IRISH HEART FOUNDATION
Fighting Heart Disease & Stroke

www.irishheart.ie

STEP BY STEP THROUGH HEART SURGERY

Produced by the Irish Heart Foundation
This booklet is one of the publications in our patient information series. It is a revised edition of the original booklet written by Mr Jim McCarthy and Mr Johnathan McGuinness, Mater Misericordiae University Hospital, Dublin.

Funding
This booklet has been paid for using public donations.

The Irish Heart Foundation
The Irish Heart Foundation is the national charity fighting heart disease and stroke. More people in Ireland die from these causes than from cancer, road deaths and suicide combined. We work to bring hope, relief and a better future to Irish families. We support pioneering medical research, campaign for improved patient care and provide vital support and information for patients. In hospitals, schools and workplaces, we support, educate and train people to save lives. As a charity we depend on your ongoing support - through your donations or by giving of your time as a volunteer or on a training course.

For more information or to donate, visit our website: www.irishheart.ie

Heart and Stroke Helpline:
Locall 1890 432 787 (Monday to Friday 10.00am to 5.00pm)

Irish Heart Foundation,
50 Ringsend Road,
Dublin 4.

Phone: +353 1 668 5001 **Fax:** +353 1 668 5896 **Email:** info@irishheart.ie

Contents

Introduction

This booklet is for people who are going to have heart surgery and for people who have just had heart surgery. It has been written to add to the information that you have already received from your doctor.

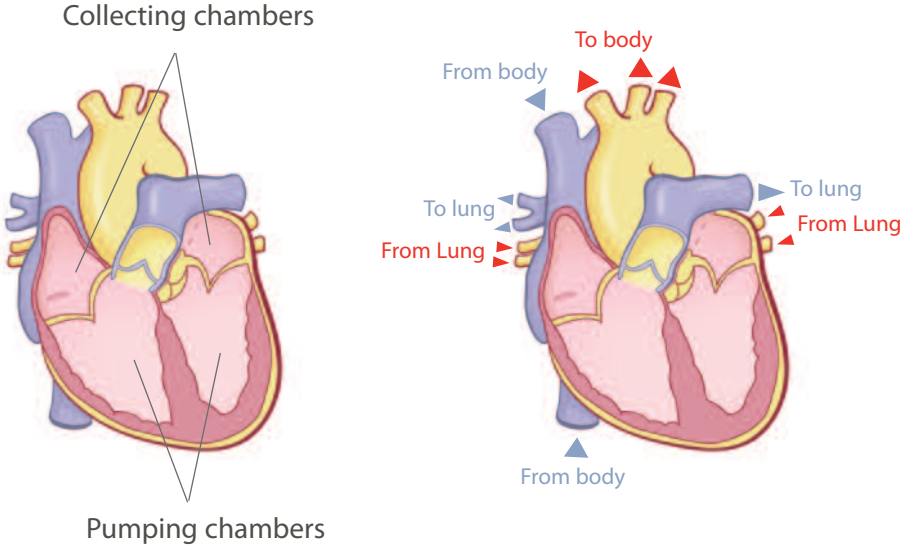
This booklet is about the most common types of heart surgery which are heart bypass operations and operations to repair or replace the valves in your heart. It explains:

- The structure of your heart and how it works.
- Why you need a heart operation.
- How the operation can correct your heart problem.
- What you can expect when you go into hospital and when you are getting ready for your operation.
- What will happen during the surgery.
- What to expect while you are in hospital after your operation.
- What to expect when you go home.
- How a heart healthy lifestyle can help improve your symptoms and reduce your risk of other heart problems.

How does my heart work?

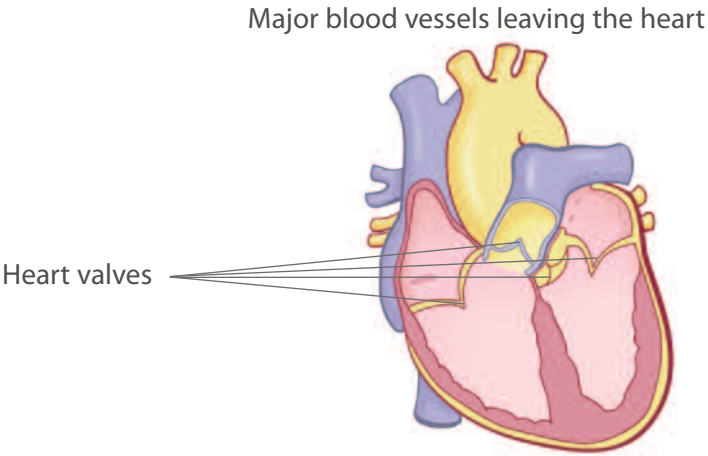
Your heart is divided into two parts – a right and a left part. The right part pumps blood to your lungs to pick up oxygen and the left part then pumps this blood full of oxygen around your body to all your organs such as your brain, kidneys, bowel and liver.

The right and left parts of the heart each have a small collecting chamber which collects the blood returning to your heart and then pushes the blood into a larger pumping chamber which squeezes to force the blood out to your lungs or the other major organs.



There are four valves in your heart – two in the right part and two in the left part. The valves between the collecting chambers and pumping chambers open to allow blood that has returned to the collecting chamber to pass into the pumping chamber, and then close to prevent the blood leaking back into the collecting chambers when the pumping chamber squeezes.

The valves between the pumping chambers and the major blood vessels leaving your heart, open when the pumping chamber squeezes to allow blood to leave your heart and close again so that the blood which has been squeezed out of your heart travels around your body and doesn't leak back into your heart.

