Oxford University Hospitals NHS
NHS Trust

Thoracic Surgery

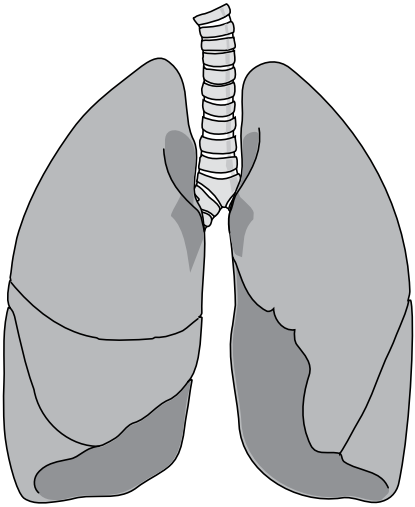
Lung Resection

Information for patients

Welcome to the Oxford Heart and Lung Centre

The information in this booklet will help to prepare you for coming into hospital for your lung operation. It will help to remind you about explanations and information that the medical or nursing staff will give you. We hope it will be a useful and helpful guide. If you need any extra information, please speak to the pre-admission nurses or the Advanced Nurse Practitioner.

What do the lungs do?



As you breathe, air is drawn into your nose and/or mouth. It then passes down the back of your throat and into your windpipe (trachea). The trachea then divides into two bronchi, which are tubes that lead to the left and right lungs. Air passes down the bronchi, which divide into further, smaller tubes and into smaller airways called bronchioles. At the end of the bronchioles are tiny air sacs called alveoli. These are where oxygen and carbon dioxide pass to and from the blood stream, through tiny blood vessels.

The left lung has two lobes (the upper and lower lobes) and the right lung has three lobes (the upper, middle and lower lobes).

What are the most common types of lung disease?

- asthma
- bronchitis
- cancer
- emphysema.

What causes lung disease?

The causes of some lung diseases are not yet fully understood. However, we do know that cigarette smoking and some industrial products cause lung and heart disease.

Smoking

Cigarette smoking is known to be the major cause of almost all heart and lung disease, including cancer.

The risk of developing heart or lung disease increases with the amount and the length of time that you smoke.

Low tar cigarettes, cigars and pipes are harmful too – there is no such thing as safe smoking. If you have smoked before your operation, this is likely to have contributed to your illness. Your stay with us will give you a valuable opportunity to stop smoking.

If you stop smoking, your risk of developing heart or lung disease is reduced.

After any chest surgery, your long-term recovery will be influenced by whether or not you smoke cigarettes. If members of your family smoke, please ask them to support you and improve their own health by stopping too.

Industrial causes

Many industrial processes and products, especially asbestos, are causes of lung disease. However, the damage caused may take years to become obvious.

What kind of assessment will happen before my operation?

Before your operation you will be invited to come to the pre-admission clinic. This is run by the pre-admission nurses. At this clinic you will be assessed by:

- A **doctor**, who will examine you and ask you questions about your previous medical history. The doctor will explain the operation or examination and why it is necessary, including the risks involved.
- The **pre-admission nurse**, who will ask you questions about your daily activities and about any support that you may need when you go home. The nurse will take your blood pressure, heart rate, weight and height. They will also give you an opportunity to ask any questions you might have about your admission.
- An **anaesthetist**, who may see you to explain how they will look after you during your operation and answer any questions you may have about having an anaesthetic.

What tests will I have before my operation?

Before your operation we will arrange tests to assess your health and fitness for surgery. The tests you will need will depend on the surgery you are having and any other health issues you may have. Some of these tests will be done at the pre-admission clinic.

Blood tests – These can tell us about your general state of health and fitness for surgery.

Chest X-Ray – These images help us to look at your heart and lungs.

Electrocardiogram (ECG) – This machine measures the electrical activity of your heartbeat and muscle function.

Spirometry – This is a simple breathing test during which you will be asked to blow into a machine. It tests how much air you can breathe in, as well as the way you breathe in and out.

Lung function tests – These look in more detail at lung capacity (how much air you can hold in your lungs) and assess how your well lungs are working. You will need to spend up to an hour in the lung function laboratory for these tests.

Ultrasound – This scan uses sound waves to create an image of the inside of your body. It is frequently used to pinpoint any fluid which might be in your lung.

