Information for Patients and Their Families before and after Lung Surgery

LIVERPOOL HOSPITAL
Established 1813

NSW GOVERNMENT Health
South Western Sydney Local Health District

Contents

Introduction

This booklet is designed to give you, your family and friends with some information about your upcoming lung surgery. It will explain what to expect before and after your operation. Please take the time to read this information. If there is anything you do not understand please talk to your health care team and ask them to explain. We have left a blank page at the back of the booklet so you can write down any questions you may have.

Reasons for Surgery

Pleural effusion: An abnormal build-up of fluid between the layers of the lung membrane (pleura). It can be as a result of inflammation due to pneumonia, lung infections, asbestosis or cancer. The cause of the effusion determines the treatment.

Pneumothorax: Also known as collapsed lung. This is the collection of air or gas in the space around the lungs. It may occur spontaneously (for no reason), after trauma or injury to the chest, or it may be related to a congenital defect.

Empyema: This is a collection of pus in the pleural cavity. It is caused by an infection which spreads from the lung to the pleural space. It can be caused by pneumonia, lung abscess or trauma. The cause will determine the treatment, which may be antibiotics or surgery.

Cancer: Tumours can be benign (not cancer) or malignant (cancer). There are many different types of lung cancer. Smoking, both active and passive are a major cause of lung cancer. However, we do not always know the reason for cancer in all cases.

Mesothelioma: This is a tumour of the pleural membranes. It can also involve the peritoneum (membrane of the abdominal cavity). It is strongly linked to asbestos exposure.

Types of procedure/operation

Lung surgery is done to repair or remove lung tissue. There are different types of surgical technique.

- Video-assisted thoracoscopic surgery (VATs) or robotic-assist thoracoscopic surgery. This is sometime referred to as keyhole surgery, with a few small incisions, the surgeon uses a camera and special instruments to perform the operation.
- Thoracotomy: is where a long incision is made between the ribs on the side of the chest. This is also sometimes called open sugery.

Many factors will contribute to type of surgery:

- Types of lung disease,
- Amount of lung tissue involved,

- The surrounding structures.

Your surgeon will discuss the most appropriate method with you.

Bronchoscopy: A thin tube (bronchoscope) is passed through either your nose or mouth into the trachea (windpipe) and bronchi (airway passages). The tube can examine the inside of the trachea, bronchi and lungs. It is possible to collect small cells or tissue samples during the procedure.

Biopsy: This is performed via bronchoscope, needle, or Video Assisted Thoracoscopic Surgery (VATs). A small piece of lung tissue is removed during the procedure and to be looked at under microscope.

Mediastinoscopy: Mediastinum is a space behind the breastbone (sternum) and between the 2 lungs. Mediastinoscopy is the procedure to look at the mediastinum. A small incision created on the sternum to insert a long thin and flexible tube. This tube has a light and tiny camera (mediastinoscope). The procedure is often done to diagnose lymph nodes.