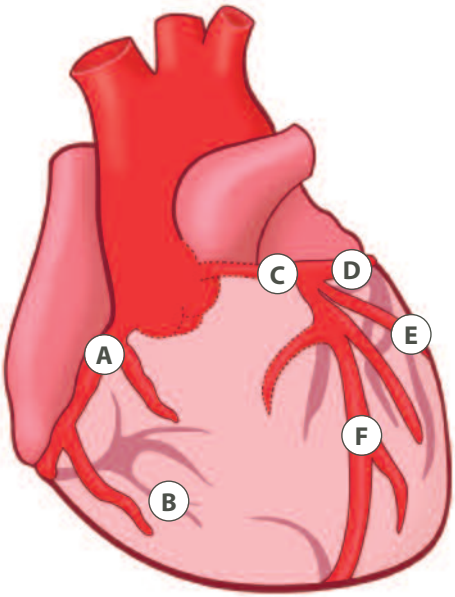


Two main problems can occur with your heart valves:

- They can become thickened and narrowed so that they don't open properly which then limits the amount of blood that can be pumped out of the heart and puts strain on your heart.
- They can leak, which means that blood which has been pumped out of your heart leaks back into it, which makes it very inefficient.

The heart muscle squeezes about 70 times a minute when you are sitting down at rest, and more than double this when you are active. To be able to pump this hard it needs a lot of oxygen. The oxygen travels in your blood to your heart muscle through blood vessels on the surface of your heart called the coronary arteries.

Coronary arteries on the surface of the heart



A: Right coronory artery
B: Posterior descending artery

Left coronary artery
C: Left Main
D: Circumflex Artery (Cx)
E: Intermediate Marginal
F: Left Anterior Descending (LAD)

There are two main coronary arteries, which divide into branches on the surface of your heart. Atherosclerosis (a fatty disease of the arteries) is when the coronary arteries narrow, which reduces the amount of blood that can get to your heart, and so it has less oxygen, which it needs to continue to pump effectively.

The electrical system of your heart is buried in the heart muscle and generates the electrical signals that tell the heart muscle when to pump. The part of the electrical system where the electrical signals begin is called the pacemaker.

What can go wrong with my heart and how can surgery correct it?

Problems with the coronary arteries

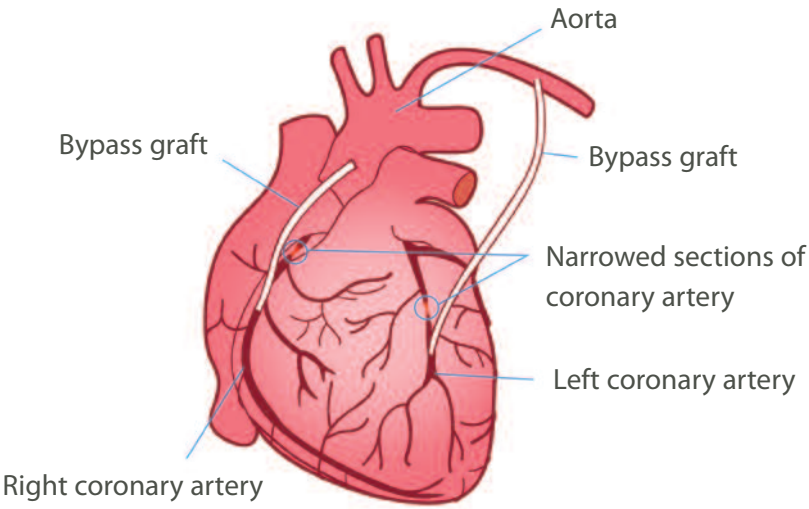
Arteries can become damaged over time by atherosclerosis (pronounced ath-er-o-scler-o-sis). Atherosclerosis comes from the Greek language and means hard porridge. This condition happens when fatty material builds up on the inside wall of your coronary arteries. This fatty material hardens into what is called atherosclerotic plaque, which narrows the artery and reduces the flow of oxygen-rich blood to your heart muscle. This is what is commonly called, hardening of the arteries.

At rest, a person with narrowing of their coronary arteries may have just enough oxygen being delivered to their heart to allow it to pump. However, problems arise when the heart has to pump harder or faster or when a person is active, for example, running, walking or sometimes just getting dressed. Then their heart needs more oxygen. However the narrowed coronary arteries stop their heart from getting more oxygen-rich blood and the person will feel breathless or feel discomfort in their chest (angina). Angina is a tightness or pain in your chest, jaw or arm which is brought on by doing an activity that needs some effort.

Your arteries can become very narrow due to the growth of this plaque. The plaque may tear away from the wall of the artery and cause a blood clot. This narrowing of your arteries reduces the flow of blood to your heart muscle and, in some cases, stops the blood from getting through completely. If heart muscle does not get a supply of blood, it becomes damaged and can die. When an area of heart muscle dies, it is called a heart attack. The medical term for heart attack is myocardial infarction or MI.

Coronary artery bypass graft surgery (CABG)

When there are narrowings in both the coronary arteries or in a few of their main branches, this is often best treated with a heart bypass operation. During a heart bypass operation, the surgeon uses a piece of blood vessel from somewhere else in your body to bypass around the narrowings or blockages in the coronary arteries.



This means that the blood supply to your heart is restored to normal. This should get rid of any chest pain or breathlessness, and reduce the chance of you having a heart attack.

The piece of blood vessel that the surgeon uses for the bypass can be taken from different places – your leg, arm, or the inside of your breastbone.

- **The piece of blood vessel from your leg is a piece of vein.** This is the vein that is removed from people who have had varicose vein surgery. The vein is just underneath your skin and the surgeon is able to remove it because the more important veins for supplying blood to the legs are deeper in your leg. The wound will be on the inside of your leg, often beginning at your ankle and going up your leg.

