

## Critical Appraisal of Literature

There are 8 multiple choice questions in this section, based on the paper by Karalapillai and others (*JAMA*. 2020; 324(9):848-858), including its supplemental content (all in one pdf file). For each question, choose the ONE best answer.

**Question 1.** Traditionally, the reason for using tidal volumes 10 ml/kg during intraoperative mechanical ventilation was to

- I. Avoid hypoxia
- II. Avoid postoperative atelectasis
- III. facilitate prone positioning
- IV. prevent barotrauma

- A. I only
- B. I and II only
- C. I and III only
- D. II and IV only
- E. I, II and III only.

**Question 2.** In this trial, patients were eligible for inclusion if they

- I. were scheduled to have cardiac, thoracic, or intracranial neurological surgery
- II. were planned to have invasive arterial pressure monitoring
- III. were scheduled to have surgery with an expected duration >2 hours, but planned to go home on the same day
- IV. were older than 40 years.

- A. I only
- B. I and II only
- C. I and III only
- D. II and IV only
- E. I, II and III only.

**Question 3.** Patients in this trial were randomized to receive intraoperative ventilation strategies that differed by randomization groups in terms of:

- I. tidal volume
- II. inspiratory oxygen concentration
- III. positive end-expiratory pressure
- IV. peak airway pressure

- A. I only
- B. I and II only
- C. I and III only
- D. II and IV only
- E. I, II and III only.

**Question 4.** Compared with conventional-tidal-volume ventilation, intraoperative mechanical ventilation with low tidal volume showed:

- A. significantly increased postoperative pulmonary complications.
- B. significantly decreased postoperative pulmonary complications.
- C. no significant reduction in postoperative pulmonary complications.
- D. significantly increased postoperative pulmonary complications only among patients who underwent laparoscopic surgery.
- E. significantly increased postoperative pulmonary complications only among patients with ARISCAT score > 26

**Question 5.** Among the composite primary outcome, the most common pulmonary complication in this trial was

- A. atelectasis
- B. pneumonia
- C. respiratory failure
- D. bronchospasm
- E. pleural effusion

**Question 6.** If, in this trial, data on primary composite endpoint are missing at completely “random fashion”,

- A. omitting cases with missing data will introduce bias.
- B. omitting the cases with missing data would comply with intention-to-treat principle.
- C. imputing the data value by using last observation carried forward will remove bias.
- D. there should be no systematic difference between trial participants with and without missing data.
- E. missingness is related to characteristics of the trial participants.

**Question 7.** During the conduction of this trial, which of the following personnel(s) was/were blinded to the treatment allocation:

- I. Patients
- II. Attending surgeons
- III. Trial statistician
- IV. Attending anesthesiologist

- A. I only
- B. I and II only
- C. I and III only
- D. II and IV only
- E. I, II and III only.

