

SNS COLLEGE OF ALLIED HEALTH SCIENCE

Affiliated to The Tamil Nadu Dr MGR Medical University, Chennai

DEPARTMENT OF CARDIOPULMONARY PERFUSION CARE TECHNOLOGY

COURSE NAME: Anatomy

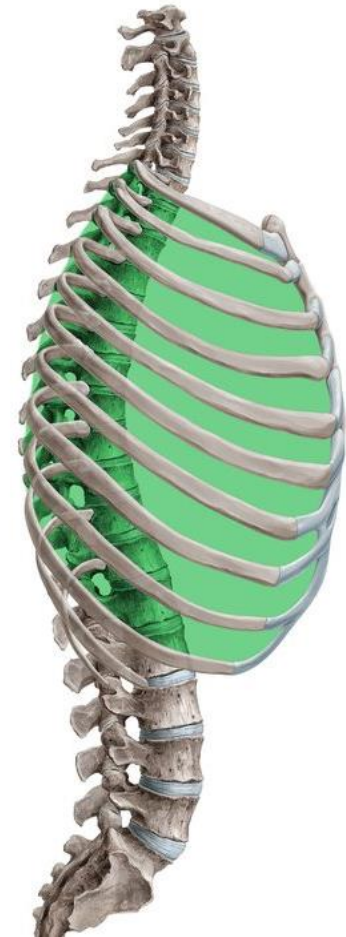
UNIT II – Thorax & Lungs

TOPIC: Intercostal Space

FACULTY NAME: Mrs. Saranyaa Prasath

Empathize – Understanding the Intercostal Space

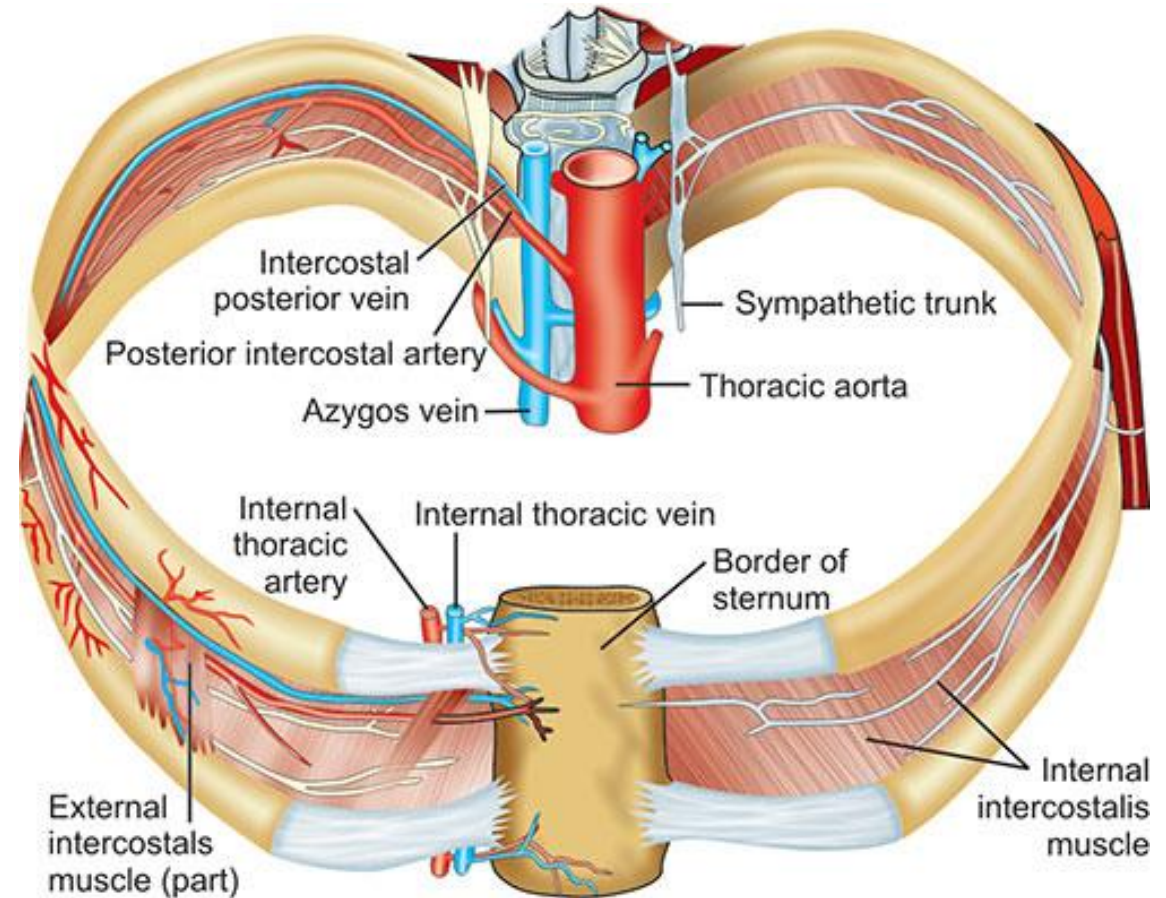
- Intercostal spaces are the regions between adjacent ribs, with **11 spaces on each side of the thorax**.
- These spaces play a vital role in **respiration and thoracic wall movement**, impacting both anatomy and clinical procedures.
- Clinicians and students must appreciate the significance of intercostal spaces in procedures like thoracentesis, chest tube insertion, and surgical access.