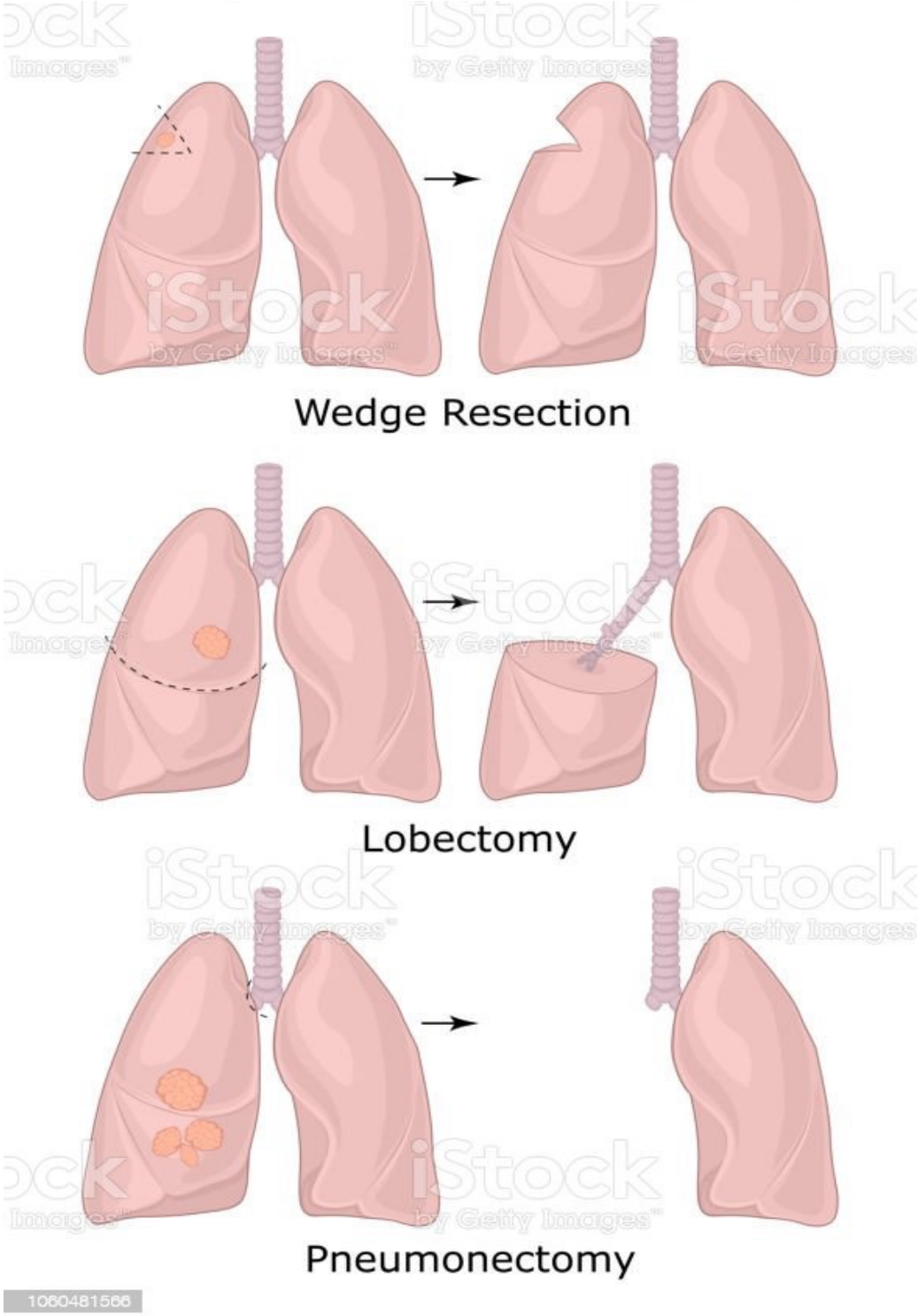
Lobectomy: Your lungs are divided into lobes; two lobes on your left lung and three lobes on your right lung. Lobectomy is a surgery to remove an affected lobe or lobes. The remaining healthy lobes will continue to work normally. Wedge resection is to remove a wedge-shaped piece of the lung tissue to remove a small tumour.

Pneumonectomy: This procedure is to remove an entire lung. You will stay in Intensive Care Unit (ICU) for 1-2 days after your operation for close observation. Many people live an active life with one lung. You may find that activities of your daily life take much longer and that your tire more easily after the procedure. Shortness of breath is common while your body adjusts to having one lung. Allow time for your body to adjust to pumping your blood through one lung.

Pleurodesis: The purpose of this procedure is to create inflammation between the lung membranes. The inflammation prevents fluid and air from collecting in the space. Sometimes surgical talc is used. This is called talc pleurodesis.