**Question 8.** The use of composite endpoint in this trial:

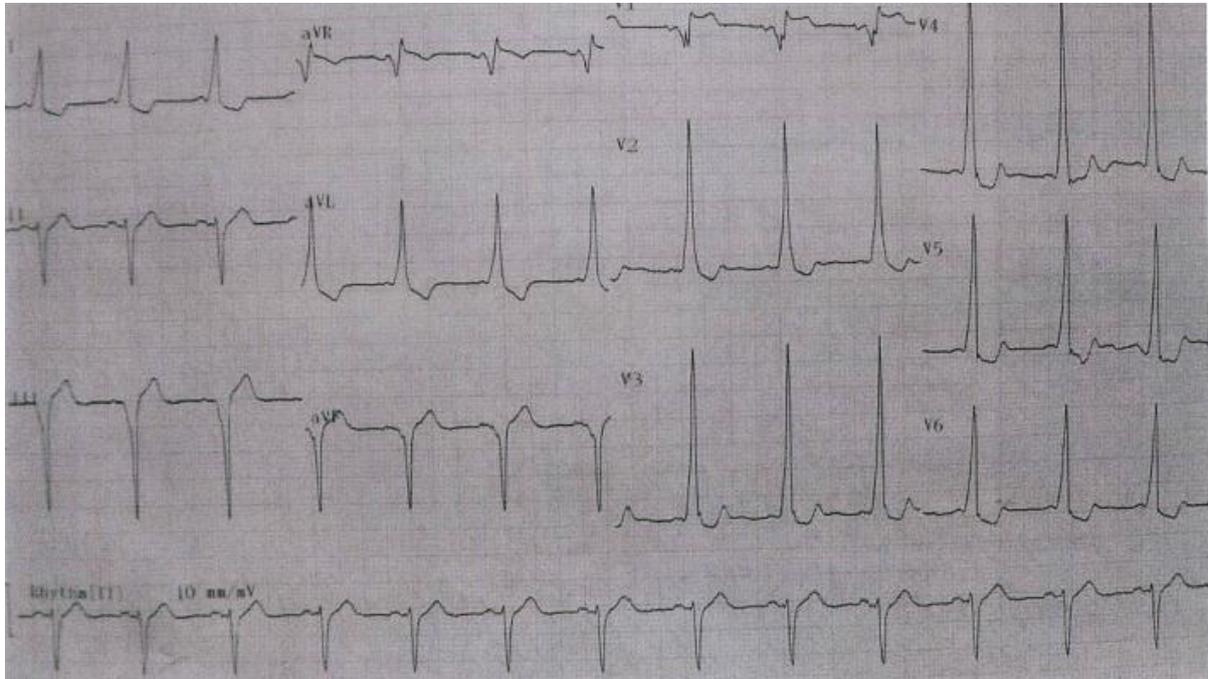
- I. reduces the sample size
- II. introduces selection bias
- III. reduces effect size
- IV. reduces the confidence intervals of the effect

- A. I only
- B. I and II only
- C. I and III only
- D. II and IV only
- E. I, II and III only.

## Investigations

### Questions 9-10

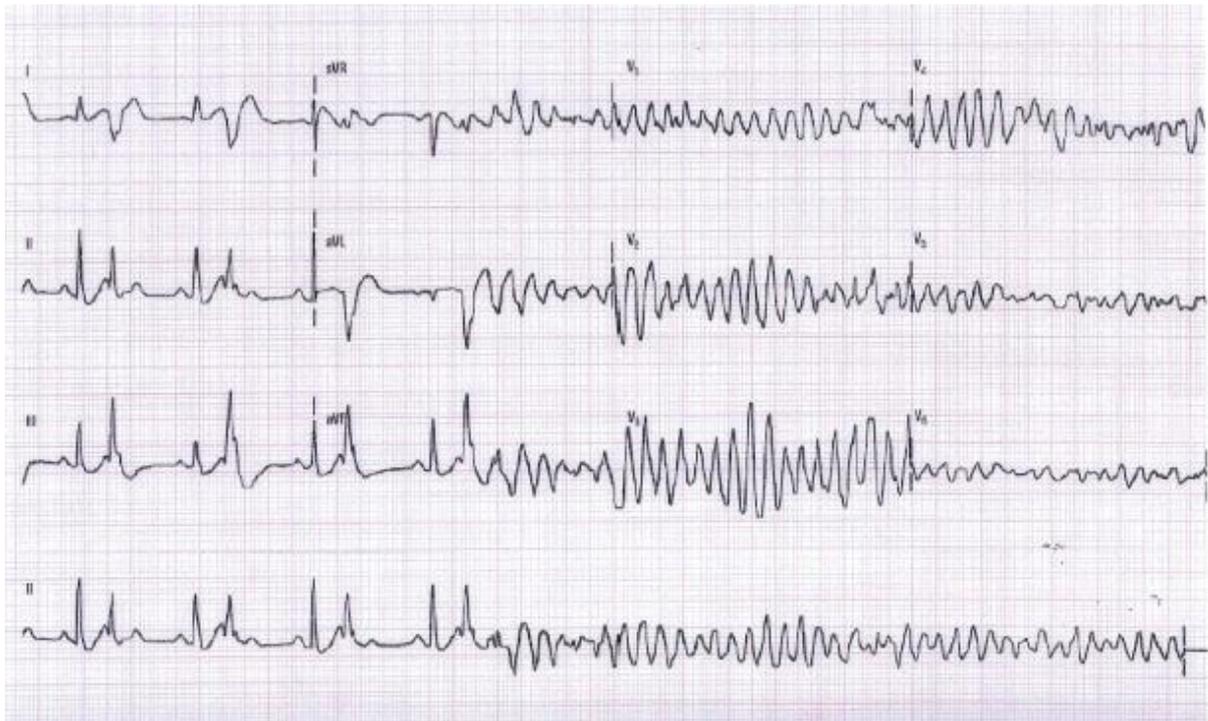
A 30-year-old woman is attending the pre-anaesthetic clinic before her elective thyroid surgery for her multi-nodular goitre. She is euthyroid all along, but has multiple episodes of sudden palpitations. The following is her ECG.