- **The piece of blood vessel from your arm** is an artery (the radial artery) and is removed from your forearm. The surgeon can remove this artery because most people have two arteries, which supply the forearm and hand with blood, but can manage with one artery. If this artery is used for your bypass, you will be prescribed a medicine called a calcium channel blocker for six months after your surgery to keep the artery widely open.

- **The piece of blood vessel from the inside of your breastbone** is an artery (the internal mammary artery). It is removed through the same chest wound used for the heart operation. This artery has the best long-term results as it remains open and supplies blood to the heart for the longest period of time.

In most bypass operations, more than one area of narrowed artery is bypassed. So for most people the artery on the inside of their breastbone will be used, together with some vein from their leg or the artery from their arm.

Single, double or treble bypass refers to the number of coronary artery branches bypassed.

Bypass surgery won't cure your heart condition, but it will improve your symptoms and make your heart safer. It is important that after your surgery you follow the lifestyle advice from your medical team and take your medicines as prescribed to prevent other areas of your coronary arteries from developing blockages.

Problems with the heart valves

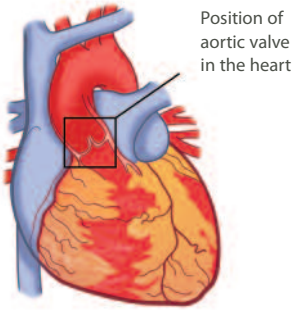
The valves in your heart can develop two main problems – narrowing or leaking:

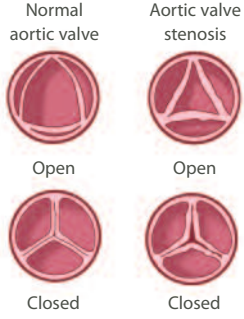
- A heart valve can become narrowed due to thickening and scarring from just simple wear and tear. This is known as degenerative valve disease. Other diseases that cause thickening and narrowing of heart valves are rheumatic fever and infections of the heart valves.
- A heart valve can leak because the leaflets (leaf-like flaps) of the valve do not meet any more as a result of damage from wear and tear, rheumatic fever or infection, or following a heart attack.

Occasionally, people are born with abnormal heart valves which are more likely to either become narrowed or leak. The two most common heart valves that are damaged are called the aortic valve and the mitral valve.

Aortic valve

This is the valve that separates the pumping chamber of your heart (the left ventricle) from the major blood vessel (the aorta) that leaves your heart to supply all the major organs with blood. If it becomes narrowed or leaky, it puts extra strain on the pumping chamber of the heart. This condition is called aortic stenosis. This generally causes breathlessness, but can also cause pain in the chest when you exert yourself and can cause a faint or blackout. The aortic valve can also leak causing breathlessness. This is called aortic incompetence. In most situations when this valve is damaged, it cannot be repaired and has to be replaced.

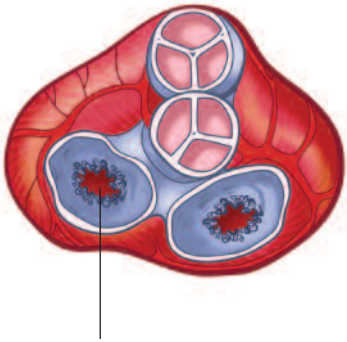




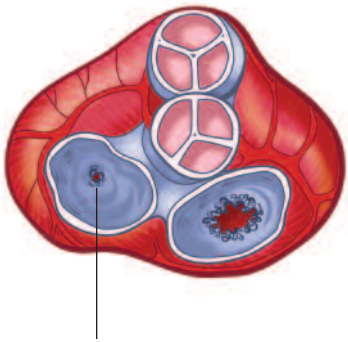
Mitral valve

This is the valve that separates the pumping chamber that sends blood all over your body from the collecting chamber that collects the blood returning from your lungs. If it becomes narrowed or leaky, it puts back pressure on the collecting chamber and the lungs. This back pressure can then cause the collecting chamber to enlarge, creating an irregular heart rhythm which gives you the feeling of palpitations.

The back pressure on the lungs can cause them to become wet and make you feel breathless when you exert yourself, or even sometimes when you are lying in bed at night. These valve problems can often be repaired. If the valve has to be replaced, it is usually replaced with a mechanical metal valve, but sometimes with a tissue valve.



Normal mitral valve



Narrowing of mitral valve (mitral valve stenosis)

Replacement valves

Replacement valves are divided into two types – tissue valves and mechanical valves. Tissue valves are either human, pig or cow valves. Mechanical valves are made from metal. Human valves (Homograft) come from a person whose heart valves were donated when they died.

The type of valve you get will depend on your age, your medical history and your lifestyle. Your surgeon will discuss the options with you.

Mechanical valve

If you get a mechanical valve, you have to take a drug called warfarin for the rest of your life. With a tissue valve you may only have to take warfarin for three months. Mechanical valves last longer than tissue valves. Typically, a tissue valve will last 10 to 15 years and a mechanical valve should last longer.

Warfarin is a blood-thinning drug that is used to prevent clots on the valve. If you are taking warfarin, you will have regular blood tests in a hospital clinic or at your GP's surgery to make sure that your blood is thin enough. Be aware of any bleeding that goes on for longer than normal and let your doctor know if this happens. You can drink alcohol, but be careful to have no more than 2 units of alcohol a day. For more information on warfarin, see our booklet, ***Step by step through heart medicines***.

Once your heart valve is repaired or replaced your symptoms will improve or disappear, and your exercise tolerance will get better.

