

Anatomy Practical Prof. Ahmed fathallah

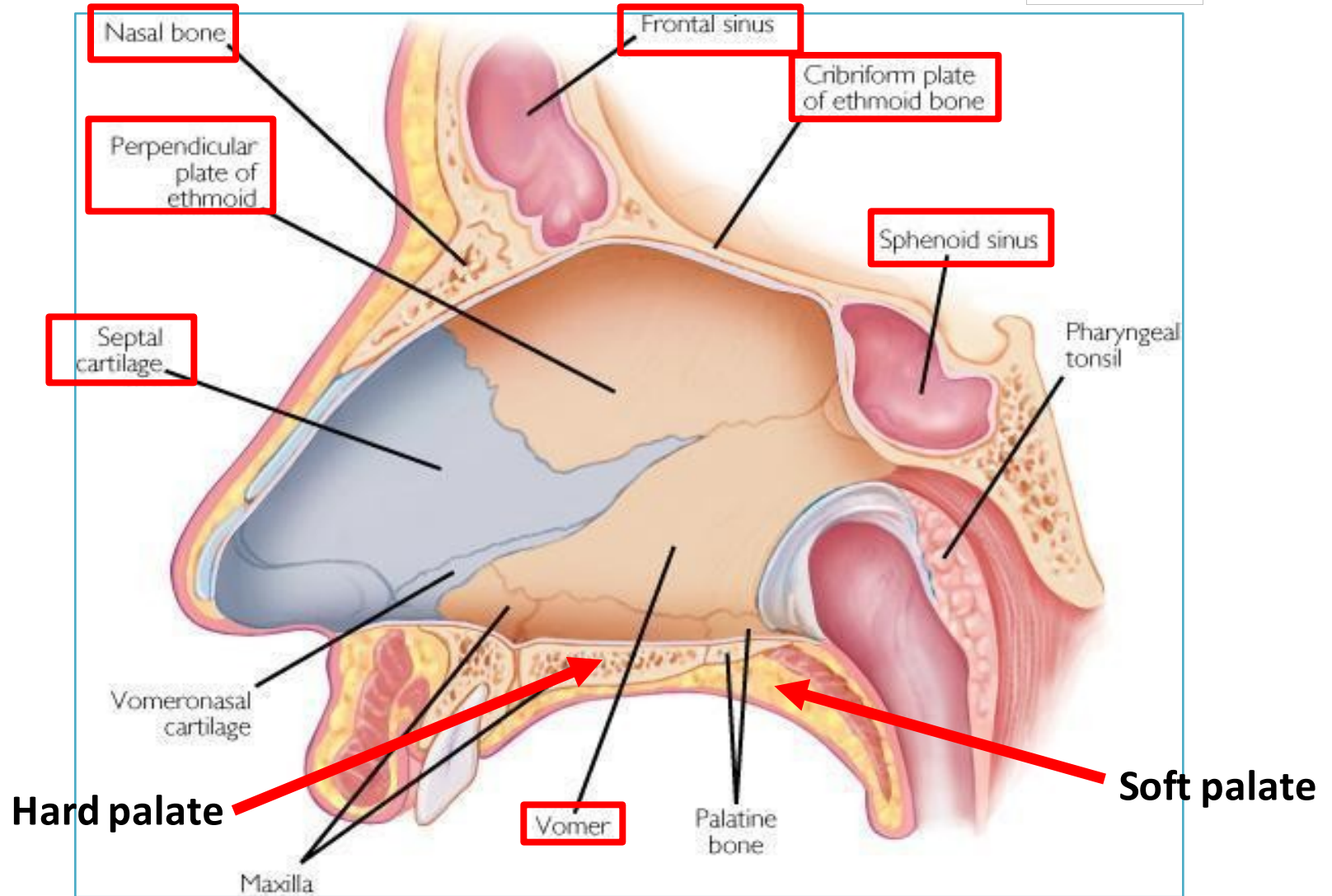
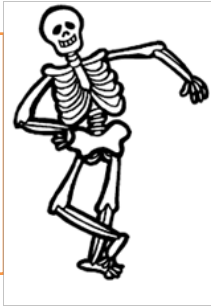
Respiratory Block ANATOMY team 435



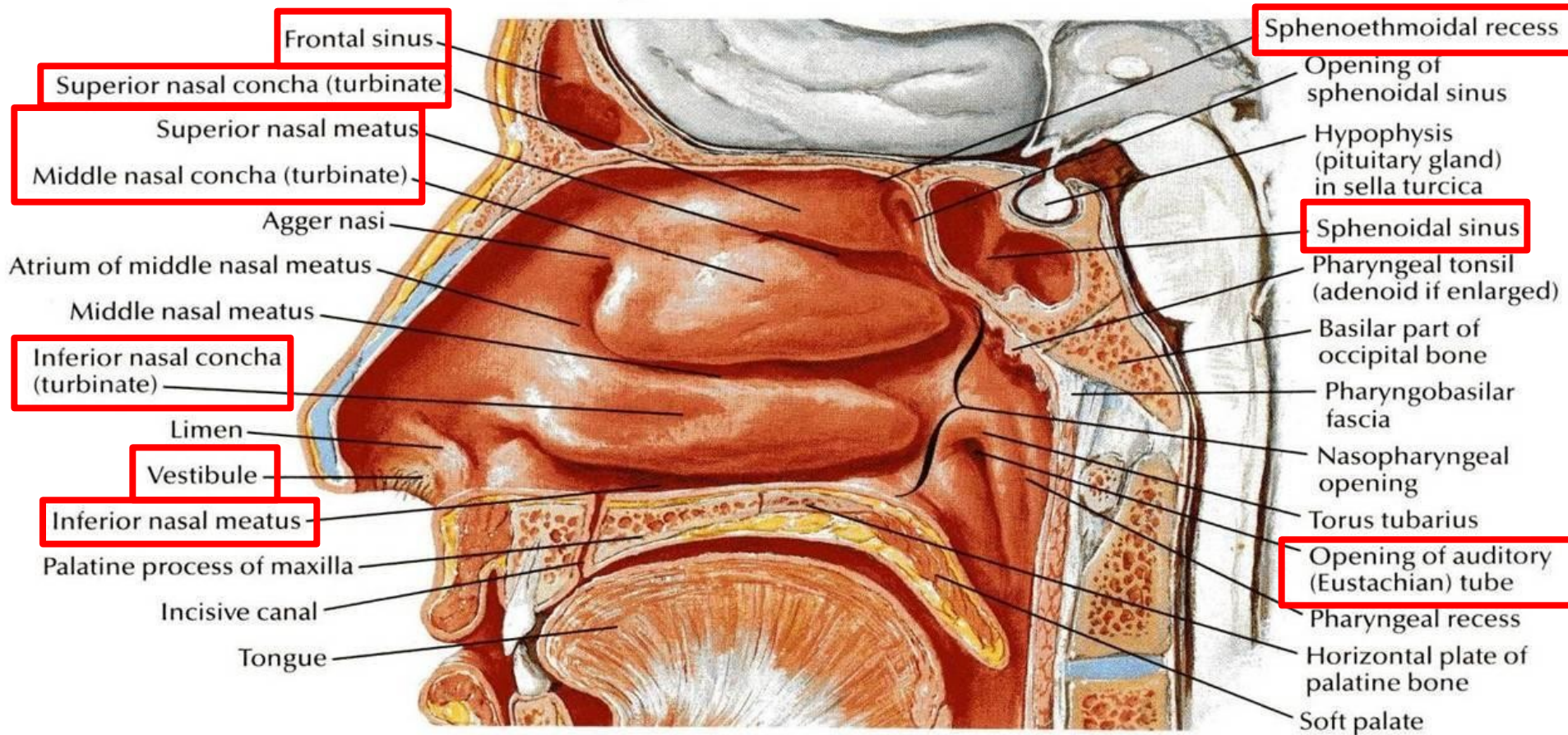
C O L O R C O D E S

- IMPORTANT NOTES
- EXTRA NOTES
- DEFINITION

NASAL CAVITY

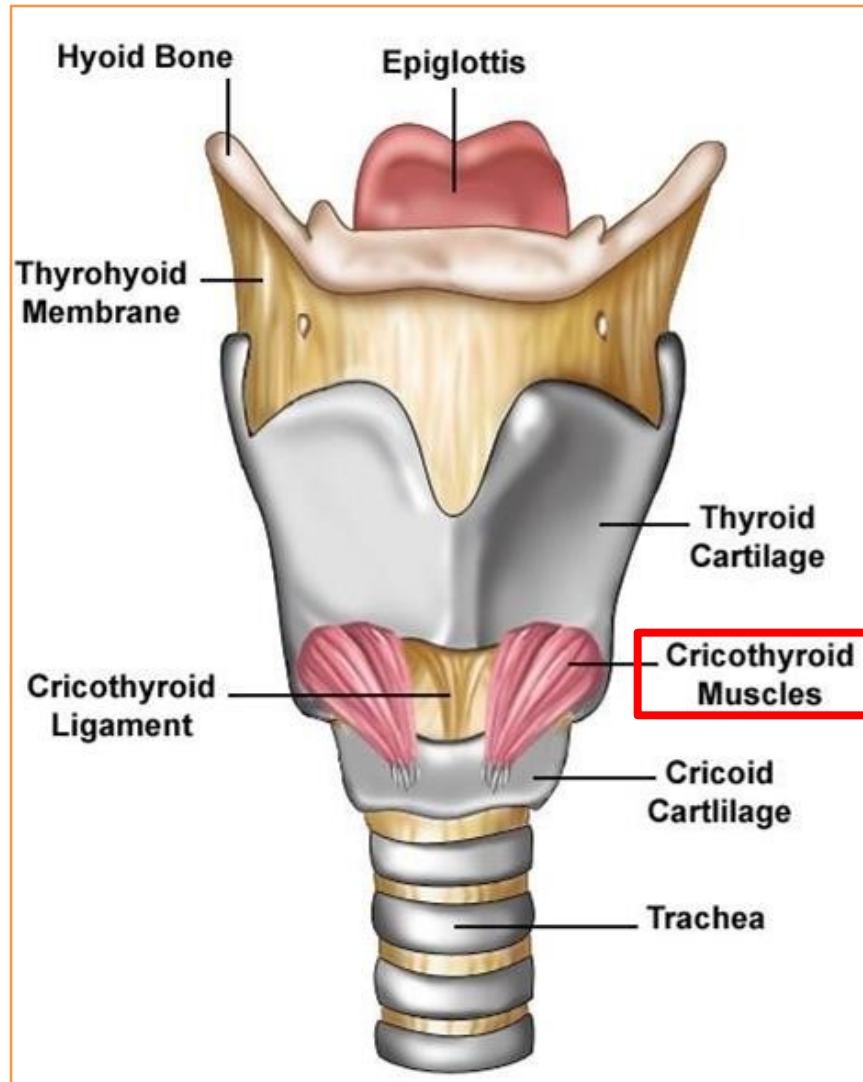


NASAL CAVITY



LARYNX, TRACHEA

- Level of beginning and termination of larynx, trachea and pharynx
- Cartilages of larynx



Beginning and termination

1- Pharynx extends from the base of the skull to level of the 6th cervical vertebra, where it is continuous with the esophagus.

2- Larynx extends from laryngeal inlet to lower border of the cricoid cartilage.

3- Trachea :

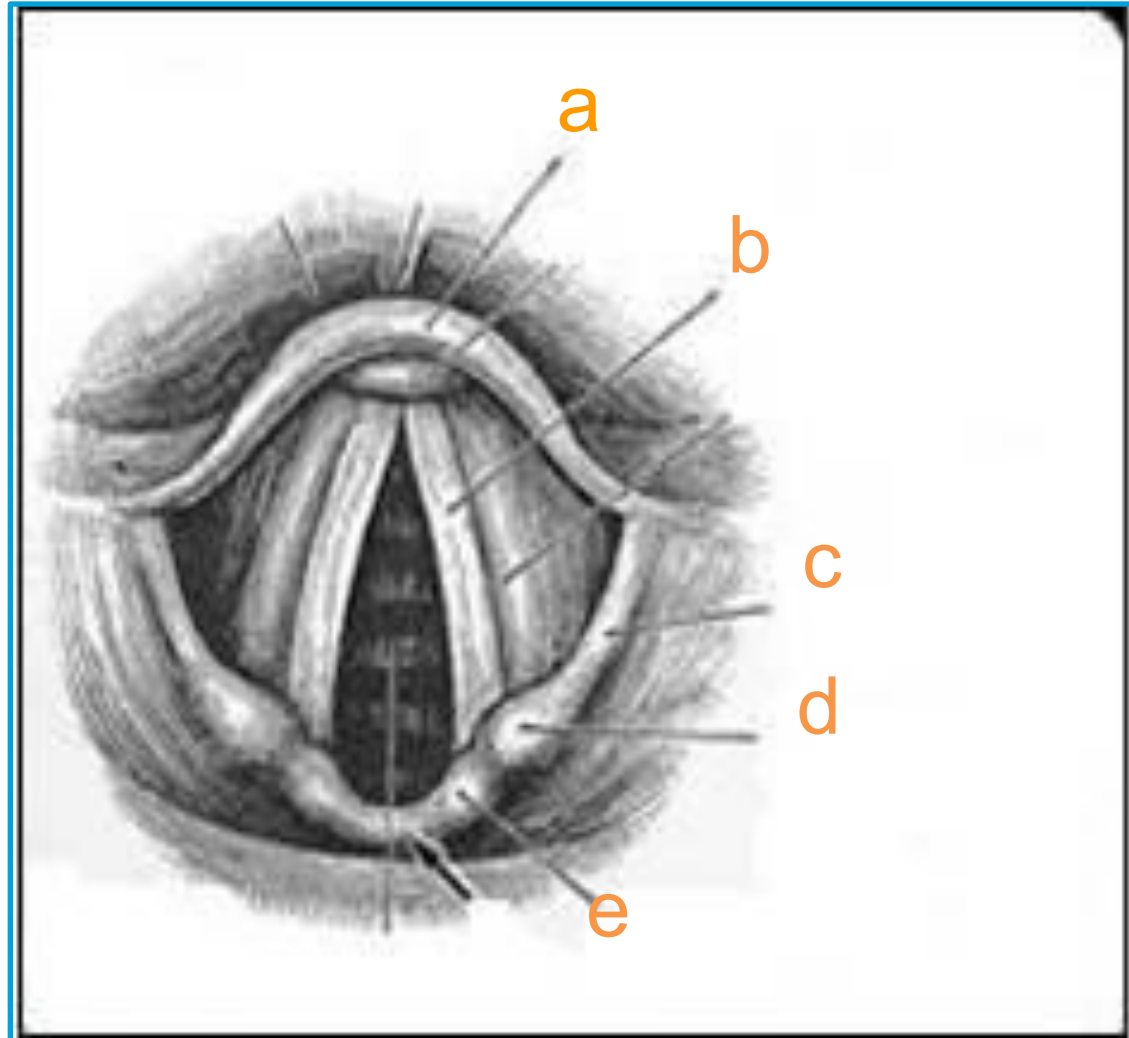
Begins: In the neck below the cricoid cartilage of the larynx (C6).

