Pneumothorax

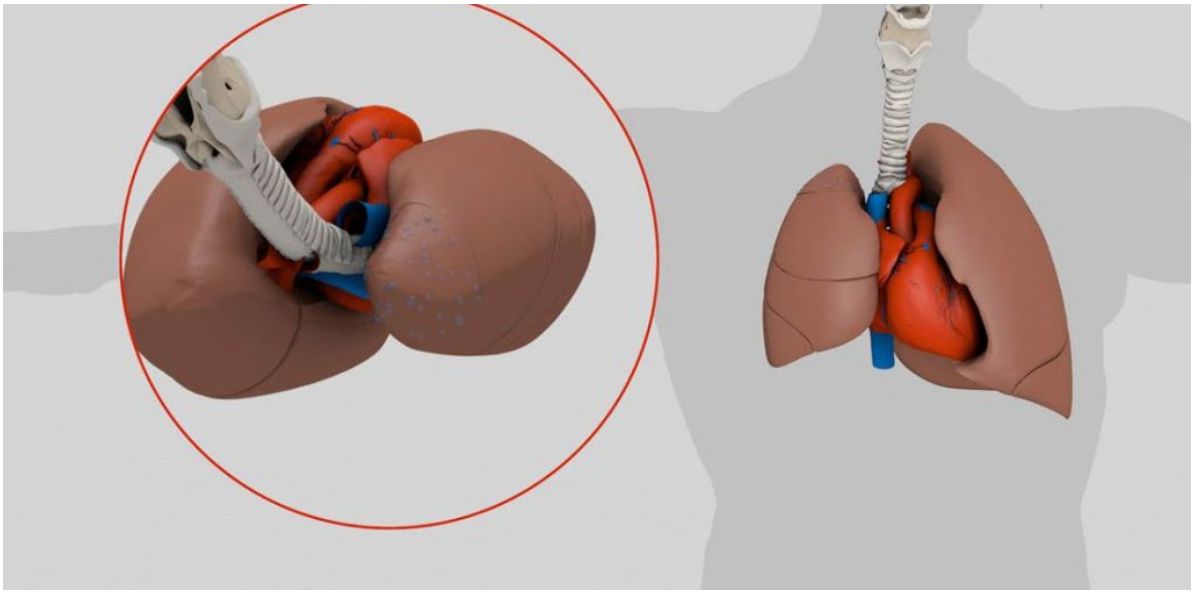
Welcome to the Thoracic Surgery Department at Queen Elizabeth Hospital Birmingham. The Thoracic team is a surgical team that deals with problems involving the chest (e.g. lungs, airways, heart etc.)

We hope that this leaflet can answer some questions or queries you might have about your procedure. The information provided in this leaflet will be discussed with you in full during your admission.

What is a pneumothorax?

When air leaks out of the lung it collapses and leaves a space around it. The medical term for a collapsed lung is a pneumothorax. A small pneumothorax will often heal by itself, however sometimes they don't heal up or they come back. A plastic tube, called a chest drain, may be used at first, but if this fails an operation may be needed to help re-inflate the lung and stop it collapsing again. If you have had a pneumothorax more than once, surgery is intended to help prevent this from happening again.

Thoracic surgeons look after patients who need surgery for a pneumothorax. They also look after patients who have a pneumothorax that is difficult to treat, even if they do not need surgery.



What causes a pneumothorax?

There are many reasons why a pneumothorax might develop, the most common reasons are listed below:

- Lung diseases, such as emphysema
- Smoking
- Young, tall and slim individuals are more at risk, with men being at higher risk

- Trauma, such as a fall
- Some medical procedures which involve the lung
- Young women may get a pneumothorax in relation to their menstrual cycle (catamenial pneumothorax)

What are the benefits of surgery?

The benefits of an operation are to remove the area of lung which is damaged and leaking air, and to prevent the lung from collapsing again. This will help you to breathe better and resume normal activities.

What are the alternatives to surgery?

There are alternatives to surgery, and these are usually trialled before we offer you an operation. This is reserved for conditions where surgery would be too risky, and include the following:

Continued use of chest drains

Given enough time, the lung should heal and stop leaking air, this healing process may take weeks. If you have a lung disease and surgery would be too risky, your surgeon may advise you to wait for the lung to heal. Different types of drains and drain settings may be used to try and help this process.