Define – Anatomy and Structure

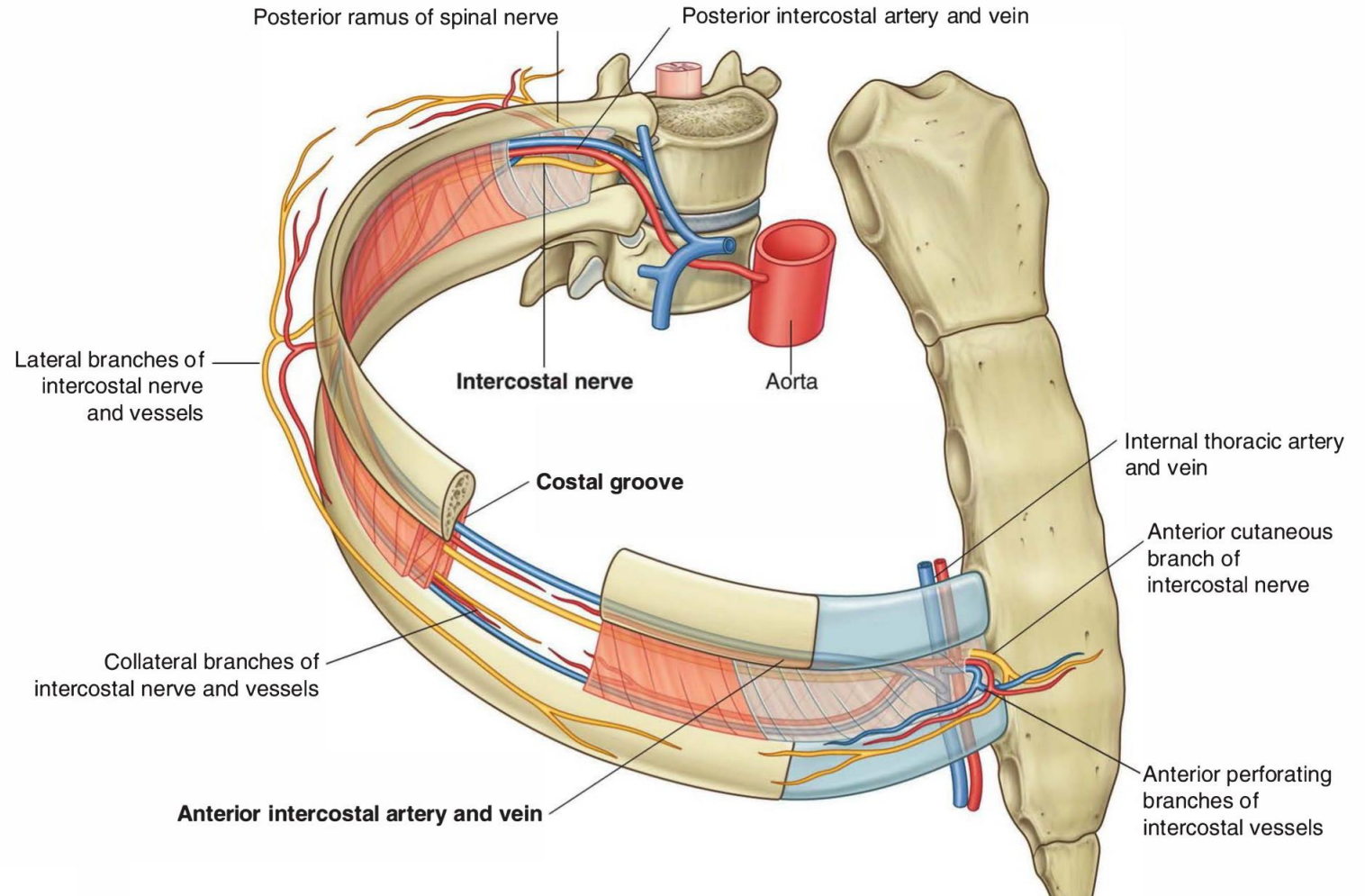
The space contains:

