York and Scarborough Teaching Hospitals
NHS Foundation Trust

Pleural Procedures

Information for patients, relatives and carers

Department of Respiratory Medicine

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Introduction

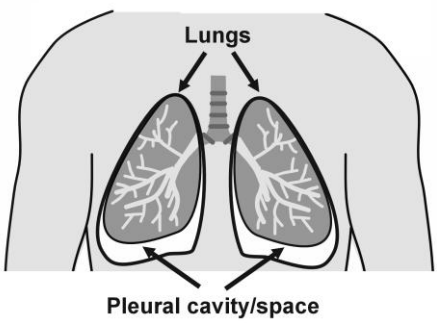
The pleural cavity is a space between the lung and chest wall. It usually contains a small amount of fluid. Sometimes fluid builds up or air leaks into this space. As the space fills the lung gets squashed down causing breathlessness and/or chest pain.

The terms pleural effusion or pneumothorax refer to a collection of fluid or air in the pleural space respectively.

If you experience either of these, you may need a procedure to help your symptoms, or in the case of fluid build-up, to find out why it has happened.

This leaflet provides information on the different types of procedure.

An ultrasound scan will usually be performed to locate and mark the safest site for any procedure. It is not required for an air leakage.



Preparing for pleural procedures

Some procedures can be done without an overnight stay; others require a short stay in hospital.

You may need to have blood tests to make sure your blood can clot effectively.

Medications that affect the ability of your blood to clot need to be stopped before the procedure. Other medications are safe to continue.

Check with the team first but generally speaking:

- Ticagrelor – stop for seven days before procedure.
- Clopidogrel – stop for five days before procedure.
- Apixaban, Dabigatran, Rivaroxaban, Edoxaban – stop for two days before procedure.
- Blood thinning injections (eg: dalteparin and enoxaparin) **–** stop the day before procedure.
- Warfarin - stop for five days before procedure. You will need an INR level checked before proceeding. The team will tell you when and how to get it done.

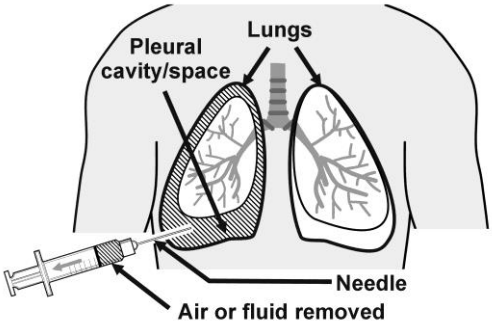
You can eat and drink as normal on the day of the procedure.

It is safe to drive afterwards but, we recommend getting someone to take you home to be on the safe side.

Pleural aspiration

Pleural aspiration involves passing a needle through the chest wall to remove fluid or air from the pleural space.

Why do I need a pleural aspiration?



A pleural aspiration is done for two reasons:

- Diagnostic – a sample of around 50-100mls of fluid is sent for testing to explore why it has built up.

- Therapeutic – a larger volume of fluid, or air, is removed to improve your symptoms; up to a maximum of one and half or two and half litres respectively. The limit reduces the likelihood of complications. Fluid samples can be sent for testing.

What happens during the procedure?

You will be asked to remove the top half of your clothing and wear a gown. You will then be positioned sitting on the edge of the bed facing away from the person doing the procedure or lying in bed with your arm raised above your head.

After cleaning your skin, an injection of local anaesthetic may be given.

A needle will be passed through your skin into the pleural space to fill a syringe with fluid (diagnostic).

If a large volume of air or fluid is being removed (therapeutic aspiration) a needle contained within a small flexible tube is used. Once in the pleural space the needle is removed leaving the tube behind. The tube acts like a pipe and can be attached to a collection bag. At the end of the procedure everything is removed, and a plaster applied.

Sometimes as your lung expands it can make you cough; this is normal and safe.

If you experience significant discomfort or feel unwell during the procedure let the team know.

A diagnostic aspiration takes 15-30 minutes. A therapeutic aspiration takes approximately 45 minutes.

What happens after the procedure?

You may require a period of observation and chest x-ray. If there is evidence of an air leak, the lung has not sufficiently re-expanded, or you become unwell after the procedure you may need to be admitted.

It takes approximately 10 days to get the results of fluid samples. The team will contact you when they are ready.