**Question 9.** List two (2) ECG abnormalities (2 marks)

**Question 10.** What is the clinical diagnosis? (1 mark)

**Question 11-12**



**Question 11.** List three (3) ECG abnormalities (3 marks)

**Question 12.** List two (2) possible electrolyte abnormalities that may be responsible for these ECG abnormalities. 2 marks

**Questions 13-14**

A 60-year-old man was booked for emergency fasciotomy under general anaesthesia. He was brought to the hospital for extensive burns with circumferential involvement of 4 limbs and torso. The following was his laboratory results on admission,

Biochemistry	Result	Normal range
Sodium	130 mmol/L	137-144mmol/L
Potassium	5.8 mmol/L	3.5-5.0mmol/L
Urea	15.0 mmol/L	2.6-6.6mmol/L
Creatinine	320 $\mu$ mol/L	49-83 $\mu$ mol/L
Bilirubin	20 $\mu$ mol/L	<17 $\mu$ mol/L
Alkaline phosphatase	110 IU/L	33-84IU/L
Alanine aminotransferase	100 IU/L	<47IU/L
Phosphate	2.6 mmol/L	0.8-1.5mmol/L
Ionised calcium	0.85 mmol/L	1.1-1.35 mmol/L

Haematology	Result	Normal range
Haemoglobin	16.5 g/dL	11.9-15.1g/dL
White cell count	$21 \times 10^9$ /L	$21 \times 10^9$ /L
Platelet	$450 \times 10^9$ /L	$150-384 \times 10^9$ /L

**Question 13.** What is the most likely cause of acute renal failure? (2 marks)

**Question 14.** What is (are) the appropriate intravenous intervention(s) at this stage (except medication to correct hyperkalaemia)? (2 marks)

**Questions 15-16**

An 80-year-old woman was booked for an emergency hip surgery after dizziness and fall. She was recently diagnosed to have moderate depression. She was clinically euvolemic. Her latest laboratory investigation results were:

Biochemistry	Result	Normal range
Sodium	112 mmol/L	137-144mmol/L
Potassium	3.6 mmol/L	3.5-5.0mmol/L
Urea	3.7 mmol/L	2.6-6.6mmol/L
Creatinine	54 $\mu$ mol/L	49-83 $\mu$ mol/L
Serum osmolality	236 mOsm/Kg	275-295 mOsm/Kg
Urine osmolality	135 mOsm/Kg	
Urine sodium	38 mmol/L	

