

# Thoracic Cavity (selective) Qu

(1) Define thoracic cavity and give its boundaries and contents.

Ans: Cavity of thorax enclosed in elastic osseocartilaginous framework which helps in both increasing and decreasing the volume of thoracic cavity.

## Boundaries

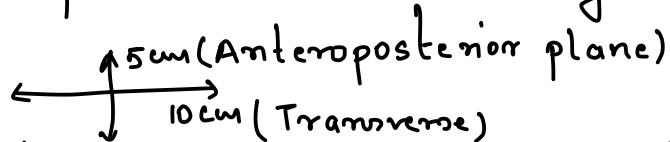
- ANTERIOR = Sternum
- LATERAL = 12 Ribs with intercostal muscles, membranes, Nerve and Vessels
- Posterior = Bodies of 12 Ribs and Vertebral Column

## Contents

- Lungs
- Heart

(2) Short Note on thoracic inlet.

Ans: It is a superior aperture of thoracic cavity.



- Inlet slopes downwards and anteriorly at angle of  $45^\circ$ .
- It is partially closed on each side by a suprapleural membrane (Sibson's fascia)

## Boundaries

POSTERIOR = Body of first thoracic Vertebrae

On EACH SIDE = First Rib and its costal cartilage.

ANTERIOR = Upper border of Manubrium sterni.

### (3) Structures passing through the thoracic inlet.

Ans: Major structures are:

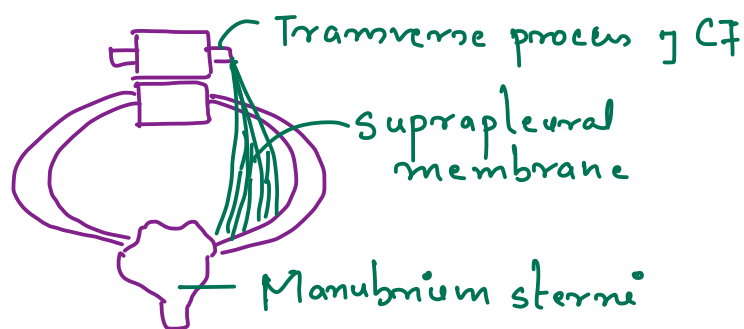
- Two tubes: Trachea and Esophagus
  - Two sets of Arteries: - Branches of Arch of Aorta (3)
    - Right and left internal thoracic Arteries.
  - Four sets of Neural structures:
    - (Right & left) vagus nerves, phrenic nerves, sympathetic trunks, first thoracic nerves.
- \* Apices of lungs covered by cervical pleura also projects upward through inlet into Root of Neck.

### (4) Sibson's Fossa:

Ans: It is a tough triangular membrane, which on either side partly separates the thoracic cavity from the neck.

#### Features:

- Its apex is attached to tip of transverse process of C7
- Its base is attached to inner border of first rib and its cartilage.
- Its inferior surface is fused with cervical pleura
- Its superior surface is fused with subclavian vessels.



#### Applied:

- It protects the apex of lung from injury.
- It prevents the puffing of root of neck during Respiration.

### (5) Thoracic outlet in Brief

Ans: Inferior aperture of thoracic cavity and closed completely by thoracoabdominal diaphragm.

#### Boundaries:

ANTERIOR = Xiphoid process

LATERAL = Costal margin formed by 7<sup>th</sup> to 9<sup>th</sup> costal cartilages and 11<sup>th</sup> and 12<sup>th</sup> Ribs.

POSTERIOR = Body of T<sub>12</sub> Vertebra.

### (6) Enumerate the major (large) openings in the diaphragm and structures passing through them.

Ans: There are 3 major openings in diaphragm.

| Opening                | Vertebral level | shape        | structures                                                                  |
|------------------------|-----------------|--------------|-----------------------------------------------------------------------------|
| (a) Vena Caval opening | T <sub>8</sub>  | Quadrangular | (i) Inf. Vena Cava<br>(ii) Right Phrenic N.                                 |
| (b) Esophageal opening | T <sub>10</sub> | Elliptical   | (i) Esophagus<br>(ii) Right & left Vagal trunks<br>(iii) left gastric A.    |
| (c) Aortic Opening     | T <sub>12</sub> | Circular     | From left to right<br>(i) Aorta<br>(ii) Thoracic duct<br>(iii) Azygos Vein. |

### (7) Short note on Cervical Rib.

Ans: Develops from costal element of transverse process of C<sub>7</sub> Vertebra.

- It is present in about 0.5% of the cases.

- Posterior end is attached to transverse process of C<sub>7</sub> Vertebra, and its distal extremity is free or attached to first rib.