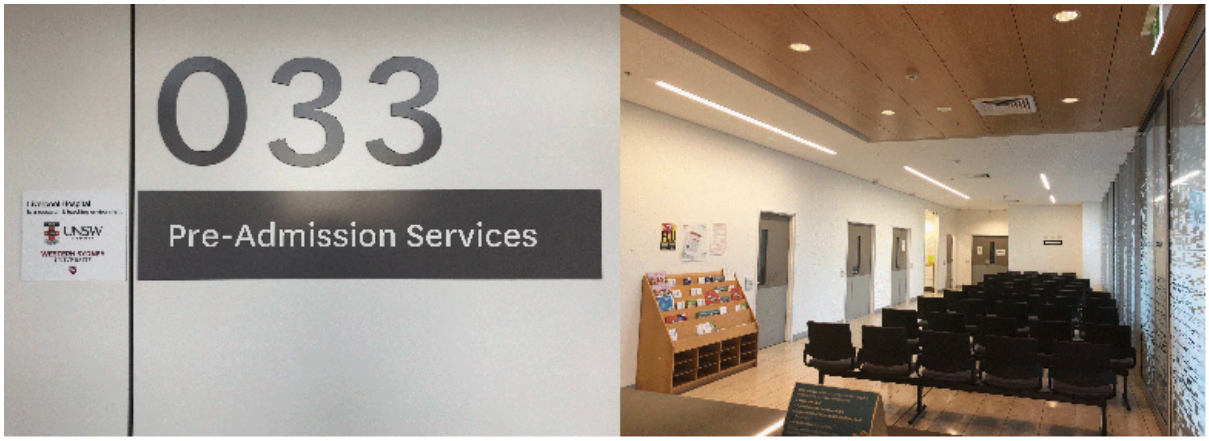
Pleurectomy and decortication: This procedure is done to strip the lining of the lung (pleura) - pleurectomy or the fibrous membrane- decortication. This is done to assist your lung to expand.

Pleuropneumonectomy: Resection of an entire lung along with the pleural lining. This surgery is mainly for mesothelioma or tuberculosis.



Preparing for Your Lung Surgery

The Cardiothoracic Pre-Admission Clinic



You will need to attend the Cardiothoracic Pre-Admission Clinic at Liverpool Hospital before your admission. This is to prepare for your operation.

Where is the Cardiothoracic Pre-Admission Clinic located?

The Cardiothoracic Pre-Admission Clinic is located in Pre-Admission Services. It is on the Ground Floor of the Clinical Services Building Reception number 033 at Liverpool Hospital, near Entrance J.

Do I need to prepare or bring anything with me?

Ensure you bring your Medicare/Pension/DVA/Private Health Fund cards. You all also need to bring medications, tests, scans and X-rays. You do not need to fast before the clinic appointment or for any tests that day. Please bring a snack or some lunch and water with you as there may not be a chance for you to go and get something to eat.

When is the Cardiothoracic Pre-Admission Clinic held?

The clinic runs every Thursday. The letter you received with this booklet will tell you what time you are required to arrive at the clinic. Your appointment will usually take about four (4) hours but sometimes delays can occur. We encourage you to bring a friend or relative with you.

If you do not speak or understand English well, or if you use sign language to communicate, please let us know before your appointment so that we can arrange for an interpreter to be present.

At the Cardiothoracic Pre-Admission Clinic, you will have individual consultation with several different members of your health care team:

- A Clinical Nurse Consultant who will collect some information about your past & present health.
- An Anaesthetist who will make sure you are fit for surgery.
- A Physiotherapist who will:

- Conduct an assessment including a simple test to see how well your lungs function (spirometry)
- Teach you how to do deep breathing, coughing exercises and shoulder exercises.

You will also need to have:

- a blood test
- a chest X-ray
- an ECG
- and any other tests that are requested by your Cardiothoracic Surgeon

Most of these tests will be done in other departments of the hospital. The Cardiothoracic Secretary or nurse will give you directions on where to go for these tests.

Things you need to do before your admission

Below are things that you need to do or think about to make sure you are well prepared for your surgery.

Do I need to stop taking any of my medications?

There are some medications you must STOP taking before your operation. These medications can increase your risk of bleeding after surgery. These drugs belong to a group known as antithrombotic drugs (used to prevent blood clots). Not all drugs in this group work in the same way. For this reason, some of these drugs MUST always be stopped before surgery. The others will be continued in some patients and stopped in others.
Your Cardiothoracic Surgeon will decide if you need to stop taking any of the medications.
If you are unsure about any of your medications, check with your GP/local doctor.

What if I smoke?