- **Muscles** - External, internal, and innermost intercostal muscles.
- **Neurovascular bundle** (intercostal nerve, artery, vein) running along the inferior border of the rib above.
- **Endothoracic fascia** separating the space from the pleura.



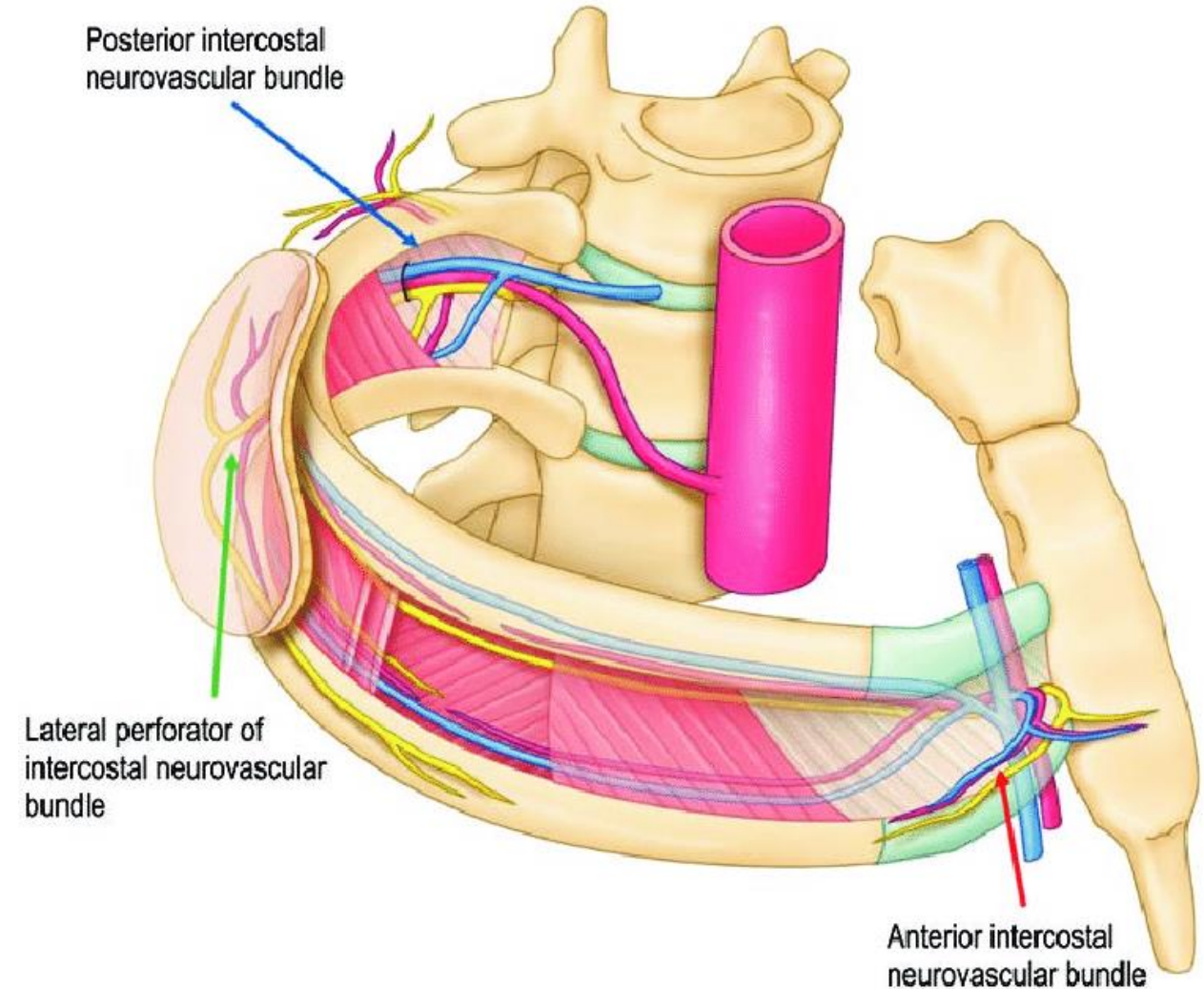
Boundaries

- **Superior:** Lower margin of the upper rib and its cartilage.
- **Inferior:** Upper margin of the lower rib and its cartilage.
