnings or symptoms. Therefore, it is important to have your blood pressure checked regularly. Your local doctor will advise you on this.

People with high blood pressure may need to take medications to help control their blood pressure. Medication is recommended in combination with lifestyle changes:

- regular exercise
- weight loss if necessary
- no smoking
- heart healthy diet (e.g. lower intake of salt and saturated fats)
- moderate alcohol intake

Diabetes and heart disease

What Is diabetes?

Diabetes is a condition wherein the body either does not produce enough insulin, or is resistant to the insulin that it produces. Without sufficient insulin the body cannot properly metabolise glucose, resulting in high (hyperglycaemia) or low (hypoglycaemia) blood glucose (sugar).

Glucose is one of the body's main fuels. When we eat any carbohydrate food (e.g. bread, pasta, rice, potatoes, cereals, fruit, or sugary "treats"), these foods are broken down into glucose and transported in the bloodstream. To use glucose efficiently, we secrete insulin from the pancreas. Insulin works like a bridge, allowing glucose to move from circulation to inside our muscles and fat. Our arteries and nerves absorb glucose directly from the bloodstream. If the blood glucose is high, our cells receive too much fuel. Over time this can cause arterial and nerve damage.

What is the link between diabetes and heart disease?

Coronary artery disease is the leading cause of mortality in people with diabetes. People with diabetes have a greater tendency to develop atherosclerosis, resulting in thickening, hardening and narrowing of the arteries. Atherosclerosis can affect both the quality and duration of our lives, by affecting circulation to the areas of the body such as the heart, brain and legs. Those with impaired glucose tolerance (pre-diabetes) are also at risk of this damage.

What are the risk factors for diabetes and heart disease?

Diabetes is usually divided into Types 1 and 2. Type 1 requires insulin injections; whereas Type 2 can be managed with a healthy diet and exercise, with addition of medications and/or insulin as required.

Risk factors for Type 1 Diabetes include:

- Family history
- Exposure to a viral, chemical or environmental factor

Risk factors for Type 2 Diabetes include:

- Family history
- Age
- Impaired glucose tolerance
- Hypertension
- High cholesterol
- Being overweight
- Cultural heritage
- History of gestational diabetes or PCOS

Who can help?

To reduce the risk of diabetes or coronary heart disease, it is important to manage as many of the known risk factors as possible. If diabetes or coronary artery disease has already developed, clear information and effective management can also help reduce the risk of further complications.

Your GP and specialist can provide perspective, help manage blood glucose levels, blood pressure, cholesterol and triglycerides. They can also ensure NSW Health Department Standards of (Diabetes) Care are addressed and see that relevant tests or referrals are made.

Referrals are often made to:

- dietitian (nutrition)
- diabetes educator (overall understanding, management of medication and glucose monitoring),
- podiatrist (foot health)
- exercise physiologist (exercise)
- healthy lifestyle unit (fitness and general health)
- Diabetes Education Centres (situated at all major public hospitals)

Quit smoking for a healthy heart

Tobacco smoking can cause long term damage not only to the heart and vascular system, but other vital organs as well. Smoking is a major risk factor many chronic health conditions including coronary heart disease, stroke, peripheral vascular disease, and various cancers.

The benefits of quitting smoking are many and your body will begin to feel benefits within 20 minutes with a decrease in heart rate.

To explore the benefits of quitting, as well as possibilities for getting ready to quit, and supportive quitting resources, visit:

www.health.nsw.gov.au/tobacco

For further information or support:

- Speak to your GP, or healthcare team
- Speak to your cardiac rehab team
- Contact Quitline on 13 QUIT (13 78 48) – a free telephone service connecting you to professional support and customised quit help
- For interactive tools and support networks Visit iCanQuit.com.au

QUIT line: 13QUIT
13 78 48

The heart failure program

What is heart failure?

Heart failure occurs when the heart is unable to pump enough blood to meet the needs of the rest of the body. It can be caused by a previous heart attack, high blood pressure, excessive alcohol intake, hardening or leaky valves, a viral heart infection or a chronic lung disease (asthma, emphysema).

If you have heart failure, you may experience the following symptoms which can be caused by your heart muscle not pumping as efficiently as normal:

- Shortness of breath
- Weakness
- Fatigue
- Swelling of the ankles

What can you do to help yourself?

- Take your medications regularly
- Weigh yourself regularly
- Reduce your salt intake
- Monitor your fluid intake
- Drink less alcohol
- Exercise regularly
- Quit smoking
- Contact the Heart Failure Program

The Heart Failure program is a free education and support program for those with heart failure. A heart failure specialist nurse visits patients in hospital and at home and liaises with their GP for ongoing care.

For further information contact the Heart Failure Program at Royal North Shore **9463 1702**.

Cardiac rehabilitation

Cardiac Rehabilitation is an important step in your ongoing care and recovery process. It combines education, exercise and support by providing you with:

- Practical information and advice on healthy lifestyle and recovery
- Information regarding the management of cardiac risk factors
- The opportunity to have questions and concerns addressed
- The opportunity to increase your confidence and ability to exercise independently
- Recommendations for planning your own home exercise program

Whilst you are in hospital

During your hospital stay, a member of the cardiac rehabilitation team will come to see you. They will provide you with the contact details for the program closest to your home as well as explain details of the program and answer any questions you may have regarding your recovery once you are home.

You may be contacted by a member of staff to follow your progress after discharge. This usually occurs around 4 weeks. Your contact details will not be used for any purpose other than these reasons.

