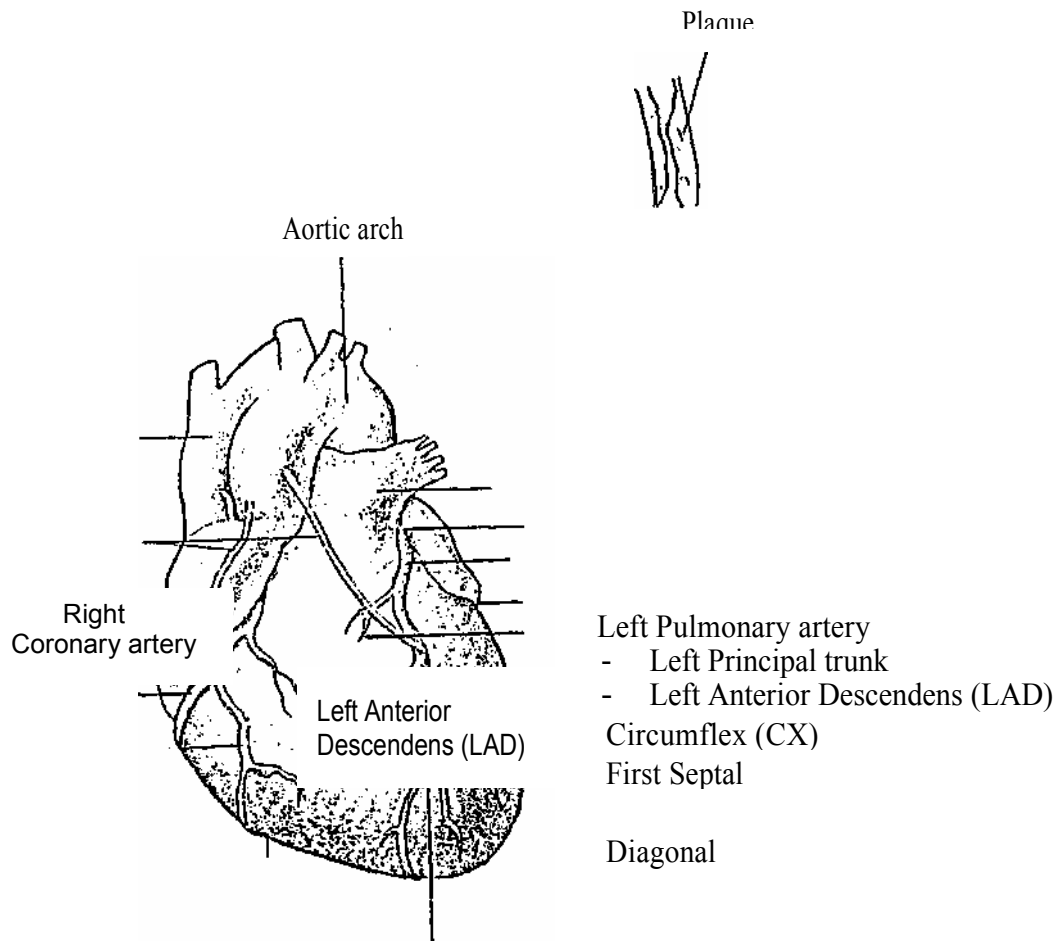


***OPEN HEART SURGERY
INFORMATION DOCUMENT***

November 2005

***Compiled by Prof WJ de Vries
Typed by Mrs H v.d. Merwe***

1 OPEN HEART SURGERY



2. CARDIOTHORACIC INTENSIVE CARE UNIT

Admission to hospital

Welcome to the Heart Unit of Universitas, Bloemfontein. If you are not already in hospital, we wish to welcome you. We are privileged to have you here.

An important question that might have arisen for you is:

- **Why must I undergo coronary artery bypass surgery – is it something I have done wrong?**

A heart attack or blocking of the arteries by cholesterol is caused by a variety of factors. If your parents or grandparents had heart diseases, the chances are excellent that you might experience problems, i.e. hereditary factors also play a significant role. However, there are certain factors that could accelerate the process, such as smoking,

obesity, inactivity, stress, etc. Therefore it is important for you to avoid these factors after the operation, particularly SMOKING, which is a noted culprit.

A heart attack or blockage of the artery generally presents with chest pain or angina, fatigue and short-windedness, or irregularity of the pulse. Some people do not have pain, and the blockage is detected by an abnormal ECG.

- **How is the operation performed?**

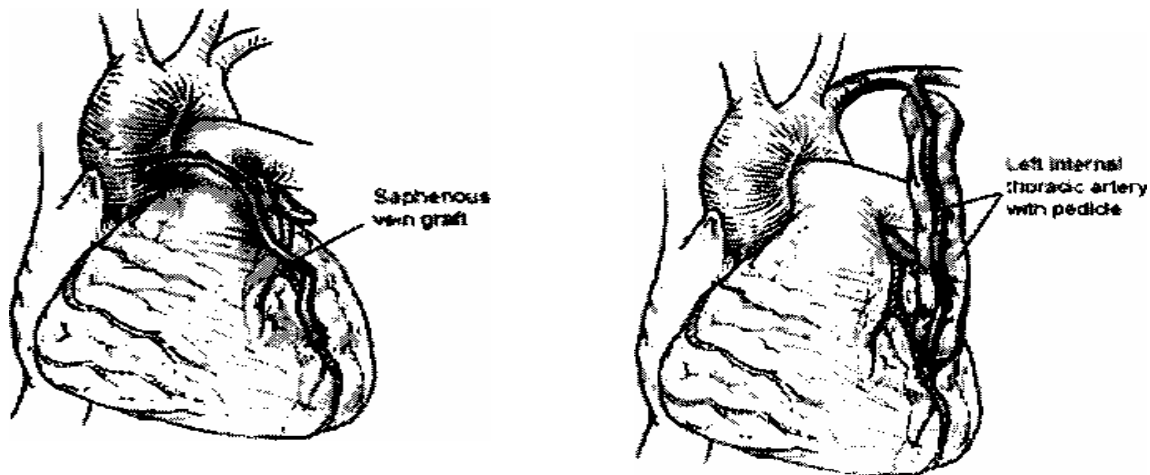
This will depend on your condition and whether there are other risk factors such as kidney or lung diseases.

The operation is generally performed by making use of a heart-lung machine (an apparatus that takes over the function of the heart and lungs). However, the surgeon will sometimes perform the operation on a beating heart, the so-called Off-pump.

In both instances use will be made of the veins taken from the leg, and usually an artery behind the breast bone (internal thoracic artery) or an artery from the arm (radial artery).

The artery will then be sutured beneath the obstruction, thereby bypassing the obstruction, hence the term 'cardiac bypass'.

The heart is never removed from the chest. Furthermore, it is important to remember that the disease process or the cholesterol could also affect the arteries that have been bypassed. Therefore it is necessary to avoid the dangerous factors mentioned above.



- **What are the chances that the operation will be successful?**

Generally, the chances are excellent and the risk involved in the operation is roughly 1%. There are, however, instances where the operation is more risky, e.g.:

- * When the cardiac muscle has already been damaged.
- * If you have already had previous coronary artery bypass surgery.

- * If you have additional conditions such as diabetes, kidney or lung diseases (please discuss your chances of success with your surgeon before the operation).

However, after surgery you ought to be free of fatigue and chest pain.

The advantages of a coronary artery bypass graft are therefore:

- * No chest pain or fatigue.
- * It prevents recurrence of a heart attack.
- * It will in some cases increase your life expectancy.

- **Are there alternatives to a coronary artery bypass?**

Yes, sometimes the artery can be stretched or a stent inserted; however, all patients do not qualify for this. The cardiologist would probably have discussed this with you.

- **Are there complications involved in the operation?**

Any operation, even a tonsillectomy could have complications. The following could occur after a coronary artery bypass and valve replacement:

Bleeding: The bleeding usually stops spontaneously after the operation. In some cases it might, however, be necessary for you to go back to theatre to stop the bleeding. It is important that you inform your doctor beforehand if you have a bleeding tendency or if there is a history of bleeding in the family, or if you are using any blood diluents (blood thinning agents) such as Disprin, Plavix, Grandpa or Voltaren, or even some herbal substances.

Heart rhythm disturbances: Often occur, particularly atrium fibrillation where the atria (upper heart chambers) beat irregularly. If this does not reverse spontaneously it is sometimes necessary for you to use Warfarin to prevent strokes.

Lung problems: Generally only in persons who at the time of the operation already have a lung disease as a result of smoking. It is important that you do not totally stop smoking just before the operation, unless you can do this a month or so before.

Confusion: This usually occurs if you have to remain in Intensive Care for a long period or if you have been using an addictive substance such as Valium or alcohol. It is also important that you inform the doctor accordingly.