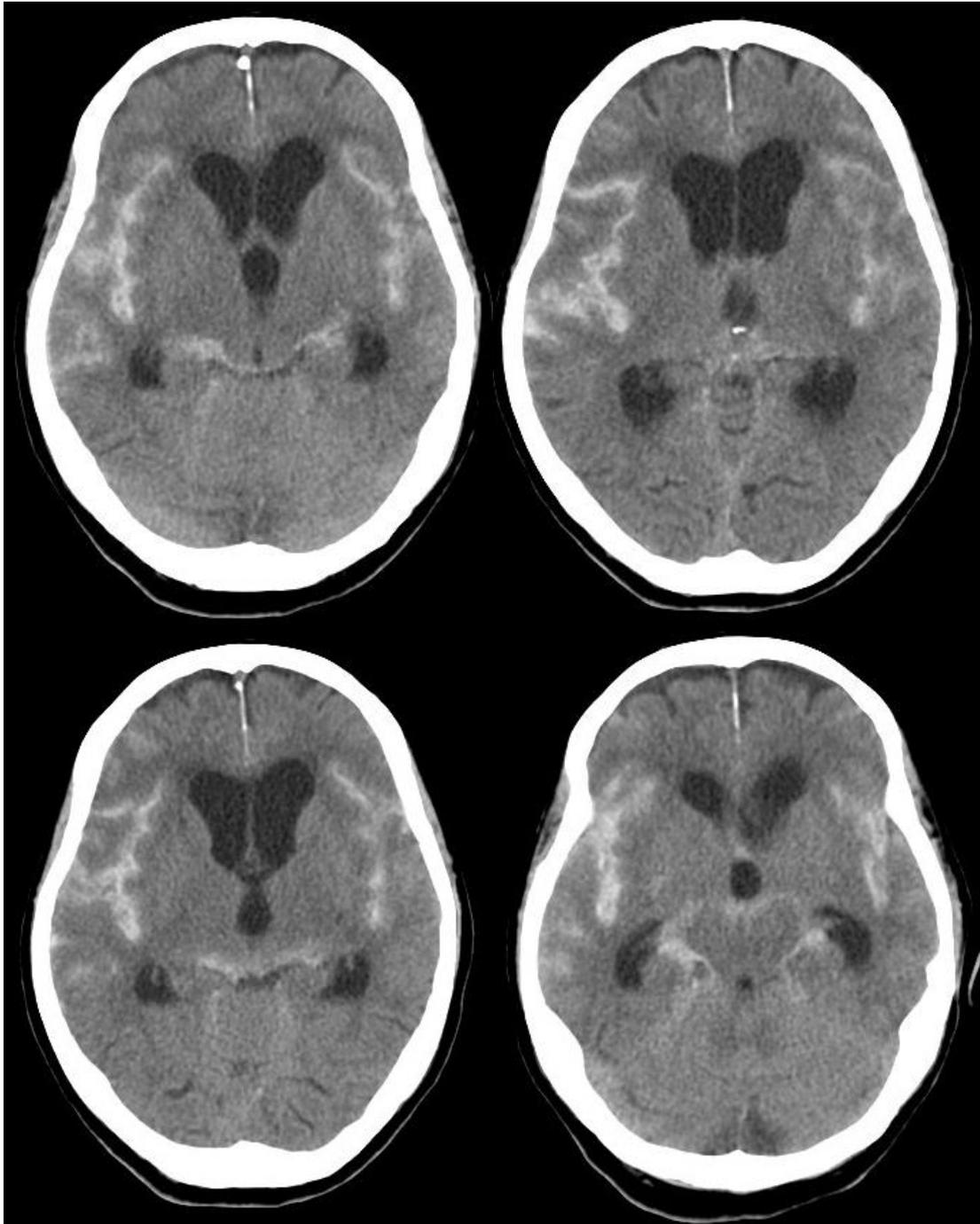
**Question 15.** What is (are) the likely cause(s) of her hyponatraemia? (2 marks)

