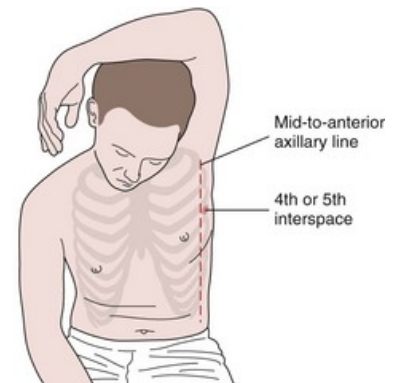


Chest Drains

AKA - "intercostal chest drain", "pleural chest drain"

What is it?

A fenestrated plastic tube inserted between two ribs (usually in the 4th or 5th intercostal space in the anterior axillary line) into the pleural cavity. The drain is connected to an underwater seal which must be kept below the level of the patient.



How does it work?

The underwater seal means that the drain can remove air & fluid from the pleural space without allowing air from the environment to re-enter through the drain.

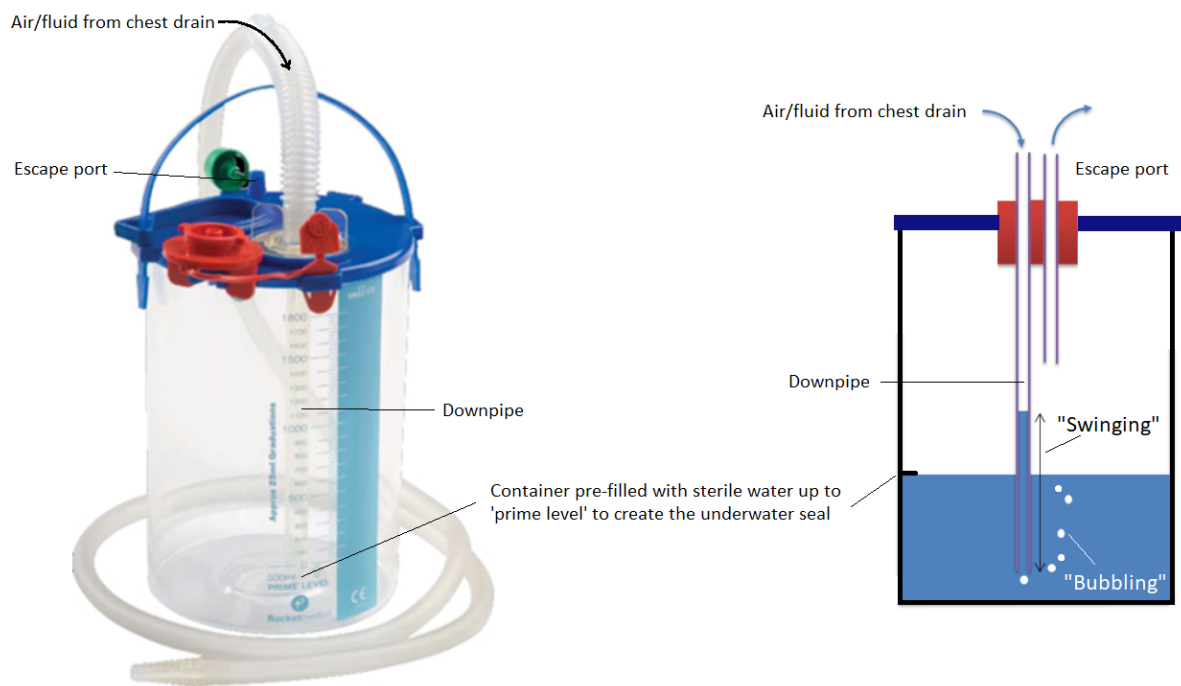
"Swinging" means the fluid from the underwater seal is oscillating up and down in the adjacent tubing. This occurs due to the changes in intrathoracic pressure during patient's ventilation and indicates that the chest drain is sited within the pleural cavity.

"Bubbling" of the fluid of the underwater seal occurs if there is still air escaping the pleural cavity through the drain and exiting via the underwater seal. This usually indicates ongoing need for a chest drain as there is still persistent air leak.

The greater the volume of air leak into the pleural cavity or the more viscous the fluid to be removed, the larger the chest drain will need to be. Smaller diameter chest drains tend to be inserted using a Seldinger technique but if it is thought there is significant ongoing air leak (e.g. bronchopleural fistula) or the pleural fluid is likely to be thick (e.g. blood) a larger diameter chest drain will be inserted via an open/surgical technique.

What does it look like?





What does it do?

Removes air & fluid which is impairing ventilation.

What can go wrong?

The most **common** complications and how to deal with them:

- Partial displacement of the chest drain
 - This may lead to surgical emphysema if the fenestrated portion of the chest drain is pulled back into the subcutaneous tissue.
 - → Call for help, consider complete removal & insertion of a new chest drain. Never try to re-insert a partially dislodged chest drain as this will introduce infection into the pleural cavity,
- Chest drain not “swinging”
 - This cannot be assessed if the chest drain is on suction.
 - → Confirm by asking the patient to take deep breaths, look for kinking or occlusion of the drain, consider flushing the drain (see oscestop guide below).
- Chest drain not “bubbling”
 - This may actually be a good sign as it could indicate resolution of the pneumothorax. If unsure...
 - → as above for ‘chest drain not swinging’.

The most **serious** complication:

- Complete dislodgement of the chest drain
 - May lead to reaccumulation of pneumothorax or a tension pneumothorax
 - → Assess the patient with ABC approach, seek help, prepare for re-insertion of chest drain if required.

Key safety point

Never clamp a chest drain inserted for pneumothorax whilst it is still bubbling. This may turn a simple pneumothorax into a tension.

Other notes

When to remove?

Further reading

EMRAP video on chest drain insertion - <https://www.youtube.com/watch?v=IdmMR8JxmFo>

OSCEstop guide to chest drains - <https://oscestop.com/chestdrainmx.pdf>

LITFL webpage on bronchopleural fistula - <https://litfl.com/bronchopleural-fistula/>