Kidney problems: These generally occur in persons who already had kidney problems previously, or who have been on the heart-lung machine for a considerable period (extensive operation), or if the heart muscle does not function well.

Strokes: Fortunately these are rare and more often occur in older patients and persons who had previously had a stroke or black-outs. Kindly inform the doctor if you experience any of these symptoms

Loose sternum (breastbone): Discussed later.

Wound infection: Slight drainage is normal, but if it is excessive, accompanied by redness or pain or smelling bad, it is abnormal. If you have any infection before the operation, please inform your doctor accordingly. Patients with diabetes are also more susceptible to infections of the leg and chest wounds in particular.

- **Period before your operation**

The most crucial factor during this period is to remain as calm as possible and to tell the nursing staff about all the questions and fears you might have regarding the operation. We will do our best to provide satisfactory answers. It is also important to provide your doctor with the above information.

It is normal to be anxious. You will meet the people involved in the operation and aftercare. This includes the following persons:



- * The surgeon who will perform the operation.
- * The anaesthetist and the perfusion technologist.
- * One of the nurses of the Cardiothoracic Intensive Care Unit will come to see you the previous day. She will take you and your family through the Intensive Care Unit if possible and if you wish to do so. She will also provide additional explanations as required by you.
- * The physiotherapist will evaluate the condition of your lungs and decide if it is necessary to treat you before the operation in order to expedite the recovery after the operation. If this proves unnecessary, she will treat you just after the operation.

A series of special investigations will be performed to ensure that all possible information that might be required is at the disposal of the anaesthetist and the surgeon.

- * An electrocardiograph of your heart (ECG).
- * Blood samples.
- * Urine samples
- * Throat swab (sometimes)
- * HIV test (sometimes)

Furthermore, it is crucial that you inform the surgeon of the following:

Previous illnesses or operations that you have had (any illness or operation), e.g.

- * Do you have diabetes or have you had an operation for varicose veins?
- * Have there been any problems with previous anaesthesia or operations?
- * Do you have a bleeding tendency or are there persons in the family who do?
- * Have you had previous strokes or black-outs?
- * What medication are you currently using (everything including Grandpa, herbs, etc)?

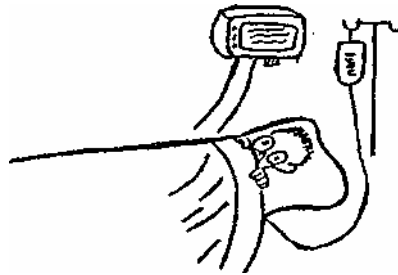
To keep the risk of infection at a minimum, it is essential that you be shaved before the operation. The following areas will be shaven:

- * The front of your chest;
- * Both arms;
- * Both legs;
- * Both groins.

The evening and morning before the operation you will be requested to bath in an antiseptic solution. This will help to prevent wound infection.

Your diet will be adjusted according to your position on the theatre list. A suppository will be given before the operation to cleanse the intestinal tract, thereby eliminating complications after surgery. The nursing personnel will clearly indicate when you are no longer allowed to eat. This is usually from 10:00 in the evening if the operation has been scheduled for the following morning.

Remember that you will receive a pre-medication two to three hours before surgery to ensure that you become calm before the operation. You are taken to the theatre from the ward where you have been admitted and prepared.



- **The period in the theatre**

During this period you are primarily in the care of the surgeon, assisted by the anaesthetist, the perfusion technologist and the theatre sister.

On admission to the theatre the anaesthetist will insert two drips; one through which medication is administered and one by means of which your blood pressure can be monitored. You will subsequently receive an anaesthetic agent and be oblivious of everything.

Your breathing and heart functions are taken over by a ventilator and a heart-lung machine. In order to do this, a respiratory tube is placed in your mouth, through your

vocal cords into your windpipe. A drip is also inserted into the large neck artery on the right side of the neck. A urine catheter is inserted to monitor the urine excretion and the renal (kidney) function. Furthermore, a tube is inserted through the nose into the stomach to prevent you from vomiting.

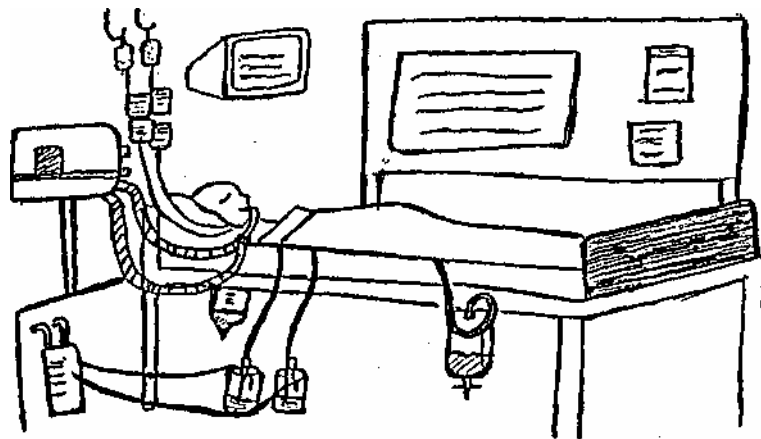
After this the operation will commence. The procedure is not discussed in detail, but if you require additional information, please feel free to ask.

After completion of the operation, while you are still anaesthetised, two or three drainage tubes are inserted just beneath the surgical incision to ensure that blood does not accumulate around the heart.

This information is provided because with the exception of the heart-lung machine, all these tubes and apparatus will still be in position in the period just after surgery. It is important for you to understand the function of each tube and that the nursing personnel will remove it at the appropriate time on the instruction of the surgeon. You must not attempt to remove it yourself.

- **The period directly after completion of the operation**

After completion of the operation you are accompanied by the surgeon and the anaesthetist to the Cardiothoracic Intensive Care Unit. In the Cardiothoracic Intensive Care Unit you will be in the care of the nursing personnel of the Unit and the surgeon who performed the operation. The nursing staff in the Cardiothoracic Intensive Care Unit specialise in this area of nursing and are capable of taking care of your needs on a continuous basis. The surgeon can be summoned to render assistance at any time. He will also come to see you every morning to ensure that everything is in order and give further prescriptions should this prove necessary.



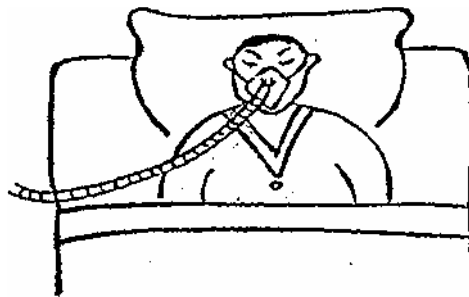
On arrival in the Unit the nursing staff will connect you to a monitor so that your blood pressure, pulse and temperature can be monitored on a continuous basis. Contrary to other operations, anaesthesia is not reversed, and as soon as you wake up medication is administered to keep you free from pain as far as possible and allow you to sleep.

Several medications are administered in the form of intravenous infusions (drips) to control your blood pressure, pulse and heart rhythm. The respiratory tube that had already been inserted through your mouth and vocal cords into the windpipe will still be in position. This is connected to a ventilator. As a result of the effect of the anaesthetic, you are not breathing by yourself and the ventilator performs this function. The ventilator breathes for you during the first 6 to 12 hours. This support gives the heart vessels that had been worked on a chance to recover. While the respiratory tube is in place you will not be able to speak, as it goes through your vocal cords. The instant it is removed you will be able to speak and possibly have a sore throat. As a result of this tube you could at times feel uncomfortable and breathe with difficulty. It is important to concentrate on remaining calm and attempting to breathe with the ventilator. It is also important not to pull on these or any other tubes. As long as the respiratory tube is in place, one nurse will attend to you alone to ensure that all is well. Therefore you need not be concerned about anything.

The urinary catheter inserted during the operation will also still be in position. Urine drains freely and constantly. At times it might seem to you that you need to urinate, but do not be concerned; there is a tube in the bladder and the urine will drain by itself.

An X-ray photo is taken of your chest directly after the operation to see that the respiratory tube is correctly positioned and also to observe the condition of your heart. The X-ray is taken in bed. The nursing staff will lift you and place the hard plate underneath you. You don't have to do anything; you must just try to relax during this procedure. The X-ray photo will be repeated every morning for as long as you are on the ventilator.

A rhythm tracing of your heart (ECG) is performed a few hours after the operation to ensure that your heart is functioning effectively. Blood samples are drawn regularly through the drip (arterial line) in your arm to ensure that the ventilator is functioning correctly. Certain medications are administered according to the results of the blood samples. You will not feel any pain during the drawing of these blood samples.



As soon as your overall condition is stable, you will be weaned from the ventilator. As soon as you are ready, the respiratory tube will be removed from your throat and you will breathe by yourself. This generally occurs 12 to 18 hours after the operation. This

period varies according to the lung function, smoking history and general condition of each patient.