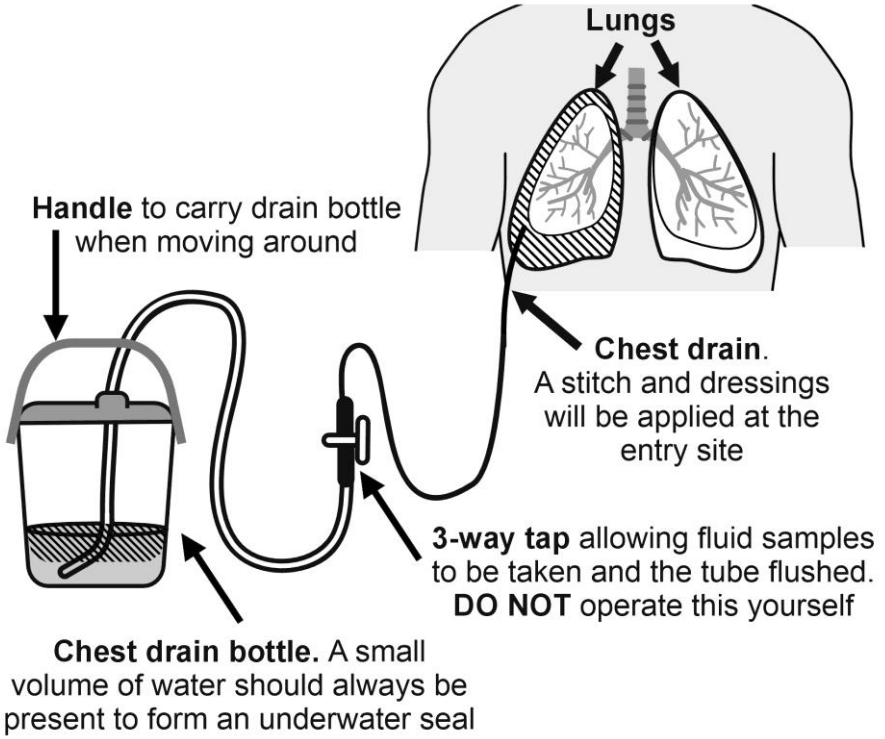
If the procedure was performed to treat an air leak (pneumothorax) you may need to return for further x-rays to ensure it has completely resolved.

What are the risks?

See page 19 for details.

Chest drain

A chest drain involves inserting a small, narrow tube through the skin in order to remove the air or fluid. The tube is attached to a bottle with a small amount of sterile water. The water will act as an underwater seal to prevent fluid or air removed going back into the pleural space.



Why do I need a chest drain?

There are a few cases when your doctor will recommend having a chest drain:

1. The collection of air or fluid is large and seriously impacting your breathing. The doctor may not feel observation or therapeutic aspiration (page 6) is enough to help your breathing.

2. You had a pleural aspiration, but the lung hasn't re-inflated sufficiently.

3. Your doctor suspects the fluid is infected.

4. If you have a build of up fluid because of cancer a drain can help your symptoms by removing all the fluid. Pleurodesis (see page 14) may be possible to prevent the fluid coming back.
   Some people opt for a permanent drain instead. See page 21.

What are the risks?

See page 19 for a list of general risks. For a chest drain there is also a possibility of the drain becoming blocked or dislodged. This risk can be reduced by you looking after your chest drain (see page 12).

If the drain falls out inform a doctor or nurse immediately. It may need to be replaced depending on various factors including how much air or fluid is left. Sometimes air can collect under the skin around the chest drain causing a “crackly” feeling. This is usually a minor problem but may need treatment if significant. Tell a doctor or nurse, especially if you think it is spreading.

What happens during the procedure?

You will be asked to remove the top half of your clothing and wear a gown. You will then be positioned sitting on the edge of the bed facing away from the person doing the procedure or lying in bed with your arm raised above your head.

After cleaning your skin sterile drapes will be placed over your chest and the bed.

An injection of local anaesthetic will be given to numb the skin.

A tiny cut is made in the numb area of skin and a needle is passed through this to locate the fluid or air.

The hole will need to be made slightly wider for the drain and you may experience some discomfort whilst this is done.

The drain will gently be eased into place and held in place by stitches and a dressing.

