PROCEDURE

Chest tube insertion

Chest tube insertion places a flexible tube between the ribs to drain air or fluid from around a lung.

PURPOSE
Drain air, blood, pus, or fluid from around a lung

PROCEDURE TYPE
Therapeutic, sometimes both; minimally invasive bedside or image-guided

WHERE IT IS DONE
At bedside, in interventional radiology, or operating theatre

ANAESTHESIA
Local; sedation or general anaesthesia in some cases

HOW LONG IT TAKES
Usually 15 to 30 minutes

PREPARATION
Emergency: none; planned: fasting and medication review if instructed

RECOVERY
Hospital stay usually; no driving while sedated or taking opioids

MAIN RISKS
Bleeding, infection, organ injury, persistent air leak

RESULTS
Immediate drainage; imaging soon; fluid tests take several days

Overview

Chest tube insertion, also called tube thoracostomy, places a flexible tube through the chest wall into the pleural space between the lung and chest wall.

Air or fluid in this space can prevent the lung from expanding normally. The tube drains it into a collection device using gravity, suction, or a one-way valve.

Insertion is often done at the bedside and usually takes less than 30 minutes. Ultrasound or other imaging may help identify a safe position. The tube may remain in place for several hours or days.

Why the procedure is performed

A chest tube can remove:

It may also drain expected air and fluid after chest, heart, or lung surgery. Collected fluid can be tested for infection, cancer cells, bleeding, or other causes.

- Air around a collapsed lung, called a pneumothorax
- Blood after injury, surgery, or internal bleeding
- Pus from a pleural infection, called an empyema
- Other fluid that compresses the lung or repeatedly returns

Who should and should not have it

A chest tube may be recommended when air or fluid is causing breathing problems, is likely to increase, or cannot be managed safely another way. Emergency drainage can be lifesaving when a worsening pneumothorax affects breathing or blood pressure.

Not every small collection needs drainage. Some stable people can be monitored with examinations and repeat imaging.

When the situation is not an emergency, insertion may be delayed or modified if you have:

Blood thinners like warfarin or apixaban increase bleeding risk but do not automatically prevent insertion. The team balances this risk against the need for drainage. Image-guided placement or surgery may be safer in difficult cases.

- A bleeding problem that can be corrected first
- Infection or damaged skin at the proposed site
- Scar tissue blocking safe access
- Anatomy that makes bedside placement unsafe
- No clear pocket of air or fluid to drain

How to prepare

Follow the treating facility's instructions because preparation depends on why and where the tube is being inserted.

There may be no time to prepare in an emergency. For a planned procedure, tell the team about all medicines and supplements, especially blood thinners. Do not stop prescribed

medicine unless instructed.

Also report medication allergies, bleeding problems, pregnancy or possible pregnancy, and previous chest surgery.

You may need blood tests and chest imaging. If sedation or general anaesthesia is planned, you may need to stop eating and drinking beforehand. Arrange a ride if you are expected to leave after sedation, although many people remain in hospital while the tube is in place.

What happens during the procedure

You are positioned so the team can reach the selected area between your ribs. Your oxygen level, heart rate, and blood pressure may be monitored.

The skin is cleaned and covered with sterile drapes. Local anaesthetic numbs the skin, deeper tissues, and lining around the lung. The injection may sting briefly. Sedation may help you relax; general anaesthesia is more common during surgery.

The clinician makes a small opening between two ribs. The tube may be inserted using a finger, instrument, or guidewire, sometimes with imaging guidance. It is then connected to a drainage system, secured, and covered with a dressing. Suction may be added.

You may feel pressure, pushing, or pulling. Tell the team immediately about sharp pain or increasing shortness of breath.

Recovery and what to expect afterward

Soreness around the tube is common. Pain relief should let you breathe deeply, cough, sleep, and move safely. Report increasing or uncontrolled pain.

You can usually eat and drink when safe after sedation or anaesthesia. You may be encouraged to change position, breathe deeply, and walk.

Keep the drainage container upright and below chest level. Do not pull, clamp, disconnect, or adjust the tubing yourself.

Do not drive while sedated, affected by prescription pain medicine, or restricted by your team. Time away from work depends on the underlying condition, pain, and whether you had surgery or an injury.

Risks and possible complications

Possible complications include:

Thick fluid, separate pockets, or clotted blood may not drain adequately. Another tube, medicine delivered through the tube, or surgery may be needed.

- Bleeding in the chest wall or pleural space
- Infection at the site or inside the chest
- Injury to the lung, diaphragm, blood vessels, or nearby organs
- A blocked, displaced, or incorrectly positioned tube
- Air leaking around the tube or under the skin
- A persistent air leak because the lung has not sealed
- Fluid entering the lung after rapid expansion, called re-expansion pulmonary oedema

Results and follow up

Air or fluid usually begins draining immediately. Breathing may improve quickly, depending on the cause and how well the lung re-expands.

A chest X-ray, ultrasound, or other imaging test often checks the tube and lung. Some fluid test results are available within hours, while cultures and cell analysis may take several days.

The tube is removed when the air leak has stopped or drainage has decreased enough and imaging supports removal. Removal is brief but may cause pulling or stinging. A dressing is placed over the opening.

Follow-up may include a wound check, repeat imaging, and review of laboratory results.

Alternatives

Alternatives depend on what needs draining and how stable you are.

Observation with repeat imaging may be suitable for a small, stable pneumothorax, but the air could increase.

Needle aspiration or a small catheter can remove air in selected cases. It is less invasive but may not provide continuous drainage.

Thoracentesis removes pleural fluid for testing or temporary relief. Fluid may return, and this approach may not drain thick pus, clotted blood, or separate pockets.

Antibiotics like amoxicillin or doxycycline treat infection but may not remove infected fluid.

Pus or complicated infected fluid often still requires drainage.

Video-assisted thoracic surgery can remove clots or infected material and repair an air leak. It may be more definitive but requires general anaesthesia and usually has a longer recovery.

For repeatedly returning fluid, options include repeated thoracentesis, a long-term tunnelled pleural catheter, or pleurodesis to seal the pleural space.

When to call your healthcare team

Get emergency help now for severe or rapidly worsening shortness of breath, blue or grey lips, fainting, confusion, or severe chest pain. If the tube comes completely out, do not replace it. Call for emergency help and follow the facility's instructions.

Tell your healthcare team urgently if:

Mild soreness, dressing care, planned imaging, and removal timing can usually be discussed during routine rounds or follow-up.

- The tubing disconnects, cracks, kinks, or suddenly stops draining
- Bubbling or drainage suddenly increases
- Pain or breathlessness worsens
- You develop fever, spreading redness, pus, or increasing swelling
- The dressing becomes soaked with blood or fluid
- The drainage container tips over or becomes full

Common questions

Will I be asleep?

Usually, you are awake with local anaesthetic. You may receive sedation. General anaesthesia is more common when the tube is inserted during an operation.

Can I drive home?

Not after sedation or while taking medicine that affects alertness. Many people remain in hospital until the tube is removed. Follow your facility's restrictions.

How painful is chest tube insertion?

The numbing injection can sting, followed by pressure or pulling. Soreness may continue while the tube is in place, but pain medicine should make breathing and movement manageable.

How long will the chest tube stay in?

It may remain for hours or several days. Timing depends on drainage, air leakage, imaging, and the reason it was inserted.

When will I know if it worked?

Drainage starts immediately, and imaging shows whether the lung is expanding. Pleural fluid laboratory results may take several days.

Can I shower with a chest tube?

The dressing and connections generally must stay dry and secure. Ask whether protected showering is allowed. Do not submerge the site in a bath or pool.

Sources

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