



# CXR #13

WAMSS SGR 2022



# Trigger

You are an intern working in ED. Amanda, a 70F is brought in by ambulance with a 3 hour history of shortness of breath.

She has a history of a previous myocardial infarction and a 40 pack year smoking history.

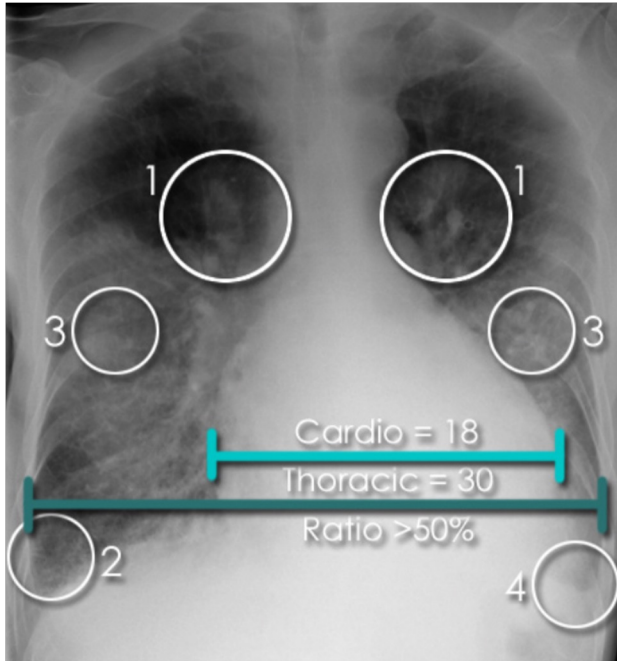
A PA CXR was performed on admission.

**Task:** Interpret the CXR and provide a working diagnosis.





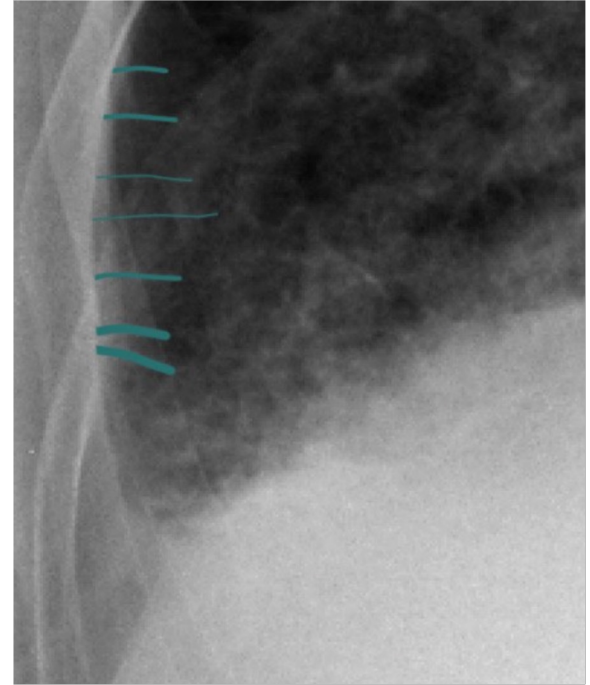
<b>Details and demographic</b>	PA CXR of a 70F presenting with acute dyspnoea
<b>RIPE/Quality</b>	Rotation : No rotational artefact
	Inspiration: Adequate inspiratory effort
	Projection: PA
	Exposure: Adequate exposure
<b>Airways and lung fields</b>	Trachea is equidistant between the two clavicles, suggesting no tracheal deviation Bilateral airspace shadowing in a perihilar (bat's wing) distribution, a sign of alveolar oedema Septal (Kerley B) lines near the costophrenic angles, a sign of interstitial oedema Prominent upper zone vessels, a sign of pulmonary venous hypertension
<b>Bones and soft tissue</b>	No obvious fractures or soft tissue abnormalities
<b>Cardo-mediastinum</b>	Cardiothoracic ratio >0.5, suggesting cardiomegaly
<b>Diaphragm</b>	Blunt costophrenic angles bilaterally, suggesting bilateral pleural effusions
<b>Everything else</b>	No free gas under the diaphragm
<b>Interpretation</b>	<p>In summary, this is a PA CXR of a 70F presenting with acute dyspnoea. There is alveolar oedema, Kerley B lines, cardiomegaly, prominent upper lobe vessels and pleural effusions bilaterally. My working differential is pulmonary oedema secondary to <b>heart failure</b>.</p> <p>A good acronym to use for the signs of heart failure is:</p> <ul style="list-style-type: none"><li><b>A</b>lveolar oedema</li><li><b>K</b>erley <b>B</b> lines</li><li><b>C</b>ardiomegaly</li><li><b>D</b>iversion of upper lobe vessels</li><li><b>E</b>ffusions</li></ul> <p>The presence of cardiomegaly suggests that the heart failure is chronic rather than acute. The pulmonary oedema may have accumulated over time (in the context of long-standing, uncontrolled heart failure) or acutely (e.g. due to another MI).</p>