Pleurodesis

We can help the lung stick to the chest wall without an operation in some cases. This can be done by using talc power or blood and injecting it into the chest through the chest drain.

Sterile talc powder is mixed with sterile water and flushed up the chest drain. Alternatively, a small amount (50mls) of your own blood may also be used instead. Both of these methods require a chest drain but do not require you to be asleep under a general anaesthetic.

Using talc powder during an operation has a higher success rate than using talc powder through a chest drain (95% for surgery versus 75% using the drain).

What does the operation involve?

A number of techniques can be used to fix a pneumothorax. There are two parts to the surgery: a) dealing with area of the lung that has leaked and b) preventing the pneumothorax from coming back.

Surgery is done with you fully asleep, under general anaesthetic, and can be done via Video Assisted Thorascopic Surgery (VATS, also known as keyhole surgery) or open surgery (thoracotomy). During surgery, you lie on your side with your arm raised. Surgery usually takes between one to two hours. After the operation, you will wake up with a plastic tube (chest drain) coming out of your chest, which is connected to a special bottle. This will stay in for at least two days in order to drain air, fluid and blood from the chest.

Keyhole surgery (VATS)

VATS stands for Video Assisted Thorascopic Surgery. Up to four small cuts are made, between 1.5cm to 5cm in length. These are used for the instruments and small camera to go into the chest. Special staples are used to cut and seal any parts of lung that need to be removed. The piece of lung can be removed through one of the small cuts. The wound is closed with dissolvable stitches. One or two chest drains are put in at the end of the operation and held in placed with a stitch. These remove any fluid or air from around the lung. The muscles and skin are stitched together again at the end of surgery.

Open surgery (thoracotomy)
In rare instances it is not possible to perform the operation via keyhole, and open surgery is performed. This involves making one longer cut between the two ribs sitting just below the shoulder blade. The two ribs are spread open to get into the chest. Occasionally, one of these ribs may be cut to give more space, however we do not remove any ribs. At the end of surgery, the two ribs are brought back together with strong stitches. The muscles and skin are also stitched back together.

If you have had repeated episodes of pneumothorax, or you wish to do scuba diving, your surgeon may decide it is best to use the open technique to do your operation.

a) **Dealing with the area of lung that has leaked air**

This part of the operation is called a BULLECTOMY

Bubbles of thin lung tissue around the edge of the lung can be the cause of a pneumothorax if they burst. A small bubble is called a bleb; a large bubble is called a bulla. Removing these abnormal parts of the lung helps stop air leaking out of the lung. Removing such a small amount of lung does not give you any long-term breathing problems.

b) **Preventing the pneumothorax from recurring**

This part of the operation is called PLEURECTOMY or PLEURODESIS

To prevent a pneumothorax from happening again, the lung needs to become stuck to the inside of the chest wall. This will significantly reduce the chance of the collapse happening again, however we cannot guarantee it will never happen again. There are two ways in which this can be achieved, one way is to remove the chest wall lining (pleurectomy or pleural abrasion), and the other is to irritate and inflame the chest wall lining (pleurodesis). Removing the pleura on the inside of the ribs makes the inside of the chest wall sticky. This causes the lung to stick to chest wall. Alternatively sterile talc powder can be put into the chest, usually during the operation. The powder causes irritation which makes the lung stick to the chest wall.

What are the risks, side effects and possible complications of a bullectomy / pleurectomy?

The risks here are a guide; your own risk may vary. You should discuss the risks and benefits of surgery with your surgeon, especially if you are worried.

General risks of having thoracic surgery are: MINOR, MORE COMMON:

Pain
It is normal to have pain after this operation. Regular pain relief will be given to control the pain and it should settle in a few weeks. Very occasionally, pain does not settle (long lasting or chronic pain), and you may need to see a specialist at a pain clinic.

Bleeding
Following chest surgery some blood loss into your chest drain is normal. Occasionally a blood transfusion will be required, if this is needed further information will be given to you. Very few patients will need to return to theatre to control the bleeding.

Information for Patients

Chest infection
This occurs in a small number of patients having this operation.
Physiotherapy, early mobilisation and adequate pain relief can help you to be more mobile and clear chest secretions; this reduces the risk of this occurring. If you develop a chest infection, you may need extra physiotherapy, different antibiotics and to stay in hospital for a little while longer.