After the respiratory tube has been removed, an oxygen mask will be placed on your face. It is important that you do not remove this frequently. After the respiratory tube has been removed, the tube that had been placed through your nose into your stomach in theatre will be removed too if your intestinal tract is working satisfactorily. A sign that the gastrointestinal tract is indeed functioning is the fact that wind is moving freely upwards and downwards. You can start eating 6 hours after this tube has been removed. The first meal comprises tea, toast, jelly, yogurt and ice-cream. After that you can take in a normal diet. If you are following a special diet, e.g. a diabetic diet, this will be provided.

The morning after the respiratory tube has been removed, the night staff will help you to sit with your feet outside the bed. Depending on your progress, you will be placed in a chair for short periods, after which you will be walking short distances. Although it will initially be painful to move, it is crucial to your recovery to mobilise (move) as soon as possible after the removal of the respiratory tube. The nursing staff and the physiotherapist will support and assist you throughout.

The drainage tubes that had been placed in your chest during the operation will be removed on the instruction of the surgeon, usually after a day or two.

Medication will be reduced gradually as your condition improves. The urine catheter will be removed as well.

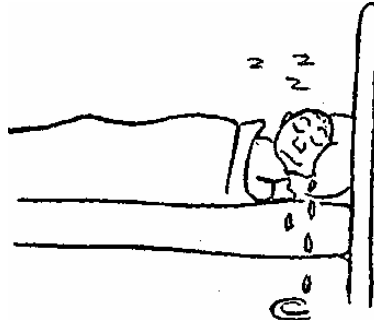
You will possibly hear alarms going off constantly. However, you must bear in mind that there are other patients in the Unit as well and that it is probably not the alarm of your monitor or ventilator going off. Should this be an alarm related to your apparatus, the nurse assigned to your bed will attend to this immediately and make the appropriate adjustments.

The noise levels in the Unit are continually high. This is because the activities in an intensive care unit do not lessen during the night. Your patience is requested in this regard.

As soon as you have stabilised, your family will be allowed to see you for a few moments. After this they will be requested to keep to visiting times. This is done to ensure that you and you fellow-patients receive optimum care throughout. At this stage it is important that your family supplies the nurse with a contact number should it be necessary to contact them.

- **Temperature**

When coming out of theatre your body will feel cold. However, your body will soon become warm again and you could even develop a fever. Patients often have a fever during the first three days following the operation, which results in excessive sweating. It is normal to have a fever and this does not occur as a result of an infection.



- **Physiotherapy in the Cardiothoracic Intensive Care Unit**

Physiotherapy after open heart surgery is of paramount importance, among others to prevent infections and to aid your general recovery. As there is a respiratory tube in your throat, you are unable to cough up the phlegm (mucus) present in your lungs or respiratory tract on your own. If this is not removed, you could develop a serious lung infection.

Physiotherapy is not always a pleasant experience for the patient, but it is a crucial part of your treatment. In order to make it easier for yourself, it is essential that you give the physiotherapist your full cooperation.

The physiotherapist will treat you twice a day.

On the day of the operation

No physiotherapy will be applied.

The first day after the operation

- * The lungs are vibrated in front, behind and at the sides to loosen the phlegm.
- * The vibration is done with a vibrating apparatus. The nurse or the physiotherapist will help you to turn onto your side during vibration.

After this the lungs are aspirated and irrigated to remove the phlegm. The respiratory tube is usually removed during this procedure. The physiotherapist will explain throughout what she intends doing.

The physiotherapist will also request you to do the following bed exercises on your own:

The second day after the operation

The physiotherapist will percuss your lungs and allow you to cough with assistance. She will also help you to sit in a chair and do several breathing and circulation exercises. You must keep your oxygen mask on during these exercises. You must also continue with the exercises shown to you the previous day.

After this, the course of the physiotherapy is roughly the same as day two, but the physiotherapist will explain what you are expected to do further. The treatment could also be adjusted depending on your condition. The physiotherapist will demonstrate to you those exercises that will help to regain the function of the muscles (see diagrams).

- **Discharge from the Intensive Care Unit**

Discharge from the Intensive Care Unit to the High Care Section occurs on the recommendation of the surgeon and no specific period can be linked to it.

- **Period in the High Care Section**

For the 3 to 4 days in the High Care Section you will be subjected to the following:

- * Depending on your condition you could again be placed on a monitor to monitor your heart rhythm.
- * Observations, including temperature, pulse and blood pressure will be performed 4-hourly.
- * If indicated, some special investigations such as rhythm tracings of your heart (ECG), X-ray photos and blood investigations might be repeated.
- * You will be mobilised further and your physiotherapy programme will be completed.

On discharge you will receive a “discharge advisory note” from the staff. The advice on the note is provided individually and could sometimes vary from that contained in this information document.

REMEMBER: THE HEART TAKES ABOUT SIX WEEKS TO RECOVER AFTER SURGERY

It takes the average middle-aged patient about 6 weeks to recover. In the younger patient it could be 3 weeks and in patients older than 65 who had a complicated course, the duration could be 8-10 weeks.

Do not be in too much of a hurry to resume your duties. You will initially feel tired, weak and without energy. Fluctuating emotions are normal. You could experience the following:

Despondency, irritability, tearfulness, poor memory, concentration problems, bad dreams and insomnia (sleeplessness). If the above-mentioned symptoms fail to improve within 4-6 weeks, you must inform your doctor accordingly.

You may resume work after 6-8 weeks. Before this you may do paperwork and receive telephone calls. If your work is physically demanding, I would suggest that you make plans for part-time employment (discuss this with your doctor as well).

- **Resuming some activities**

| | |
|--------------------------|--------------------------------------|
| Normal working programme | 4–8 weeks |
| Travelling | 3 weeks |
| Long trips | 6–8 weeks |
| Flying | 3–6 weeks |
| Cycling | 8 weeks |
| Jogging | 8 weeks |
| Swimming | 6–8 weeks |
| Golf | 8 weeks |
| Alcohol | Moderately |
| Bathing | Bath when stitches have been removed |
| Showering | Already in hospital |

As in the case of any bone fracture, the chest bone takes 6-8 weeks to rejoin firmly. (It will, however, rejoin firmly). It might initially be difficult to wear a safety belt, but I do advise you to do this for your own safety. Try placing a small cushion between your chest and the safety belt.

WHAT TO EXPECT AFTER YOUR CARDIAC SURGERY

| Weeks 1- 6 | After 6 weeks | After 3 months |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Light housekeeping: -Dusting -Setting the table -Washing dishes -Folding clothes Light Gardening: -Potting plants -Trimming flowers Needlework Reading Cooking meals Climbing stairs Small mechanical jobs Shopping Restaurants Movies Church Attend sports events Passenger in car Walking Treadmill Stationary bike Shampooing hair Playing cards/games | Continue activities of weeks 1-6 (but you may be able to tolerate more). Return to work part-time (If your job does not require lifting, and returning is approved by your surgeon) Heavy housework: -Vacuuming -Sweeping -Laundry Heavy gardening: -Mowing lawn -Raking leaves Ironing Business or recreational Travelling Fishing Light aerobics (no weights) Walking dog on leash Driving a car or small truck Boating | Continue activities of weeks 1 to 3 months (but you may be able to tolerate more) Heavy housework: -Scrubbing floors Heavy gardening: -Shovelling snow -Digging Football/Soccer Softball/Baseball Tennis Bowling Hunting Jogging Cycling Golfing Weight lifting Motorcycle riding, Push-ups Swimming Water skiing Skydiving |

Chest support



Chest support is crucial for patients who have had a heart operation. Chest bone (sternum) detachment is one of the greatest complications after chest surgery. After surgery the sternum is sutured by means of stainless steel wires. Complete bone fusion occurs only six weeks after surgery; therefore support for that period or even afterwards is crucial to prevent malfusion or non-fusion as well as detachment.

Wound support is particularly important during coughing, sneezing or hiccoughing. Sneezing and coughing are the most significant causes of detachment – therefore, please take care!

Support the wound as follows:

- Fold arms across your chest with your hands under your armpits. Press down against the sternum (chest bone) with your forearms and fix your clavicle (shoulder blade).
- Prevention of sternum detachments.

Avoid the following activities for 6-8 weeks after your operation, thereby ensuring that the strain on the sternum remains as low as possible:

- Lifting, pulling or pushing of heavy objects, e.g. suitcases, lawnmowers, drawers, etc.
- Driving a vehicle, cycling.
- Too much pressure on both arms when getting up from a bed or chair.
- Contact sport or resistance exercises, e.g. golf, cricket, tennis, etc.
- Activities performed with your arms above your head, e.g. changing a light bulb.
- Stretching to take objects down from a cupboard or shelf.
- Vacuuming, sweeping and clearing up.
- Exhausting cleaning sessions.
- Raking in the garden.
- Washing the car.
- Sawing.
- Activities within an hour after mealtimes.

