

3.4 Thorax

Name: _____ Class: _____ Date: _____ **Total: 24 marks**

KEY WORDS mediastinum

Objective

Localise mediastinal structures and read the two nerve routes past the lung root.

1 Key knowledge and worked examples

■ **The box and its anchors**

Middle mediastinum = heart + pericardium (two-thirds left); posterior = aorta + oesophagus. Bifurcation at the sternal angle (T4/5); arch branches: brachiocephalic, L carotid, L subclavian; apex at L5 ICS MCL.

■ **Worked example: the two routes**

Phrenic (C3–5) ANTERIOR to the root → diaphragm irritation refers to the shoulder tip; vagus POSTERIOR → left recurrent laryngeal under the arch → hoarseness ✓.

2 Practice

2.1 Which nerve supplies motor power to the diaphragm, and from which roots? [3]

2.2 Where does the trachea bifurcate? [3]

2.3 Why is pericardial tamponade lethal at 100–200 mL? [3]

3 Exam-style questions

3.1 A mass at the left lung root: hoarseness plus left shoulder tip pain.

Explain both symptoms from the two nerve routes. Predict the order of signs if the mass grows anteriorly vs posteriorly. State the examination for each. [8]

3.2 A stabbing chest injury: hypotension, engorged neck veins, muffled sounds.

Name the anatomy (pericardium as a closed bag) and the mechanism (diastolic filling collapse). Explain why the pulse may fall on inspiration. State the intervention’s anatomical route and target. [7]

Solutions

2.1

- Phrenic nerve, C3–5 (“C3, 4, 5 keeps the diaphragm alive”).

2.2

- At the sternal angle, T4/5 disc level ✓.

2.3

- The fibrous bag cannot stretch: small volumes stop diastolic filling.

3.1

- Vagus posterior: left recurrent laryngeal under the arch → hoarseness; phrenic anterior: C4 referral to shoulder tip.
- Growing anteriorly irritates phrenic first (shoulder pain, then exam: palpate/tap the diaphragm); posteriorly, vagal/recurrent first (hoarseness, then exam: voice + laryngoscopy).

3.2

- Pericardium: closed, fibrous, no slack. Blood inside compresses the thin-walled right heart during diastole → falling output.
- Inspiration lowers intrathoracic pressure, pooling venous blood in the lungs; with the pericardium full, the septum shifts and the pulse volume drops (pulsus paradoxus).
- Needle below the xiphoid, aimed at the left shoulder – the route avoids the pleura and reaches the pericardial sac.