



CXR #10

WAMSS SGR 2022

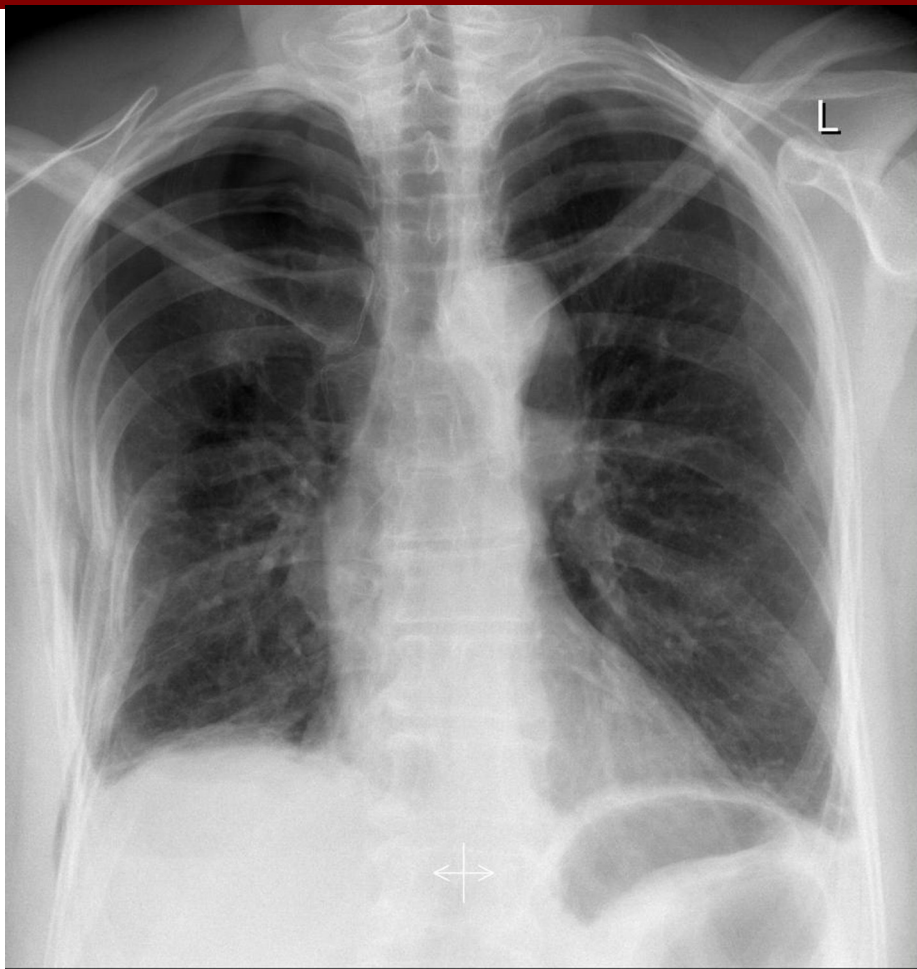


Trigger

Mina, a 68-year-old female presents to ED with right-sided chest pain and difficulty breathing following a fall off her bike whilst riding. She also says she has some right sided shoulder tip pain.

Mina appears uncomfortable and is taking fast, shallow breaths and when she coughs she winces in pain.

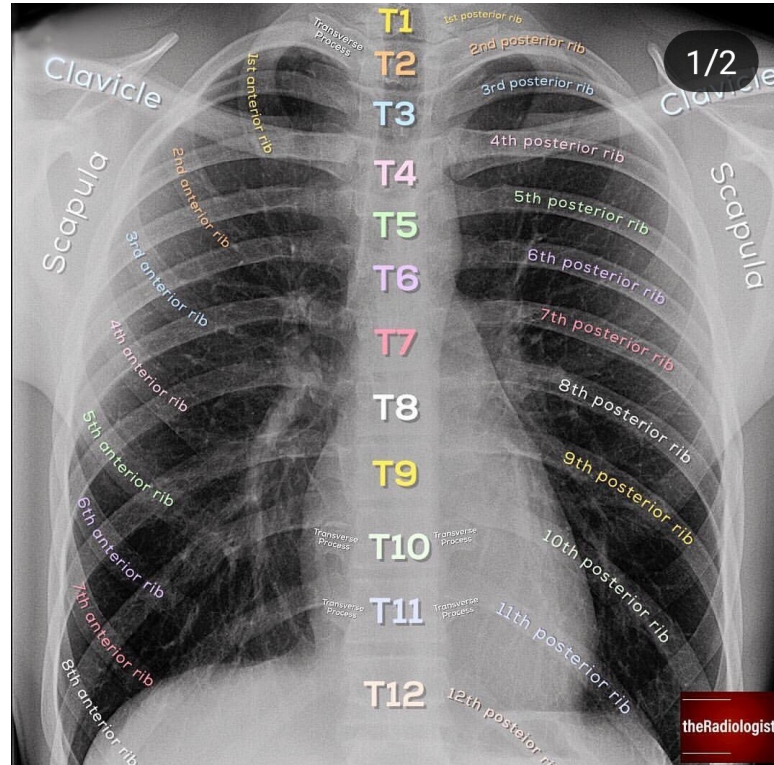
Task: Interpret the CXR and provide a working diagnosis.