Problems with an irregular heart rhythm

Often, people develop an irregular heart rhythm from problems with their valves or narrowings in their coronary arteries.

This irregular heart rhythm is called atrial fibrillation. It happens because other areas in the collecting chambers of the heart start producing irregular electrical impulses, which override the natural pacemaker in your heart's electrical system. This causes the heart to work harder than it needs to, because it can't work as efficiently.

In recent years a new surgical procedure was developed to correct this irregular heart rhythm. The procedure creates scar tissue in the walls of the collecting chambers to isolate the abnormal electrical impulses so that they don't interfere with the natural pacemaker in the electrical system of the heart.

The procedure is called a Cox-Maze procedure. It works in about 60% of people to get rid of the irregular heart rhythm. Your surgeon will offer this procedure to you if you have an irregular heart rhythm and he or she feels that it might work for you.

People can develop an irregular heart rhythm from problems with their valves or narrowings in their coronary arteries.

What can I expect before my heart operation?

Before you see a surgeon about your heart operation, your GP will have referred you to a heart specialist called a cardiologist, or you may have gone to a hospital emergency department because your symptoms were sudden or severe.

For some people, their symptoms gradually get worse or they may experience breathlessness or chest pain. You may find you can't be as active as you were a year ago without getting symptoms, or you may start getting symptoms when you are resting or doing simple activities such as getting dressed.

Other people suddenly develop symptoms of breathlessness or chest pain, or may even have a heart attack as the first warning that they have a problem with their heart.

Your cardiologist will do tests do find out what the problem is with your heart. These tests usually include blood tests to measure your cholesterol and will look at how well your kidneys and liver are working, as well as your blood count. A chest x-ray and a tracing of the electrical activity of your heart (ECG) are painless, straightforward tests. Most people will also have had an ECHO or an angiogram (also called cardiac catheterization), or both. For more information, see our booklet, ***Step by step through cardiac catheterization and angioplasty***.

- An **ECHO** is an ultrasound scan of the heart. It is done by putting some gel on your chest and then placing a probe on your chest to give some moving pictures of the inside of your heart. It is painless and gives very good pictures of your heart valves, as well as showing any problems with the chambers of your heart.
- An **angiogram** is a specialised test, which involves passing a small tube through a blood vessel in your groin or arm. Dye can then be injected through this needle that will show up your coronary arteries on x-rays, so that any narrowings or blockages can be seen. It also allows the cardiologist to look at your heart valves and assess how well your heart is working.
- More recently, **CT scans** are also being used to see the coronary arteries. This is a non-invasive x-ray test that can show narrowings in the coronary arteries.
- Some people need **cardiac MRI**, which gives more information about the structure of the heart. It also demonstrates how much heart muscle is replaced with scar tissue.

Once your cardiologist makes the diagnosis, he or she will discuss your problem with a cardiac surgeon. They will come to a joint decision as to whether your problem might best be treated with surgery and plan the timing of surgery.

Before you go into hospital

The surgical team may ask you to stop certain medications before you go into hospital, especially blood-thinning drugs such as plavix, warfarin, dabigatran or prasugrel, but you should not stop these unless you are told to. As soon as you have the date for your operation, it is a good idea to make sure your cardiologist and the surgeon know what medicines you are taking and to ask them if you need to stop taking any of them before you go into hospital.

The day before your operation

You will be admitted to hospital the day before your operation. The surgical team will talk to you about your medical history, examine you, and look at the results of all the tests and investigations that have been carried out. Your blood tests, ECG, and chest x-ray will be repeated to make sure there are no new problems.

The surgical team will discuss the operation with you and explain what you can expect during your recovery. This is an important time for you to ask any questions you may have. You may like to have a close friend or family member with you to ask any additional questions.

The surgical team may ask you to stop certain medications before you go into hospital.

The anaesthetist who will be looking after your anaesthetic will also meet with you to talk about what you can expect and any pain relief needed after the operation. The nurses on your ward will also tell you what you can expect and answer any other questions you may have.

The physiotherapist will show you some breathing exercises that you need to do after the operation, to prevent a chest infection.

You can help yourself and the surgical team by doing the following:

- **Stop smoking.** People who smoke have more mucus in their lungs, which is hard to remove after surgery and will put smokers at more risk of suffering a chest infection.

- **Bring all your normal medicines with you** to the hospital to show to the surgical team. The nurses on your ward will give you your medicines while you are in hospital.

- **Leave valuables at home.** It is best not to bring jewellery or money to the hospital.

- **Plan for when you are ready to go home.** For the first two weeks at home you will need to relax as you did in hospital, do no work, and have your meals prepared for you. Make arrangements to have somebody at home with you for those two weeks.

The night before your surgery

- The nurses will give you a special soap to shower with to kill skin germs.
- Your chest and legs will be shaved for you if needed.
- You will probably be asked not to eat anything from midnight.
- If you have diabetes the surgical team may put you on a drip to control your blood-sugar levels if needed.

The morning of your operation

- You will be given a theatre gown and a sterile hat to wear.
- The nurses on your ward will give you your medicines with a small sip of water.
- An hour before you go to theatre you may be given a relaxant tablet to take if you want.
- You will be asked to remove any false teeth and non-permanent bridgework, hair clips, jewellery and nail polish before going to the operating theatre.
- A porter will collect you from the ward and bring you on a trolley to the operating theatre with a nurse.
- At the operating theatre, you will be taken into the anaesthetic room where you will meet your anaesthetist again. The anaesthetist will put a needle in your arm and then give you the anaesthetic drugs to put you asleep and block any pain. You will not be awake during the surgery.