**Question 16.** What investigation(s) will you order? (2 marks)

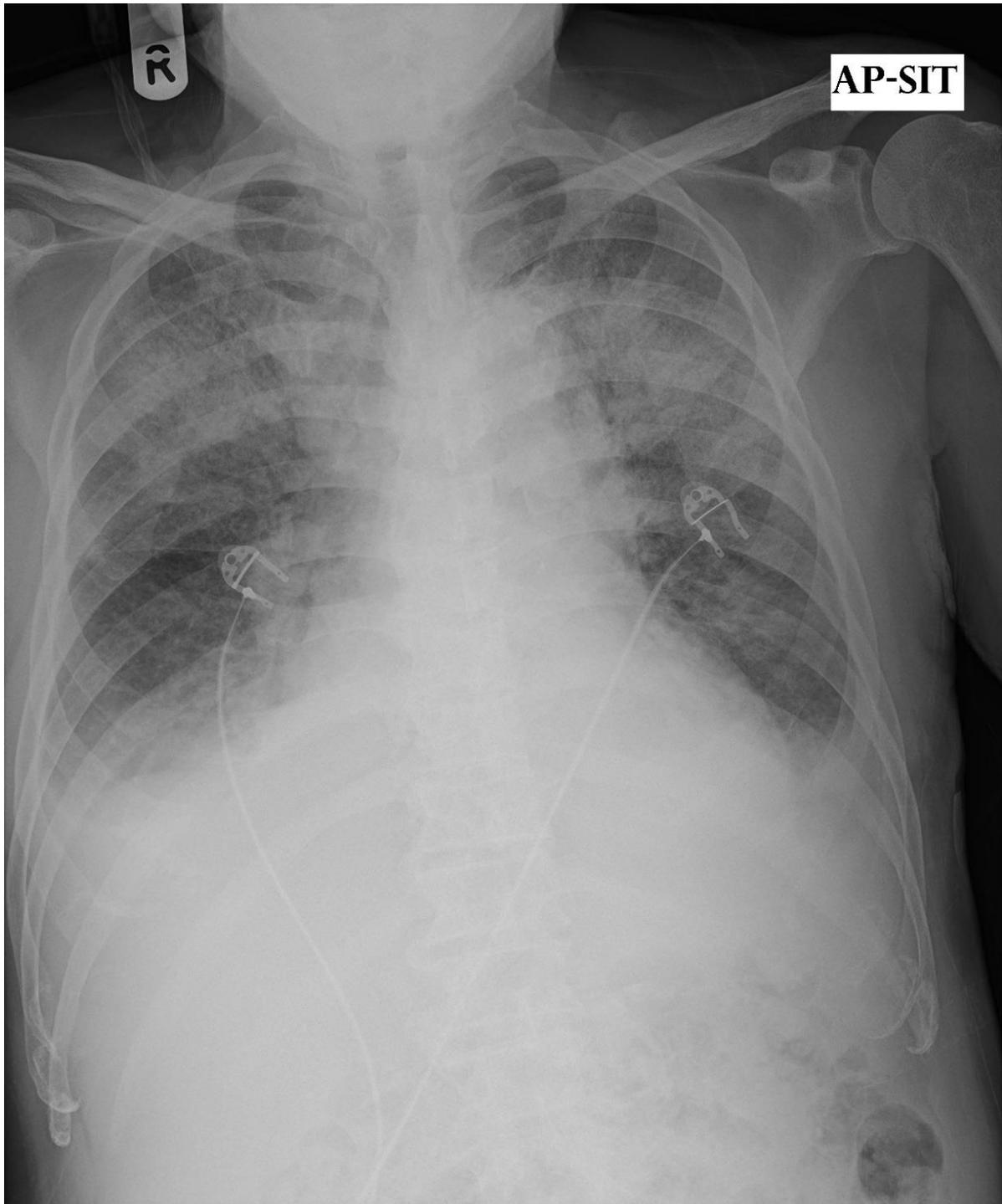
**Radiology**

**Question 17.