- **Anterior:** Lateral border of the sternum between costal notches
- **Posterior:** Body of the corresponding thoracic vertebra.



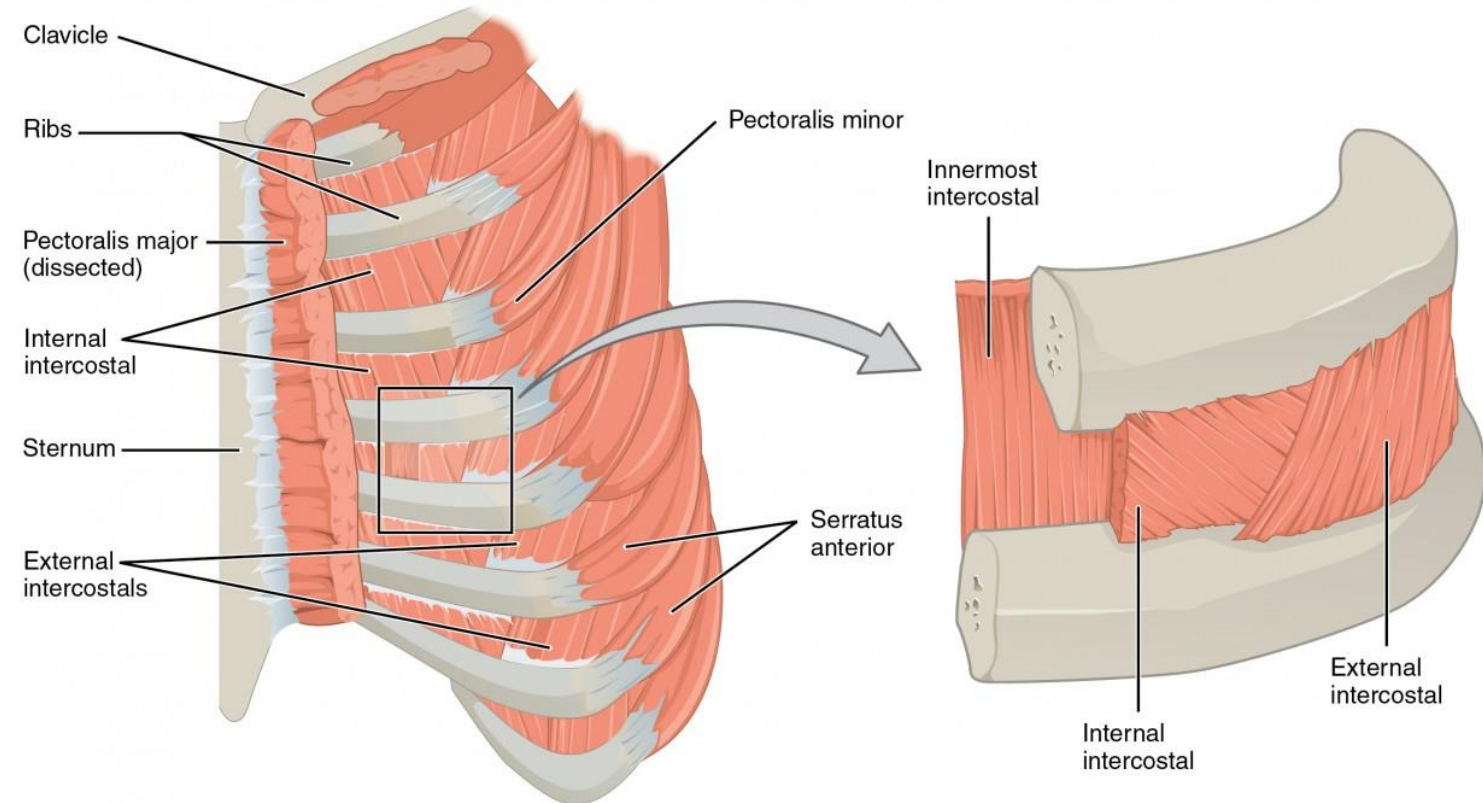
Features of Space

- Each directed downward & forward
- Narrow towards vertebral column & broad towards sternum, widest at costo-chondral junction
- Posterior part is inter-osseous while ant part is inter-cartilaginous