Female patients must start wearing a bra as soon as the pain allows them to do so.

Wound care



The wound areas could be painful and have a “numb” sensation for a few weeks after surgery. A certain degree of redness and itching could occur as well. This will disappear in time. Preferably shower. If you don’t have a shower, you may take a bath, but avoid soaking in the bath.

Clean wounds with Hibitane (Saline) once a day and pack with gauze. Do not use any cream or powder on or near the wounds. Inform your doctor of any severe redness, drainage or a sudden increase in pain. If you become feverish, contact your doctor. Clips can be removed by your general practitioner as requested by your thoracic surgeon (see discharge prescription).

You must bear in mind that the incision wound is very sensitive to sun and I recommend that you use **Sun Protection Cream**. This will also prevent the forming of keloid (this is a hard overgrowing of tissue that tends to occur in the chest area. In some people these do form, no matter what the precautions.

Leg wounds/arm wounds

Arteries for the coronary artery bypass were probably taken from one or both of your legs. Sometimes an artery is also taken from the arm. The length of the wound varies from patient to patient. The wounds of the legs can also be more sensitive than the chest wound.

Many patients are concerned that their legs will now receive less blood supply as a result of the arteries that have been removed. However, the body adapts quite remarkably in the sense that leg arteries form collateral branches so that blood supply is not restricted.

There are certain guidelines that you must kindly follow with regard to leg wounds:

- Do not cross your legs when sitting.
- When sitting, straighten your legs by putting your feet on a bench or chair. Do not let your legs hang down.
- Do not sit motionless for long periods.
- Walking is good exercise for the leg wounds to heal rapidly.
- If a long journey is undertaken, it is important to stop every 2 hours and move around to aid circulation.

The above-mentioned actions are important to aid blood supply to the legs and prevent clotting.

Pain

- Pain behind the shoulder or shoulder-blade sometimes occurs (muscle pains).
- Light neck and shoulder exercises could aid this problem (see exercises).

How to reduce the risk of further heart disease:

- Have your blood pressure checked regularly.
- Follow a balanced diet with little animal fats and cholesterol.
- Maintain a normal weight.
- Be active – follow an exercise programme.
- Do not smoke.
- Avoid stress.
- Use your medication as prescribed.
- Regularly go for follow-up examinations.
- Develop a positive attitude towards life.

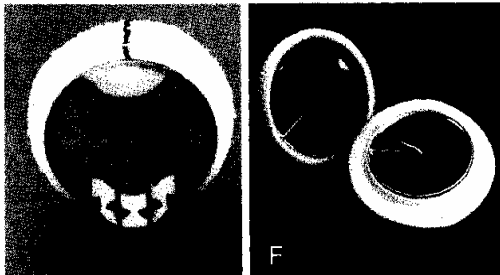
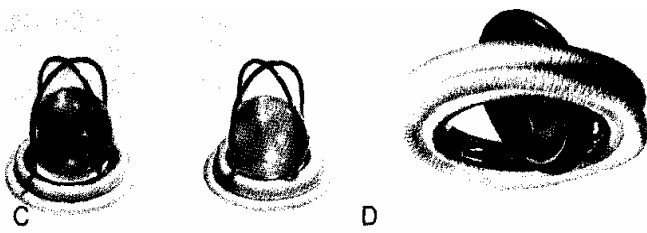
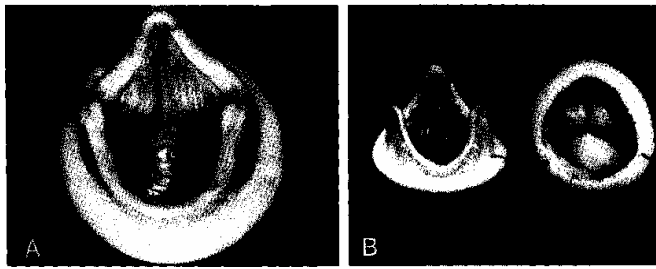
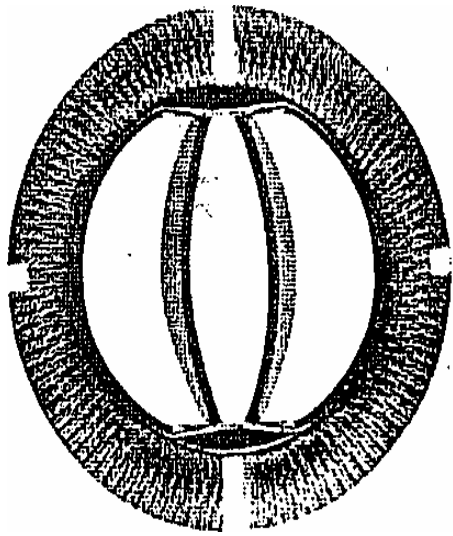
When to telephone your doctor

- Wounds: Redness, swelling, tenderness or drainage.
- Drainage of leg wounds often occur, but **ANY** drainage of the chest wound must be reported immediately.
- Angina symptoms similar to those you experienced before the operation.
- Fever higher than 38°C for more than 2 days.
- Feeling as you have been affected by flue (pains, cold shivers, loss of appetite, fatigue) lasting longer than two days.
- Feeling of short-windedness that continues even after activity has stopped.
- Pulse faster than 120/min or irregular.
- Weight gain, swollen ankles, severe fatigue, tender feeling over the abdomen and short-windedness could be signs of heart failure. This can only be rectified by taking the appropriate medication.
- Any other symptoms that you find disturbing.

Dial the emergency number and fully explain the problem.

If a doctor is not available immediately, the message will be conveyed and he will contact you later. If you live a far distance away, you can also phone your general practitioner

HEART VALVE REPLACEMENTS



There are four valves that control blood flow through the four chambers of the heart. These are like one-way doors that allow the blood to flow in one direction and prevent blood from accumulating in the heart chamber it originates from. When the heart beats, the valves close to prevent the blood from flowing back.

When these valves become diseased or damaged, it could happen that the valves fail to open and close properly. This consequently interferes with the normal blood flow of the heart, which could result in damage to the heart muscle itself.

A diseased or damaged valve could affect blood flow in 2 ways, namely:

- If the valve fails to open completely the flow of blood will be obstructed. This is known as valvular stenosis
- If the valve fails to close properly it will cause the blood to leak back into the chamber it came from. This is known as “valvular incompetence” or “regurgitation”.

Both stenosis and incompetence of the valve places an additional working load on the heart. If you have stenosis, the valve will obstruct the blood flow, causing your heart to pump harder to get the blood past the obstruction.

If you have incompetence, a leaking valve implies that your heart would have to pump harder to pump out sufficient blood because the blood is leaking back through the faulty valve.

The blood behind the affected valve will now be subjected to increased pressure. This could cause an accumulation of fluid in your lungs or the lower part of your body, depending on which valve is affected.

Symptoms of valvular disease of the heart

The symptoms depend on which valve has been affected. Persons with moderate valvular disease could experience minimal symptoms. An increased burden on the heart could cause fatigue or tightness in the chest with exercise, or palpitations. The backward pressure could also cause short-windedness and swollen ankles and legs. Chest pain (angina) could also occur as a result of insufficient blood flow through the coronary arteries. If severe obstruction is present a person could experience dizziness and fainting fits.

Causes of valvular disease of the heart

The valves of the heart could become diseased or damaged as a result of several factors, namely:

- Congenital defects;
- Rheumatic fever;
- Bacterial infections;
- Age;
- Normal “wear and tear” of the tissue could weaken or harden the heart valves (if you consider that your heart valves open and close with each heartbeat throughout your life, a certain degree of wear and tear could surely be expected).

Cardiac valve operation

There are several types of valves that could be used to replace a damaged valve. The doctor might even be able to repair the valve. Your doctor will decide which would be the best for you (discuss this with him before the operation).

There are various operations that we can perform on the valve:

Repair – If the valve is stenosed we can stretch the valve, or if the valve is dilated (enlarged) we often place a ring inside the valve.

In general two types of valves are used:

Allograft – This is a human valve that is implanted, usually the aortic valve (valve of the aorta)

Tissue valve – made from bovine or pig material.

The advantage of using the above is that anticoagulant (Warfarin) is not required, but these tend to last only 6 to 10 years.

Mechanical valve – manufactured from Pyrolite, and this necessitates using lifelong anticoagulant therapy. However, the advantage is that the valves last very long.

After care

It is perfectly normal to hear your heart beating after the operation. It usually sounds like a watch ticking. You will gradually become used to it and eventually be totally unaware of it.