Ends: In the thorax at the level of sternal angle (lower border of T4), by dividing into right and left principal (main, primary) bronchi

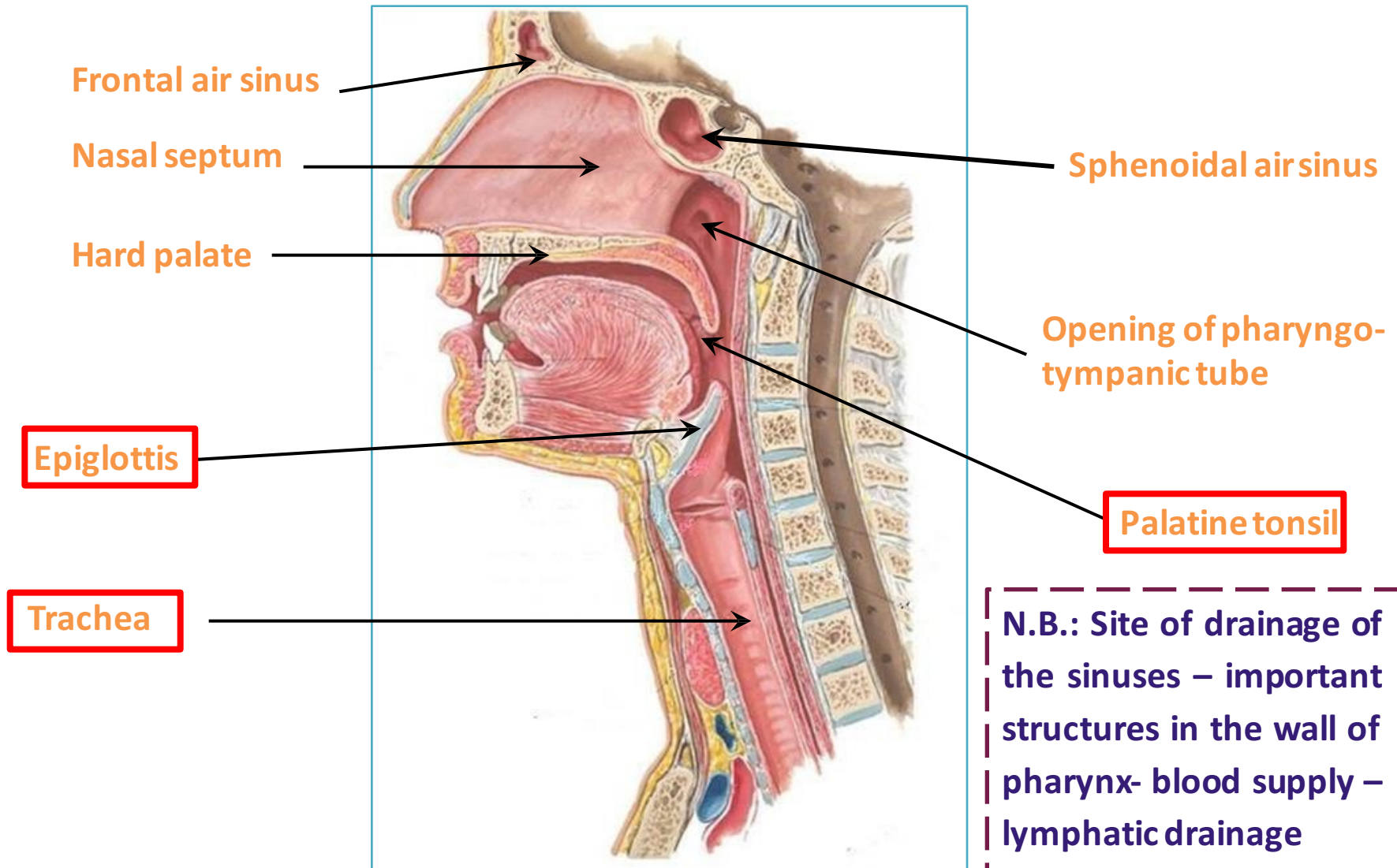
Larynx

Superior view

- a. epiglottis.
- b. Vocal cord.
- c. Aryepiglottic fold.
- d. Cuneiform cartilage.
- e. Corniculate cartilage.



NASAL CAVITY, LARYNX, PHARYNX, TRACHEA



Innervation of Pharynx

Nerve Supply

Sensory:

- Nasopharynx: Maxillary nerve
- Oropharynx: Glossopharyngeal nerve
- Laryngopharynx: Vagus nerve

Motor Nerve Supply:

- All the muscles of pharynx are supplied by the pharyngeal plexus.
except ; the Stylopharyngeus is supplied by the glossopharyngeal nerve

Blood vessels and lymphatics

Arterial supply:

§ Ascending pharyngeal artery

§ Ascending palatine artery

§ Facial artery

§ Maxillary artery

§ Lingual artery

The Veins :

drain into pharyngeal venous plexus, which drains into the internal jugular vein

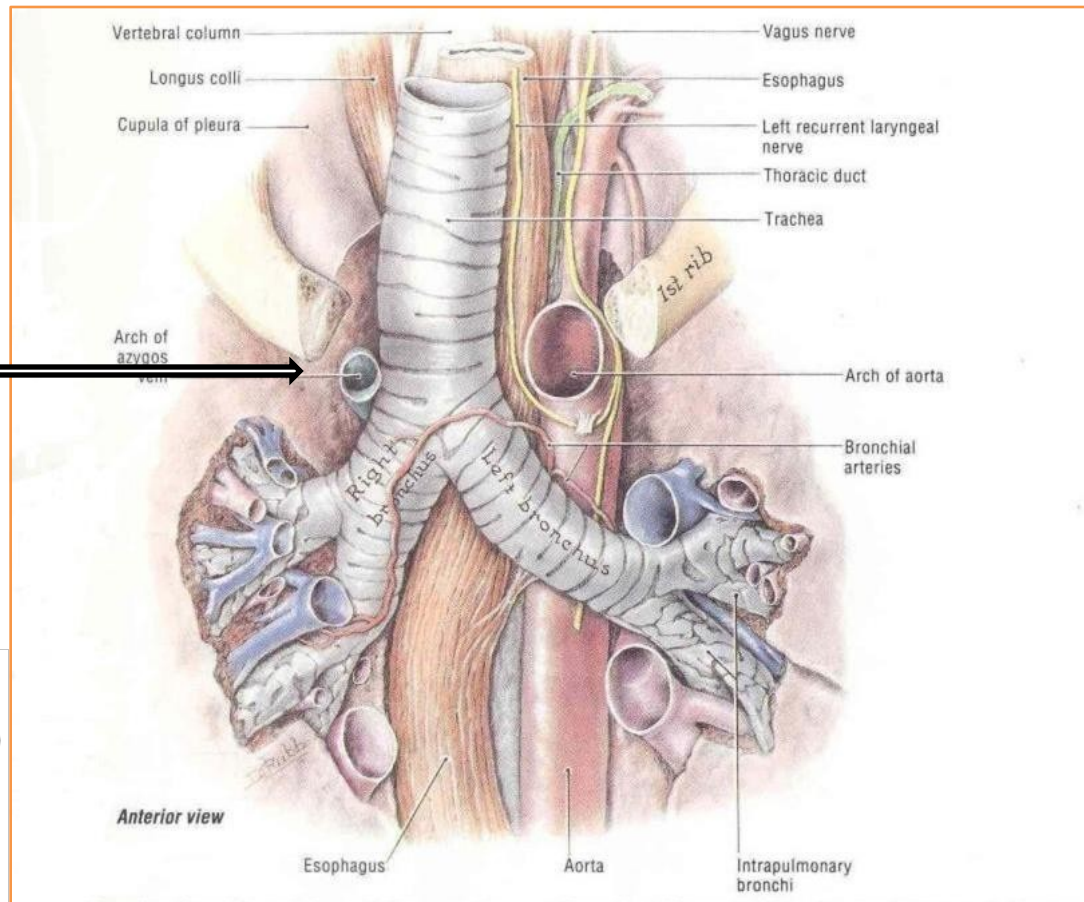
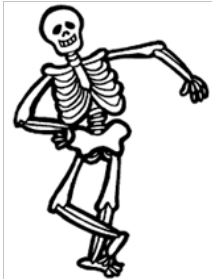
The lymphatics :

drain into the deep cervical lymph nodes either directly, or indirectly via the retropharyngeal or paratracheal lymph nodes

TRACHEA & BRONCHI

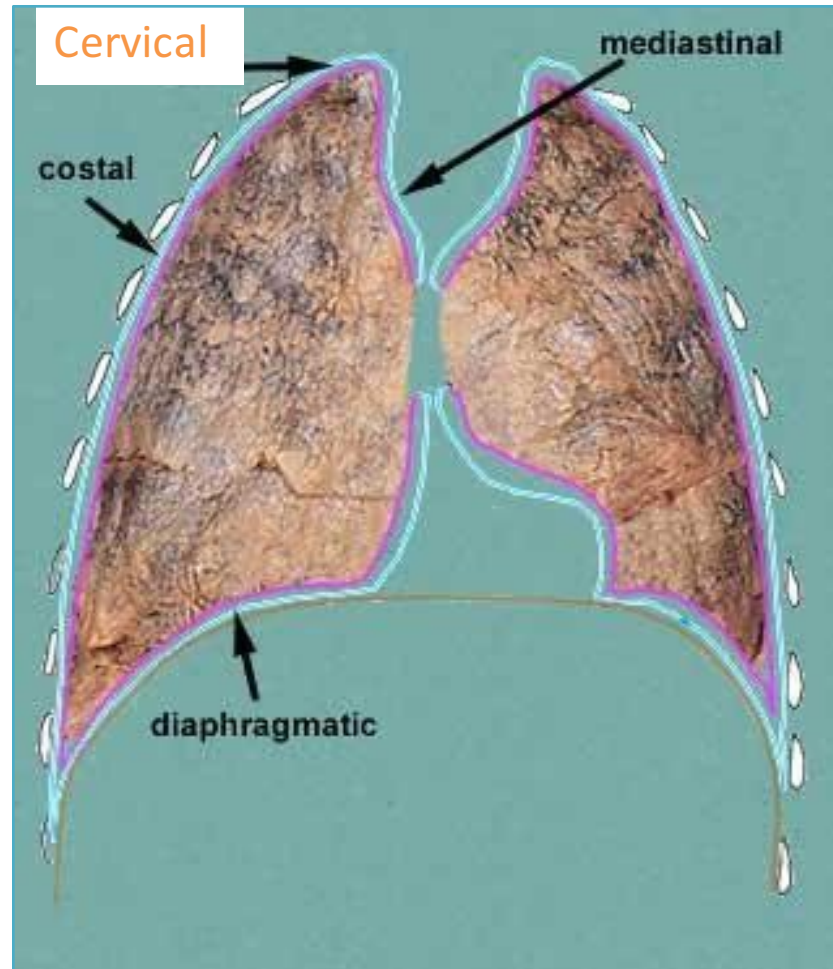
Superior mediastinum

Level OF T4
(end of the superior mediastinum)



This picture also shows posterior mediastinum

LUNG & PLEURA



**Nerve supply- Surface
Anatomy**

Innervation of lung

- **Pulmonary plexus** at the root of lung....is formed of autonomic fibers from sympathetic & parasympathetic fibers.

1- Sympathetic Fibers

From ... **Sympathetic trunk**...

Action: **Broncho-dilatation / and vasoconstriction.**

2- Parasympathetic Fibers

From.....**Vagus nerve**

Action: **Broncho-constriction and secretomotor to bronchial glands /and vasodilatation**

surface of anatomy

- **Apex:**

- lies one inch above the medial 1/3 of the clavicle.

- **Right pleura:**

- **The anterior margin** extends vertically from sternoclavicular joint to 6th costal cartilage.

- **Left pleura:**

- **or margin** extends from sternoclavicular joint to the 4th costal cartilage, **The anterior** deviates for about 1 inch to left at 6th costal cartilage to form the **cardiac notch.**

- **Inferior margin :**

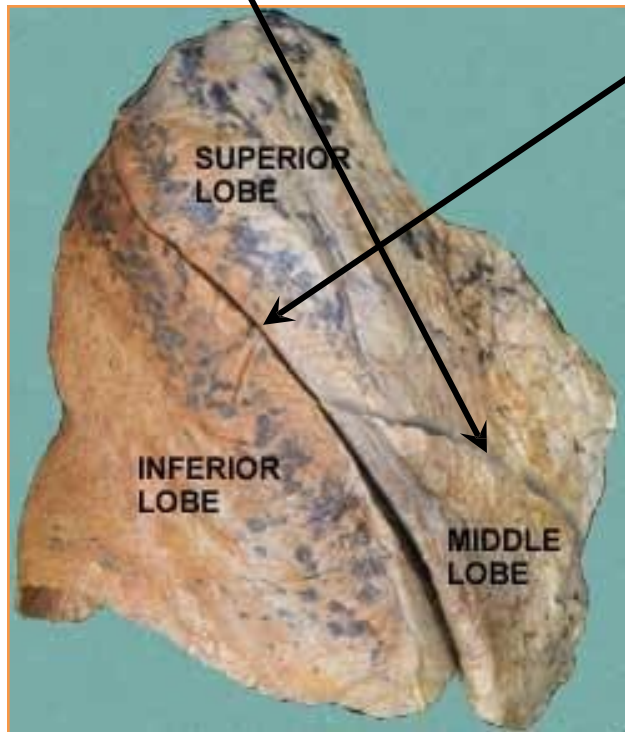
- Passes around the chest wall, on the **8th** rib in midclavicular line, **10th** rib in **mid-axillary line** and finally reaching to the last thoracic spine.