If you smoke, you MUST STOP. If you have smoked within 6 weeks of your operation, the risk of complications is much higher. Your surgeon may decide that these risks are too high to proceed with your operation. If you continue to smoke and don't tell us that you have been smoking, you are taking a serious risk with your health. Most people need help to quit, so talk with your health care team about alternative replacement therapy. You can decide the best therapy for you.
You may contact Quitline on 13 78 48.

When can I return to driving?

You are advised not to drive a car until you have seen your surgeon at your follow up visit. The recommended period for no driving is 4 weeks after a thoracotomy and 1-2 weeks after a thoracoscopic surgery.

Important Information for your Family and Friends

Can my family visit me before my operation?

As it can take 4 hours or more until you arrive in the cardiothoracic ward, your relatives will probably be more comfortable waiting at home during this time.
If your family chooses to wait at the hospital, they may wait in the ICU waiting room which is located on Level 2 of the Clinical Services Building. Use lift D to get there.

When can my family visit me after my operation?

Visiting hours in the cardiothoracic ward are 10 am-8 pm. During the first one or two days after your operation, you will need plenty of rest. Only close family members and friends will be able to visit you.
Please organise for only one member of your family or friend to phone for information during your hospital stay. That one family member or friend should be the contact person for everyone else to get updates on your progress.

What to Do with Valuables

It is best if you do not bring valuables (e.g. money, jewellery, etc) into the hospital with you, but if you forget, please give them to your family to take them home for safekeeping.

Admission to Hospital

When do I have to be at the Hospital?

The Admissions department will contact you with the date of your operation. This is about 1 to 2 weeks before the operation.
On the last working day before your surgery, the Perioperative Unit will phone you between 1:00pm and 3:00pm. They will inform you of what time to arrive and when you should last eat and drink.
Please come to the Perioperative Unit Reception 211 at the time advised. From the main concourse in the Clinical Building take Lift B to level 2.
Occasionally, some people need to be admitted to the hospital the day before their surgery. If this applies to you, you will receive a letter from the hospital. The Pre-Admission Services will call you at 12:30pm on the day you are to be admitted to confirm that a bed is available. The staff in Pre-Admission Services will tell you what time you need to come in.
You will need to come to the Pre-Admission Services to register (this is the same place you went for your Cardiothoracic Pre-Admission Clinic appointment). When you register, you will be directed to a ward for admission.

When do I have to stop eating and drinking?

The evening before your surgery, you should have dinner as usual. After midnight, do not eat or drink anything so that your stomach will be empty at the time of surgery. But you can still take your normal medications in the morning (except those that have been stopped in preparation for your surgery) with a sip of water. You may brush your teeth and rinse your mouth with water but do not swallow the water.

What else do I need to do on the night before my surgery?

You will have been given some antiseptic liquid soap at the Pre-Admission Clinic. You will need to have a shower using this soap on the evening before your surgery. You should not use any deodorants or apply any talcum powder after this shower.
It is very important to remove jewellery, nail polish and makeup.

What do I need to bring with me to the hospital?

You should prepare a bag containing toiletries. These can be a comb, soap, toothpaste, and toothbrush, underwear, pyjamas and loose-fitting slippers.

What happens in the Perioperative Unit?

When you arrive at the Perioperative Unit, the rest of your preparation will need to be done.

- A ward orderly or nurse will use a surgical clipper to remove excess hair from the necessary parts of your body.
- You will need to have another shower using the antiseptic liquid soap.
- After your shower, you will need to put on a hospital gown ready for the operating theatre.
- You will also be given a special “hat” to wear. If you are allergic to anything (not just medicines) your “hat” will be red. This is to remind the staff that you have an allergy
- An Anaesthetist will see you again to do a final check to make sure you are okay for surgery.
- If you wear dentures or glasses, you can wear them to the operating theatre if you wish. They will be removed once you are asleep and returned to you after your operation when you are transferred to the ward.

Will my operation go ahead as planned?