After a valve replacement operation you have three major responsibilities:

- **Firstly:** Maintain good oral hygiene and visit a dentist regularly.
- **Secondly:** Make sure that the doctor or dentist is aware of your heart problem.
- **Thirdly:** You must receive prophylactic antibiotics when visiting the dentist or if a doctor intends to perform another operation on you.

Anticoagulant therapy

When you have received a mechanical heart valve, it will necessitate you taking a blood thinning agent such as Warfarin for the rest of your life, the reason being that blood clots could form around the valve, which if it becomes detached and lands in the bloodstream, could cause a stroke, lung damage and even death. Anticoagulant is often not necessary when you have received a so-called tissue valve or if the valve has been repaired. It will be necessary to have an INR (a blood test) done as prescribed by your doctor. The INR indicates how thin your blood is. It is crucial for you to go for an INR test regularly, as the Warfarin dosage is adjusted accordingly. The blood test can be done at any pathologists or at your general practitioner. Already have it tested within your first week at home. Your general practitioner or pathologist will adjust the Warfarin dosage and arrange with you when to come for the next blood test. In the beginning this will be weekly and later every 6 to 8 weeks.

May I use other medication?

Some medication enhances the action of Warfarin. You must be particularly careful with medication for rheumatism, cold remedies, antibiotics and aspirin (e.g. Disprin, Codis, Grandpa, etc.). Panado can be used for fever/pain. There is also medication that weakens the action of Warfarin. **ALWAYS CONSULT WITH YOUR DOCTOR/PHARMACIST!** And refrain from using any “over the counter” medication.

What about alcohol?

Alcohol enhances the action of Warfarin. A bleeding tendency could therefore occur. Alcohol intake must be limited to a minimum.

Does my diet play any role?

Usually no diet adjustment is necessary. As already mentioned, Warfarin reacts with Vitamin K. Green leafy vegetables are rich in vitamin K. If you eat an excessive amount of raw vegetables / salad, you might require an increased dose of Warfarin. The excessive use of coffee, chocolate, oranges and avocado pear could also affect the coagulation period. If you effect any dietary changes, you should determine the INR-value more frequently.

What time of day must I take Warfarin?

Ideally in the evening. When you go for a blood test during the day, your dosage could then be adjusted easily. You can therefore take a smaller or larger dose the same evening should this prove necessary.

Any of the following symptoms could be an indication that your Warfarin dose is too high:

- small cuts that bleed for an excessively long period;
- bleeding that does not stop by itself;
- a nose bleed that lasts longer than a few minutes;
- bleeding gums;
- red or dark-brown urine;
- red or black stools;
- Females that bleed more than usual during menstruation, or have other vaginal bleeding.

If you are concerned, contact your doctor.

IMPORTANT HINTS

- Do not skip or forget your therapy. Wear a Medic Alert bracelet if you are going to need Warfarin for the rest of your life.
- Always mention to your doctor/dentist/pharmacist that you are on Warfarin therapy.
- Have your blood tested regularly – the correct dosage is important! Inform your doctor immediately if you suspect pregnancy. What can I as the patient do to reduce my risk of further problems? As discussed previously, you can only do the following:
 - * Have your blood pressure checked regularly.
 - * Follow a balanced diet with little animal fats and cholesterol.

- * Maintain a normal weight.
- * Be active – follow an exercise programme.
- * Do not smoke.
- * Avoid stress.
- * Use your medication as prescribed.
- * Regularly go for follow-up examinations.
- * Develop a healthy attitude towards life.

Blood pressure

The blood pressure of a normal adult is about 120/80mmHg. The 120 value is called the systolic blood pressure and is roughly your age + 100 mmHg. The lower blood pressure is the diastolic blood pressure and must not be more than 95 mmHg. The following is important in a person with high blood pressure or hypertension.

Use the medicine as prescribed by your doctor.

Loose weight if you are overweight – for each kg of weight you loose, blood pressure could fall by 2mmHg.

Diet – Limit salt intake to one teaspoon per day. Use alcohol moderately.

Stress – Lowering stress levels is also very important in the treatment of blood pressure.

Exercise – Regular aerobic exercises (three times a week) are important for the control of your blood pressure.

Smoking – If you smoke, your blood pressure will tend to be higher.

Smoking

The above is definitely detrimental to the cardiac vessels and you must make an active effort to stop the habit. Smoking is injurious to the cardiac vessels in the following ways:

It causes spasm or constriction of the cardiac vessels. It also damages the vessel wall and causes acceleration of the process of atherosclerosis. It also causes increased coagulation in the vessels of the heart. It increases blood pressure by causing constriction of the vessels. Smoking also makes the heart more irritable and increases the chance of rhythm disturbances. A smoker has a 50% greater risk of dying from a heart attack than a non-smoker. If you have to undergo a coronary artery bypass or a valve replacement operation, you must stop smoking about a month before the time and not for example only a week before the operation. With the latter situation the airways are too irritated by the anaesthetic and the lungs secrete a significant amount of phlegm, which might cause a problem after the operation. If you have not yet stopped smoking, then refrain from smoking the evening before the operation.

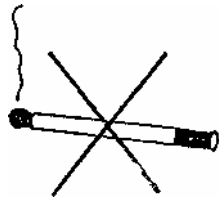
How do I stop smoking?

There are three aspects that require your attention when you stop smoking, namely:

- Smoking tobacco is addictive.
- You will withdraw from the addictive effect of smoking.
- The psychological effect smoking has on you.

Tobacco addiction

Tobacco is an addictive substance. If you stop smoking, withdrawal could occur as a reaction of the body to nicotine deprivation. Your hospitalisation will bring about forced cessation of smoking while you are on bed rest. Nicotine is cleared from your system within 48 hours if you don't smoke, particularly if you take in lots of fluids. Patients usually experience withdrawal symptoms. You could utilise the opportunity in the hospital to view yourself as a non-smoker and to start planning a lifestyle free of smoking (nicotine replacement such as nicotine gum and spray are not recommended for heart patients, as this will still expose the heart to the detrimental effects of nicotine).



Withdrawal from the addictive effects of smoking

When the habits that had accompanied smoking in the past are withdrawn, it could be difficult to cope with. You could for example have smoked “unconsciously” as a result of a habit when reading the newspaper, driving a car, telephone conversations or after dinner. Make a list of such situations and try to find alternatives for smoking in these situations that would suit your lifestyle. Suggestions for such alternatives are:

- When reading the newspaper or driving a car – eat fruit, listen to relaxing music, declare the car a smoke-free area and use the ashtray for small change.
- Socialising and eating habits – avoid alcohol (as most smokers smoke a cigarette when having a drink), drink orange juice instead of coffee, change your brand of coffee, immediately get up from the table after a meal and brush your teeth or do the dishes.
- When watching TV – knit or give attention to another hobby that keeps your hands occupied; eat low calorie foods.
- Join a gymnasium (start exercising gradually).
- Visit a movie theatre where smoking is prohibited.

The psychological effect smoking has on you

This is the feeling you have that you could not cope without smoking. However, it will become easier for you when you make a firm decision to stop smoking. Many patients state that when craving to smoke, they just think of the severe pain and distress they experienced

with their admission, and this rapidly discourages them from smoking. Do not attempt to initially smoke less and then stopping altogether – this generally does not work. When you decide to stop smoking – stop smoking altogether.

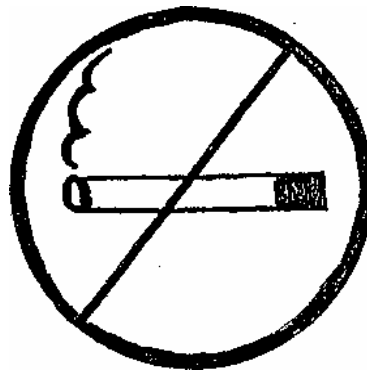
Common withdrawal symptoms and ways of coping with it:

| | |
|--------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Intense craving to smoke | This usually lasts 2-5 minutes at a time. Drink water, chew sugar-free gum, eat fruit or popcorn (low calorie content), or put a toothpick in your mouth. Try to avoid alcohol for at least two weeks. Think about the positive results of cessation of smoking and the negative consequences of smoking. Go for a walk or do exercises. Work at a hobby. |
| Anxiousness, irritability, restlessness | Smoking does not relieve stress and anxiousness – it merely treats the withdrawal symptoms and irritability. Take regular exercise (start gradually with walking and increase as you find it comfortable). Follow a balanced diet – rich in fibre and low in fat and sugar. Use relaxation techniques such as deep breathing exercises and progressively relaxing the muscles in your body |
| Nausea and constipation or diarrhoea | Consider that this seldom lasts for longer than four days. |
| Hunger (this occurs because metabolism is normalising) | Eat six small meals per day. Drink lots of water. Eat low-calorie foods such as popcorn and carrots. |
| Finding it hard to concentrate Headaches | Work for brief periods with regular breaks. Talk to a supportive person about your feelings. Follow a healthy diet. |
| Coughing | This occurs because the villi (tufts of hair) in the lungs that get rid of foreign material are starting to recover. Phlegm and tar that have accumulated in the lungs are now starting to clear up. It could take up to three weeks to clear up. Drink lots of water to aid the process. |

To stop smoking could be one of the best investments for your and your family's future. Your risk of coronary artery disease and other diseases such as cancer will decrease significantly.