Magnetic Resonance Imaging (MRI) scan or Computed Tomography (CT) scan – These scans give a 3-dimensional picture of your body and can help us to see if any cancer has spread to other organs. Both these scans are painless but may make you feel claustrophobic, as you have to lie still whilst the scanner moves you in and out of a large circular machine. However, the radiology staff will reassure you throughout the procedure.

Positron Emission Tomography (PET) scan – This scan creates pictures showing where there is active cancer throughout the body. You will need to have a PET scan before your lung surgery, to make sure that surgery is the most appropriate treatment for your cancer. During this test you will have an injection of special dye into a vein in your hand or arm, to highlight active cancer cells. You may be asked to not eat before this scan.

Lung Perfusion scan – This produces a picture of blood flow to your lungs and measures their ability to take in air.

Are any tests performed under anaesthetic?

Bronchoscopy

This involves passing a telescopic camera into your windpipe to look at the main airway of your lungs. We may also collect small samples of tissue called biopsies. These are then looked at in our laboratory.

Mediastinoscopy

This test involves making a small cut just above your breastbone. We would then insert a very narrow tube with a small camera attached. The surgeon uses the camera to look at the lymph nodes in your chest and take a small sample of tissue (biopsy).

What are the different types of lung resection surgery?

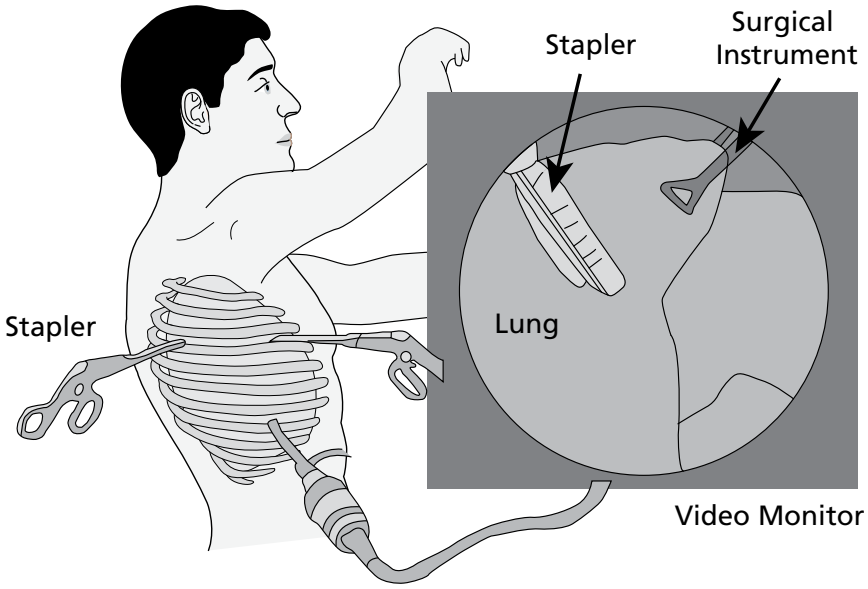
Thoracotomy

This is the cut made by the surgeon to allow them to get to your lungs. The cut will run below your shoulder blade at the back, then under your arm towards your nipple. A cut is then made between two of your ribs, which are then spread apart. This allows the surgeon to be able to see your lungs.

Video Assisted Thorascopy (VATS)

This is a form of keyhole surgery. The surgeon will insert a telescopic camera in through small cuts in your chest. This allows the surgeon to examine your lungs or pleura (the membrane covering your lungs) using video images. They can also use these small holes to carry out some types of surgery.

Carrying out the surgery using a thoracoscope



Sternotomy

This is a cut is made through your breast bone to allow the surgeon to get to your chest cavity.

Pneumonectomy

This is the removal of the whole lung.

Lobectomy

This is the removal of one or more lobes of the lung. The remaining lobes should gradually expand to fill the space

Wedge Resection

This is the removal of a small part of one of the lobes.

Sleeve Resection

This involves removing one lobe of the lung and part of the main airway. The remaining lobes of the lung are then attached to the rest of the airway.

Decortication

This is a procedure to remove damaged and infected tissue from the lungs or chest cavity.

What are the benefits and risks of lung resection surgery?

Any operation requiring a general anaesthetic carries with it a risk of complications. Your surgeon will discuss with you the common risks and also any specific risks that relate to you, before you are asked to sign that you are happy to have the operation (give your consent).

Make the most of this opportunity to discuss any questions or worries you might have. You need to feel confident that you understand what the operation involves, as well as the risks, before you sign the consent form.