In most cases, the surgery will go ahead as planned, but unfortunately postponement of surgery can occur. Your operation may need to be postponed because of the emergency needs of other patients or you develop an infection.
We acknowledge that this may be very stressful for you and your family. If this does happen, your operation will be rebooked as soon as possible.
If your operation is to be done later, check with your doctor about your medication schedule. This is including any medications that you stopped before your surgery. Your surgeon will reschedule your surgery. The surgical team will inform you of the new date.

Post-Operative Consideration

A speedy recovery after lung surgery is a result of hard work by you, with support from the nursing, medical, physiotherapy and allied health staff.
The most common complications after thoracic surgery are pain and constipation.
It is very important that your pain is well controlled by analgesics (pain relief). Some of the analgesics we prescribed for you are narcotic based which often makes people constipated. It is important to walk, drink 1-1.5 L of fluid daily, have a high fibre/fruit diet and if required, take aperients, constipation can be very painful.

Oxygen: You will be given oxygen via a mask over your face. As your health continues to improve, the oxygen level will be decreased. You will not need oxygen when you go home.

Monitoring: Your blood pressure, temperature, pulse and oxygen levels will be monitored regularly. This may be annoying and disturb your sleep, but it is for the initial post-operative period and it's important for us to check frequently.

Chest Drains: After your operation, you will have two or three plastic drainage tubes coming from your chest. These tubes drain blood that builds up in your chest as a result of your operation. Drainage from these tubes will gradually decrease. These tubes will usually be removed one or two days after your operation.
Intravenous Lines: After your operation you will have medications and fluids given through intravenous (IV) lines. These lines are usually taken out on the second day after your operation.

Pain Relief: Regular pain medication is very important to ensure you are comfortable and able to do your deep breathing and coughing exercises. These exercises are important for your recovery and will help prevent pneumonia and lung infections.
At the end of theatre, the surgeon often places a small catheter along the incision site. A drip is attached, and a constant flow of local anaesthetic is administered. The infusion is stopped, and catheter removed usually 3 days after your operation.
You will also be connected to a Patient Controlled Analgesia (PCA) machine. This machine allows you to get pain medication as you need it, by simply pressing a button. It means that you will be able to control your pain relief based on your pain level.

Once the chest drains have been removed, pain generally decreases and can be managed with oral medication. Usually, you will be given a long-acting pain tablet. When you are taken off the PCA machine, if your pain is not relieved by the long-acting tablet, you can ask for extra pain tablets. This will be given every three to four hours depending on your pain.

Although your pain can be kept to a minimum, it cannot be completely relieved. Please let staff know if your pain persists.

Nausea and Vomiting: Some patients experience nausea and vomiting after surgery. This may be related to the anaesthetic and /or the pain relieving medications. Be sure to let the staff know if you are feeling nauseated so that medication can be administered to relieve your symptoms.

Drinking and Eating: You will be able to have ice to suck and small sips of water soon after you have woken up from your operation. The day after your operation, you will be able to have a light meal such as a sandwich.
If you have had a pneumonectomy, you will not be able to eat or drink until the day after you operation. It is common for you not to feel hungry for few days. Your appetite will gradually return to normal.

Medication: You may start back on your normal medications on the evening of surgery day (or else the next morning). Some of the medications you were on before may not be re-started or may be re-started at a lower dose than normal and gradually increased during your hospital stay. If you have any questions about your medications or their doses, you should ask your doctor or nurse.

Physiotherapy

***Exercises*:**

The physiotherapist will provide appropriate exercises so you can start practicing before surgery.
From the first day after your surgery, the physiotherapist will encourage you to begin exercising. This may involve gentle shoulder exercises to prevent stiffness and maintain joint range of motion. These shoulder exercises are attached at the back of the booklet. Once the chest drain is removed, the physiotherapist will review and progress these exercises as appropriate.
Throughout the day, it is important to be sitting upright and out of bed, as much as possible. This will allow for your lungs to re-inflate after surgery.

Deep Breathing & Coughing Exercises:

To help with your recovery and prevent chest infections, it is important that you perform deep breathing and coughing exercises. This is called the Active Cycle of Breathing Technique. The exercise is attached at the back of this booklet. These exercises will help with the re-inflation of your lungs and help generate more effective coughs to clear phlegm from your chest.