Make a list of sources of support that exist for you, such as your relationship with God, church activities, family members, friends and your doctor. Ask them to help you and continue motivating you.

In some cases you could use the following – Zyban – ask your doctor to prescribe this for you.



Diet

The advantages of a healthy diet are the following:

- You will lose weight, which will aid your general sense of wellbeing.
- It will be easier to control your blood pressure.

It is also important to maintain a normal weight and controlling your cholesterol (have it tested every 6 months).

Under 10 years: 4 mmol/l
 10–20 years: 4 mmol/l
 20-30 years: 4.6 mmol/l
 30–40 years: 5,2 mmol/l
 Older than 40 years: 5,6 mmol/l

The HDL fraction (good cholesterol) must be above 1,0 mmol/l and the LDL fraction (bad cholesterol) must be under 3 mmol/l. The triglycerides or fatty acids must be below 1,8 mmol/l.

Your cholesterol could vary after the operation and we recommend that you have it tested 6-8 weeks after the operation (with follow-up we could draw your blood and test it, but then you must have been fasting for at least 12 hours, i.e. if the follow-up is 14:00 in the afternoon, do not eat breakfast or have coffee or tea in between).

Do not loose more than 0,5 kg of weight per week.

How do I know when I am overweight? (See tables below). Super obesity is present if a person's weight exceeds the acceptable norm by 50kg.

The body mass index (BMI) is generally used to determine whether or not a patient is obese.

E.g. the BMI of a person with a height of 1,75 m and weighing 75 kg will be $75/1,75 \times 1,75 = 24,5$.

If one uses the BMI as a criterion, persons are classified as follows:

| | |
|-----------------------------|---------|
| Super obese | > 50 |
| Morbidly Obese | 45 -50 |
| Medically significant obese | 35 – 45 |
| Obese | 30 – 35 |
| Overweight | 25 - 30 |
| Ideal body weight | 20 - 25 |

| | Height to cm | Small bones | Medium <i>bones</i> | Heavy Bones |
|------------------------------------------------------------------------|-----------------|----------------|------------------------|----------------|
| Male (in typical indoor clothing Shoes with 2,5 cm heels) | 157.5 | 50.9-54.5 | 53.4-58.6 | 57.3-64.1 |
| | 160.0 | 52.3-55.4 | 55.0-60.5 | 58.6-65.5 |
| | 162.5 | 53.6-57.3 | 56.4-61.8 | 60.0-67.3 |
| | 165.0 | 55.0-58.6 | 57.7-63.2 | 61.4-69.1 |
| | 167.5 | 56.4-60.5 | 59.1-65.0 | 62.7-70.9 |
| | 170.0 | 58.2-62.3 | 60.9-66.8 | 64.5-73.2 |
| | 172.5 | 60.0-64.1 | 62.7-69.1 | 66.8-75.5 |
| | 175.0 | 61.8-65.9 | 64.5-70.9 | 68.6-77.3 |
| | 177.5 | 63.6-68.2 | 66.4-72.7 | 70.5-79.1 |
| | 180.0 | 65.4-70.0 | 68.2-75.0 | 72.3-81.4 |
| | 182.5 | 67.3-71.8 | 70.0-77.3 | 74.5-83.6 |
| | 185.0 | 69.1-73.6 | 71.8-79.5 | 76.4-85.9 |
| 187.5 | 70.9-75.9 | 73.6-81.8 | 78.6-88.2 | |
| Female (in typical indoor clothing Shoes with 5 cm heels) | 147.5 | 41.8-44.5 | 43.6-48.6 | 47.3-54.1 |
| | 150.0 | 42.7-45.9 | 44.5-50.0 | 48.2-55.5 |
| | 152.5 | 43.6-47.3 | 45.9-51.4 | 49.5-56.8 |
| | 155.0 | 45.0-48.6 | 47.3-52.7 | 50.9-58.2 |
| | 157.5 | 46.4-50.0 | 48.6-54.1 | 52.3-59.5 |
| | 160.0 | 47.7-51.4 | 50.0-55.5 | 53.6-60.9 |
| | 162.5 | 49.1-52.7 | 51.4-57.3 | 55.0-62.7 |
| | 165.0 | 50.0-54.1 | 52.7-59.1 | 56.8-64.5 |
| | 167.5 | 51.8-55.9 | 54.5-61.4 | 58.6-66.4 |
| | 170.0 | 53.6-57.7 | 56.4-63.2 | 60.5-68.2 |
| | 172.5 | 55.5-59.5 | 58.2-65.0 | 62.3-70.0 |
| | 175.0 | 57.3-61.4 | 60.0-66.8 | 64.1-71.8 |
| 177.5 | 59.1-63.3 | 61.8-68.6 | 65.9-74.1 | |
| 180.0 | 60.9-65.5 | 63.6-70.5 | 67.7-76.4 | |
| 182.5 | 62.7-67.3 | 65.5-72.3 | 69.5-78.6 | |

Everyone is aware that cholesterol is a great culprit in coronary artery diseases. It is also known that cholesterol is closely associated with diet and that saturated fat is the principal evil.

(Bear in mind that saturated fat and cholesterol are not synonym. If one sees 0% cholesterol on a product it does not necessarily mean 0% saturated fat)).

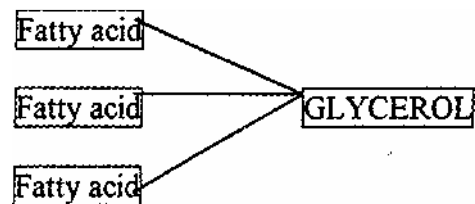
The three principal components of our diet are:

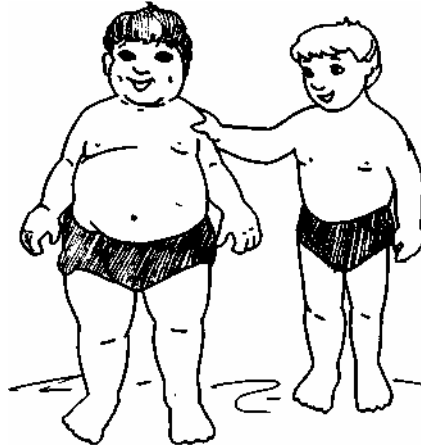
- Proteins - for restoration and building of tissue
- Carbohydrates - use of energy
- Fat - for energy and storing long-term energy

Note: Fat provides more than twice the energy than the others, but also more than twice the kilojoules.

Fat

The structure of the fat molecule is very simple and comprises 3 fatty acids that are attached to a glycerol molecule. If we consume more carbohydrates and protein than what our bodies need, this is converted into fat that accumulates around the waist.





Yes, perhaps I should lose some weight!

The fats that we use are found in

| | |
|------------|-----------------------------------------------|
| Animal fat | Predominantly saturated fatty acids. |
| Fish oils | Predominantly unsaturated fatty acids. |
| Plant oils | Predominantly mono- and poly-unsaturated fats |

Saturated fats (bad news)

Cholesterol comes from saturated fat. Saturated fat is present in products such as beef, pork, butter, cream, full-cream milk, cheese, chocolate, ice-cream, biscuits, rusks, etc. For example, if one eats boerewors it is like giving cholesterol a one-way ticket to the wall of the artery where it accumulates. Pork has less fat, as the fat can often be removed. The fat in meat is often not visible and is present in the meat (even if one removes all the visible fat, a considerable amount of fat remains in the meat). Chicken also has less fat, but the skin of chicken is loaded with fat.

Mono-unsaturated fats

These tend to slightly reduce LDL levels, but have no effect on the HDL levels. The oils are more stable when heated and do not break down. Olives, olive oil and avocados are examples of mono-unsaturated fats.

Polyunsaturated fats

These fats reduce both the HDL and LDL fractions. Examples of these fats include sunflower, maize and Soya oils. These oils should be used without heating, as prolonged exposure to heat changes their chemical composition and causes oxidation of the fats which could make it potentially hazardous. The oxidised components will in turn oxidise LDL and this is absorbed in the wall of the artery, thereby causing plaque.

Avoid fast foods where oil is used repeatedly. Margarine consists of plant oils that are hydrogenated so that some of the double compounds are lost, thereby converting it into so-called trans-fatty acids that behave like saturated fats and are atherogenic. Tub margarine is lower in saturated fat and contains no trans-fatty acids. Avoid the block type margarines.