What happens during the heart operation?

- You will be asleep during the operation. The operation usually takes between three and five hours.
- Most heart operations are carried out through the front of the breastbone to get access to your heart.
- In most heart operations, you will be placed on the heart and lung machine. This machine will breath for you and pump blood around your body so that your heart can be stopped to do the operation. The heart bypass, valve repair or valve replacement will then be done.
- After this, the surgeon gets your heart beating again and then stops the heart and lung machine.
- The surgeon will stop any bleeding and put in some temporary wires that come out through your skin and will be attached to an artificial pacemaker. This will control your heart rhythm, if needed, following the surgery. The wires will be removed a few days after your surgery.
- They will then close your breastbone with wires to give it strength while it is healing. These wires are buried within the bone and you won't be able to feel them. The wires are left there forever, but you will not be aware of them and they rarely cause a problem.
- The wound is then usually closed with absorbable stitches.

The operation usually takes between three and five hours.

What can I expect after my heart operation?

Immediately after the operation

You will be kept asleep after your operation and brought back to the intensive care unit (ICU). In the ICU, you will have one nurse who will be responsible for looking after you.

While you are in the ICU, you will be attached to a number of monitors by tubes and wires. This is normal. You will be connected to monitors to watch your blood pressure, heart rhythm and temperature. You will be kept asleep and a ventilator will control your breathing for at least the first few hours after your operation.

Your family may come in briefly to see you in the ICU within the first few hours after your operation, but you will be asleep.

Once your blood pressure has settled and there is no bleeding, the ICU team will wake you up and, when you are breathing well, they will take you off the ventilator and take the breathing tube out. It is usual to wear an oxygen mask for the first few days after your surgery.

When you wake up in the ICU you may feel confused at first. The ICU is a busy, noisy place, and it is normal to lose track of what time it is.

You will notice that you have a line in your arm for monitoring your blood pressure, and a small tube in your bladder to drain your urine for monitoring your kidneys. You will have some tubes in your chest to drain away any blood from around your heart and re-expand your lungs. These tubes are usually removed the morning after your surgery before you leave the ICU.

You will be given regular painkillers, but if you are still in pain it is important to tell your nurse who will give you extra drugs to ease the pain. You will be allowed to eat and drink the day after your surgery.

Most patients are in the ICU for one to two days, and then transferred to the high dependency unit (HDU) or a cardiac ward. Some patients need more time in the ICU.

Two to three days after the operation

- Once you are back on the ward or in the high dependency unit, you will still be connected to a monitor for the first couple of days.
- You will be off the drip and eating and drinking again.
- The nurses will help you to sit on a chair on the second day after the operation.
- Get up as soon as you can and talk to family and friends. This may speed up your healing and helps family and friends feel less worried about you. Ask for help when you need it.
- Each morning, the surgical team will come to see you to check how you are doing, change your medicine to help your heart recover from the operation most effectively, and deal with any problems.
- You will have regular blood tests to check your blood count and keep an eye on how well your kidneys and liver are working.
- The nurses will give you your medicine for the day, help get you up, dress your wounds, and regularly check your blood pressure, pulse and oxygen levels.
- The physiotherapist will see you again to remind you of the breathing exercises that you were taught before the operation. You must take deep breaths regularly to help expand your lungs.
- It is normal after heart operations to have swelling in your legs, and you will be given water tablets to get rid of this extra swelling. You should raise your legs on a stool or your bed when you are sitting on the chair to help the swelling to go down. Don't cross your legs.
- You will be given an anti-clotting injection once a day and special stockings to wear to prevent a clot forming in your leg or your lungs.

Four to six days after the operation

At this stage, you should be walking around your bed. The physiotherapist will take you for a walk to make sure that you are steady on your feet. You will no longer be connected to the monitor so you don't need to wait for the nurses to get you up and walking. Instead, go for walks along the corridor with your family and friends. Walking makes you feel better, improves your breathing, and helps the swelling in your legs to go down.

The surgical team will check your wounds each morning to make sure they are healing well, and to treat any infections early with antibiotics. Most of your stitches will be absorbable and on the inside, so will not have to be taken out. Sometimes staples are used to close the wound, and these will be taken out before you go home. You will be sore, especially in your chest, and should continue to take regular painkillers.

The following things may happen while you are recovering in hospital after the operation:

- You will have lost blood during your heart operation. Your blood count will be checked regularly, and if it is low you may be given a blood transfusion. The transfusion will give you more energy.
- If your wound develops an infection, you will need daily dressings and antibiotics.
- It is quite common for a person's heart rhythm to become irregular suddenly after a heart operation. You may not be aware of the irregular heartbeat so this is why you are connected to a monitor for the first three days. If it becomes irregular, you will be given medicine to convert it back to a normal heart rhythm.
- You may notice night sweats.
- People often get confused two to three days after their heart operation. This is quite common, and in most cases is related to the heart and lung machine that was used during the operation. It usually only lasts one to two days.

- Your sleep pattern will often be upset in hospital and for the first week or two after discharge.
- Many people find that their taste for food is poor for the first two weeks after the operation.
- Most people feel quite a lack of energy for the first week or two after the operation. This improves gradually thereafter.
- To give your breastbone extra support while it is healing, you may be given a chest binder to wear while in hospital.
- Women often find that it is very uncomfortable to wear a bra just after the operation.
- Your chest, arm or leg wounds may feel numb for a few months. This feeling can often change to slight pins and needles as the numbness wears off. However, sometimes the numbness persists.

On the fifth or sixth day after your operation, the physiotherapist will check to make sure that you can cope with going up and down stairs. You will have a final chest x-ray and ECG test. You will be given advice about what to do when you go home and what medicine you should now take. You will normally be able to go home six or seven days after your operation.