The physiotherapist will teach you this breathing technique before surgery and after your surgery. You are encouraged to perform these exercises hourly on your own.

If you are finding it difficult to breathe deeply or cough due to the pain, please ask for pain relief medications every three to four hours.

Mobility:

Exercise and walking have been proven to assist with your recovery from surgery and reduce the risk of blood clots. Following your surgery, your walking may be limited by your chest drain and other drips and attachments. However, the staff can assist you to sit out of bed, walk and perform bedside exercises.

The physiotherapist will review you daily and gradually increase your walking distance until you are able to walk safely on your own. By the time you are ready to leave the hospital, you would be able to walk independently on flat ground and on a flight of stairs. Once you leave the hospital, you will be expected to walk regularly at home to improve your lung fitness and physical wellbeing.

Pulmonary Rehabilitation Program is an exercise and education program that teaches you the skills you need to exercise safely and manage your breathlessness.
Depending on your surgery and recovery, the physiotherapist will refer you to the program. The referral will be done on the day of your discharge from hospital.

Elastic or Compression Stockings: During your hospital stay, you will need to wear elastic or compression stockings. The stockings help blood from your legs return to your heart and prevent fluid from building up in the legs. They also help to prevent blood clots.
The nurses will help you to put on and take off the stockings. Before you go home, the nurses in the ward will teach you and your carer how to do this.

Wound care: The dressing will be removed from your wound on the third day after your operation. You will be able to shower with your wound uncovered. Do not rub the stiches or use highly perfumed soaps, talcum powder or lotions around the area. Your wound sites tend to have dissolvable stiches.
The drain stiches would be removed 7-10 days after the drains were removed by hospital staff or by your local doctor if you have gone home.
Occasionally fluid continues to leak form the holes where the chest drains were in place. Although this is not uncommon, you should go and see your local doctor. If the fluid is bright red blood, you should go the nearest emergency department. If you have any concerns about your wound after you left hospital, you should see your local doctor.

Pneumonectomy and Pleuropneumonectomy Specific

Many people live an active life with one lung. Shortness of breath is common while your body adjust to having one lung. You may find that activities of our daily take much longer and that you tire more easily. Take your time. Allow time for your body to adjust to pumping your blood through one lung.

Pain is one of the biggest problems after lung surgery as previously indicated in this booklet. You may have some pain for 1-3 months after surgery. It is very important to take your pain medication. If you have pain, you will resist from deep breathing and coughing exercise. With one (1) lung, it is imperative to deep breathe and cough and ensure your lung fully expanded and clear.

Constipation occurs frequently due to the narcotic in the analgesics we give you. This can make your pain worse. Be active, eat a high fibre diet and drink water.

Atrial Fibrillation (AF) is a rapid heart rate which frequently occurs after this type of surgery. You can feel short of breath, light headed, nauseated and have chest pain. Sometimes people will experience these symptoms. We will commence you on an 'anti-arrhythmic' drug. The surgeon may refer you to a cardiologist if you haven't seen one previously. These medications tend to be short term (6 weeks) rather than life long.

Relax, take your time.
Your weight is recorded before and after surgery. If you weight increases, it will place more stress on your body and make your heart and lung work harder. In the initial post-operative period we will restrict your fluids to 1-1.5L daily. This will ensure that you are not becoming dehydrated, your kidneys are functioning, but you are not carrying any extra fluid.

Signs of carrying extra fluid are increase shortness of breath, and swollen ankles. We may restrict your fluids further or give you some diuretic tablets. These will make your urinate more and thus remove the fluid.

The surgery cuts into many layers which are supplied by nerves, so you may feel pain at the front of your chest even though your suture line is at the back.
You may also feel that there is water moving in your chest. This is because fluid fills up slowly in the area where the lung has been removed. This is normal.

If you are to have any procedure in the future and a chest x-ray is taken, there may be concern from your doctor/nurse that you have fluid in your chest. You actually do have fluid in your chest- it's meant to be there. The fluid eventually congeals- this keeps your heart and lung in place. This area must not be drained.

If your doctor has concern, ask them to contact your thoracic surgeon, prior to proceeding with any treatment on your lungs.