Fish oils

These contain the omega-3 fatty acids that tend to lower triglycerides, but have little or no effect on the HDL and LDL fractions. Furthermore it reduces the adhesive power of platelets as well as fibrogen, which is an advantage. The important sources of fish oils are salmon, mackerel and herring, but tuna, trout and sardines also contain these oils.

Remember, when you eat fish it is the oil contained in the fish that is beneficial and not the oil the fish has been fried in.

Carbohydrates

The major part of the diet must consist of carbohydrates. Carbohydrates consist of sugars and starch. Carbohydrates form an important part of the fibre of the diet and are found in a soluble and insoluble form. The insoluble form is found in bread, grains, fruit and vegetables. Soluble fibre also aids the reduction of cholesterol. The exact mechanism is not known, but soluble fibre requires bile in order to be excreted. Cholesterol forms part of the bile and consequently a greater amount of cholesterol will be excreted as well. Soluble fibre is found in bran, legumes, fruit and vegetables.

Protein

As adults we tend to consume more protein than we need, as we are no longer forming cells, but need it only for repair purposes. Sources of protein include meat, fish, chicken, eggs and dairy products. Protein is often associated with saturated fats and it is essential to remove the fat where possible and to prepare the protein in a fat-free way.

Minerals and vitamins

A balanced diet will contain all the necessary vitamins. Free radicals are highly reactive atoms and molecules that are extremely unstable and could cause damage to tissue as well as organs. These are implicated in coronary artery disease as well as some malignant tumours. Antioxidants such as Vitamin A, E and the spore element Selenium could neutralise the effect of free radicals. Antioxidants are present in fruit and vegetables. If for some reason you do not eat sufficient fruit and vegetables, it is suggested that you use supplements that contain vitamins and minerals.

Salt intake must be limited to one teaspoon per day, particularly if you suffer from high blood pressure.

Alcohol

In small quantities it forms part of a normal diet. HDL levels are increased by moderate alcohol intake. If it is not part of your lifestyle, do not start now.

Do not consume more than 2 units per day.

With the above in mind, follow the following general principles:

The daily kilojoule intake must not be less than 4000/day. Most adults will loose weight with

a kilojoule intake of 5000-5500 per day. Your diet must be high in carbohydrates (60-65%). The protein intake must be 15% and fat about 20%. The food item that you use must contain less than 10 gram of fat per 100 gram (see on the label of the food item). Use cereal and porridge for breakfast rather than bacon and eggs. Use low-fat dairy products such as fat-free milk, cottage cheese and low-fat cheese, yogurt and ice-cream. Avoid butter and margarine on bread and rather try tomato sauce, chutney, honey, cottage cheese, fat-free yogurt or jam on the bread.

Grill, steam or dry-fry food. Do not use butter, oil or margarine to prepare food. Use non-stick cooking spray or oil-free salad dressing to panfry food. Keep meat, chicken and fish portions small and remove all visible fat, also the skin of the chicken. Eat peppermints, jelly babies and marshmallows or Super C to control your appetite. Reduce your intake of saturated fats, e.g. chicken without the skin, and fish rather than red meat. Remove visible fat. Avoid full-cream dairy products such as butter, cheese and ice-cream. Be cautious of food with hidden fats, such as cakes and rusks. Bake instead of fry. Furthermore, only one teaspoon salt if you are hypertensive. Use alcohol in moderation.

Exercise

An exercise programme is important to expedite recovery as well as to control your weight and cholesterol. It is also excellent relaxation therapy and will aid the reduction of stress in your life. There are two types of exercise:

The first ones are to regain the tone and strength of your muscles (see diagrams) and the second is walking. After 8 weeks you can start doing other exercise such as playing golf, jogging or swimming (discuss this with your doctor). Should you wish to start jogging after 8 weeks, it is suggested that you acquire a heart monitor.

Wear comfortable clothes and do not exercise in extreme temperatures. Carry a water bottle with you and frequently take a sip. You could also fill the bottle with Energade for a little additional energy.

In the ward, shortly after you operation, the physiotherapist will help you to walk. The target is to walk approximately 150 m in the ward.

After discharge the target is for you to walk about 3-5 km in 60 minutes after 6-8 weeks. This will also be a measure of how readily you would be able to cope with your job.

The programme will depend on your age, the condition of your heart and your motivation. Therefore you must not become despondent if you cannot quite reach the distances; we will adjust the programme according to your condition.

The intensity of your exercising is 60-80% of maximum pulse rate.

Average values:

| | |
|-------------|------------------------------------|
| 1-2 weeks: | not more than 100 beats per minute |
| 2-4 weeks: | not more than 120 beats per minute |
| 5-12 weeks: | not more than 130 beats per minute |

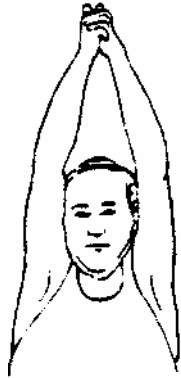
The maximum pulse rate after 3 months is calculated according to $220 - \text{age}$, i.e. if you are 60 years of age, the maximum pulse rate is 160 and 60-80% of this is 96-128 pulse beats per minute.

(Ask the doctor or nurse in the ward to show you how to take your pulse.).

Diagram

Please take your pulse in the mornings when you wake – resting pulse, and also after you have exercised.

The following exercises must be done in the morning and evening to strengthen your muscles:



Shoulder flexion: Clasp both hands together, keeping elbows straight. Lift arms over head. (Five times.)



Wall climbing: Stand facing the wall and "walk" the fingers of both hands up the wall as high as possible (five times).



Shoulder shrugging: Hunch shoulders up and down (five times).



Elbow circling: Place fingertips on shoulders. Move elbows in a circle, going up and back. Repeat in opposite direction (five times each)



Arm swinging: Sit in a chair, allowing arms to hang loosely at sides. Swing arms forward and backward (ten times)



Flexion: Sit in a chair with hands resting on knees. Flex forward from the waist and then straighten up (five times)



Trunk rotation: Sit in a chair and place hands on sides and waist. Looking over right shoulder, turn shoulders to the right. Repeat, moving shoulders and looking to the left (five times).

The above-mentioned exercises are to restore the tone and mobility of the scapula (shoulder blade) and must be performed in the morning and evening for 8 weeks, independent of your walking programme, i.e. it is for strengthening the muscles through which the surgeon made the incision.

Exercise programme

Warming up (7 minutes) or walk slowly for 3 minutes. Repeat each of the following exercises 10 times.

Stand with your hands at your sides. Slowly lift up your arms forward until level with your shoulders while you inhale. Drop your arms while you exhale.

Stand with your hands at your sides. Slowly lift up your arms sideways until level with your shoulders while you inhale. Drop your arms while you exhale.

Stand with your hands at your sides. Bend alternately to the left and the right side.

Sit. Place your hands in your sides and breathe deeply. Now turn your body to the left while exhaling. Turn back to midposition while you inhale. Repeat to the right.

Sit. Place your hands on your shoulders and breathe deeply. Now touch your left knee with your right elbow while exhaling. Return to midposition while you inhale. Repeat to the other side.

Sit. Drop your chin to your chest. Alternately move your ear in the direction of your left and right shoulder.

Walking programme

Start the first day's walking with 5 minutes. Gradually increase the time so that you are walking the following times at the end of every week:

| Week | Time | Frequency |
|------|------------|--------------|
| 1 | 5 minutes | 1 x per day |
| 2 | 10 minutes | 1 x per day |
| 3 | 15 minutes | 1 x per day |
| 4 | 20 minutes | 3 x per week |
| 5 | 25 minutes | 3 x per week |
| 6 | 30 minutes | 3 x per week |

Start the new week with the same time you ended with the previous week, but walk slightly faster than the previous week. Remember that you must not walk so fast that you are unable to conduct a conversation, and after walking you must feel as if you could repeat the distance; if not, you have been overdoing it.

At the end of the sixth week you ought to be able to walk at quite a brisk pace.

After the sixth week you may gradually increase the distance until you can comfortably walk 3 to 5 kilometres.

Cooling off (7 minutes)

Walk slowly for 3 minutes. Do all the exercises in the warming-up programme.

Stand in front of a table. Hold on to the table with your right hand while holding your left foot. Pull your leg backwards. Hold for 5 seconds and relax. Repeat 5 times with each leg.

Sit on the floor with your legs apart. Try to touch your left foot with your hands. Hold for 5 seconds and relax. Repeat 5 times to each side.

Sit. Stretch out your arms forward. Hold for 5 seconds and relax. Repeat 5 times. Lie on your back. Stretch yourself out, hold for 2 seconds and relax. Lie for 2 seconds in this relaxed position. Keep up this programme until you see the surgeon again in 6-8 weeks. After that the above exercises can be left and you can continue walking, jogging, swimming or doing another sport of your choice (this can be discussed in more detail during your follow-up). The reason for 3-5 kilometres in one hour is that if you are able to manage that, you could easily return to any fulltime job.