What do I need to look out for when I go home?

In the first six weeks

Rest

For the first two weeks, it is important to rest at home as you were doing in hospital. Take regular short walks, eat regularly, and have somebody prepare your meals for you. Have somebody stay with you for a couple of weeks if you live alone.

Anxiety and depression

It is common to feel down or anxious from time to time in the first few weeks after you go home. These are normal feelings and should pass. If you continue to feel anxious or depressed, talk to your doctor, he or she will be able to help.

Driving

Don't drive or work for at least six weeks, until you see your surgeon again in the outpatient clinic (usually six weeks after your operation).

Sex

You can have sex 3 to 4 weeks after surgery, depending on how quickly you recover and how you feel. Men often have impotence or some difficulties maintaining an erection after heart surgery. This may be due to emotional upset rather than a medical problem. If you are depressed or anxious, this can cause the problem rather than other medical causes of impotence. Some medicines that are used for people with heart problems, for example beta blockers, can cause impotence. Whatever the cause, if this is a problem for you, talk to your doctor or call our National Heart and Stroke Helpline on Locall 1890 432 787.

Caring for your wound

You will need to continue to take some form of painkillers, even if it is just paracetamol for a few weeks. Your surgeon and the nurses on the ward will give you specific guidelines for your recovery, including instructions on how to care for your wound and general health after the surgery.

Problems to look out for

Contact your doctor if you:

- Notice your wounds becoming red, painful, hot, swollen or weeping.
- Have chest pain, feel breathless or get bad palpitations.
- Have a fever.
- Feel dizzy or have blurred vision.

Outpatient check-up at six weeks

You will have an appointment to come back to the outpatient clinic after six weeks. The surgical team will talk to you about your recovery, and examine you to make sure your wounds have healed well, and your heart is recovering well.

They may stop some of the medicine that you were taking immediately after your heart operation. At this stage, they will tell you when you can go back to work and whether you can start driving again. It is a good idea to write down any questions you want to ask and bring them with you to this clinic visit. You may like to bring a friend or relative with you as well.

From six weeks to three months

Driving and going back to work

You will be allowed to start driving again. Take it slowly and gradually ease back into driving. Don't drive heavy vehicles such as a van, and don't drive long distances until three months after your operation. It is important to tell your employer, insurance company and the driving licence authority about your heart condition. Generally, most people take three months off before returning to work, but this is not always possible and you can discuss this with your surgeon.

Travel and holidays

We do not recommend that you go on long journeys or trips abroad for six to eight weeks after your heart surgery. Travel with someone else and make sure you have enough medicine for the journey and for your holiday. Avoid very cold and very hot climates, and make sure you drink enough fluids in hot weather. It is always safest to discuss your trip with your doctor before making plans.

Cardiac rehabilitation

The cardiac rehabilitation unit in your local hospital will contact you at this stage to start phase three of your rehabilitation programme. Although your heart problem may have been fixed or your symptoms reduced, your heart will take time to recover from having to cope with this problem for a while. Cardiac rehabilitation is to strengthen your heart muscle to get the best possible recovery from it. It will also help and advise you on having a more heart healthy lifestyle to prevent you having more problems in the future and to reduce any symptoms you still have.

Cardiac rehabilitation is a continuous process of care which usually begins in hospital. It is offered to people who have had bypass surgery, heart valve surgery, angioplasty and to people who have had a heart attack. You can divide cardiac rehabilitation into four phases.

Phase 1
This is the time you spend in hospital after your operation. During this phase, you will get information about, your risk factors for heart disease and the medicines you have been prescribed. Your medical and surgical teams will also discuss with you issues such as returning to work and driving. If you have a partner or family, it is helpful for them to be included in these discussions.

Phase 2
This takes place immediately after you have left hospital. The focus of this phase is getting you to look at your lifestyle and ways that you can make it more 'heart healthy'. This includes looking at your eating habits and physical activity or exercise, losing weight (if you need to), stopping smoking and reducing stress. Depending on which hospital you are attending, this phase of cardiac rehabilitation may be by phone follow-up, home visits or individual or group education sessions.

Phase 3
This phase takes 6 to 12 weeks to complete. Your cardiac rehabilitation centre will arrange for you to visit the centre two or three times each week for exercise training and education sessions. To take part in cardiac rehabilitation, contact the cardiac rehabilitation department at your local hospital or the hospital where you had your operation.

Phase 4
This phase is about maintaining lifestyle changes that you have made and staying healthy. When you leave phase 3 of cardiac rehabilitation, which is very structured, it is important to keep exercising and to stay with your heart-healthy habits. Some cardiac rehabilitation centres offer phase 4 of cardiac rehabilitation or can give you information on leisure centres in your area that offer the service. You may decide to exercise on your own without going to a cardiac rehabilitation centre or a leisure centre. In this case, your cardiac rehabilitation team can help you set a safe and realistic programme of activities to suit you.

Your heart health

Your bypass operation has reduced your symptoms of coronary artery disease, but it has not cured it. New blockages can develop unless you improve your heart health and take your medicines as prescribed. If you have had valve surgery, you want the new or repaired valve to last as long as possible.

Your surgical and cardiac rehabilitation teams will discuss lifestyle changes with you. You can also contact the Irish Heart Foundation's National Heart and Stroke Helpline on Locall 1890 432 787. We have books and leaflets on all the heart health topics mentioned below. Our helpline nurses can advise you on making these changes and send you information. To keep your heart healthy, it is important to:

Quit smoking

If you continue to smoke after surgery or a heart attack, you double your risk of further heart problems or of having another heart attack. If you need help quitting, talk to your doctor about the best options to help you stop smoking.