Wound infection
Showering before your surgery, frequent hand washing and using the alcohol rubs provided will reduce this risk. Some patients will still develop a wound infection needing antibiotics and wound dressings. You may require help from the district nurses to dress the wound once you have been discharged.

Shortness of breath
Some people are more short of breath after surgery. Part of your pre-op assessment is assessing your risk of being breathless after surgery. If you already have lung disease, there is a higher risk of being breathless, including needing to have oxygen at home.

Air leak
Air leaking from the lung into the chest drain for a few days is common after lung surgery. Occasionally this lasts for longer, possibly weeks. A chest drain will need to be in place until this settles. You may be able to go home with the chest drain still in place. You will need to come back to clinic for regular check-ups until the air leak settles and the drain can be removed.

Painful shoulder
This is quite common. It can be eased with pain relief and regular shoulder exercises.

Constipation
Painkillers often cause constipation. To help you should have a healthy diet, drink enough fluid, take laxatives and walk around.

Disorientation
Disorientation and confusion can happen for a few days after surgery. It may be caused by strong painkillers, anaesthetic drugs, lack of sleep and the hospital ward being different from home. You should return to normal within a few days.

Recurrence
If you had no specific cause of the pneumothorax, the risk of it coming back without surgery is 20 to 30%. If the pneumothorax was caused by lung disease, the risk of it happening again is about 25%. If you have VATS surgery for pneumothorax, the risk of it happening again is about 5%. Recurrence usually happens within a few years of the first pneumothorax but it can happen many years later. It may come back on the other side of the chest.

Prolonged air leak
Air may continue to leak out of the lung after surgery. Occasionally this lasts for longer, possibly weeks. A chest drain will need to be in place until this settles. You may be able to go home with the chest drain still in and come back for regular check-ups until the air leak settles. The risk of this is higher if lung disease caused the pneumothorax.

It is your choice whether to go ahead with surgery or choose another kind of treatment. We will respect your wishes and support you in choosing the treatment that suits your individual circumstances. You are always welcome to seek a second opinion.

MAJOR, LESS COMMON:

Sepsis
Sepsis arises when our body's response to infection injures its own tissues and organs. It may lead to shock, multi-organ failure, and death.

Intubation and ventilation
A chest infection may cause you to have shortness of breath, which may be severe enough to require help from a ventilator machine. This can be with a face mask with you fully awake, or via a tube in your windpipe intubation and ventilation with you under sedation. If you need help breathing via a tube for a long time it may be better to have a temporary tracheostomy. This is a tube that is put in through the neck and removed once breathing improves.

Blood clots
These can occur in the legs (Deep Vein Thrombosis) and then travel to the lung (Pulmonary Embolism). The risk is greatly reduced by wearing support stockings, having daily injections of a blood thinning drug, and early mobilisation. Special boots called Flowtron boots are also put on your legs during your operation.

Heart attack or stroke
This can occur during or after surgery. The risk is higher in patients with a cardiac history or undiagnosed cardiac disease. For this reason, every patient will be fully assessed before surgery.

Acute kidney injury
Your kidneys may not work as well after surgery but this is usually temporary and gets better with extra fluid.

Death
There is a small risk to your life with this operation.

What can I expect during my admission and during my recovery?

There are two routes in which you might present to hospital. The most common route in as an emergency, where you have been transferred from another hospital. The less common route is via our elective pathway, where you will be given a date for your procedure and will come into hospital from your home. In most cases, you will be in hospital for at least a few days depending on your recovery.

If you are a smoker, your recovery will also depend on stopping smoking. Smoking is the leading cause for lung collapse to re-occur and can lead to chest infection. We also encourage you to do as much walking as possible to improve your breathing.

Sometimes, the lung continues to leak air, despite having an operation. In these cases, we may send you home with a drain attached to a bag and bring you back to clinic to remove the drain at a later date.

Following surgery, sudden movements can cause discomfort due to the healing and recovery process. You may also have some muscle weakening as a result of having an operation. It is generally not advisable to drive for 4-6 weeks after an operation to allow time for healing. We advise patients to check with their motor insurance provider following surgery.

On average, we expect that it will take around three months for you to return back to your usual level of activity.

Information for Patients

If you require this information in another format, such as a different language, large print, braille or audio version please ask a member of staff or email interpreting.service@uhb.nhs.uk.