

## WORKSTATIONS

### Needle Thoracocentesis and Chest Drain

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#### Recap your indications for thoracocentesis;

- ☞ Suspicion of a tension pneumothorax
  - distressed patient RR > 28/m
  - P > 100/m; BP < 100 mmHg
  - Hyperinflated chest wall
  - Absent breath sounds
  - ↓ air entry

#### Equipment

- Animal model (pig or sheep thorax)
- Portex chest drain bag set
- Artery forceps x 1
- 14g cannula x 8
- 10ml syringe
- Plastic aprons
- Disposable gloves
- Sheets to protect floor and table

#### Needle thoracocentesis - procedure

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The instructor is to perform a *silent demonstration*, then a *talk through*, then ask each *student to demonstrate* the task, talking a colleague through.

1. Place a cannula and needle with attached syringe in the intercostal space.
2. Draw back on the syringe to demonstrate a free flow of air.
3. Remove the syringe and needle.

During the talk through cover the following points.

- indication for needle thoracocentesis
- landmarks for needle thoracocentesis
- action on failure of technique to relieve a tension pneumothorax (because of skin plug or needle too short)

#### Tips

- ☞ Long cannula is essential
- ☞ Bigger > 16G better
- ☞ Patients do not need local anaesthetic
- ☞ Leave metal introducer in place as intercostal muscles crush plastic
- ☞ If you get a gush of air rapidly insert 2 more
- ☞ Immediately set up for a chest drain

## **Complications**

- ☞ Failure to penetrate chest wall with 14G cannula
- ☞ Iatrogenic pneumothorax (< 10%)
- ☞ Haemothorax
- ☞ Infection - cellulitis, emphysema
- ☞ Puncture of great vessels or heart

## **Advantages of intercostal thoracocentesis**

- Quick
- Useful in entrapped patient

## **Disadvantages**

- often inadequate
- poorly performed

## **Chest drain - procedure**

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The instructor is to perform a *silent demonstration*, then a *talk through*, then ask each *student to demonstrate* the task, talking a colleague through.

1. Open the chest drain bag kit; prime the bag with 20ml of air (syringe in kit); stiffen the catheter with the blunt introducer, inserted into the distal end of the catheter through one of the holes.
2. Inject a local anaesthetic.
3. Make a 3cm incision between the ribs through skin and fat (scalpel contained in kit).
4. Blunt dissect through the intercostal muscle layers with the artery forceps.
5. Pierce the pleura with the artery forceps.
6. Insert a finger through the hole and sweep through 360 degrees.
7. Insert the catheter and introducer, remove the introducer. Advance the catheter to the black circumferential line.
8. Secure the catheter using the stitch provided in the kit.

During the talk through cover the following points:

- indications for inserting a chest drain
- landmarks for chest drain insertion
- rationale for 'blunt' dissection technique vs trochar
  
- rationale for chest drain bag vs underwater seal in pre-hospital, emergency department, and interhospital transfer environments
- simple methods for securing the drain

### *Field Tip - Securing the Drain*

- Fold a short piece of elastoplast tape around the drain at the level of the black circumferential marker.
- Place the drain to one side of the wound.
- Insert a single stitch through the wound at the opposite end.
- Continue the stitch through the elastoplast tape.
- Secure with a knot.

## **Closure**

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At the end of the session allow time for questions and summarise the key points.