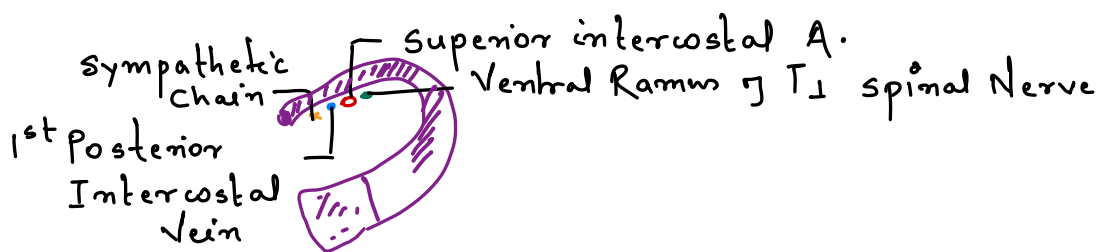
## Applied :

- The cervical rib reduces the size of scalene triangle and may cause :
  - Tingling, pain, and numbness along the medial side of the hand and little finger, due to compression of lower trunk of brachial plexus.
  - Pallor and coldness of upper limb due to compression of subclavian artery.
  - Reduction in radial pulse pressure.

## (8) Structures passing in front of neck of first rib.

Ans: From Medial to lateral side, these are :

- (i) Sympathetic chain
- (ii) First posterior intercostal vein.
- (iii) Superior intercostal Artery.
- (iv) First thoracic Nerve (Ventral Rami)



## (9) Short note on sternal angle (Angle of Louis)

Ans: It is a horizontal bony angulation formed at the junction of manubrium and body of sternum.

- It can be palpated in a living person as a bony transverse ridge about 5 cm below the suprasternal notch.

## • Anatomical Events at Angle of Louis -

- (i) Articulates on either side with costal cartilage on the 2<sup>nd</sup> rib which helps in counting the ribs in clinical practice.

- (ii) Ascending Aorta ends at this level.
- (iii) Arch of Aorta begins and ends at this level.
- (iv) Descending Aorta begins at this level.
- (v) Pulmonary trunk divides into two pulmonary Arteries.
- (vi) Azygos vein enters the superior vena cava.
- (vii) Trachea divides into two principal bronchi.
- (viii) Marks the junction between sup. & inf. mediastinum.
- (ix) Marks the junction between two discontinuous dermatomes.
- (x) Superior Vena cava pierces the fibrous pericardium.

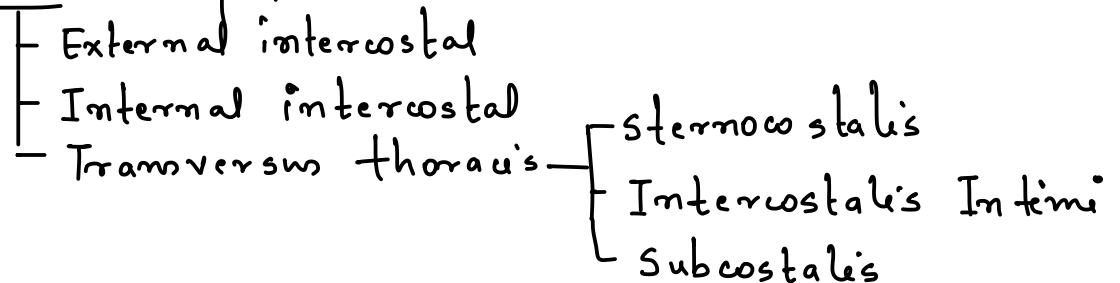
(10) Define Intercostal space and Enumerate its contents.

Ans: It is a space between two consecutive ribs and their costal cartilages.

### Contents

- A typical intercostal space contains:
  - (a) 3 intercostal muscles
  - (b) A neurovascular bundle.

The intercostal muscles are arranged in 3 layers, from superficial to deep, these are



- The neurovascular bundle consists of Intercostal Nerve, Intercostal Vein and Intercostal Artery.
- The bundle runs between the middle and inner layers of intercostal muscles and lies in subcostal groove on inner surfaces of rib near its lower border.

(11) Give the direction of fibres of intercostal muscles.

Ans: Muscle                      Direction

|                      |                                  |
|----------------------|----------------------------------|
| Ext. Intercostal     | Downward, forward and medially   |
| Internal Intercostal | Downward, backward and laterally |
| Transverse thoracis  | Downward, backward and laterally |

(12) Short note on intercostal nerves.

Ans: The intercostal nerves are anterior primary rami of thoracic spinal nerves and are located in the intercostal spaces. Thus, there are 11 intercostal nerves in thoracic wall.

### Classification:

(a) Typical Intercostal Nerves: They remain confined within the respective intercostal spaces of thoracic wall.  
As - 3<sup>rd</sup>, 4<sup>th</sup>, 5<sup>th</sup> & 6<sup>th</sup> Intercostal Nerves.

(b) Atypical Intercostal spaces: They extend beyond the thoracic wall.

As - 1<sup>st</sup>, 2<sup>nd</sup>, 7<sup>th</sup>, 8<sup>th</sup>, 9<sup>th</sup>, 10<sup>th</sup> & 11<sup>th</sup>  
Intercostal Nerves.

• The 7<sup>th</sup> to 11<sup>th</sup> are Thoracoabdominal Nerves as they leave the thoracic wall to supply Anterior Abdominal Wall.



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