- **Posterior margin :** along the vertebral column from the apex to the inferior margin.

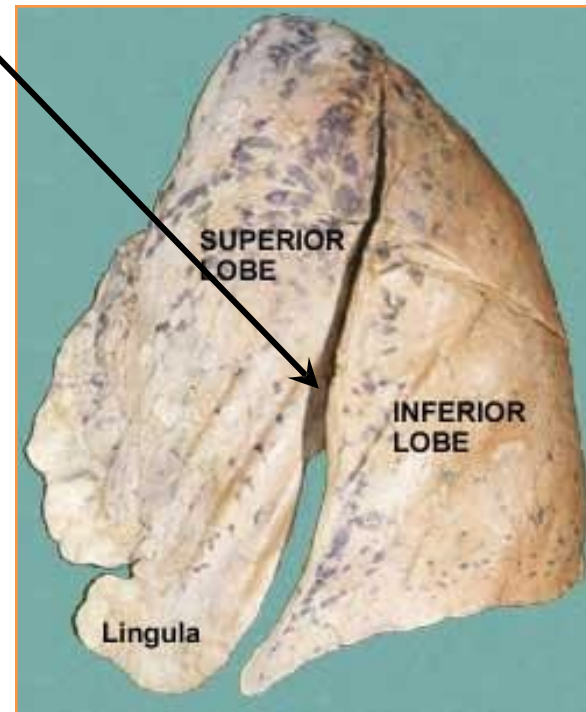
It is important to identify the left lung from the right one.

LUNG & PLEURA

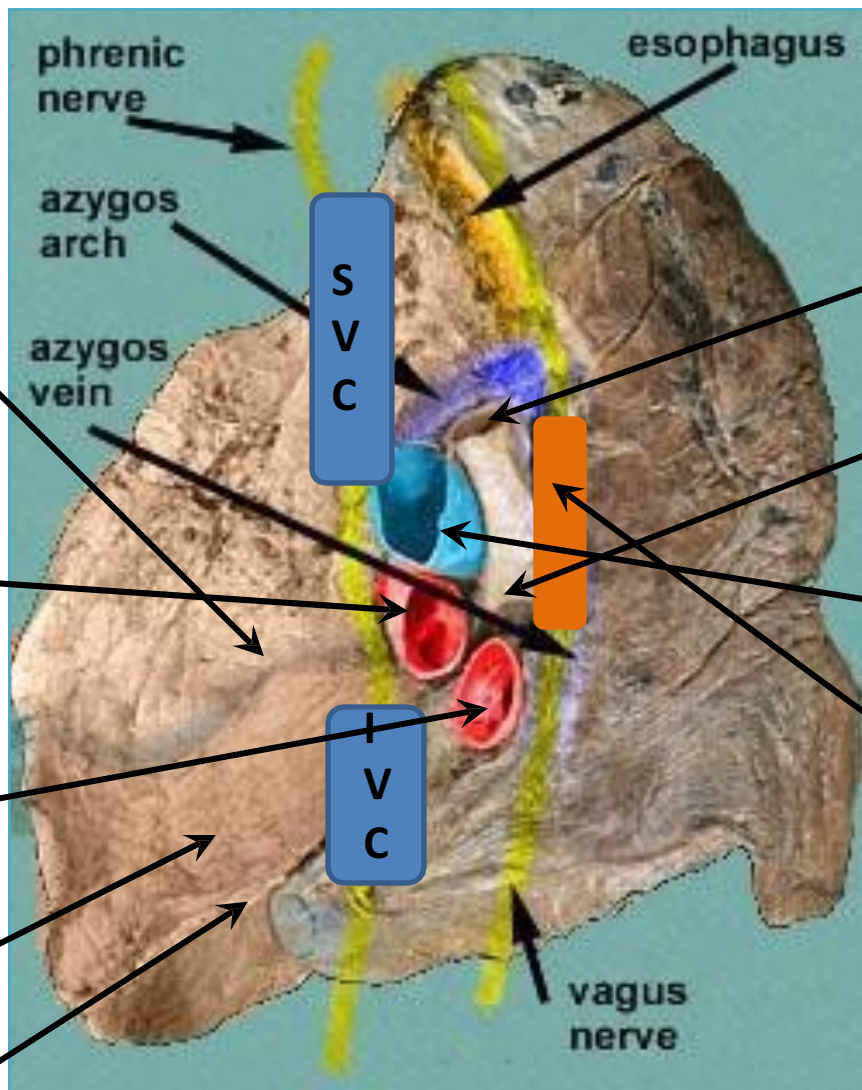
Transverse (horizontal) fissure



Oblique fissure



RIGHT LUNG



Transverse fissure

Superior pulmonary vein

Inferior pulmonary vein

Cardiac impression

Oblique fissure

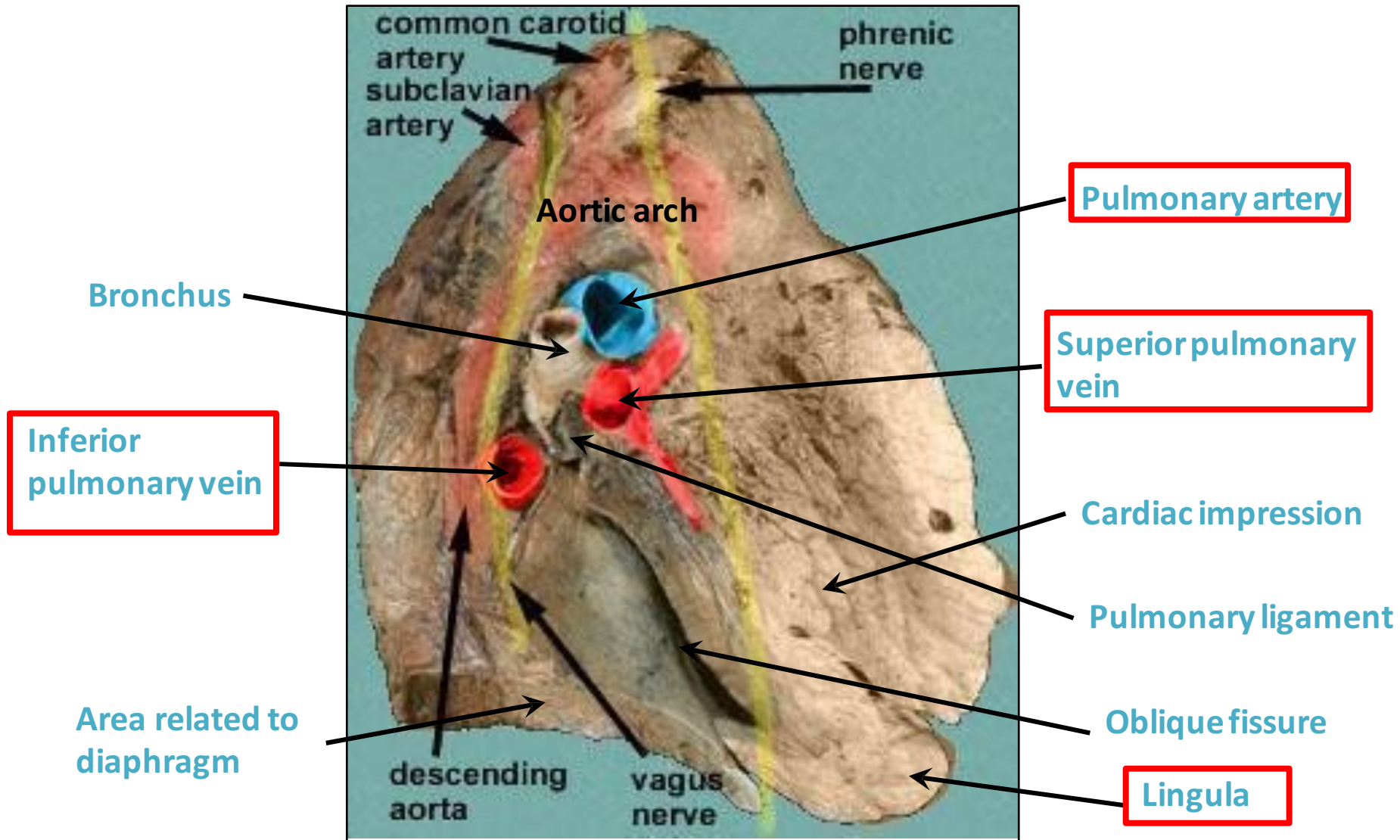
Superior lobar bronchus

Inferior lobar bronchus

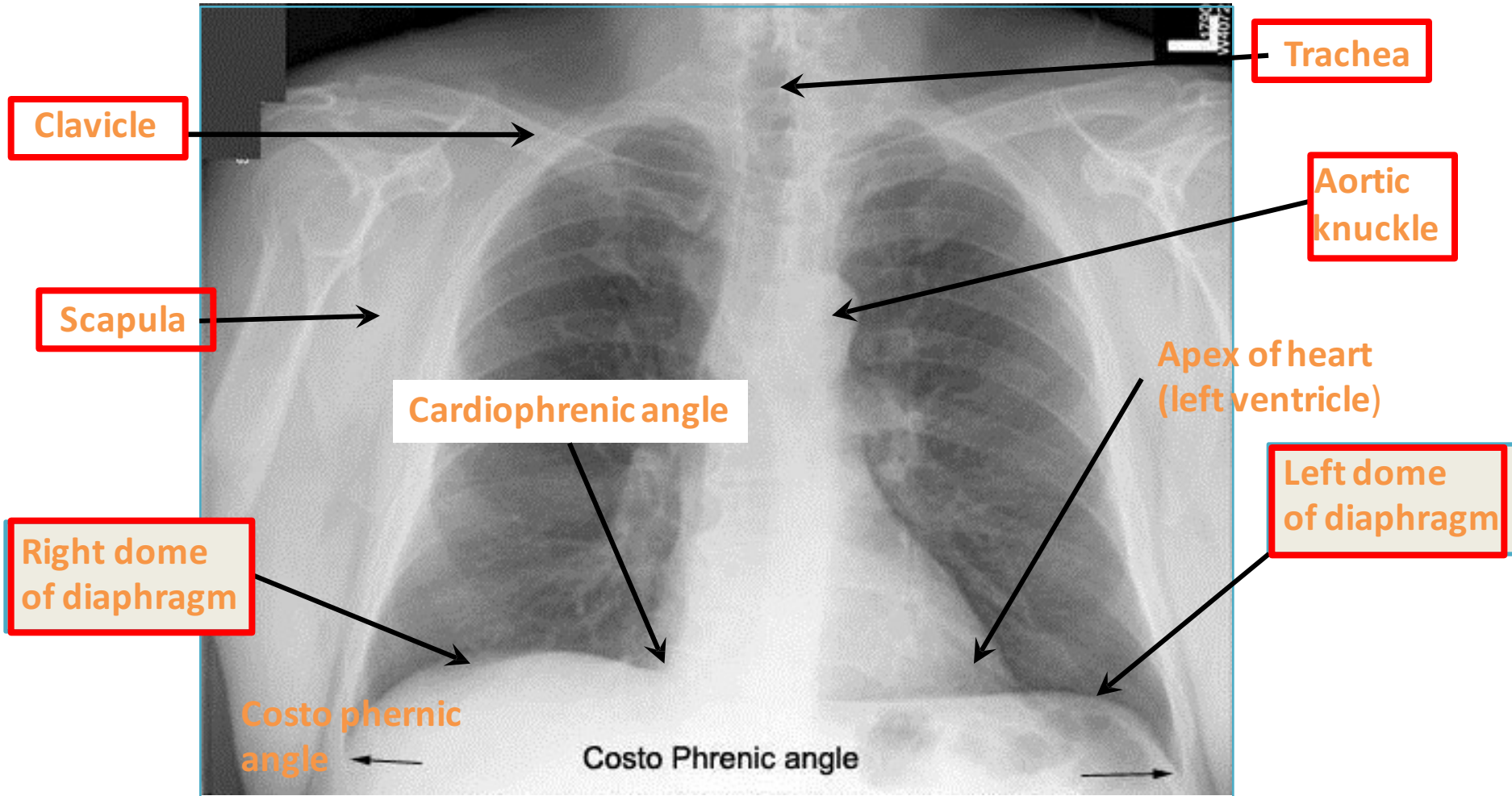
Pulmonary artery

Esophagus

LEFT LUNG

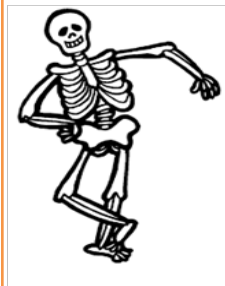
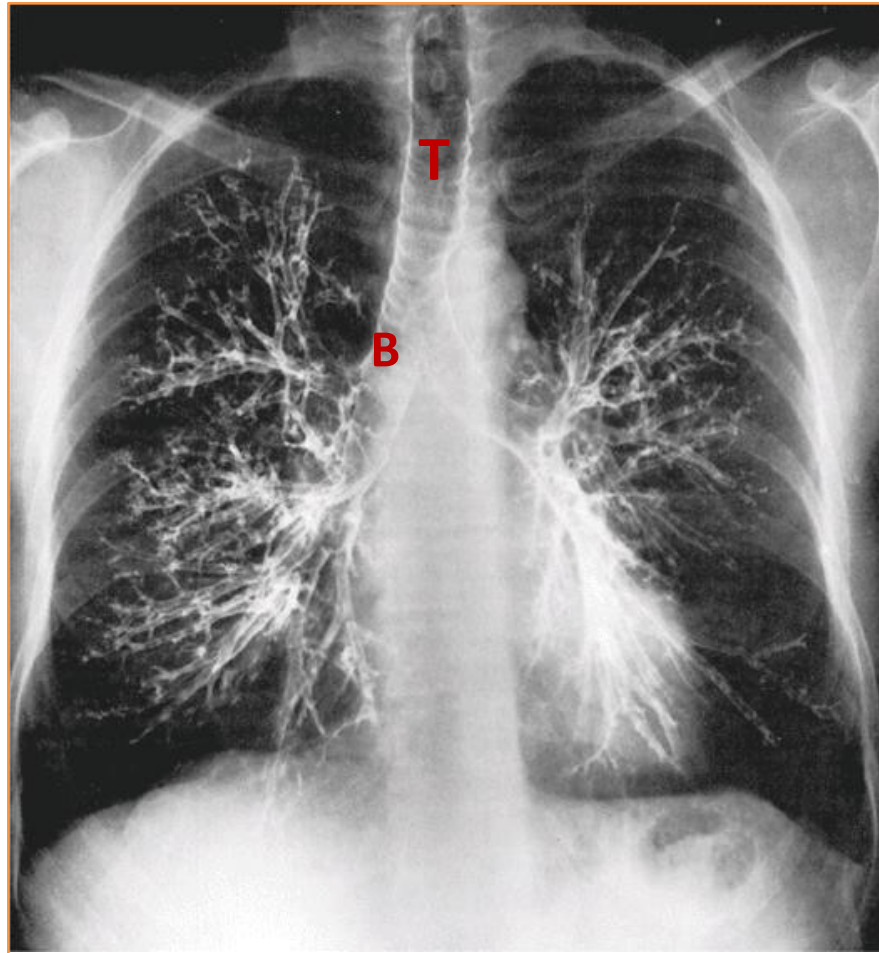


RADIOLOGY



- Remember that The transverse diameter of the heart should not exceed half the width of thoracic cage.