Ideate – Clinical and Functional Relevance

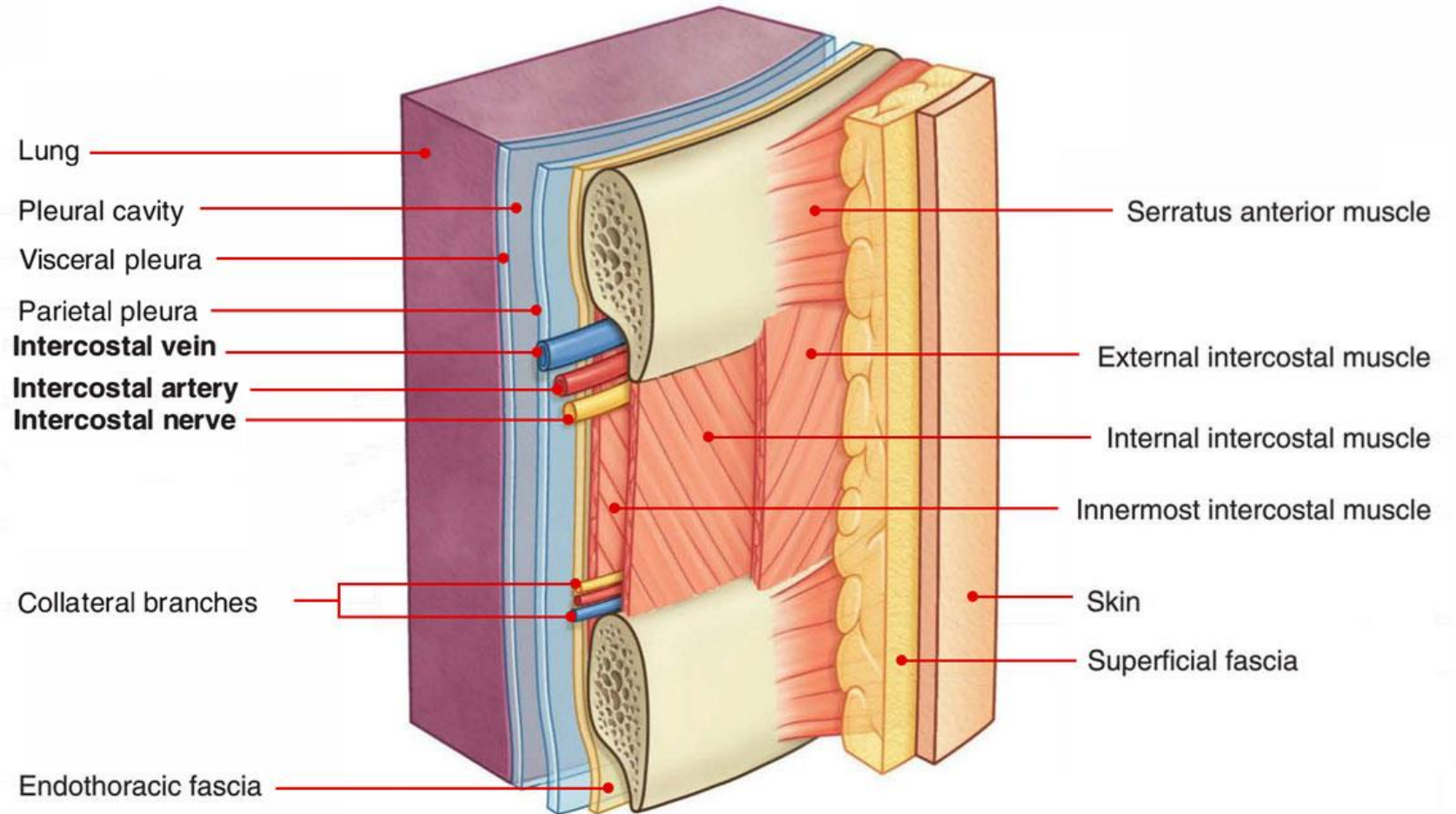
- The intercostal muscles facilitate chest wall movement during breathing:
 - External intercostals elevate ribs during inspiration.
 - Internal intercostals aid in forced expiration.
- The neurovascular bundle is crucial for sensory and motor innervation of the thoracic wall.