Take regular physical activity

You don't have to be sporty or join a gym to be physically active. Walking, gardening, or simply taking the stairs instead of the lift are good activities to improve your heart health. Talk to your doctor about the types and levels of physical activity that are best for you. Always increase any activity you do gradually and check with your doctor before starting new activities.

Eat healthily

Eat a healthy, balanced variety of foods that are low in fat, sugar and salt to help your heart health. Eat plenty of fruit, vegetables and wholegrain foods. Include oily fish, such as salmon, mackerel and fresh tuna in your weekly eating plan. Choose low fat ways to cook food and limit the amount of alcohol you drink.

Lose weight

Be a healthy weight for your height and build, lose weight if you need to. This will make you feel better and can help lower your blood pressure. The best way to do this is by eating smaller portions of healthy food, combined with regular physical activity. Avoid crash diets.

Control high blood pressure and high cholesterol

You may need to take medicines to lower your blood pressure or your cholesterol. Eating healthily and taking regular physical activity will also help.

Control your diabetes

If you have diabetes, you may only have discovered it from blood tests carried out before your heart surgery. Some people have diabetes for years without knowing it. It is important to control your blood sugar to reduce further complications from diabetes. You can control your blood sugar with tablets or insulin. If you have diabetes, it is also very important that you never smoke and that you keep your cholesterol very low and control your blood pressure.

Manage your stress levels

Try to avoid stressful situations and learn how to manage stress.

Take your medicines

Your medicines are designed to keep your heart and blood vessels as healthy and efficient as possible, and to ensure that the effects of your heart bypass or valve surgery last as long as possible. It is important to take all of your medicines as prescribed. If you have any questions or experience any side effects, talk to your doctor or pharmacist. If you are having dental work or a medical procedure, make sure the dentist or doctor know what medicines you are taking and also about your heart condition and surgery. Never stop taking your medicines unless your doctor tells you to.

Visiting your GP and cardiologist

Make sure to visit your GP and cardiologist regularly. Your hospital team will advise you how often you need to see your doctors. Don't miss your appointments, they are important to monitor your heart health and check how well your medicines are working.

An explanation of medical terms used in this booklet

Angina
Angina is chest pain or chest discomfort. Sometimes you can also feel pain in your arm or jaw. It happens when not enough oxygen-rich blood gets to your heart muscle.

Angiogram
This is also called cardiac catheterization. An angiogram is a test using dye and x-ray to see if you have any problems in your arteries, valves or the chambers of your heart.

Angioplasty
Angioplasty is a treatment to unblock your arteries and increase blood flow to your heart muscle. A small device like a balloon is put into your artery and inflated to flatten the blockage against your artery wall.

Aorta
The aorta is the main artery in your body. It brings blood from your heart to all parts of your body.

Aortic valve
The aortic valve controls the flow of blood from your heart to the rest of your body.

Arrhythmia
This is an abnormal heart rhythm or heartbeat. It can be fast, slow or irregular.

Atherosclerosis
Atherosclerosis is a condition where fatty material builds up on the inside wall of your coronary arteries. This hardens to make atherosclerotic plaque, which narrows your arteries and reduces blood flow to your heart muscle.

Atrial Fibrillation
This is an irregular heart beat that affects your heart's ability to pump blood efficiently.

Beta blocker
This is a drug that slows your heart rate.

Blood count
This is a blood test that gives lots of information about your health such as, the level of oxygen in your blood, your blood's ability to form clots and if you have any infections.

Blood pressure
Blood pressure shows the amount of work that your heart has to do to pump blood around the body. The two numbers in your reading show the level of blood pressure. One number records blood pressure when the pressure is at its highest as the heart muscle squeezes out the blood from the heart - this is called systolic pressure. Then the heart relaxes, which allows the blood to flow back into the heart - this is called diastolic pressure. The normal level of blood pressure is usually about 120 (systolic) over 80 (diastolic). If you have been told that your blood pressure is higher than 140 over 90 (140 over 80 if you have diabetes), you should discuss this with your family doctor.

Calcium channel blocker
This is a drug that helps widen your blood vessels.

Cardiac rehabilitation
This is a programme of education, exercise and psychological support for people after a heart attack or heart surgery.

Cardiac CT Scan
This is a type of x-ray that produces a 3D picture of your heart to check for narrowing or blockages in your coronary arteries.

Cholesterol
This is a fatty substance made mainly in your liver. Our bodies need a certain amount of cholesterol to keep our cells healthy. A high cholesterol level is caused by eating too much saturated (animal) fat and some inherited conditions.

Coronary arteries
These are the blood vessels that bring blood to your heart to keep the muscle healthy and beating efficiently.

Coronary artery bypass graft (CABG)
This is an operation that attaches a healthy piece of blood vessel to either side of a narrowed coronary artery. Blood flow can then bypass the narrowed artery and bring more oxygen-rich blood to your heart muscle.

Echocardiogram (ECHO)
This is an ultrasound examination of your heart to see how well your heart muscle and valves are working.

Electrocardiogram (ECG)
An ECG test measures the rhythm and electrical activity of your heart. Small sticky pads are put on your body connected to wires that link up to the ECG machine. The machine reads and records the electrical signals from your heart.

Heart attack
A heart attack is when blood cannot get to part of your heart muscle and the muscle dies or is permanently damaged. Myocardial infarction (MI) is the medical term for a heart attack.

Mitral valve
The mitral valve controls the flow of blood between chambers in the heart.