Temperature: If you develop a fever or temperature, then it is preferable if you attend your local doctor or go to the nearest emergency department.

Transfer of Care (discharge) information

The following information will give you a better idea of what to expect in relation to your recovery after your discharge from hospital.
Although people who had lung surgery share similar experiences during the recovery, each person responds differently.

On the day you go home, you will be provided with discharge letters and prescriptions. You will also be given the contact details of your Cardiothoracic Surgeon. This is for you to make your follow-up appointments.

Make sure you have the following things to take with you:

- A letter for your GP/local doctor, who you should see within two days and then again two weeks after your discharge. You may be required to see your GP/local doctor more often to follow up with any blood tests or medication changes.
- A letter for your Cardiothoracic Surgeon, as you will need to make an appointment and see them four (4) weeks after discharge.
- A prescription for medications that you need to take after discharge.
- A copy of your discharge summary, which includes a list of the medications you need to take. Please make sure you understand when and why you are taking your medications before you leave the hospital.
- Two pairs of elastic stockings as you will need to wear them for six weeks after your surgery.
- Pain medication from the hospital pharmacy (if appropriate).

Pain and Discomfort: Aches and discomfort may continue after you leave hospital. It is common for these symptoms to continue for at least a few weeks. It is important when you are at home to continue taking regular pain relief. If the medication you are taking does not provide adequate pain relief, you should contact your local doctor for assistance. Stronger medication may be required for some period of time.

Constipation: Pain relieving medications that contain morphine or codeine slow down the activity of the bowel and cause constipation. Constipation can be prevented by taking care of your bowels as well as your pain.

The following actions will help prevent constipation:

- Take an aperient while you are taking pain medication
- Increase the amount of fibre in your diet, e.g. fresh fruit and vegetables, unprocessed bran, cereals, dried fruits, and yogurt
- Increase your fluid intake as long as you are not on fluid restriction
- Maintain or increase your exercise level

Mobility and Exercise: your goal should be return to your preoperative level of activity as soon as possible. You should try and increase your level of activity each day. Remember that it will take some weeks to increase your fitness after a major operation.

Questions I need to ask

When to Call for Help

If you have any of the following symptoms:

- Severe chest pain or tightness of chest
- Extreme shortness of breath
- Fainting
- Chest wound that begins to pull apart or starts leaking
- Fever greater than 38^{0} C and/or chills
- Palpitations or new onset of irregular heartbeats

- Dizziness or light-headedness that does not go away with rest
- Persistent nausea or vomiting
- Severe wound pain not relieved with pain medication
- Persistent fatigue
- Persistent depression