Prototype – Diagram and 3D Representation

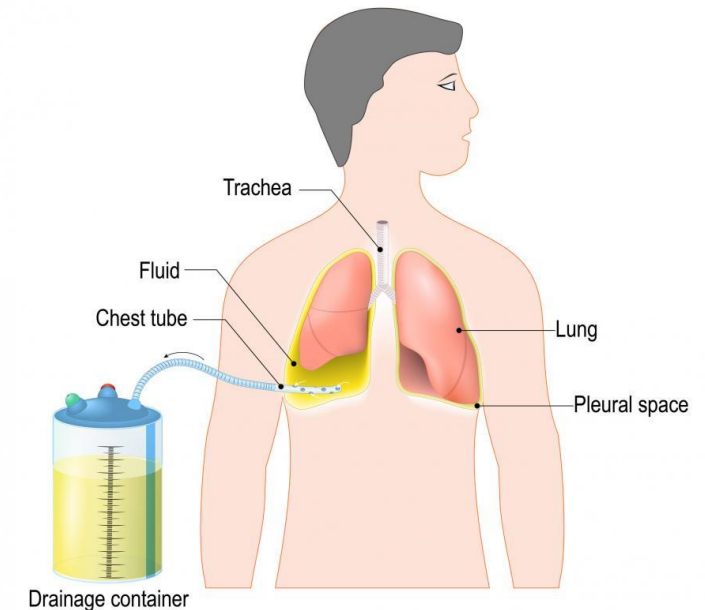
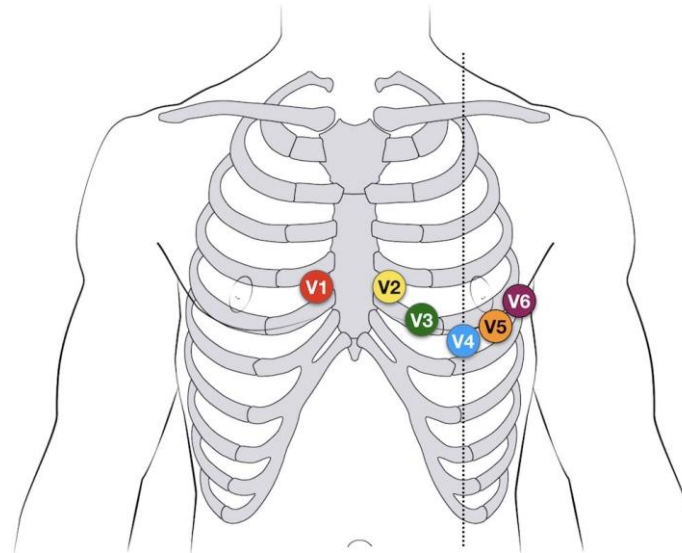
Visualize the intercostal space using cross-sectional diagrams:

- Show layers: skin, fascia, muscles, neurovascular bundle, endothoracic fascia, pleura.



Test – Clinical Application

- **Thoracentesis:** Safe entry into the 5th–9th intercostal spaces.
- **Chest tube insertion:** Utilizes the 4th–5th intercostal spaces in the midaxillary line.
- **Cardiac Procedures:** The 4th and 5th intercostal spaces are often used for placement of electrodes for electrocardiography (ECG)



Summary



Boundaries

The intercostal space is bounded by the rib, the sternum, and by the thoracic vertebrae.



Contents

Each intercostal space contains muscles, nerves, and vessels. Function: respiration and sensation.



Muscles

There are three layers of intercostal muscles: external, internal, and innermost.



Intercostal Nerves

The intercostal nerves are the anterior rami of the thoracic spinal nerves.



Intercostal Vessels

Each intercostal space contains an intercostal artery and vein.

References

- <https://www.earthslab.com/anatomy/intercostal-spaces-and-its-contents/>
- <https://www.kenhub.com/en/library/anatomy/intercostal-spaces>
- <https://www.ncbi.nlm.nih.gov/books/NBK538321/>
- <https://www.slideshare.net/slideshow/intercostal-space/54657325>
- <https://my.clevelandclinic.org/health/body/intercostal-muscles>

THANK YOU