



## Learning points

- BTS guidance on spontaneous pneumothorax
- Decompression / Aspiration / Drain insertion overview

### The Case:

- A 25M presented to CRH ED with acute onset SOB and chest pain that morning.
- Vapes and smokes cannabis regularly. No other PMH.
- Sent for CXR which showed a large right sided pneumothorax
- No history of trauma. No previous episodes.
- Stable observations. Not in respiratory distress. No oxygen requirement.

### Initial thoughts:

- Well the diagnosis is easy
- Let's move him to resus
- Drain or no drain? And how quickly?

### Options

Essentially we have 4 options when faced with a pneumothorax:

1. Needle thoracocentesis decompression (always followed by a drain)
2. Seldinger chest drain
3. Needle aspiration
  - a. +/- drain afterwards
4. Observation only
  - a. High flow oxygen and admit
  - b. Discharge and follow up CXR

### So let's go through these options

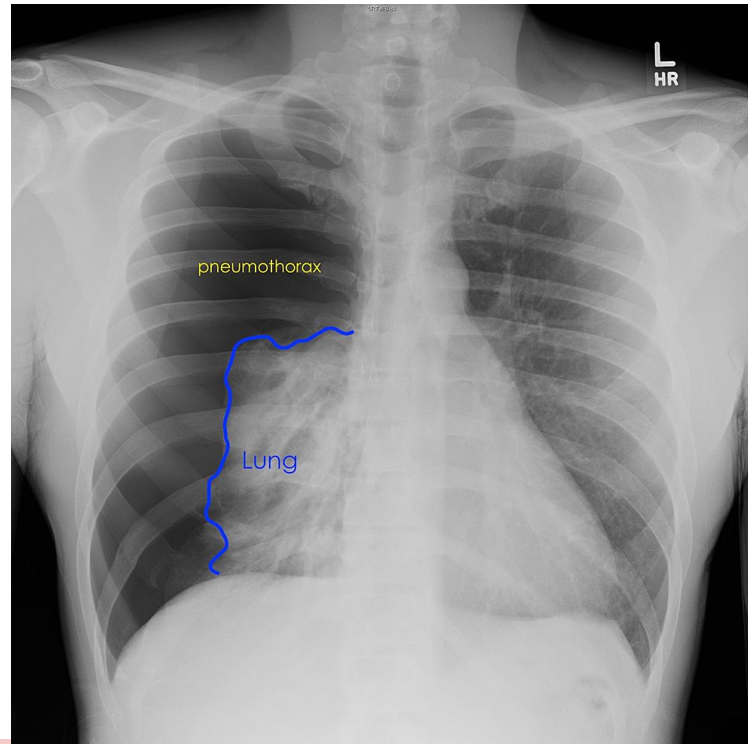
#### Needle thoracocentesis decompression

We do this for tension pneumothorax. Tension can be:

- [Radiological tension](#) - Pneumothorax, mediastinal shift, tracheal shift, flattened diaphragm
- Clinical tension - Haemodynamic instability (tachycardic, hypotensive, rising O2 req.)

And how?

- Paeds - 2nd intercostal space mid clavicular line:
  - [This study](#) looked at CT chest scans in children and suggested 100% success rate with 22g (blue) in 0-5 year olds, 20g (pink) in 5-10 and 18g (green) in >10.
- Adults - 5th intercostal space anterior to the mid axillary line (where we will put our drain)
  - 5th ICS not 2nd ICS as in larger adults some cannulas can not reach the pleural space, or do and then dislodge / kink / block, leading to high failure rates
  - Thoracostomy is another option in emergency situations where decompression has not achieved adequate result. It is the first step in open drain insertion so is also useful in trauma patients who are intubated and ventilated and subsequently tension.
  - Thoracostomy is also [recommended in ALS](#) in cardiac arrest when tension is suspected (if you needle decompress an arrested patient you should rapidly follow this with a thoracostomy)
  - [This video](#) discusses the ATLS update from decompressing in the 2nd ICS in adults and demonstrates decompression in 5th ICS





## Seldinger drain insertion

- [This video](#) demonstrates seldinger technique for drain insertion
- This is different to open chest drains utilised in trauma when there is a haemothorax
- Seldinger chest drains are smaller and so if there is a haemothorax they are easily clotted by blood
- They can be used for both traumatic and spontaneous pneumothoraces
- Any patient who has had a tension pneumothorax decompressed via needle or thoracostomy subsequently needs a chest drain insertion
- My top tips are to be familiar with all equipment, line it up in order you will need it and take time to properly position your patient - so they are comfortable and you can get to where you need to be

## Needle aspiration

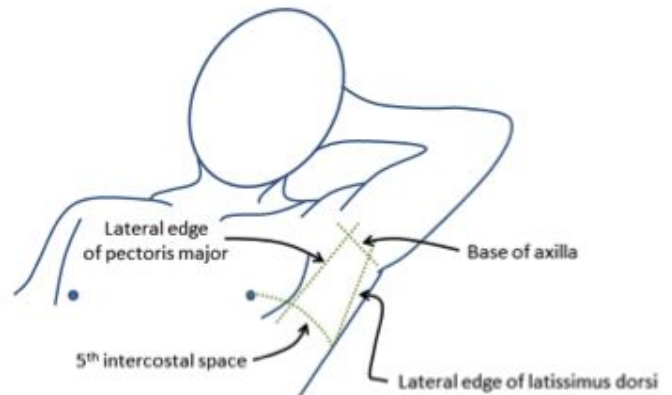
- [This video](#) demonstrates needle aspiration
- Again should be done in the 'triangle of safety'
- Use a 3 way tap, a 50ml syringe and be prepared to aspirate large volumes!
- Repeat CXR following to assess response

## Observation

- For minimally symptomatic patients observation only may be an option
- See algorithm below - secondary pneumothoraces require high flow O2 and admission (higher risk of deterioration requirement intervention)
- Primary pneumothoraces could be managed as an OPD with safety netting advice and planned repeat CXR

## So how do we decide what to do?

Well, thankfully, there is an [algorithm](#) for that, courtesy of the British Thoracic Society and easily accessible on [EMBEDs](#)  
Note ambulatory device is not an option at CHFT



## Confirming drain position

- A CXR can not confirm the position, as it is a 2D representation.
- It can show resolution of pneumothorax, and can ensure the most proximal bore in the drain has passed the rib, but a drain that is in the soft tissues of the chest wall may look like it is in the chest.
- Confirmation is through improvement in clinical condition and seeing 'swinging' on the chest drain - [An example here](#)

## Back to our Case:

- Well following our algorithm:
  - Symptomatic
  - No high risk features
  - Safe to intervene
  - Patient's priority was symptom resolution
  - We could have aspirated but given the size of the pneumothorax we went straight for a seldinger chest drain. Good resolution of pneumothorax on repeat CXR and admitted to MAU when he was monitored and had a repeat CXR at 24 hours.