Details and demographic	AP CXR of a 68F after a fall from her bike, presenting with right sided chest pain, dyspnoea, and right sided shoulder pain
RIPE/Quality	Rotation: rotated to the right (space between clavicle and spinous processes is wider on the right)
	Inspiration: adequate inspiration
	Projection: AP
	Exposure: adequate exposure
Airways and lung fields	Mild left-sided tracheal deviation Right lung apex has no vascular markings Thin visceral pleural line seen on right side
Bones and soft tissue	Posterior ribs 3-8 fractured on the right side, with ribs 5 and 6 clearly displaced
Cardo-mediastinum	Left heart border visible
Diaphragm	Some bilateral costophrenic blunting
Everything else	Subcutaneous emphysema on the right side
Interpretation	AP CXR of a 68F after a fall from her bike, presenting with right sided chest pain, dyspnoea, and right sided shoulder pain. The CXR is of adequate quality. Posterior ribs 3-8 on the right side are fractured, with ribs 5 and 6 displaced, and the right lung apex has no vascular markings with a thin pleural line seen. This is suggestive of a pneumothorax . Given the history of a fall and the presence of several rib fractures my working diagnosis is a traumatic pneumothorax .

Counting Ribs





Follow-up Questions

WAMSS SGR 2022



1. What are common risk factors for a pneumothorax?
2. What are the classic examination findings of a pneumothorax?
3. Why does Mina need to be assessed for signs of haemodynamic instability?
4. Other than a CXR, what other investigations and management would you like to do for Mina?



Question 1

Risk factors for a pneumothorax:

- **Non-modifiable**
 - Male
 - Family history
 - Younger age
 - Tall and thin body type
- **Modifiable**
 - Smoking
 - Underlying lung disease e.g. asthma, COPD
 - Trauma



Question 2

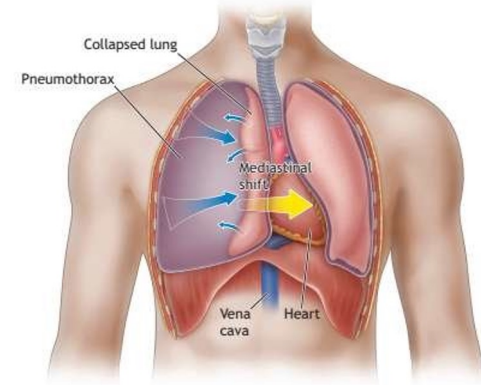
Examination findings of a pneumothorax:

- **Inspection** - tachypnoea (and other signs of respiratory distress), reduced chest expansion on the affected side. Hypoxia is a late sign
- **Palpation** - tracheal deviation away from the affected side (tension PTX)
- **Percussion** - hyperresonant (if the pneumothorax is large)
- **Auscultation** - reduced/absent breath sounds on the affected side

Question 3

A common complication of a **spontaneous** or **traumatic pneumothorax** is a **tension pneumothorax**