** refers to the following non-contrast CT images taken from a 35 year-old-man with headache.

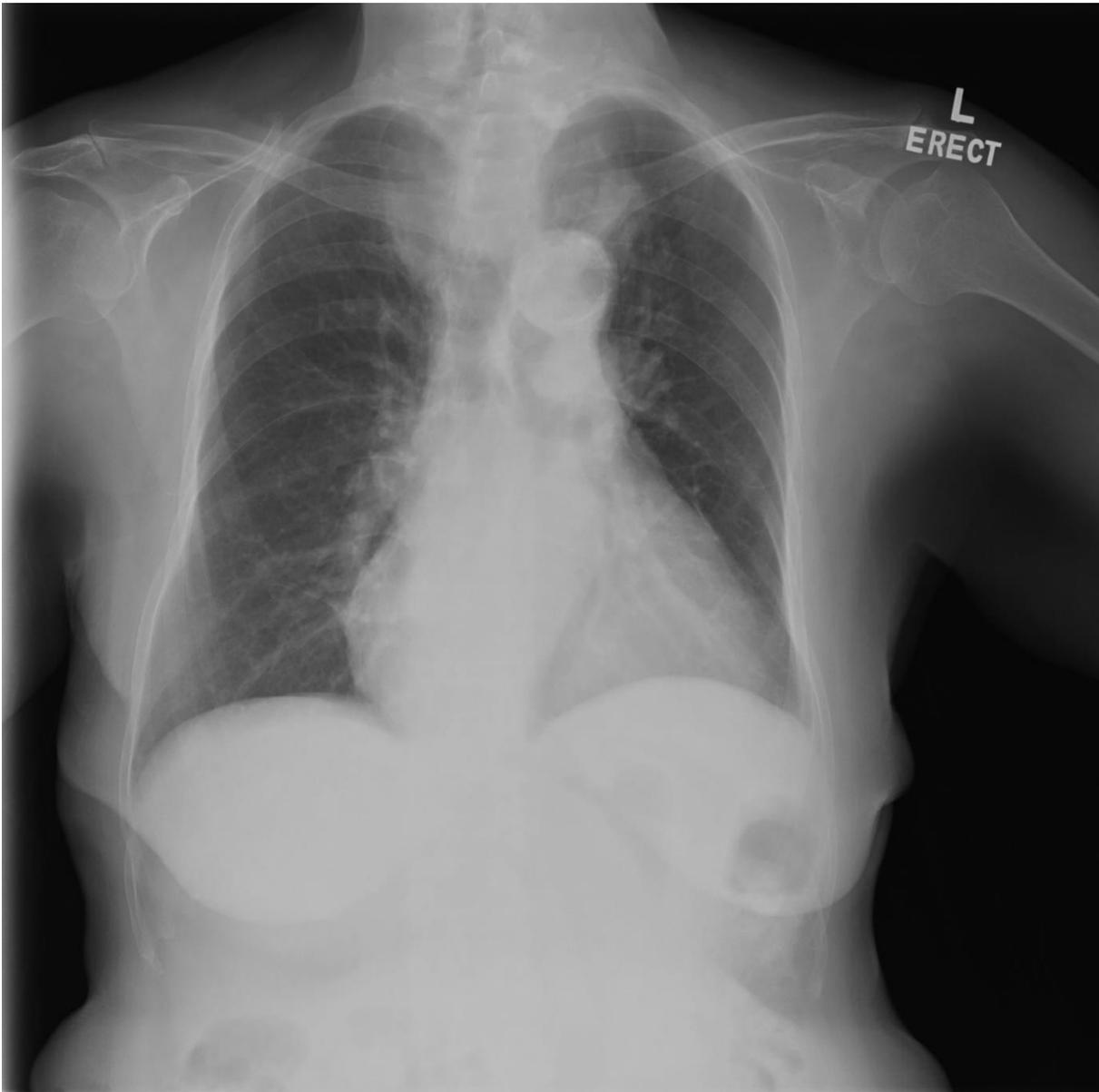
List three (3) abnormalities (3marks)