Who to Call for Help

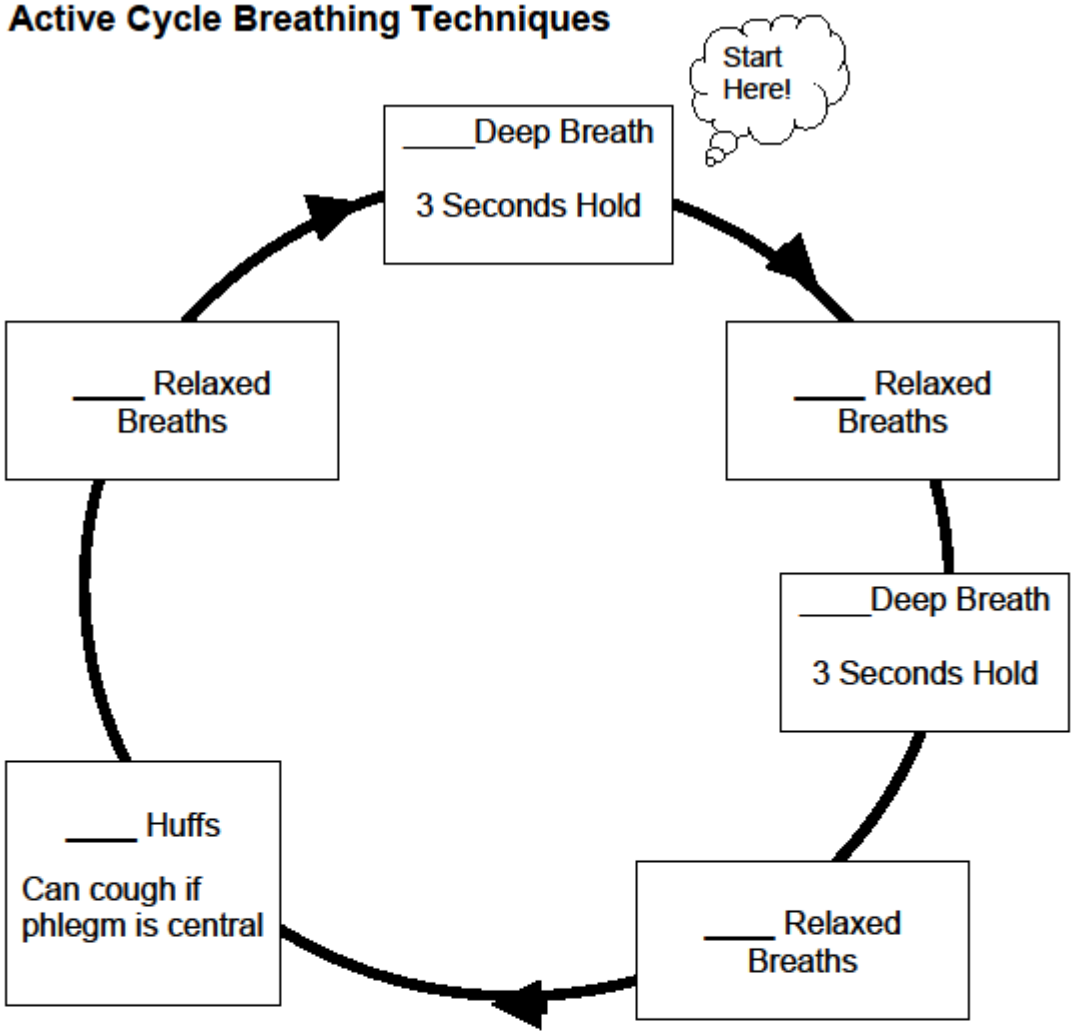
In the event of an **Emergency** phone **000**
If you are concerned or worried, please see your GP/local doctor

For advice, phone:
Cardiothoracic CNC or Case Manager: 8738 6312 or 8738 3798 or phone Liverpool Hospital on 8738 3000 and ask for Cardiothoracic CNC.
Monday to Friday (excluding public holidays) 7:30am to 3:30pm

Cardiothoracic/Cardiology Ward CB3E: 8738 7350

Cardiothoracic Registrar: 8738 3000 and ask for the on-call Cardiothoracic Registrar.

Active Cycle Breathing Techniques



Repeat ____ cycles
Every 1 - 2 hours

- ❑ Left side lying
- ❑ Right side lying
- ❑ Sitting Upright

Created by Physiotherapy Department at Liverpool Hospital.
Updated November 2017

SHOULDER EXERCISES- once chest drains are removed.

	1. Perform this exercise whilst lying flat on your bed. Raise your arm as high above your head as you can with your non-performing arm supporting. Lower slowly.
	2. When exercise 1 is easy to perform, you can perform the same movement whilst sitting in a chair or in an upright position in bed. To further progress this exercise, raise the arm without the support of the other arm. Lift your arm so that your elbow comes as close to your ear as possible.
	3. Lie with your back on the bed, take both hands to the back of your head, raise elbows and open elbows out as far as possible, squeezing your shoulder blades together. Then bring your elbows together to touch. Repeat this motion. You can also do this in sitting upright.

	4. Position yourself upright in a chair or on the edge of the bed. Lift your arms out sideways, up and over your head. Slowly lower your arms down.
	5. Position yourself upright in a chair or on the edge of the bed. Place hands on your shoulders, slowly turn, twisting to the left as far as comfortable. Repeat this motion for the right side.

	6. Position yourself upright in a chair. Place hands on your shoulders, bend sideways to the left as far as comfortable. Repeat this motion for the right side.