Who will look after me during my hospital stay?

You will be admitted under the care of a Consultant Thoracic Surgeon who is assisted by two other doctors, a Registrar and a Senior House Officer.

Nursing staff are all fully qualified and many have specialist cardiothoracic qualifications. This means they specialise in the care and treatment of people with heart and lung problems.

The **Matron** manages the Cardiothoracic Unit. A **Sister** is responsible for the cardiothoracic ward.

Anaesthetists are fully qualified doctors who will put you to sleep for your operation. They monitor your condition very carefully throughout your operation and make sure that you have enough pain relief during your recovery period.

Physiotherapists will visit you after your operation. They will help you keep your lungs clear and will help to get you moving after your operation. This will speed up your recovery and get you back to a level of activity which allows you to go home.

Occupational Therapists are available to give you advice and information about going back to your daily activities after your surgery. They can also give you some useful items of equipment to use at home, if you need them.

A **Dietitian** is available to give you advice and information on what to eat and drink.

A **Pharmacist** will visit the ward each day to monitor your medication and give you advice on your medicines.

What happens on the day of my operation?

When you come to the pre-admission clinic, the nurse will give you instructions about when you should stop eating and drinking before your operation. You will also be given an antiseptic lotion, mouthwash and nasal cream and instructions on how to use them before your admission. You will be told what time to arrive at theatre direct admissions (TDA) on the day of surgery.

When you arrive you will be asked to change into a clean hospital gown and you will be fitted with surgical stockings. These will help prevent blood clots forming during the operation.

Before the operation

The nurse or operating department practitioner (ODP) will check some important details with you such as your name, date of birth, and any allergies you may have. They will also confirm that you have signed your consent form.

When it is time for your operation you will be taken to the anaesthetic room. We will help you to move onto a trolley and the nurses will then connect you to heart and pulse monitors. Your anaesthetist will insert a small needle in your arm to give you drugs to make you go to sleep.

If you are having an epidural for pain relief this will also be inserted before the operation starts. The anaesthetist will discuss this with you before your surgery.

Throughout the operation the anaesthetist will be looking after you and will give you medication to keep you asleep and relieve pain.

Some of the medical equipment used in thoracic surgery

- **Chest drains** (see page 14).
- **Cardiac monitor** – this is attached to your chest by sticky pads and helps the nursing staff to monitor your heartbeat.
- **Intravenous cannula (drip)** – you may have one or two of these going into the back of your hand or arm, through which you can be given fluids and medication.
- **Neck line** – this goes into a large vein in your neck. It is used for giving intravenous drugs and fluids directly into your bloodstream.
- **Urinary catheter** – this is a tube used to drain away urine from the bladder. You will have a catheter if we need to monitor how much urine you are producing or if you have difficulty passing urine after your surgery.
- **Oxygen** may be given to you through small tubes, just inside your nostrils, or a face mask over your nose and mouth.

As your condition improves all of these will be removed.

What happens after my operation?

When the operation is over you will be woken up. You will be transferred to either the recovery ward or the cardiothoracic critical care unit (CTCCU) where specially trained nurses will look after you. They will make sure you have good pain relief and that you are breathing well. You will be given oxygen through a face mask to help you recover.

You if you go to the recovery ward you will be transferred to the cardiothoracic ward (CTW) once the medical team and recovery nurses are happy that you are recovering well. If you go to the CTCCU after your operation you may stay there overnight.

Pain relief

For the first few days after your operation you may be given pain relieving medication in the following ways:

Patient Controlled Epidural (PCE)

Medication is given through a fine tube placed in your back, which numbs the area around the wound and any drains you may have. You will be able to give yourself extra pain relief by pressing a button. The dose of medication is set by the anaesthetist so there is no risk of you overdosing.

Paravertebral block

Local anaesthetic is delivered through a fine tube in your back to the nerves around the site of your operation. The amount of local anaesthetic you receive is set by the surgeon and anaesthetist.

Patient controlled analgesia (PCA)

Pain relieving medication is given through a pump into the drip in your hand. You will be able to control your medication by pressing a button. Alternatively, your nurse can control your medication if they feel your pain is not controlled. Again, the dosage is set so there is no risk of overdosing.

Once you are able to eat and drink we will give you pain medication as tablets every four to six hours. Your nurse will assess your pain with you using a scale of 0 to 3 [0=no pain, 3=severe pain]. It is important that you are comfortable enough to carry out your deep breathing and coughing exercises. Please tell us if you start to have any pain so we can make changes to your medication if needed.