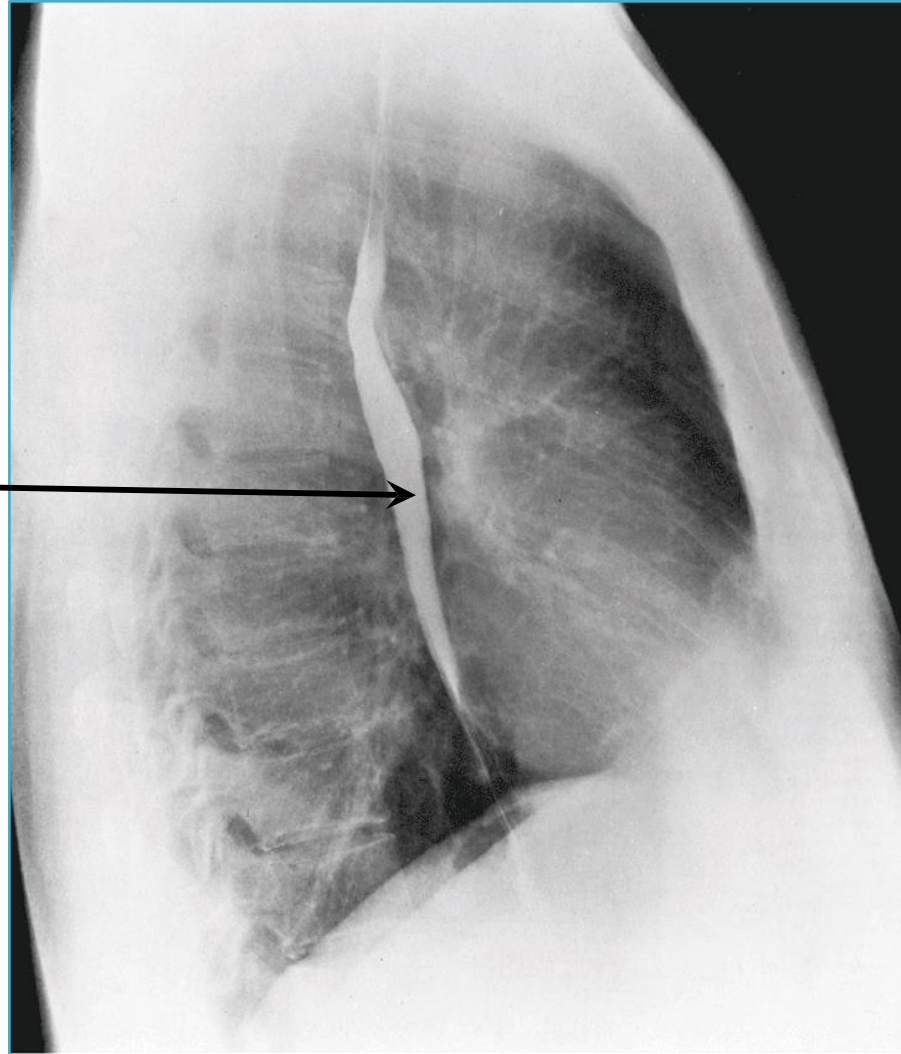
RADIOLOGY



RADIOLOGY

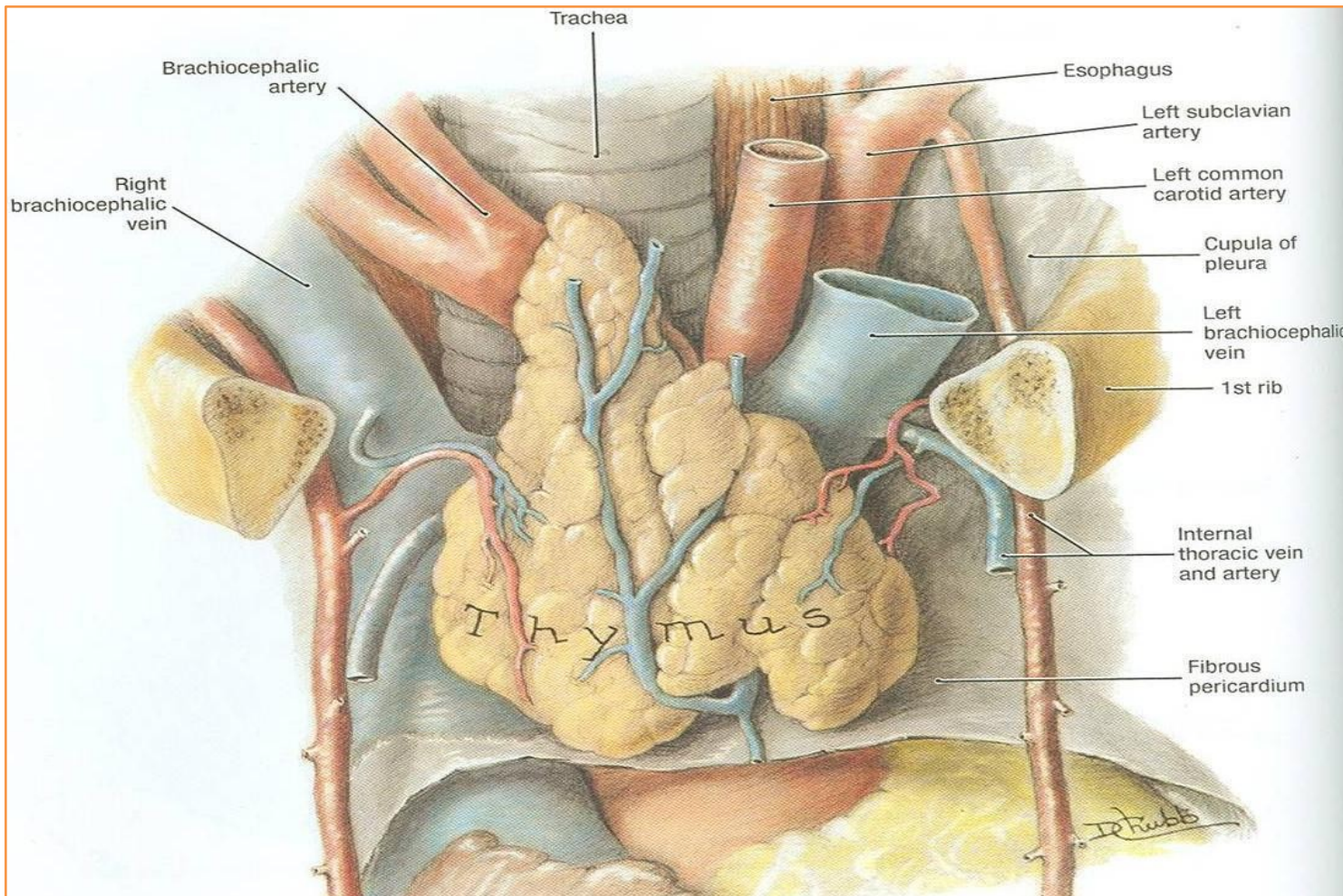
Barium swallow

Esophagus



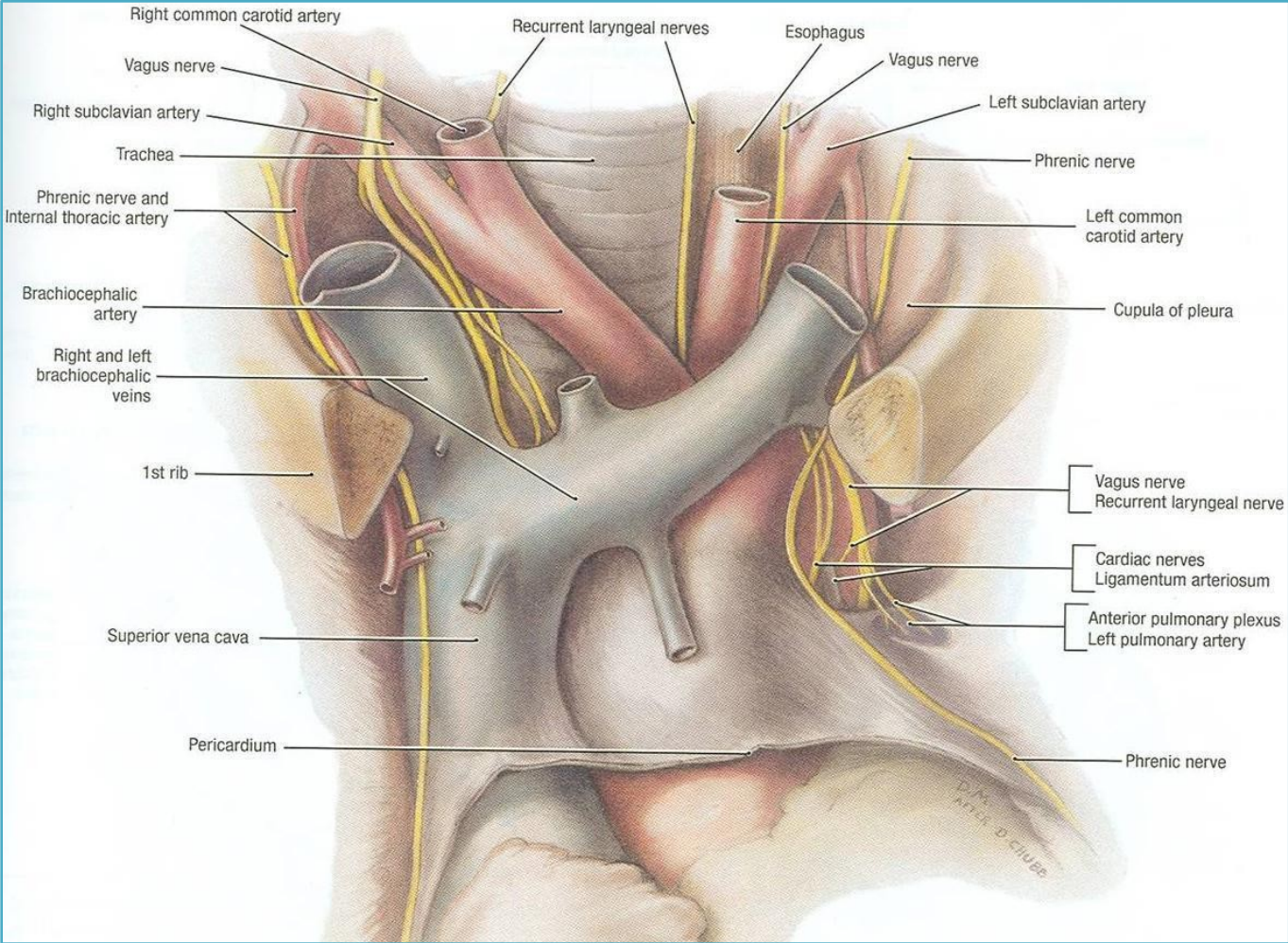
MEDIASTINUM

Contents



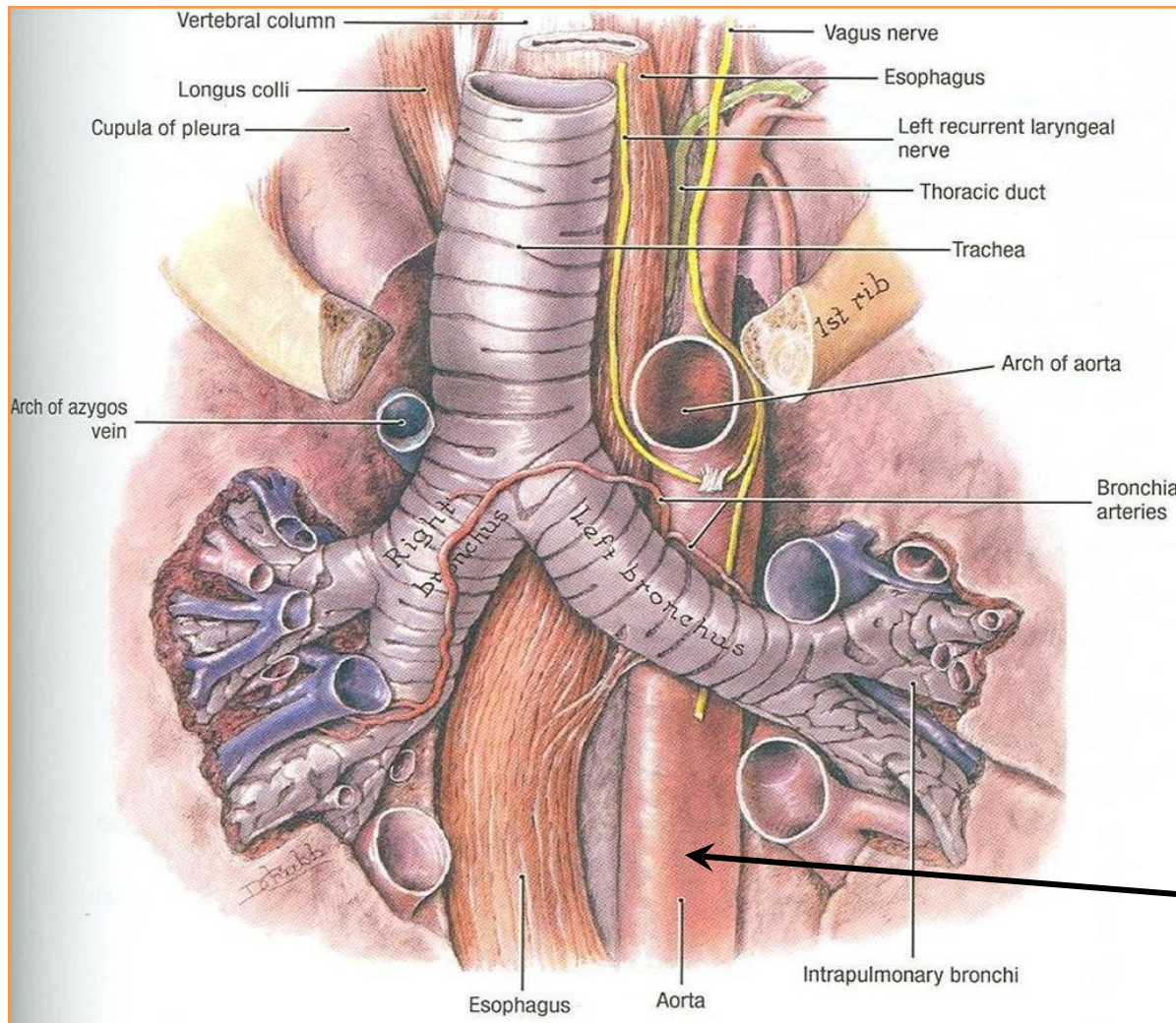
MEDIASTINUM

Contents



MEDIASTINUM

Contents



N.B.:
LEVEL OF T4

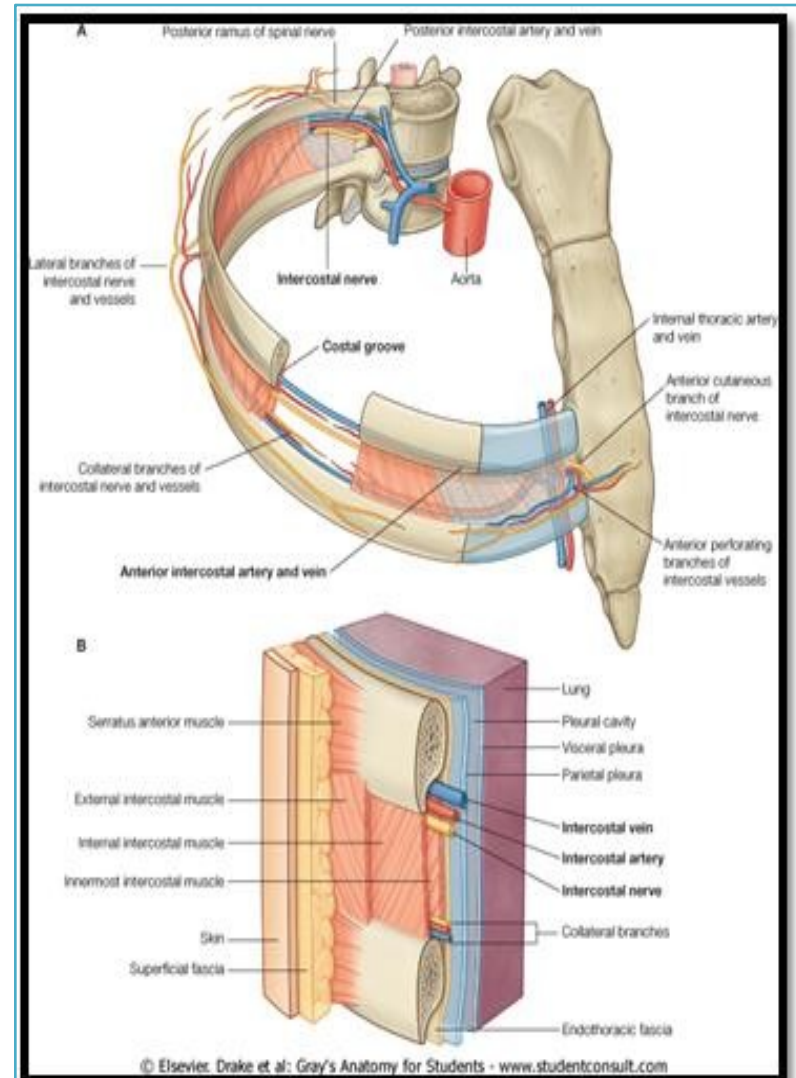
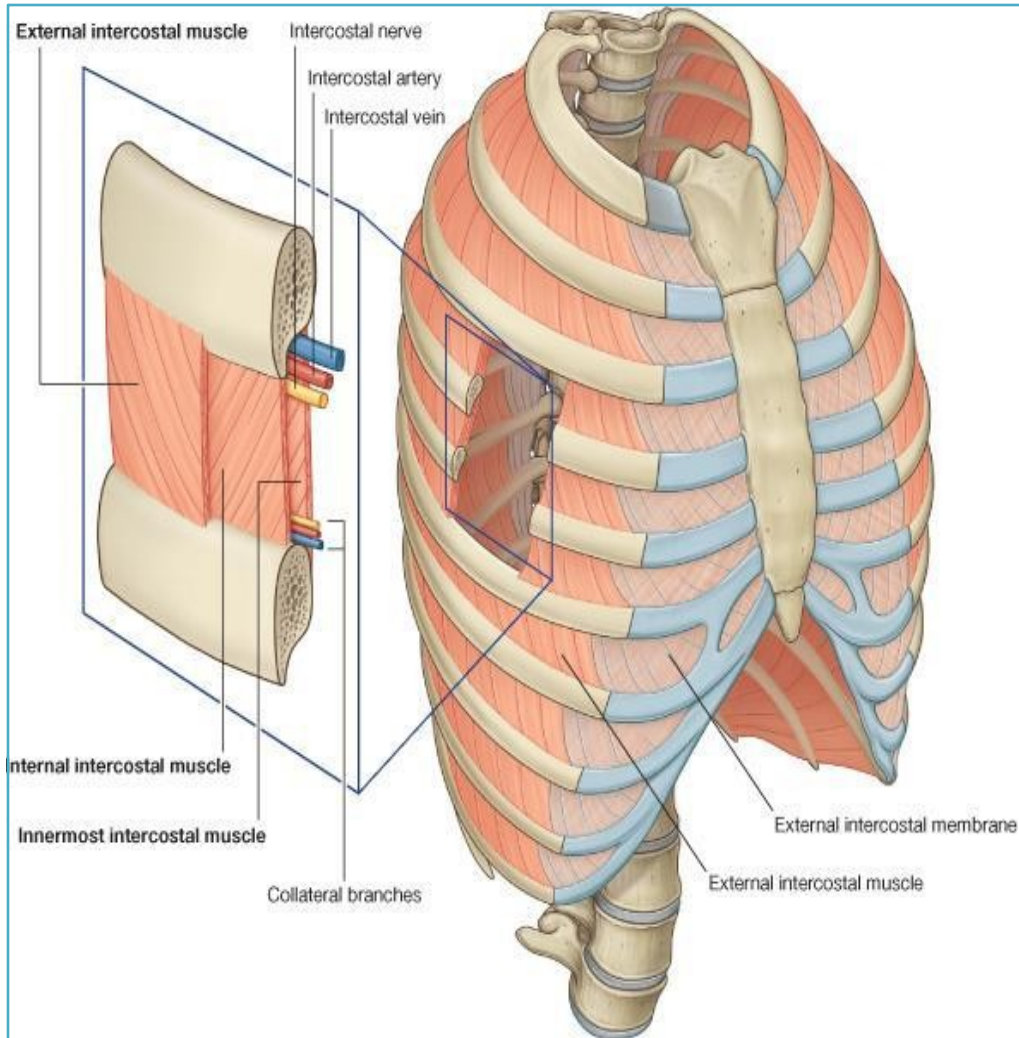
Level of T4 is at the Level of:

- **Sternal angle**
- **Second costal cartilage**
- **Bifurcation (1) of trachea**
- **Bifurcation of pulmonary trunk (2)**
- **Beginning & termination of arch of aorta**

Descending aorta

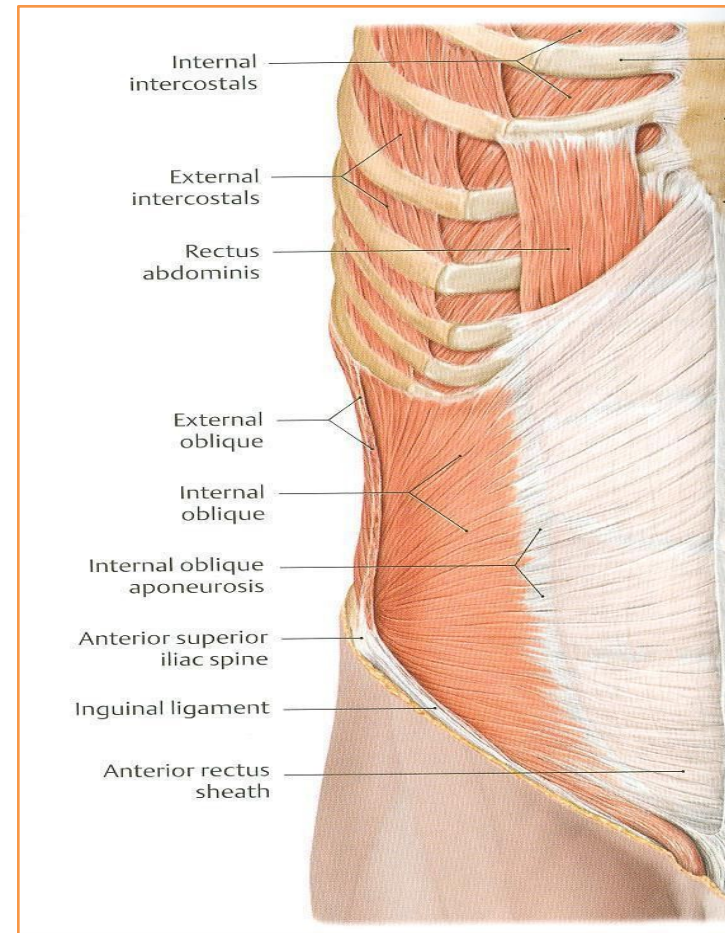
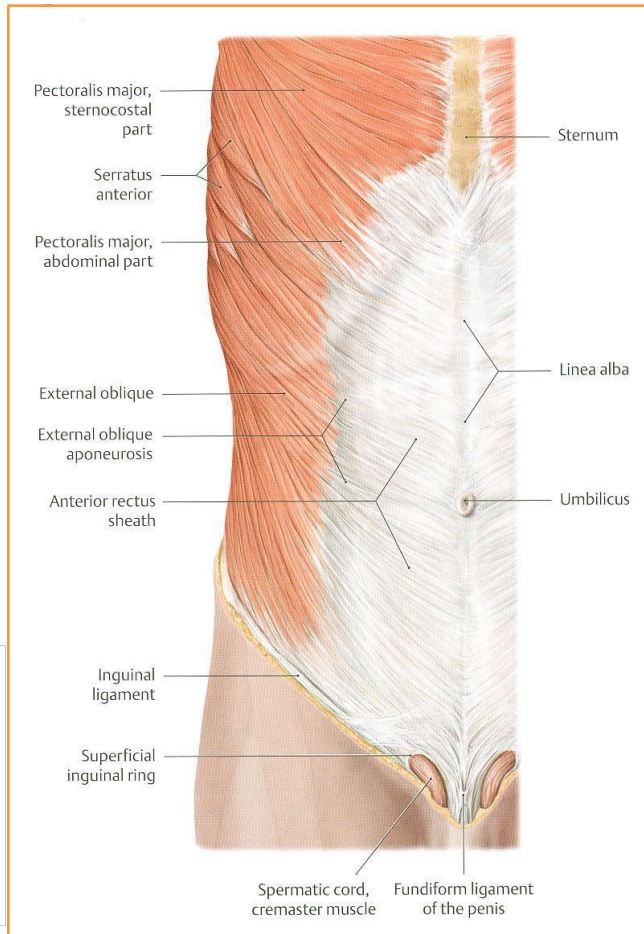
MUSCLES INVOLVED IN RESPIRATION

Action- Nerve supply



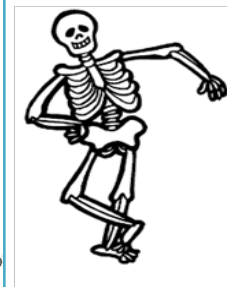
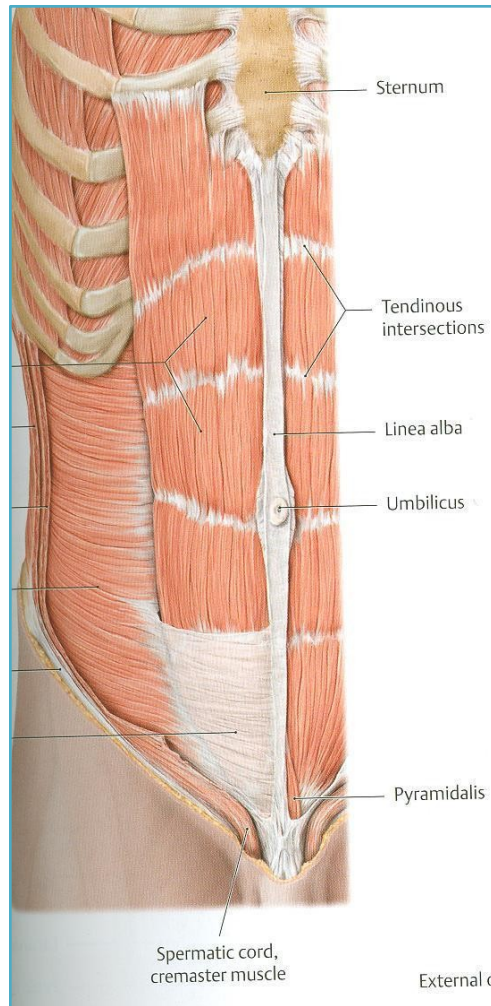
MUSCLES INVOLVED IN RESPIRATION