Danger signs with exercise

If you experience any of the following symptoms, stop immediately and rest for 1-2 minutes:

- Pain
- Short-windedness
- Nausea
- Dizziness
- Palpitations
- Swelling of hands and feet
- Pulse drops instead of rising

If the symptoms clear up, continue, but at a slower pace. If symptoms persist, stop exercising for the rest of the day and contact your doctor. Avoid climbing stairs for two weeks after your valve replacement.

If your resting pulse is 15 beats per minute faster than the previous day – skip the exercise. Please refrain from exercising if you have a cold.

Keep a record of your exercising (logbook). This will allow you to see how you are progressing and also serve as motivation. Bring it with you when you come for your follow-up after 6 weeks and also when you see the cardiologist after 6 months. The following is an example of entries in the logbook:

| Date | Resting | Pulse | Time | Pulse after exercising | Distance |
|----------|--------------------------|-------|--------|------------------------|----------|
| 1 Jan 05 | <input type="checkbox"/> | 60 | 20 min | 80 | 1,5km |
| 2 Jan 05 | | 65 | 30 min | 70 | 2,5km |

You could also make a note of how you felt after walking, e.g. feeling good; walked around the block; it was slightly overcast and cool and my left leg was a little stiff, etc.

When can I resume sexual activities after my operation or heart attack?

It is natural for a couple to be nervous about having sex after a heart attack or heart operation. Many people are scared that sexual intercourse would place too much strain on the heart. Sex with your regular partner is safe about 3-4 weeks after your heart attack or heart operation. It is important to be patient, to communicate openly and allow both parties to be emotionally and physically prepared.

For patients who have had a heart attack and those who had undergone an operation, the following are some guidelines for resuming a normal, healthy sex life:

- Resume sex when you are well-rested, not anxious and stress-free
- Allow at least an hour after mealtimes before having sex.
- Any position that is comfortable and relaxed can be used. If you have had a heart operation, some positions could cause pain and discomfort on the wound areas. For the first eight weeks you must assume those positions where it is not necessary to put any weight on your arms. If you experience any angina – stop.
- A general rule that applies is: If you are able to climb 2 flights of stairs, it is safe to have sex.
- A heart attack does not cause impotence, although some medication that you are taking might cause fatigue, anxiousness and depression, which could interfere with your sexual function. If you experience problems, your doctor can help you to determine the cause and if necessary, change your medication.

Is it normal to feel depressed after a heart attack or heart operation?

Yes; for most patients, having a heart attack or undergoing a heart operation is a terrifying experience, usually accompanied by various emotions. Some people have the tendency to deny that anything is wrong. Others on the other hand could experience varying degrees of depression, anxiety, rage and frustration. All these feelings are common and natural. Just as you have to recover physically, you have to be restored emotionally. This takes time and patience. It is important to identify your emotions, accept and assimilate it in order to return to a normal lifestyle.

Because each person is unique, you will have to personally find the appropriate mechanisms for living with your particular emotions.

Medication on discharge

Lanoxin – Given to persons with an enlarged heart, and often for rhythm disturbance of the heart as well.

B-Blockers – Such as Tenormin, Sotacor, etc. Given to keep the heart rate slightly slower, as well as for blood pressure.

ACE Inhibitors – such as Coversyl is given for the control of blood pressure. The medication also acts on the wall of the artery and prevents strokes and future heart attacks.

Ca antagonists – such as Adalat – often for the control of blood pressure, and sometimes rhythm, such as Tilazem.

Anti-platelet agents – Disprin is given to prevent the adhesion of the platelet to the blood at the wall of the artery, thereby causing clots.

Anti-inflammatory agents or pain tablets –Mypradol is generally used to relieve the muscle pains and stiffness. Voltarin is sometimes given as well.

Antacid agents – NI. Ulsanic or Zantac is given for 10-14 days to prevent gastric ulcers. As this is a stressful operation, one can often develop a gastric ulcer, sometimes without being aware of it.

Statin – such as Lipitor is given for raised cholesterol, but even though a person might not have raised cholesterol, patients who have had a coronary artery bypass operation do benefit from this agent and therefore it is prescribed in any event.

Other

Anticoagulant – Warfarin, sometimes if the rhythm of the heart is abnormal or if one has had a valve replacement.

Medication for diabetes.

Medication for increased blood pressure.

Medication for rhythm disturbances – such as Cordarone X.

Make sure of the following before discharge:

- that you understand your condition as well as the operation that had been performed;
- that you have a prescription for medication;
- that you have the doctor's letter stating what operation had been performed and when your stitches must be removed (usually 10-12 days after the operation);
- that you have a letter for work – if necessary;
- the date of your next follow-up appointment
- which operation had been performed, e.g. valve replacement (which valve, mechanical of tissue valve), coronary artery bypass – which arteries have been bypassed and what the condition of your heart is;
- the name of the surgeon who operated on you;
- the name of the cardiologist who treated you;
- that you know how to treat your wounds;
- that you know about your exercise programme;
- that you know all the do's and don'ts.
- that you have all the emergency numbers and know what to do in a crisis.
- The surgeon will see you again for your 6-week examination and if necessary, make adjustments in the medication you are using. Make sure that you bring along all the medication that you are using and please make a list of complaints, problems or questions you might have;
- Afterwards you must be followed up by your cardiologist on a 6-12-monthly basis in order to determine your progress. The appointment will be made for you in the hospital or when you see the surgeon again;
- Kindly fill in the following form with your surgeon or the nurse.

DISCHARGE INSTRUCTIONS RECORD - CARDIAC SURGERY

PURPOSE

1. To facilitate patient's compliance after discharge.
2. To facilitate easier transitions from hospital setting to home.
3. To provide educational material as a resource.
4. To assist patient in identifying the need for modification in lifestyle.

RESOURCE MATERIALS:

1. Discharge Booklet
2. Medication List

EDUCATIONAL MEETINGS ATTENDED: _____

CONTENT REVIEWED:

| | Yes | No | | Yes | No |
|------------------------------|--------------------------|--------------------------|-------------------------|--------------------------|--------------------------|
| Coronary Artery Disease | <input type="checkbox"/> | <input type="checkbox"/> | Activities/Restrictions | <input type="checkbox"/> | <input type="checkbox"/> |
| Valvular Disease | <input type="checkbox"/> | <input type="checkbox"/> | Walking Goals | <input type="checkbox"/> | <input type="checkbox"/> |
| Coronary Artery Bypass Graft | <input type="checkbox"/> | <input type="checkbox"/> | Driving | <input type="checkbox"/> | <input type="checkbox"/> |
| Valve Replacement | <input type="checkbox"/> | <input type="checkbox"/> | Stairs | <input type="checkbox"/> | <input type="checkbox"/> |
| Risk Factors | <input type="checkbox"/> | <input type="checkbox"/> | Lifting | <input type="checkbox"/> | <input type="checkbox"/> |
| Infection Prevention | <input type="checkbox"/> | <input type="checkbox"/> | Flying | <input type="checkbox"/> | <input type="checkbox"/> |
| Pacemaker Implantation | <input type="checkbox"/> | <input type="checkbox"/> | Housework | <input type="checkbox"/> | <input type="checkbox"/> |
| Pulse-taking | <input type="checkbox"/> | <input type="checkbox"/> | Swimming/Jacuzzi/Sauna | <input type="checkbox"/> | <input type="checkbox"/> |
| Bathing/Showering | <input type="checkbox"/> | <input type="checkbox"/> | Golf/Tennis/Jogging | <input type="checkbox"/> | <input type="checkbox"/> |
| Incisional Care | <input type="checkbox"/> | <input type="checkbox"/> | Other | <input type="checkbox"/> | <input type="checkbox"/> |
| Sensations | <input type="checkbox"/> | <input type="checkbox"/> | Return to Work | <input type="checkbox"/> | <input type="checkbox"/> |
| Weighing | <input type="checkbox"/> | <input type="checkbox"/> | Sexuality | <input type="checkbox"/> | <input type="checkbox"/> |

PATIENT/FAMILY OBJECTIVES:

- | | Yes | No |
|--------------------------------------------------------------------|--------------------------|--------------------------|
| 1. Verbalized definition of the disease process. | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. Verbalized understanding of surgical procedure in general terms | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. Verbalized need for and ways to modify lifestyle | <input type="checkbox"/> | <input type="checkbox"/> |
| 4. Stated intent to comply with activity regime and restrictions | <input type="checkbox"/> | <input type="checkbox"/> |

FOLLOW-UP APPOINTMENTS:

Cardiothoracic Surgery: ____/____/____ Cardiology: ____/____/____

ADDITIONAL COMMENTS:

Date: ____/____/____ Cardiac Surgical Liaison Nurse: _____ R.N.