Throughout your recovery an anaesthetist will be available to give you advice about pain, sickness or any other problems that may arise.

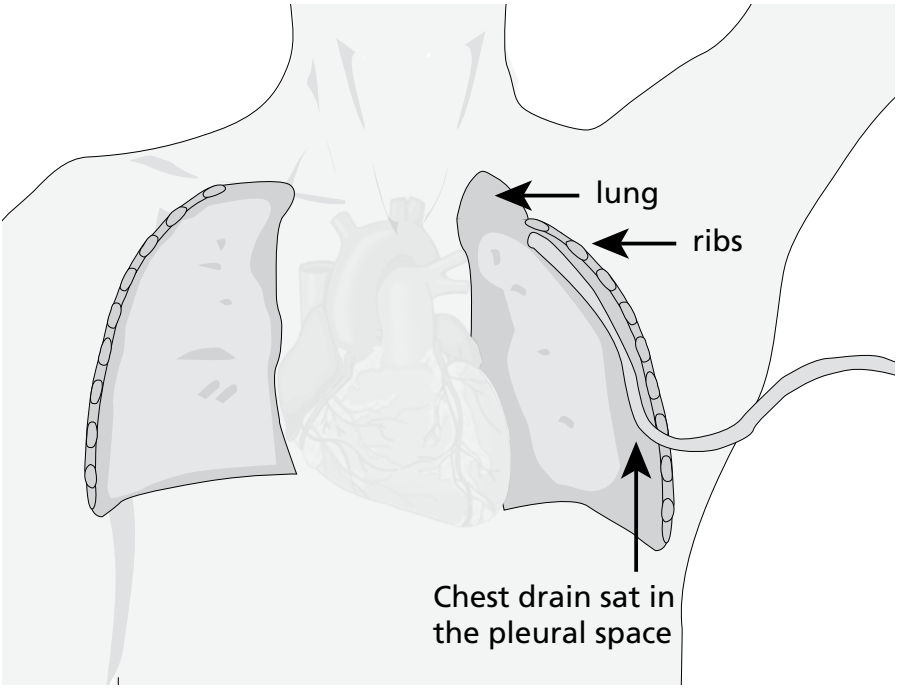
Chest drains

Chest drains are necessary after lung surgery. Their job is to remove any fluid and air which can collect in the chest cavity.

The drain is a one way system that draws fluid and air out, and stops it from going back into the chest. The chest drain is a tube which has one end in your chest cavity and the other attached to a chest drain pump. The tube is held in place by a stitch. The drain pump controls the amount of suction applied to the drain and measures how much air is leaking out. The amount of suction applied to your chest drains may be changed as you recover from your operation.

You can help to open your lungs back up by moving or walking around and by deep breathing and coughing.

Chest drains are usually removed when the doctors are happy that they are no longer required



How do I look after my chest drains?

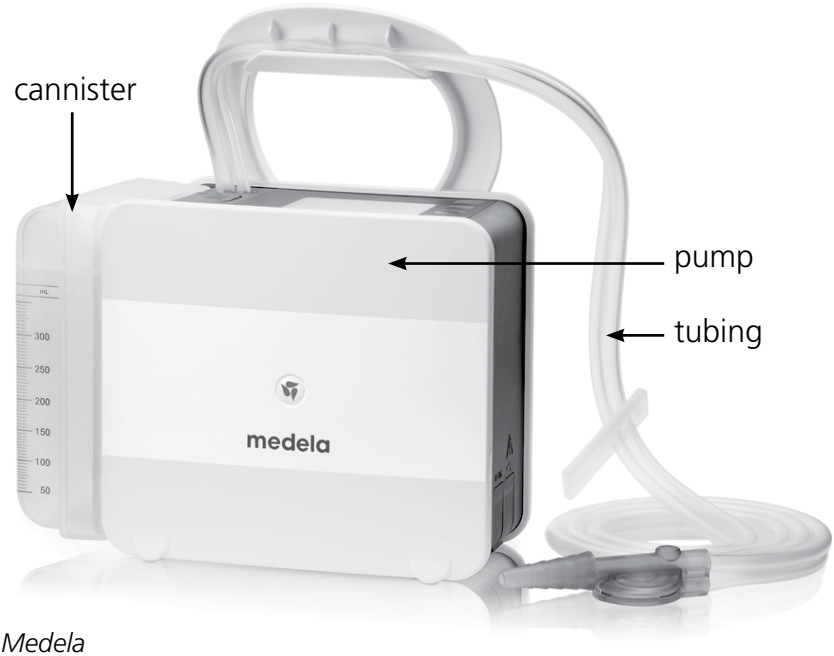
Try not to pull on the tubing as this may cause pain or discomfort. Try to avoid bending and folding the tubing, as this slows down drainage.

