

# What is the Thoracic Wall?

## Worksheet

The thoracic wall is formed by 12 rib pairs connecting posteriorly to the vertebrae and anteriorly (via costal cartilage) toward the sternum, with three intercostal muscle layers between ribs that raise and lower the rib cage during breathing.

## Questions

1. How many pairs of true ribs are there?

- A) 5
- B) 7
- C) 10
- D) 12

2. What is the correct order of structures in the costal groove, top to bottom?

- A) Nerve, Artery, Vein
- B) Vein, Artery, Nerve
- C) Artery, Vein, Nerve
- D) Nerve, Vein, Artery

3. Which ribs are called 'floating ribs'?

- A) 1-2
- B) 7-8
- C) 8-10
- D) 11-12

4. Where should a needle be inserted relative to a rib to avoid the neurovascular bundle?

- A) Just below the rib's lower border
- B) Just above the rib's upper border
- C) Directly through the middle of the rib
- D) Location doesn't matter

5. A patient has a laceration just below a rib. Which structure of the neurovascular bundle is most at risk, and why?

6. Identify whether ribs 3, 9, and 12 are true, false, or floating ribs.

7. Which intercostal muscle layer is most active during quiet inspiration, and what does it do?

8. Define: How many pairs of ribs are there?

9. Define: What is the VAN order in the costal groove?

10. Define: Why do doctors insert needles above a rib's upper border?

## Answer Key

1. B) 7 - Ribs 1-7 are true ribs, each with its own cartilage to the sternum.
2. B) Vein, Artery, Nerve - The mnemonic VAN gives the order Vein, Artery, Nerve from superior to inferior.
3. D) 11-12 - Ribs 11-12 have no anterior attachment and are called floating ribs.
4. B) Just above the rib's upper border - The bundle runs along the inferior border of the rib above, so inserting above the lower rib's superior border is safer.
5. The intercostal neurovascular bundle runs in the costal groove along the INFERIOR border of each rib Order from top to bottom is Vein, Artery, Nerve (mnemonic VAN) A needle or blade just below a rib is most likely to hit the intercostal vein or artery, causing bleeding Clinically, chest tubes and needles are inserted just ABOVE a rib's upper border to avoid this bundle
6. Rib 3: true rib (1-7) - has its own cartilage attaching directly to the sternum Rib 9: false rib (8-10) - cartilage attaches indirectly via rib 7's cartilage Rib 12: floating rib (11-12) - no anterior attachment at all
7. There are three layers: external, internal, and innermost intercostals External intercostal fibers run obliquely and elevate the ribs, expanding the thorax Elevating the ribs increases both the anteroposterior and lateral chest diameter This increases thoracic volume, dropping pressure and drawing air into the lungs
8. 12 pairs: 7 true, 3 false, and 2 floating.
9. From superior to inferior: Vein, Artery, Nerve - running along the inferior border of each rib.
10. To avoid the intercostal neurovascular bundle, which runs along the inferior border of the rib above.

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