

## Summary sheet for removal of a chest tube in adults



### Safety Tip!

- Always refer to your hospital's policy or procedure on removal of chest tubes, before removing a chest tube.
- If you are not experienced in this procedure, seek supervision from somebody who is.

### Indications for chest tube removal

<i>Reason for chest tube</i>	<i>Indicator for removal</i>
Drainage of fluid	Over 24 hours, drainage less than 200ml
Drainage of pneumothorax	Air leak (bubbling) ceased for 24 hours in presence of tube patency AND the lung is fully inflated on x-ray (1)

### Procedure for removal of a chest tube:



### Safety Tip!

For large bore tubes, it is recommended that two operators are involved. One person assumes responsibility for removal of the tube and the second operator securely closes the insertion site. (2)

- Check that appropriate equipment is sterile, on-hand and appropriate for your specific patient requirements.
- Explain process to the patient & rehearse the breath hold technique with them. Either, ask the patient to breath hold at a particular stage of respiration (e.g. full inspiration, full expiration) or to perform the Valsalva manoeuvre (by pinching their own nostrils closed and blowing out, as if to unblock their ears).



### Safety Tip!

Regardless of which breathing technique is to be used, practise it with your patient prior to the actual tube removal. This will build up your patient's confidence in their ability to perform it at the required moment.

- Ensure appropriate analgesia +/- premedication (if necessary) administered to patient.
- Check suction is disconnected.
- Perform social hand-wash, don personal protective equipment.
- Remove the mesenteric tag of tape, loosen and remove dressing(s) and anchoring device if present, ensuring the chest tube is supported once the dressing is removed.
- Set up sterile field – perform clinical hand-wash and don sterile gloves, set up equipment using a sterile field and 'prep' the skin and sutures around the drain site with antiseptic.
- If in place, unwind the tails of the wound closure suture from the chest tube. Place one throw of a knot in the wound closure suture in the centre of the wound.
- If present, release the locking mechanism on the 'pigtail' catheter. If unsure seek advice.
- Cut the anchoring suture and support drainage tubing.
- Place a gauze square over the top of the tube with the non-dominant hand (to reduce splash injury).
- Direct patient to perform the selected breathing technique.
- Use dominant hand to remove tube (while patient is performing the selected breathing technique) in a brisk firm movement while the non-dominant hand (or assistant) supports and controls the insertion site. Little to no resistance should be felt when removing the tube.



### Safety Tip!

It is vital that the operator removing the chest tube minimises the risk of splash injury by placing a dressing over the tube and by carefully placing the removed tube onto a non-adherent liner. Personal protective equipment (PPE) must be worn including eye protection, mask (or alternatively face shield), gown or apron and gloves to prevent bodily fluids from splashing the operator's mucous membranes and clothes.

- Edges of the wound should be gently squeezed together as the tube is removed.
- Close the insertion site by tying off the wound closure suture provided or by squeezing the sides of the chest tube insertion site together immediately after the tube is withdrawn.
- Small bore catheters usually have a small incision (around 5 mm) that does not require suturing. Apply 'Steristrip(s)' to keep the sides of the wound sealed. (2)
- Apply dressings in accordance with local procedure.

### After removal of the chest tube:

- Request the patient to cough, to ensure that no air can be heard escaping from the tube site.
- Advise patient to report any increase in chest pain or tightness, shortness of breath or air loss or oozing from the insertion site.
- Ensure regular patient observations. Assess and document patient's SpO<sub>2</sub>, vital signs, air entry, pain level.
- Document the procedure and outcome in patient's medical record.
- A chest x-ray should be obtained 1-3 hours post procedure to confirm that the lung has remained inflated. (3) Small residual air collections usually spontaneously resolve over 24-48 hours. Ensure the chest x-ray has been ordered and is reviewed by MO in a timely manner. This task may need to be included in the handover to next shift.

### Potential complications after removal of a chest tube:

- Recurrence of the pneumothorax resulting from a continued air leak into the pleural space from the lung, or entry of air into the pleural space via the chest tube track during tube removal.
- Re-collection of pleural effusion.
- Infection in pleural space (empyema) or subcutaneous infection at the insertion site
- Bleeding.
- Necrosis around tube site (if the suture is too tight, especially if a 'purse string' suture is used!)
- Pain.

### References:

1. Havelock T, Teoh R, Laws D, Gleeson F, B. T. S. Pleural Disease Guideline Group. Pleural procedures and thoracic ultrasound: British Thoracic Society Pleural Disease Guideline 2010. Thorax. [serial on the internet] 2010; 65 Suppl 2:ii61-76.
2. Tang ATM, Velissaris TJ, Weeden DF. An evidence-based approach to drainage of the pleural cavity: evaluation of best practice. Journal of Evaluation in Clinical Practice 2002;8(3):333-40.
3. Bell RL, Ovadia P, Abdullah F, Spector S, Rabinovici R. Chest tube removal: end-inspiration or end-expiration? Journal of Trauma-Injury Infection & Critical Care.2001 Apr; 50(4):674-7.