A further tube connects the drain to a bottle into which the fluid or air will empty.

The procedure takes 30-45 minutes, sometimes longer.

You need to remain in hospital while the drain is in place.

What happens after the procedure?

A chest x-ray will be arranged to check the drain is in the correct place and look for complications.

You will be reviewed regularly. Fluid is usually drained off slowly, as sudden release of fluid can drop your blood pressure.

You may experience discomfort when the anaesthetic wears off. Regular pain killers will be provided. If your pain is not controlled, please let the ward staff know.

How to look after your chest drain

You can get up and move around while your chest drain is in place.

Note: You must carry the drainage bottle by the handle and keep it below the level of your waist. If you lift it higher there is a risk of fluid from the bottle going back into your chest.

Do not pull on the tubing and try to avoid it becoming tangled.

Do not swing or carry the drainage bottle by the tubing. If you feel the tube is leaking, or has moved, you have increased pain or breathlessness, please tell your nurse.

When will the chest drain be removed?

The drain may stay in for a few days to weeks depending on the underlying condition being treated. Occasionally, people do not get better with the drain and are referred for surgery.

Removing a chest drain is simple and straightforward. It is taken out by removing the dressing, cutting the stitch, and then gently withdrawing the drain from the chest while you hold your breath. A new dressing will be placed to cover the site.

Sometimes an extra stitch is required to close the drain site. It can be removed after five to seven days. The team will ensure arrangements are made for this.

Pleurodesis

Pleurodesis is where medicine is injected into the pleural space to cause inflammation. The inflammation helps to stick the lung to the chest wall preventing the fluid or air collecting again. It is successful in seven out of 10 cases (70%).

How is the procedure carried out?

Medical sterile talc is used in our hospitals. This will be inserted in a liquid form through the chest drain. Local anaesthetic is given through the drain before the talc liquid.

The fluid is left in for a period and then allowed to drain, after which the tube is usually removed. The talc causes inflammation as outlined above.

What are the risks?

The process relies on producing inflammation which can be painful despite pre-medication. Let staff know if you need more pain killers.

Fever within 24 – 48 hours is common and usually settles with paracetamol.

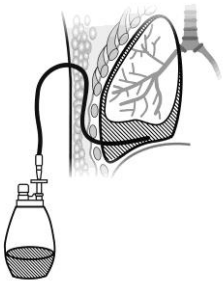
Pleural infection occurs in approximately one in 100 cases.

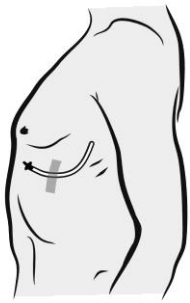
There is very small risk of developing inflammation in the lungs which makes you breathless and drop your oxygen levels. If this happens you will need oxygen and close monitoring in the hospital. Very rarely, about one in 1000 people, this condition can be life threatening.

If you feel unwell during or after pleurodesis inform a doctor or nurse.

Indwelling Pleural Catheter (IPC)

An IPC is a specially designed tube which stays in the pleural space to drain fluid as needed. This is done in the community by district nurses. The tube will be tunnelled under the skin with one end inside the chest and the other coming out through the skin with a one-way valve at the end which is usually capped.





Why do I need an IPC?

If your fluid comes back despite pleurodesis (page 14), an IPC will help keep on top of your breathlessness and avoid further admissions to hospital.

Sometimes pleurodesis is not possible. If your doctor suspects the fluid will recollect quickly, they may recommend an IPC.

You can choose to go straight to an IPC without trying a chest drain and pleurodesis (see page 21).

See page 19 for information on risks.

How is the procedure carried out?

You will be laid down on the side opposite to the fluid. The person doing the procedure will perform an ultrasound scan to select the best site for the IPC. It is usually placed on the side of your chest under your armpit, but your doctor can choose different location depending on the ultrasound scan and position of the fluid.

After cleaning your skin with antibacterial solution, sterile drapes will be placed over your chest and the bed.

An injection of local anaesthetic will be given to numb the skin.

The doctor will make two small cuts to make a tunnel under the skin through which the drain will be inserted. Stitches are required to secure it in place.

The end will be attached to a vacuum bottle to drain some fluid. Once removed a cap is placed on the valve and the whole tube is covered with a dressing.