Action- Nerve supply



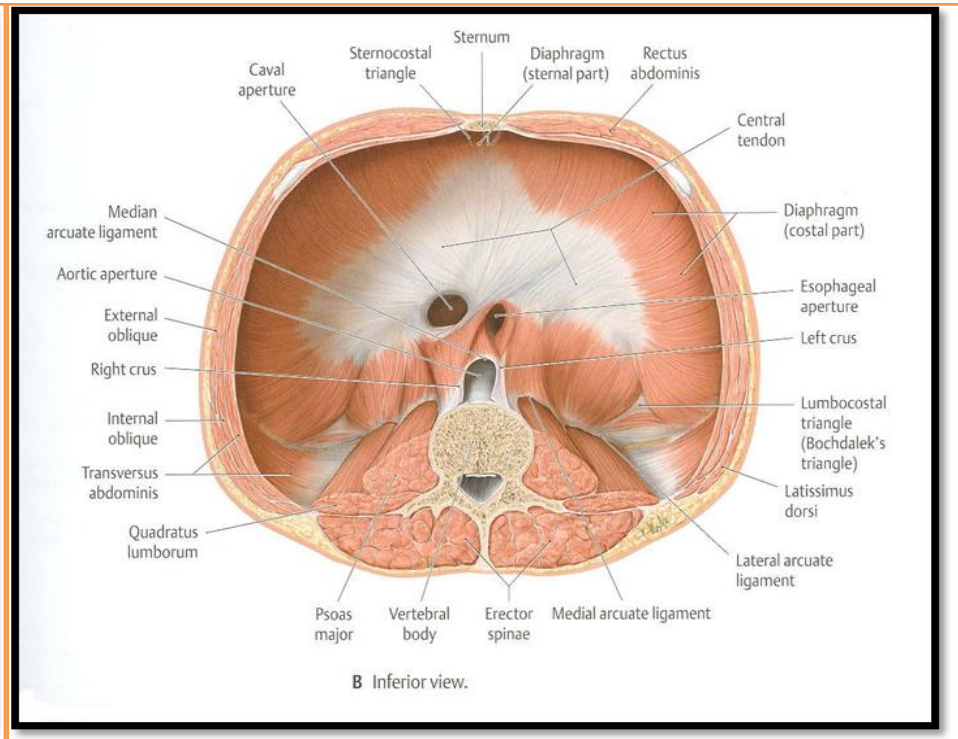
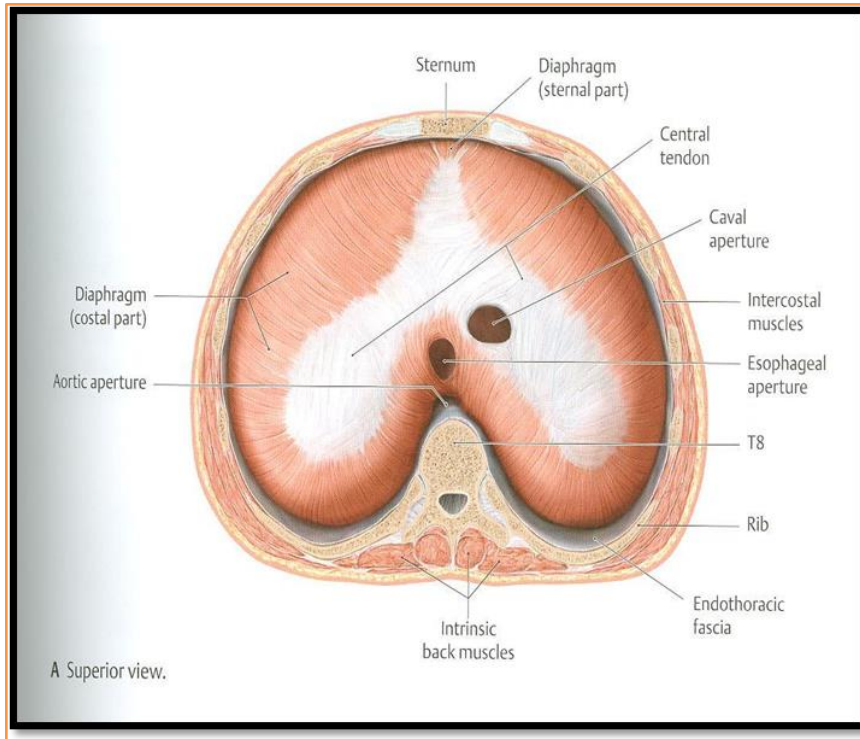
MUSCLES INVOLVED IN RESPIRATION

Action- Nerve supply



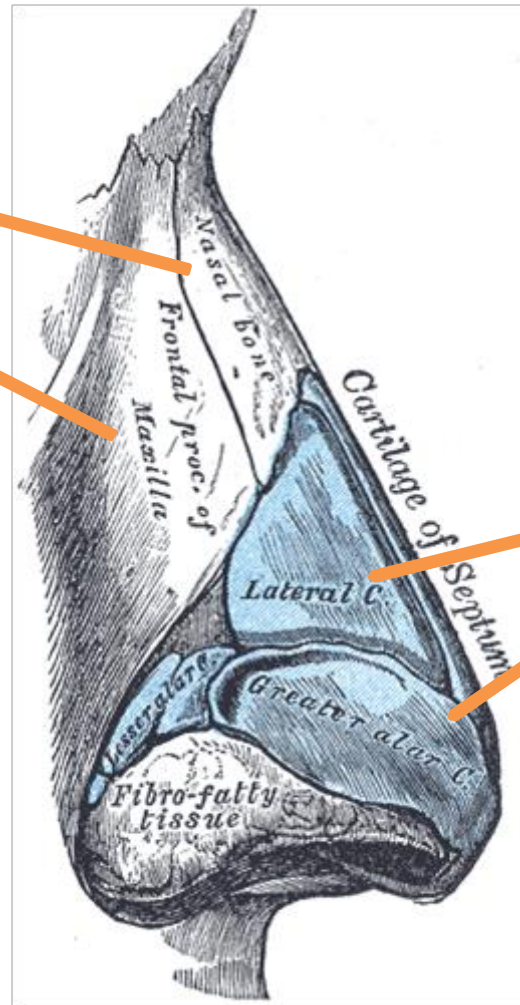
DIAPHRAGM

Action- Nerve supply



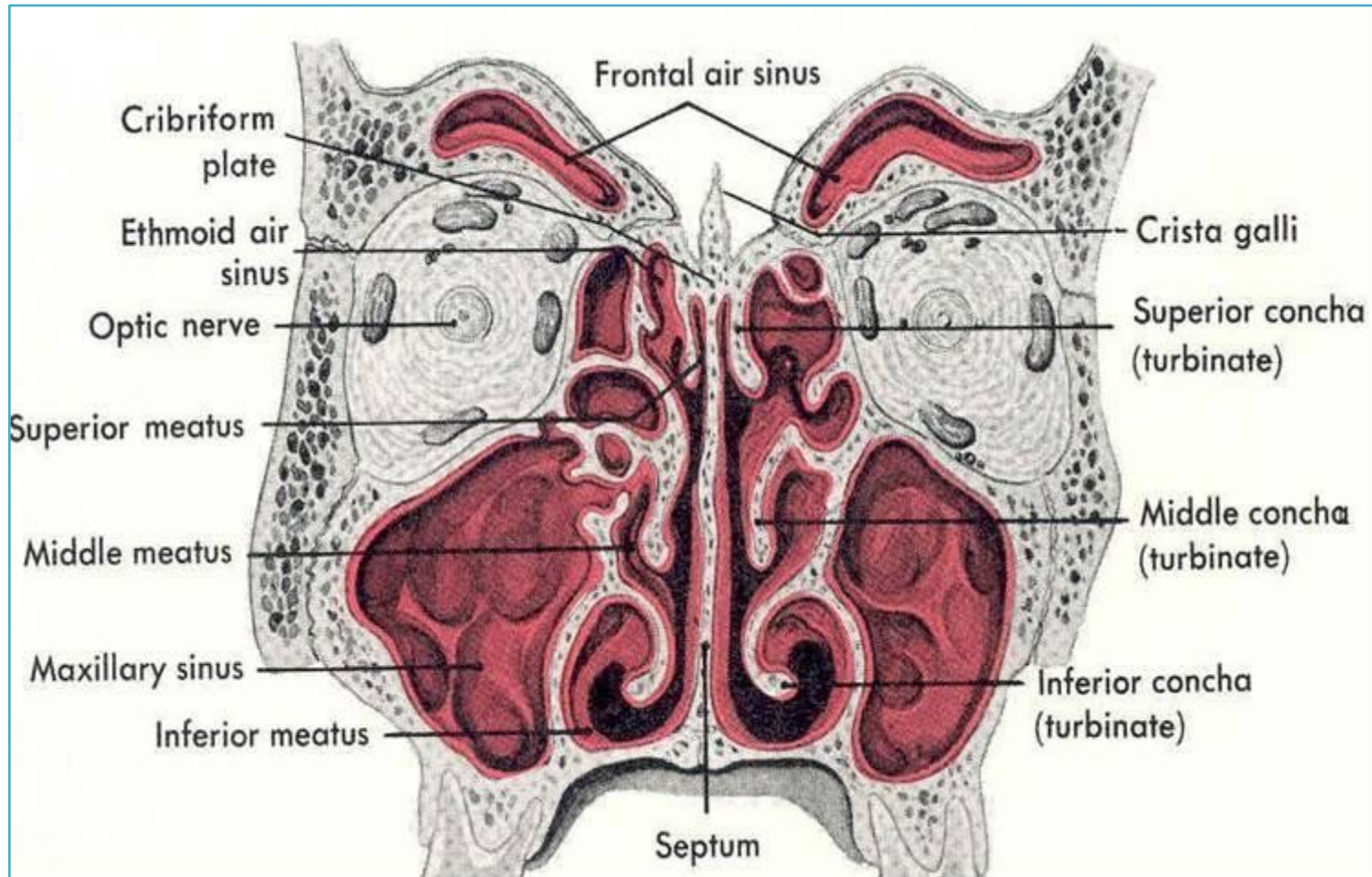
Nose

Formed
above by:
Bony
skeleton



Formed
below by
plates of
hyaline
cartilage

NASAL CAVITY



Nasal Cavity

- Extends from the external (anterior) nares to the posterior nares (choanae).
- Divided into right & left halves by the **nasal septum**.
- Each half has a:

Roof :

- Narrow & formed (from behind forward) by the:

1. **Body of sphenoid.**
2. **Cribriform plate of ethmoid bone.**
3. **Frontal bone.**
4. **Nasal bone & cartilage**

Floor :

- **Separates it from the oral cavity.**
- **Formed by the hard (bony) palate.**

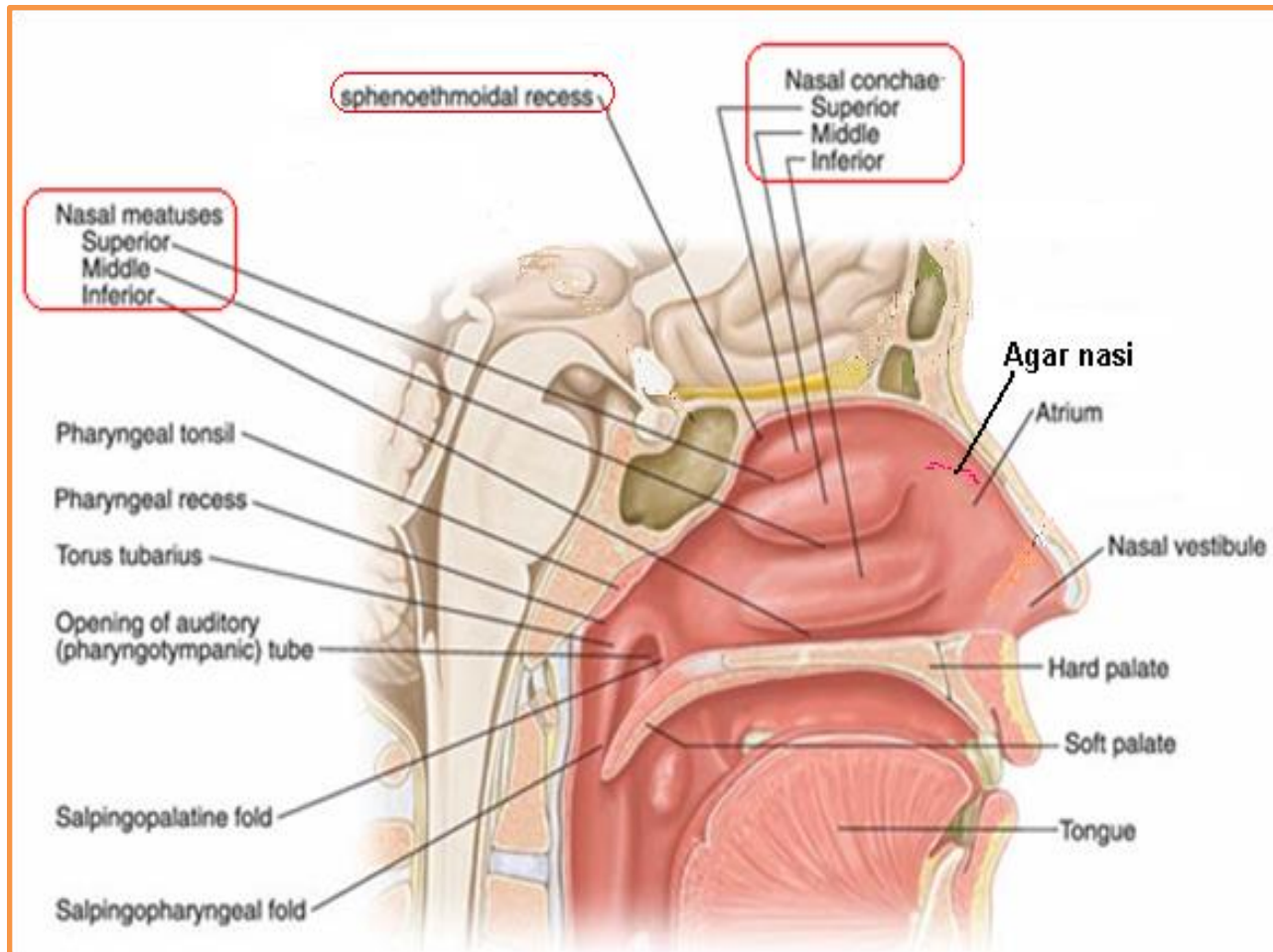
▪ Medial Wall (Nasal Septum) :

- **Osteocartilaginous partition.**
- **Formed by:**
 - 1- **Perpendicular plate of ethmoid bone.**
 - 2- **Vomer.**
 - 3- **Septal cartilage.**