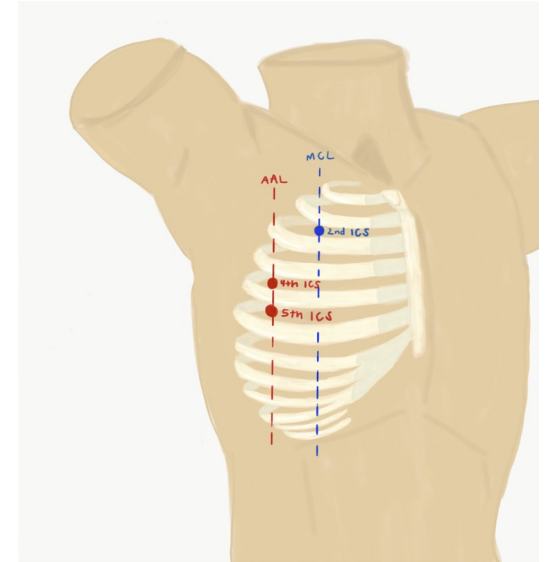
- It occurs when a one-way valve forms in the chest wall/pleura, allowing air into the pleural space and pressure to build up in the thoracic cavity
- The build up in pressure compresses other thoracic and mediastinal structures
 - The contralateral lung is compressed, exacerbating hypoxaemia
 - The heart is compressed, reducing cardiac filling and venous return
- This results in haemodynamic instability and an increased risk of cardiac arrest and death



Question 3

A tension pneumothorax is managed by immediate needle decompression, high-flow oxygen and analgesia

- Insert a large-bore cannula into the pleural space through the fourth or fifth intercostal space in the mid-axillary line ¹
- A 'hiss' of air confirms the diagnosis



***Must be done by a trained professional**



Question 4

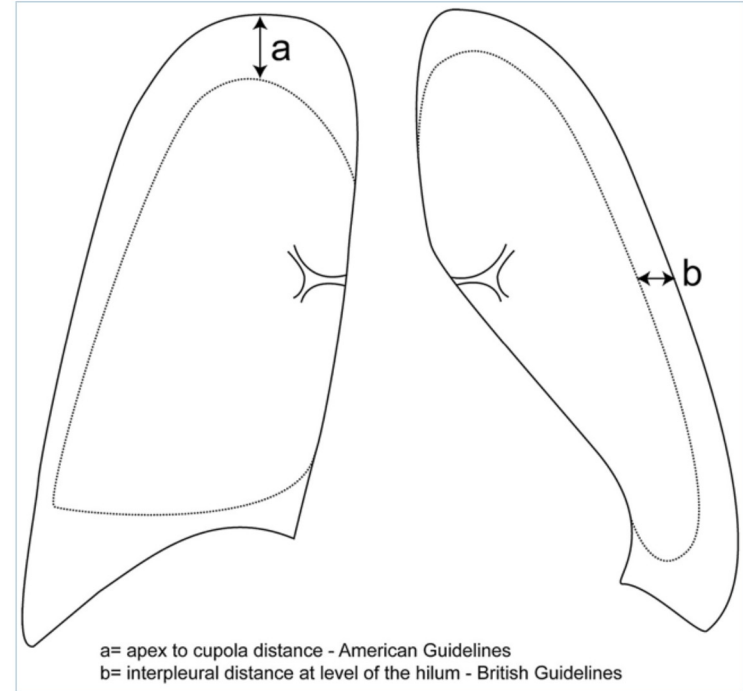
Investigations:

- **Bedside** - ECG (exclude cardiac cause), VBG (snapshot of her respiratory function)
- **Bloods** - FBC/coags (an INR ≥ 1.5 or platelets ≤ 50 may be contraindications to placement of a chest drain). Consider an ABG (if in respiratory distress), troponins (exclude cardiac cause) and D-dimer (exclude PE if Wells' ≤ 4)
- **Imaging** - the CXR determines if the pneumothorax is large or small. Consider a CT (exclude other causes)

Question 4

Determining whether a pneumothorax is large or small:

- Large: if **a** >3 cm or **b** >2 cm
- Small: if **a** <3 cm and **b** <2 cm





Question 4 cont.

Management:

1. **?tension pneumothorax** → if so decompress asap
2. **Give high-flow O₂** → maintain saturations at 94-98%
3. **Analgesia** → ibuprofen and/or codeine
4. **Assess if large or small pneumothorax**
 - a. **If large** → insert chest drain
 - b. **If small** → observe and maintain O₂ saturation
5. **If traumatic** → refer to thoracic surgeon ?drain



Thank you!

E sgr@wamss.org.au

A M501 University of Western Australia, 35 Stirling Hwy, Crawley, WA 6009

W wamss.org.au | **FB** WAMSSUWA | **IG** @wamssuwa