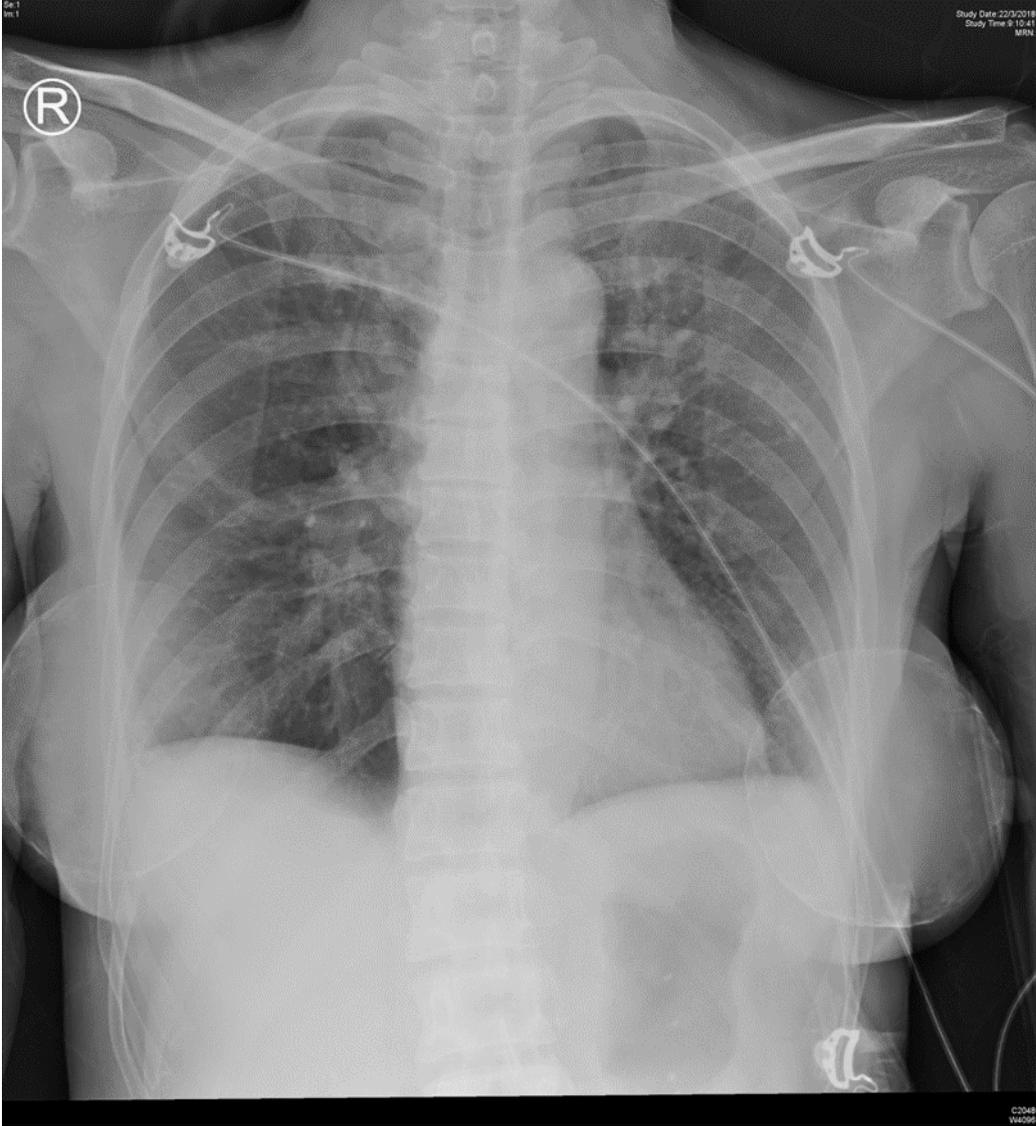
**Question 18.** refers to the following chest radiograph taken from a 65-year-old male presented with dyspnea to the emergency room. List three (3) abnormalities. (3 marks)



**Questions 19.** refers to the following chest radiograph taken from a middle aged female with dyspnea. List two abnormalities (2 marks)



**Question 20** refers to the following chest radiograph of a middle aged female with chest discomfort.  
List one abnormality (1 mark)



**Question 21** refers to the following chest radiograph taken in a 50-year-old man in ICU with dyspnea. Name the devices marked A, B, C and D.