If the tubing comes out of your body or off the pump, ask for help immediately. Your nurse will need to reconnect the tubing to the pump.

If the tube comes out of your body we will close the hole with a stitch and then assess you to see whether you need to have another drain put in. However, the drain is stitched in place so this is very unlikely to happen.

If the drain either comes off the pump or out of your chest, you may need to have a chest X-ray. This is to check the drains are working correctly.

Drain pump



Exercise

Exercise is a vital part of your preparation for surgery and your recovery afterwards.

If part of or all your lung has been removed you will have to train your remaining lung to work harder to make up for this. Exercise and physiotherapy is the only way to do this. This will be hard as you will feel breathless and tired, but will become easier as you recover.

We will give you instructions on the exercise you need to do before and after your surgery. This is part of the Enhanced Recovery Programme. Details can be found in the enhanced recovery programme booklets:

Enhanced Recovery – Patient Information Leaflet

This will have been given to you at your clinic appointment with the consultant.

Enhanced Recovery – Patient Diary

This will be given to you at the pre-operative assessment appointment.

Every day we have a set quiet time between 1-3pm. Please take advantage of this and have a rest on your bed, as you may feel more tired as usual.

What can I eat?

You will need more calories (energy) from your diet to help your body heal and regain strength. It is common after an operation to lose your appetite and you may not wish to eat large meals. Most people find that eating 'little and often' is best.

Your nurse can give you high calorie drinks to supplement your meals if necessary.

For more expert advice we can refer you to our dietitian.

When will I be able to go home?

You will be discharged from hospital when we are happy that you are recovering well. This is often after the chest drains are removed.

If you are making good progress but your chest drain needs to stay in, we can attach a drain that is safe for use outside the hospital. We can then discharge you home. We will give you specific instructions and training on the care of the drain. You will have an appointment to see the Advanced Nurse Practitioner in Thoracic Surgery at the chest drain clinic after you return home.

When you return home you must make sure there is someone responsible with you for the first week, to look after you. If you live alone you could arrange to stay with a relative. If this is not possible, please tell us when you come to pre-admission so that arrangements can be made to give you some help at home.

Please arrange for someone to collect you from hospital and take you home. You will need to go home in either a car or taxi. This will be more comfortable for you, and also quicker for you to return to the hospital if there are any complications on the journey home.

When you leave the ward we will give you:

- a supply of medication, which your nurse will explain to you, and a written plan of when to take your tablets
- a letter for your GP
- an appointment for stitch removal/wound check and letter for your practice nurse at your GP surgery.
- discharge advice booklet and contact details, should you need help once you are home.

You may be told about your follow-up appointment, but a date will also be sent to you in the post. This date can vary from two to six weeks after you get home.

Signs and symptoms to look out for

If you have any of the following problems please see your GP or contact the Advanced Nurse Practitioner (contact details are at the end of the leaflet):

- continued problems with constipation despite taking regular laxatives and eating a high fibre diet
- an increase in the amount of pain you have, despite taking regular painkillers
- your wound becoming redder than before, swollen, warm to touch or leaking fluid
- any part of your wound coming apart
- your breathlessness becoming worse and you or your family are concerned.

Contacts

If you have any question or concerns, please contact one of the numbers below.

Advance Nurse Practitioner, Thoracic Surgery
(Monday to Friday, 7.45am to 4.00pm)
Tel: 01865 572 653
Tel: 01865 741 166 and ask for bleep 1184 (if urgent)

Cardiothoracic Ward
(24 hours)
Tel: 01865 572 662

Co-ordinator (if the Ward are unable to answer the phone)
(24 hours)
Tel: 01865 741 166 and ask for bleep 1971

Matron
Tel: 01865 572 649
Tel: 01865 741 166 and ask for bleep 1185 (if urgent)

If you have a specific requirement, need an interpreter, a document in Easy Read, another language, large print, Braille or audio version, please call **01865 221 473** or email **PALSJR@ouh.nhs.uk**

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