1. Prominent upper zone vessels
2. Kerley B lines
3. Alveolar oedema
4. Blunt costophrenic angles



Kerley B lines





# Follow-up Questions

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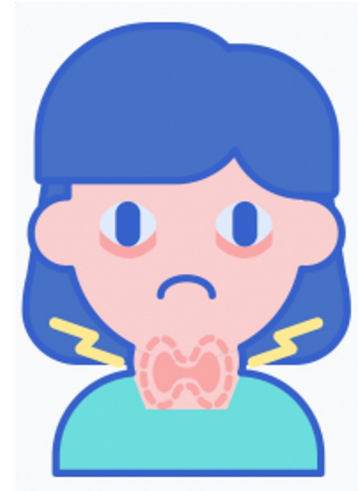


1. What are some causes of acute heart failure in a patient with no adverse cardiac history or cardiovascular risk factors?
2. Other than a CXR, what investigations would you do to workup suspected heart failure?
3. Beta blockers are widely used in heart failure with a reduced ejection fraction (HFrEF). Are there any contraindications to their use?



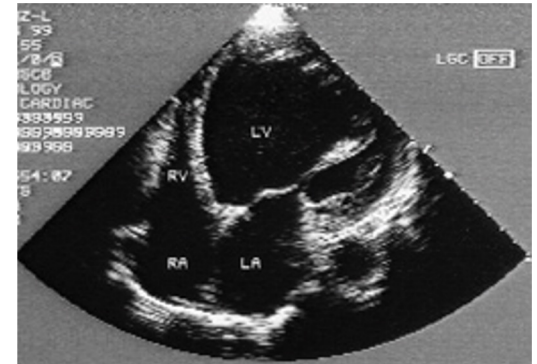
# Question 1

- Viral cardiomyopathies e.g. Coxsackie B, COVID-19
- Hyperthyroidism e.g. due to Graves' disease
- Severe anaemia
- Toxic medications e.g. anthracyclines (used for chemotherapy)
- Recreational drug use e.g. cocaine



## Question 2

- Basic bloods e.g. FBC, UECs, TFTs – looking for causes e.g. anaemia, electrolyte abnormalities, infections
- BNP – raised level suggests myocardial damage and supports the diagnosis of heart failure
- Echocardiogram – assess the structure and function of the heart, and classify as heart failure with a reduced or preserved ejection fraction



## Question 3

- Historically, beta blockers were avoided in patients with diseases like asthma and Raynaud's phenomenon because of the risk of provoking exacerbations
- Due to their benefit on symptoms and mortality, beta blockers are now recommended for all patients with HFrEF, except for in a few specific cases (e.g. a patient with critical limb ischaemia)
- It is important to note that beta blockers can initially make heart failure worse due to their effects on HR and BP
- To minimise this risk, they are avoided during episodes of acute decompensation, and are started at a low dose which is titrated up gradually





# Thank you!

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**E** [sgr@wamss.org.au](mailto:sgr@wamss.org.au)

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

**W** [wamss.org.au](http://wamss.org.au) | **FB** WAMSSUWA | **IG** @wamssuwa