Outpatient Cardiac Rehabilitation Program at RNSH

Assessment

We encourage all patients to attend a follow up appointment with the cardiac rehabilitation team to discuss recovery and have cardiac risk factors identified. An appointment should be made as soon as possible once you are discharged home from hospital.

The assessment will consist of an individual consult with a cardiac nurse specialist and an exercise physiologist; this is an opportunity to evaluate your rehabilitation needs including which method of exercise is most appropriate for you. After the assessment you may then enrol in the exercise and/or education program.

You will need to attend an assessment before you commence the exercise and education program. Bookings are essential.

Education

The cardiac rehab education modules are designed to equip you with the knowledge, skills and confidence to manage your cardiovascular health.

Education topics include:

- Heart health, risk factors and recovery
- Physical activity and exercise
- Managing stress, anxiety and wellbeing
- Nutrition
- Medications

Exercise classes

A 6 week program of supervised exercise sessions, run in a group setting and led by an exercise physiologist, cardiac nurse and physiotherapist. Your blood pressure and heart rate will be monitored and you will be asked to exercise within your own limitations. Activities include walking, aerobic stations, and light resistance exercises.

Support

Our group-based programs offer a good opportunity to meet and gain support from people who share similar experiences to you. We also offer specialist individual counselling. Counselling is available by appointment and provides you with the opportunity to discuss issues relevant to yourself on a one to one basis.

Sessions are conducted throughout the year, please contact Cardiac Rehab at RNSH for more information 9463 1705, or contact your local cardiac rehab program.

Who do I contact about cardiac rehabilitation?

During your stay in hospital at RNSH a member of the cardiac rehabilitation team will visit you to discuss options for cardiac rehabilitation close to your home.

You should contact your local cardiac rehabilitation program within the first week of your discharge home from hospital.

Your Closest Cardiac Rehabilitation Program is:

Hospital.....

Phone Number:.....

For further information regarding cardiac rehabilitation, or to locate program in your local area contact the

National Heart Foundation on 13 11 12 or
visit www.heartfoundation.org.au

Other Cardiac Rehabilitation programs:

Bankstown Hospital Eldridge Rd, Bankstown 9722 7963

Concord Hospital Hospital Rd, Concord 9767 6765

Central Coast Gosford and Wyong Hospitals.....1300 725 565

Hornsby Hospital Palmerston Rd, Hornsby..... 9477 9844

Mona Vale Community Health Centre Coronation St,
Mona Vale 9998 6180

Royal Prince Alfred Missenden Rd, Camperdown.....1300 722 276

Ryde Hospital Denistone Rd, Eastwood.....9858 7764

St Vincent's Hospital Victoria St, Darlinghurst 8382 2321

Westmead Hospital Hawkesbury Rd, Westmead 8890 6787

NSW Health offer Cardiac Rehabilitation across all local health districts. If your local cardiac rehab is not listed here contact your nearest public hospital or the heart foundation.

There are also a number of Private Hospitals that offer Cardiac Rehabilitation programs; if you prefer to access a private program contact your local private hospital or the Heart Foundation.

Other contacts that may be helpful

Aboriginal and Torres Strait Islander Health Service 9462 9017

APAC RNSH 9462 9460

Diabetes Australia 1300 136 588

Heart Failure Services RNSH 9463 1702

Hypertension Clinic RNSH 9463 1739

National Heart Foundation 13 11 12

Northern Sydney Drug and Alcohol Services 1300 889 788

NSW Mental Health Line 1800 011 511

Royal North Shore Hospital Main Switch 9963 1600

Quitline 13 78 48

Web resources that may be helpful:

Australian Government Department of Health ..... www.health.gov.au

Austroads ..... www.austroads.com.au

Diabetes Australia ..... www.diabetesaustralia.com.au

Dieticians Association of Australia ..... www.daa.asn.au

Exercise Right ..... exerciseright.com.au

Food and Nutrition Australia ..... www.foodwatch.com.au

Heart Research Australia ..... www.heartresearch.com.au

Healthy Lifestyle NSLHD ..... www.nshealthpromotion.com.au

National Heart Foundation ..... www.heartfoundation.org.au

National Prescribing Service (NPS) Medicine Line ..... www.nps.org.au

Quit Smoking ..... www.iCanQuit.com.au

St Vincent's Hospital Heart Health ..... www.svhhearthealth.com.au

'Your Room' NSW Health (alcohol & other drugs) .. yourroom.health.nsw.gov.au

Resources in other languages

The Heart Foundation provides heart health resources, including the heart attack action plan and healthy lifestyle tips, in over 25 different languages. Visit the Heart Foundation website for more information:

www.heartfoundation.org.au/support/information-in-your-language

Donating to cardiac rehabilitation

The NORTH Foundation, (formerly the Kolling Foundation), works in partnership with our hospitals and research units to raise much needed funds so they can continue to provide the best in patient care and drive research to find solutions to real-world health problems impacting our community.

If you would like to make a voluntary contribution to Cardiac Rehabilitation or any other services at Northern Sydney Local Health District please visit the North Foundation website:

https://northfoundation.org.au/how-you-can-help/donate/

My follow-up appointments

G.P. within 2-4days of discharge

Dr .....

Date ..... Time.....

Cardiologist within 3-4weeks of discharge

Dr .....

Date ..... Time.....

Surgeon within 4 weeks of surgery

Dr .....

Date ..... Time.....

Cardiac Rehabiliation

Location.....

Date ..... Time.....

APR20 / V6

CATALOGUE NUMBER: NS08956-E