Pacemaker
Our hearts have a natural pacemaker that controls the rhythm of our heart beat. Sometimes heart surgery can upset this pacemaker and you may be attached to a pacing machine to help your heart beat normally for a few days after your operation. Heart attacks and various diseases of the heart muscle and heart's electrical system can permanently damage the heart's natural pacemaker. In these cases, people will have an artificial pacemaker inserted in their chest and attached to their heart to help control their heart rhythm.

Palpitations
This is a feeling that your heart is beating too fast or irregularly.

Rheumatic fever
Rheumatic fever is a condition that can cause inflammation throughout your body. It develops as a complication of a type of bacterial throat infection known as a streptococcal infection (strep throat). Rheumatic fever can cause permanent damage to heart valves. The use of antibiotics to treat streptococcal infections means that rheumatic fever is now very rare in Ireland. It is estimated that less than one in every 100,000 people is affected by rheumatic fever each year.

Ventilator
This is a machine that breathes air into and out from your lungs. It is often used to support your breathing during and after heart and other types of surgery.

Warfarin
This is an anti-coagulant medicine that thins your blood and works to stop clots developing.

More information

Useful websites:
www.irishheart.ie
www.stroke.ie
www.iacr.info
www.hse.ie
www.bhf.org.uk
www.heart.org

Other Irish Heart Foundation publications:

Step by step through stroke, a guide for those affected by stroke and their carers
Step by step through heart medicines
Step by step through inherited heart disease, familial hypercholesterolaemia
Step by step through heart failure
Step by step through angina
AF and you, information for people living with atrial fibrillation
Step by step through cardiac catheterization and angioplasty
Step by step through heart attack
Manage your stress
All about your heart and stroke
Time to cut down on salt
Manage your blood pressure
A healthy cholesterol
Healthy eating
Be active
Quit smoking
Lose weight

Heart and Stroke Helpline:
Locall 1890 432 787
Monday to Friday 10am to 5pm
www.irishheart.ie

Please make a donation today

IRISH HEART FOUNDATION
Fighting Heart Disease & Stroke

The Irish Heart Foundation is Ireland's national charity dedicated to the reduction of death and disability from heart disease and stroke. Over 90% of our funding comes from public and business donations. We depend on your goodwill and generosity to continue our work.

If you found this booklet useful, please help our charity to continue to provide heart & stroke information by donating today.

You can make your donation today:

By post: Irish Heart Foundation, 50 Ringsend Road, Dublin 4
Online: www.irishheart.ie
By phone: 01 6685001

Personal Details

Name: _____

Address: _____

_____

_____

Email: _____

Phone: _____ Mobile: _____

Credit or debit card (one off donation)

Amount: ☐ €250* ☐ €100 ☐ €50 ☐ €25 ☐ Other € _____

Card Number: ☐☐☐☐ ☐☐☐☐ ☐☐☐☐ ☐☐☐☐

Exp Date: ☐☐ / ☐☐ Security Code**: ☐☐☐

Signature: _____ Date: ___ / ___ / ___

* If you donate €250 in one year (or €21 per month) we can claim tax back at no cost to you.
** Last 3 digits on the signature strip on the reverse of your card.

The Irish Heart Foundation is committed to best practice in fundraising and adheres to the **statement of guiding principles for fundraising** promoting transparency, honesty and accountability. Any personal information you provide will be held in accordance with the Data Protection Acts 1988 and 2003.

SEPA Direct Debit Mandate

Unique Mandate Reference:

Creditor Identifier: **IE02ZZZ306322**

By signing this mandate form, you authorise (A) the Irish Heart Foundation to send instructions to your bank to debit your account and (B) your bank to debit your account in accordance with the instruction from the Irish Heart Foundation.

As part of your rights, you are entitled to a refund from your bank under the terms and conditions of your agreement with your bank. A refund must be claimed within 8 weeks starting from the date on which you account was debited. Your rights are explained in a statement that you can obtain from your bank.

Please complete all the fields below marked*

*Bank Name: _____

*Address: _____

*Account number (IBAN): _____

* Swift BIC: _____

Creditor Name: **IRISH HEART FOUNDATION**

Creditor Address: **50 RINGSEND ROAD, DUBLIN 4, IRELAND**

*Type of Payment: ☑ Recurrent (Monthly) ☐ One-off Payment

* Signature: _____ *Date Signed: _____

Please return completed form to the Irish Heart Foundation.

My monthly instalment amount is: ☐ €21* ☐ €18 ☐ €15 ☐ €10

☐ Other € _____ *per month*

*A regular gift of €21 per month could be worth an additional €9 from the Revenue Commissioners per month at no extra cost to you.

Your first contribution will be taken on either the 2nd or the 20th of the next available month. Please select which date you prefer. ☐ 2nd ☐ 20th

You will be notified in writing ten days in advance of your first direct debit. If you wish to cancel within 7 days of a direct debit payment please contact your own bank.

Preferences

I would like to hear about other IHF events, activities, awareness campaigns and appeals.

☐ Yes

Do you need a postal receipt: ☐ Yes ☐ No

Registered Charity Number: CHY 5507
Source Code: APP00248

The Irish Heart Foundation is the national charity fighting heart disease and stroke.

IRISH HEART FOUNDATION
Fighting Heart Disease & Stroke

Irish Heart Foundation,
50 Ringsend Road,
Dublin 4

T: +353 1 668 5001
F: +353 1 668 5896
Email: info@irishheart.ie

Heart and Stroke Helpline:
Locall 1890 432 787
Monday to Friday 10am to 5pm

Web:
www.irishheart.ie
www.stroke.ie

Registered Charity
Number CHY 5507

February 2013