What happens after the procedure?

A chest x-ray will be arranged to check the drain is in the correct place and look for complications.

You will be kept under regular observation while in hospital. You are usually discharged the same or next day.

What happens after you go home?

There will be two stitches on your skin following the procedure which need to be removed by district nurses or practice nurse at your GP:

- The one closing the cut through which the drain was inserted needs to be removed in seven days.
- The one securing the tube in position should be removed in two weeks. At this point we expect the soft cuff that stays under the skin to secure it.

Before you are discharged, the team will arrange for a district nurse to visit you at home and drain fluid off on a regular basis.

Risks and complications of pleural procedures

Pleural procedures are carried out safely on a regular basis, but, as with any intervention, there are risks. Some are applicable to all and are detailed here. Procedure specific risks are covered in the relevant section.

- Pneumothorax – air in the pleural cavity occurs when the needle damages the lung causing an air leak.
- Fewer than one in 100 risk in pleural aspiration.
- Fewer than one in 500 risk in chest drain insertion.
- Bleeding – the risk is small, and bleeding will usually stop with pressure. Serious bleeding requiring more invasive intervention and/or blood transfusion is rare with rates of fewer than one in 200 (0.5%).
- Infection – there is higher risk of infection with an indwelling pleural catheter (one in 50 people) than the short-term chest drains (one in 100 people). This risk is reduced by cleaning your skin before the procedure with antibacterial fluid and the doctor performing the procedure using sterile gloves, gown, and drapes. District nurses are also trained to drain the IPC as hygienically as possible to reduce the risk of infection.
- Pain – local anaesthetic is used to numb the area. You may experience discomfort when it wears off. Oral pain killers (eg: paracetamol or ibuprofen) should be sufficient to manage this.

- Damage to other organs – this could happen if the needle used catches another organ e.g. the lung, liver or diaphragm. Ultrasound is used to locate the organs in the chest before the procedure so the risk of this is extremely low.
- Failed procedure – there may not be enough fluid for a sample, or it may be formed in pockets, preventing the procedure being completed. Sometimes a fluid sample does not yield a result when it is analysed.
- If air has been aspirated to treat a pneumothorax the volume removed may not be sufficient to treat the problem, and a chest drain recommended.
- Re-expansion pulmonary oedema – a very rare (fewer than one in 100 (1%)) but potentially serious complication that is thought to occur because of the lung re-inflating too quickly. It can lead to more difficulty in your breathing and is treated with oxygen and diuretics.
- Death – extremely rare with previous national audit data suggesting a rate of fewer than one in one thousand (0.1%).

Pleurodesis or IPC – it is your choice

This option does not apply to everyone. However, those with collections of fluid due to cancer may be given the option of trying a standard chest drain and pleurodesis or proceeding straight to an IPC.

Each procedure is discussed in detail on pages 9-18 but key points to consider are summarised below:

	DRAIN and PLEURODESIS	**IPC**
Pros	Temporary tube removed before discharge. Small or no scar.	Day case or overnight stay. Can drain repeatedly without more procedures.
Cons	Approximately one week in hospital. Fluid may recur requiring IPC. Pleurodesis may not be possible if lung does not re-expand.	Permanent tube requiring care. Regular district nurse visits to manage fluid level.

Tell us what you think of this leaflet

We hope that you found this leaflet helpful. If you would like to tell us what you think, please contact:
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Teaching, training and research

Our Trust is committed to teaching, training and research to support the development of health and healthcare in our community. Healthcare students may observe consultations for this purpose. You can opt out if you do not want students to observe. We may also ask you if you would like to be involved in our research.

Patient Advice and Liaison Service (PALS)

PALS offers impartial advice and assistance to patients, their relatives, friends and carers. We can listen to feedback (positive or negative), answer questions and help resolve any concerns about Trust services.

PALS can be contacted on 01904 726262, or email yhs-tr.patientexperienceteam@nhs.net.

An answer phone is available out of hours.

Leaflets in alternative languages or formats

If you would like this information in a different format, including braille or easy read, or translated into a different language, please speak to a member of staff in the ward or department providing your care.

Patient Information Leaflets can be accessed via the Trust's Patient Information Leaflet website: www.yorkhospitals.nhs.uk/your-visit/patient-information-leaflets/

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