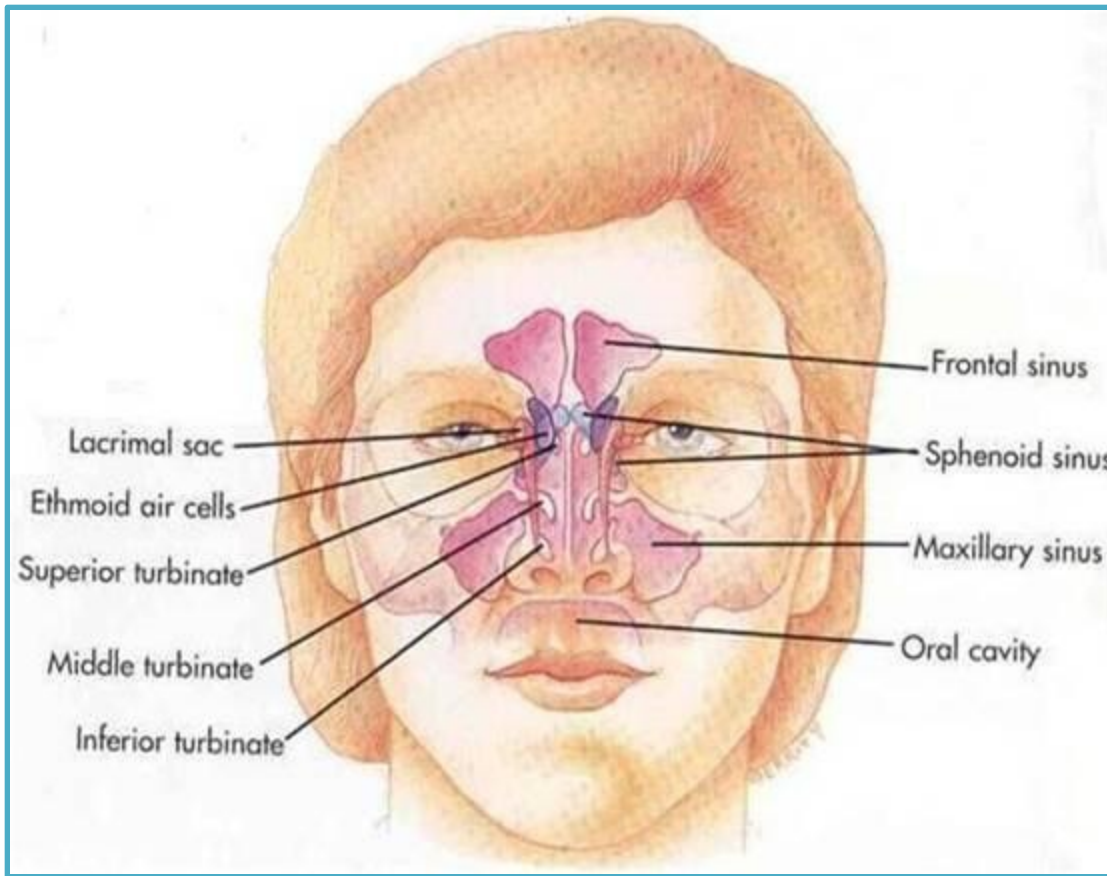
▪ Lateral Wall :

- **Shows three horizontal bony projections, the superior, middle & inferior conchae**
- **The cavity below each concha is called a meatus and are named as superior, middle & inferior corresponding to the conchae.**

NASAL CAVITY



Paranasal Sinuses



§ Air filled cavities located in the bones around the nasal cavity:

- ethmoid
- sphenoid
- frontal bones
- maxillae.

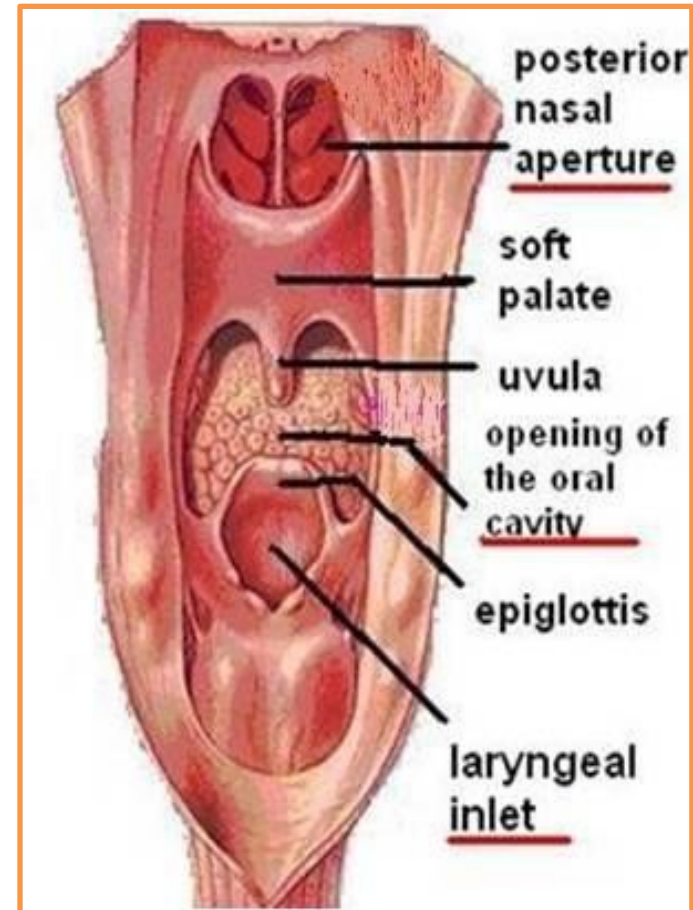
Pharynx

§ Muscular tube lying behind the nose, oral cavity & larynx.

§ Extends from the base of the skull to level of the 6th cervical vertebra, where it is continuous with the esophagus

§ The anterior wall is deficient and shows (from above downward):

- Posterior nasal apertures.
- Opening of the oral cavity.
- Laryngeal inlet.



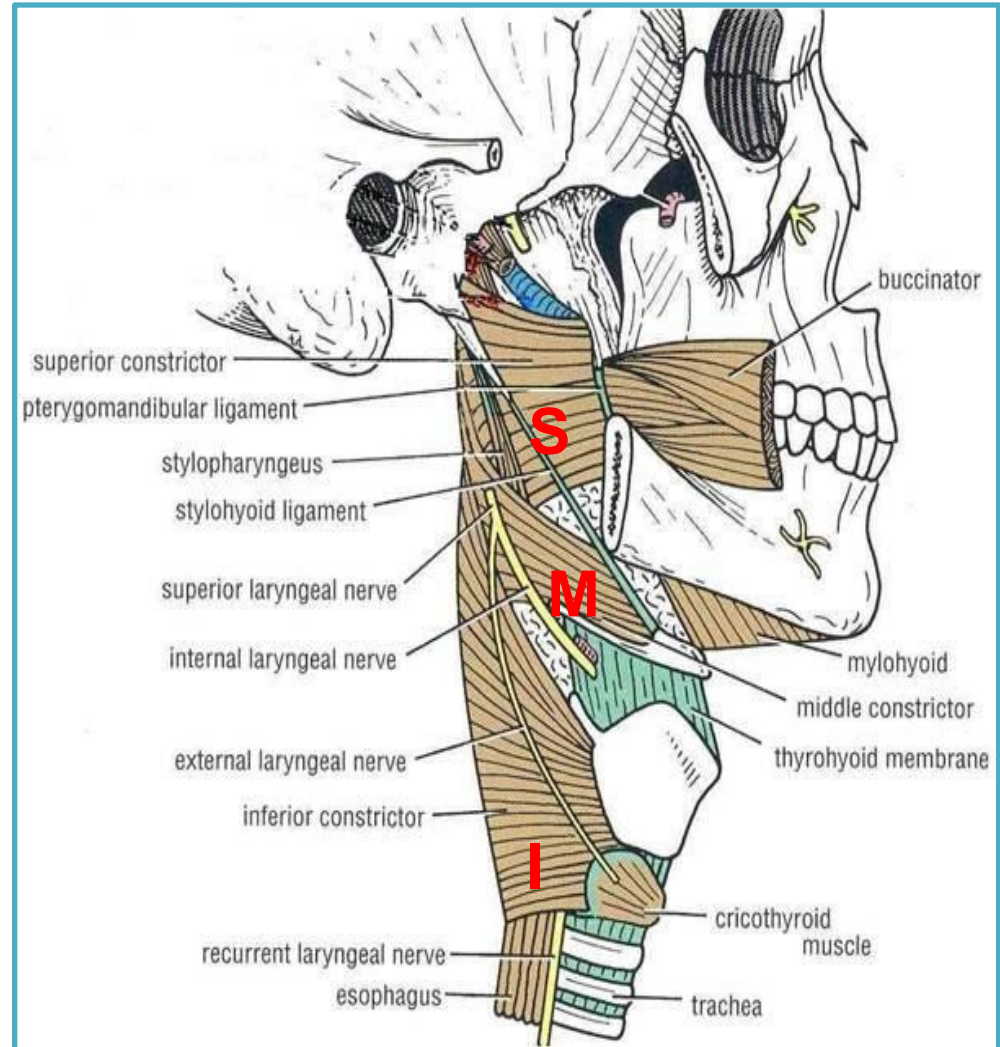
Circular (Constrictor) Muscles

§ Three in number:

- Superior constrictor,
- Middle constrictor &
- Inferior constrictor

Functions:

- Propel the bolus of food down into the esophagus.
- lower fibers of the inferior constrictor (Cricopharyngeus) act as a sphincter, preventing the entry of air into the esophagus between the acts of swallowing.



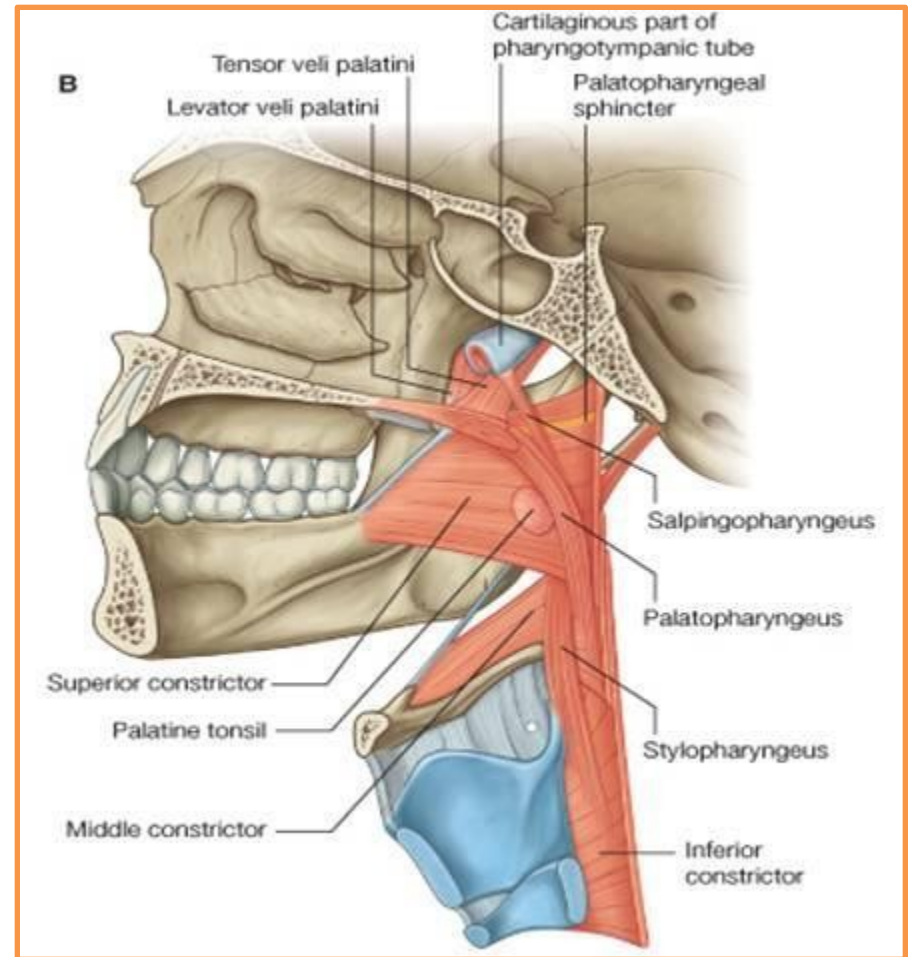
Longitudinal Muscles

§Three in number:

- Stylopharyngeus
- Salpingopharyngeus
- Palatopharyngeus

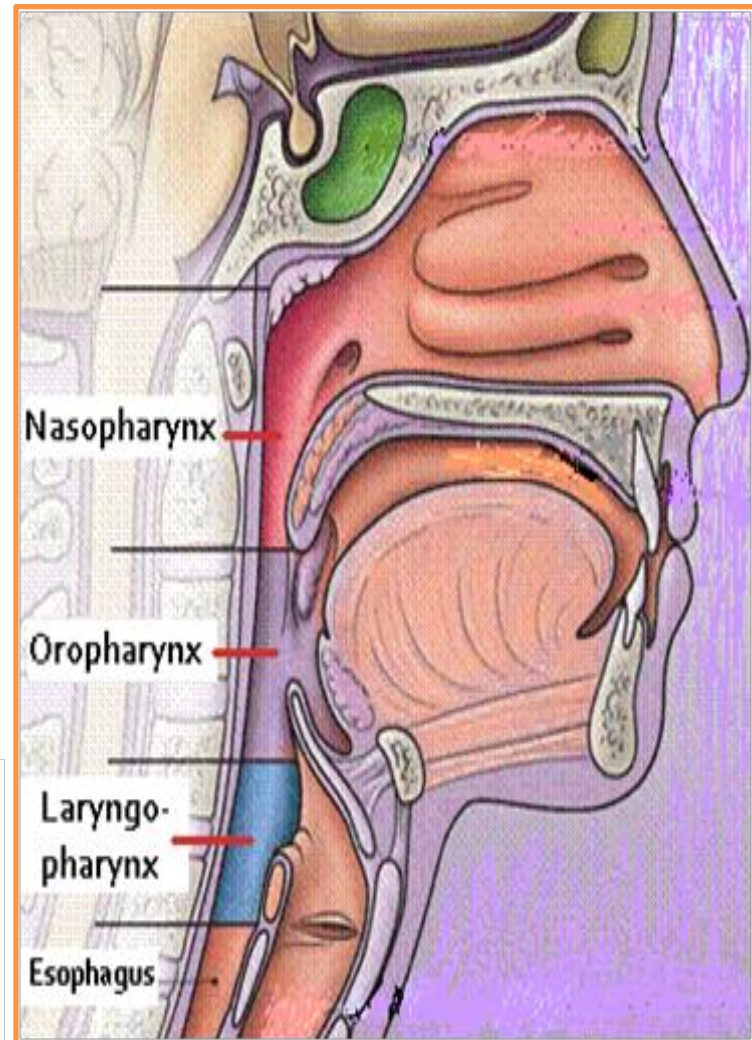
§Function:

- Elevate the larynx & pharynx during swallowing

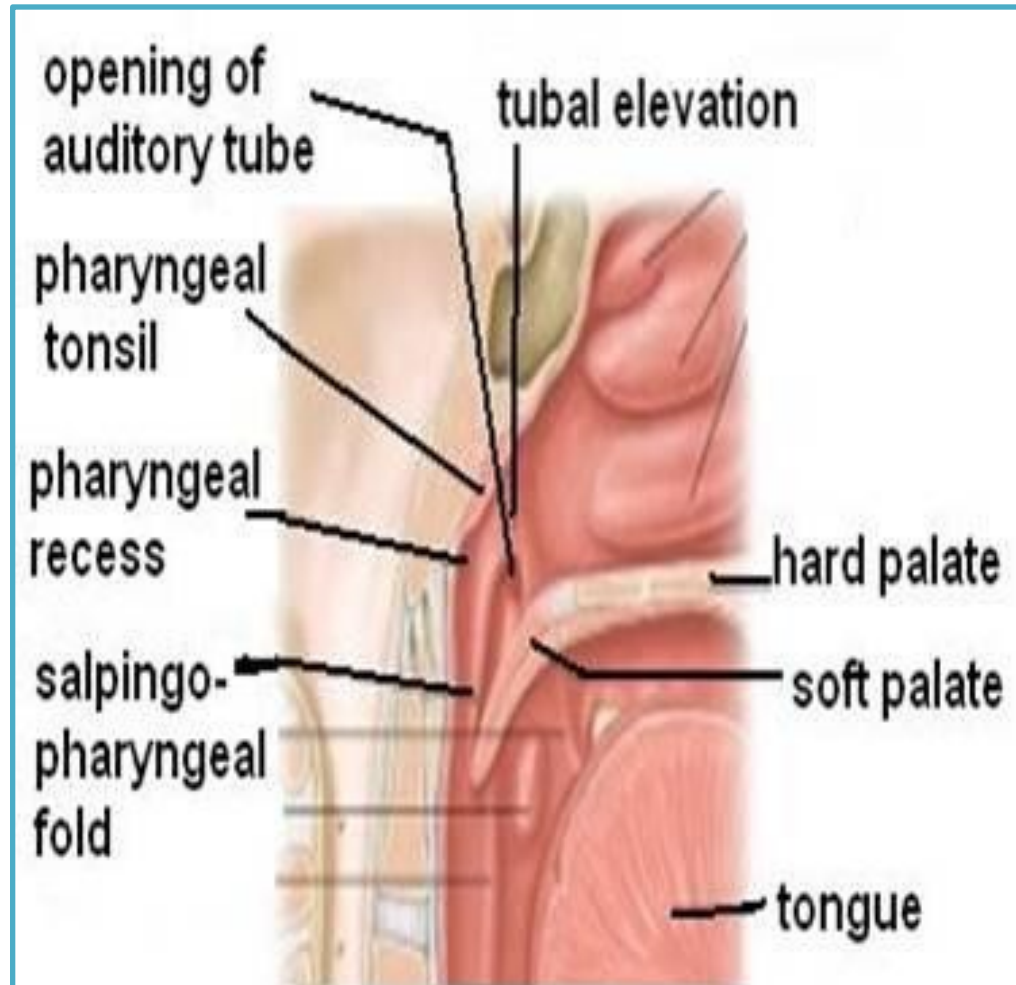


§Pharynx is divided into three parts:

- **Nasopharynx.**
- **Oropharynx.**
- **Laryngopharynx.**



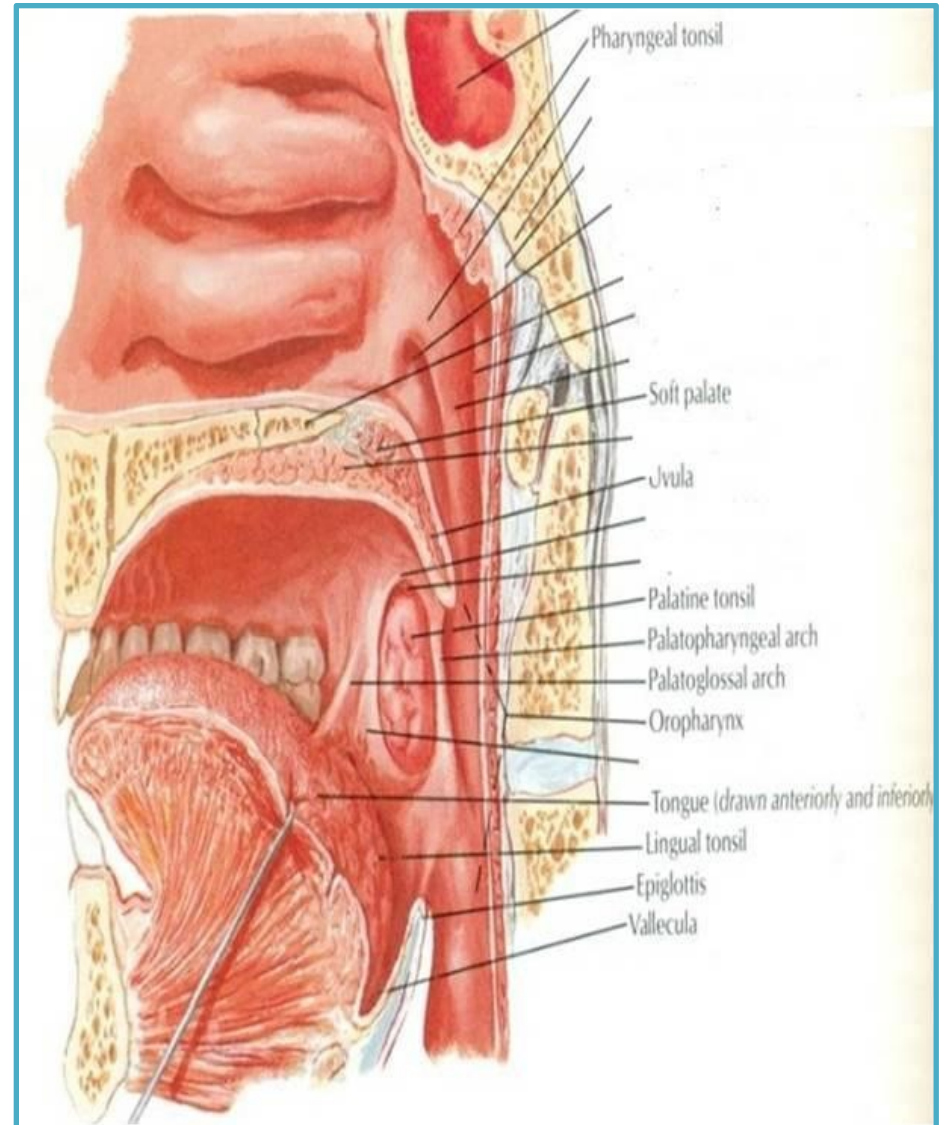
Nasopharynx



Oropharynx

Lateral wall shows:

- Palatopharyngeal fold.
- Palatoglossal fold
- Palatine tonsil located between them in a depression called the 'tonsillar fossa



LARYNX

• The cartilaginous skeleton is composed of:

1. Thyroid

2. Cricoid

3 Single

3. Epiglottis

.....

4. Arytenoid

5. Corniculate

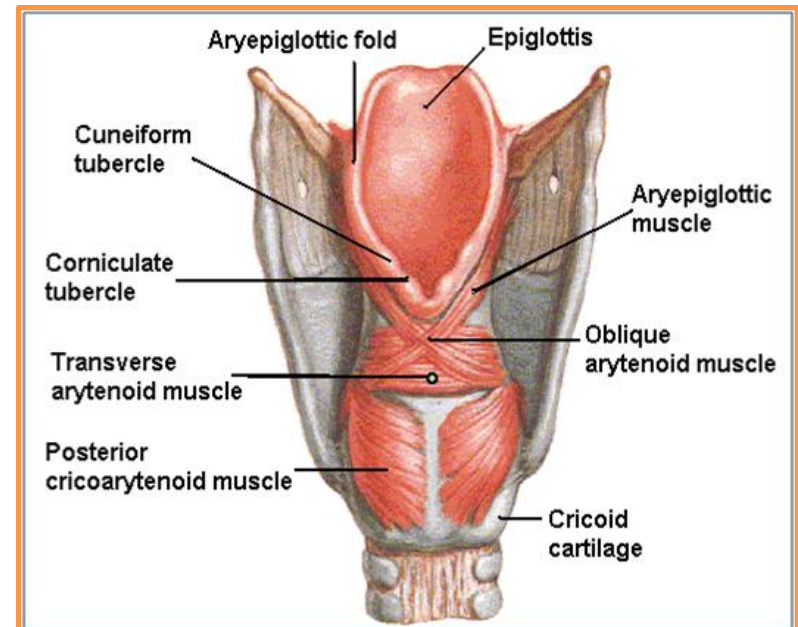
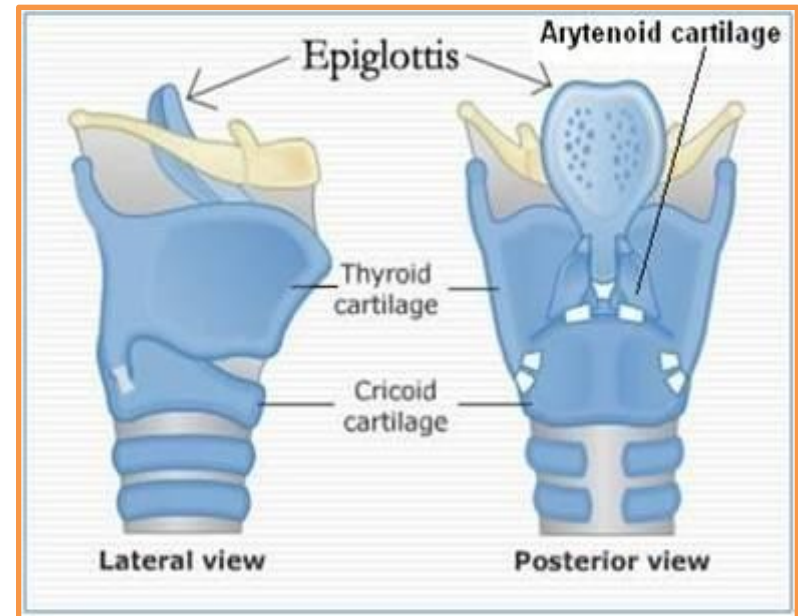
6. Cuneiform

3 Paired

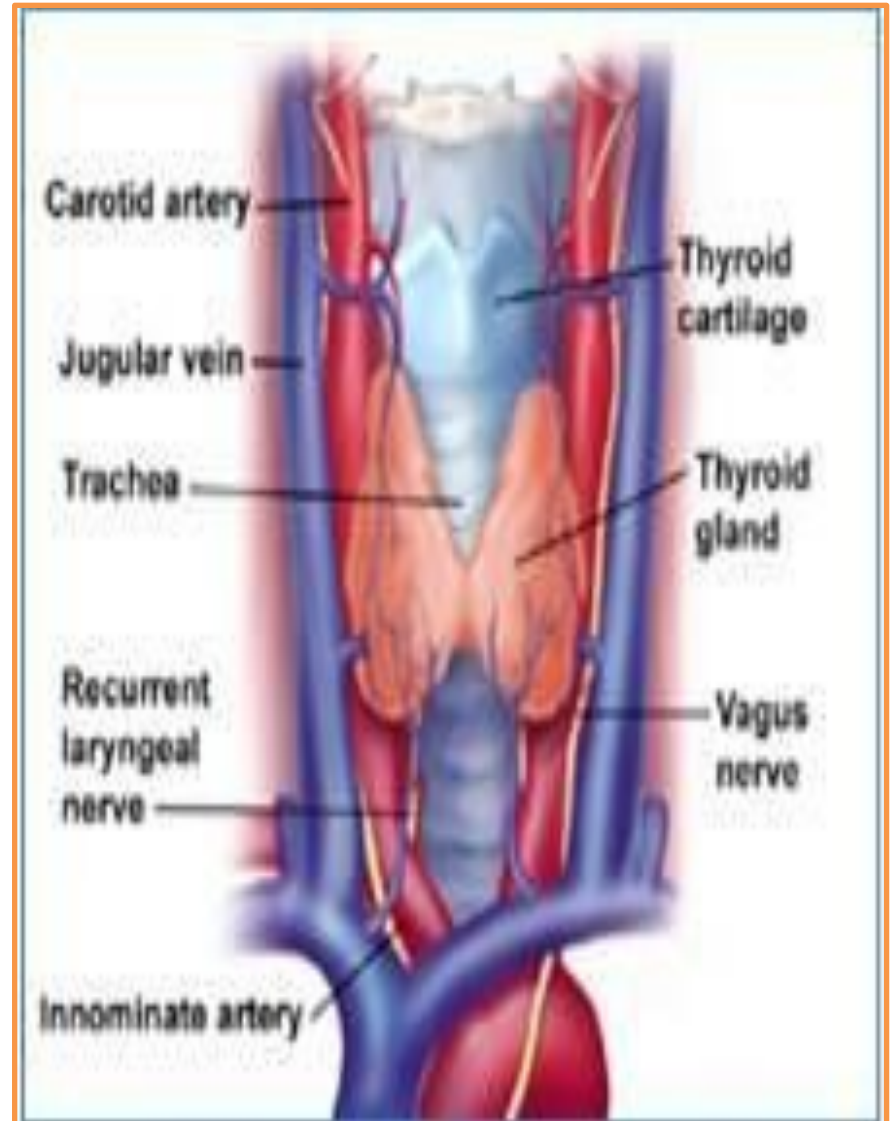
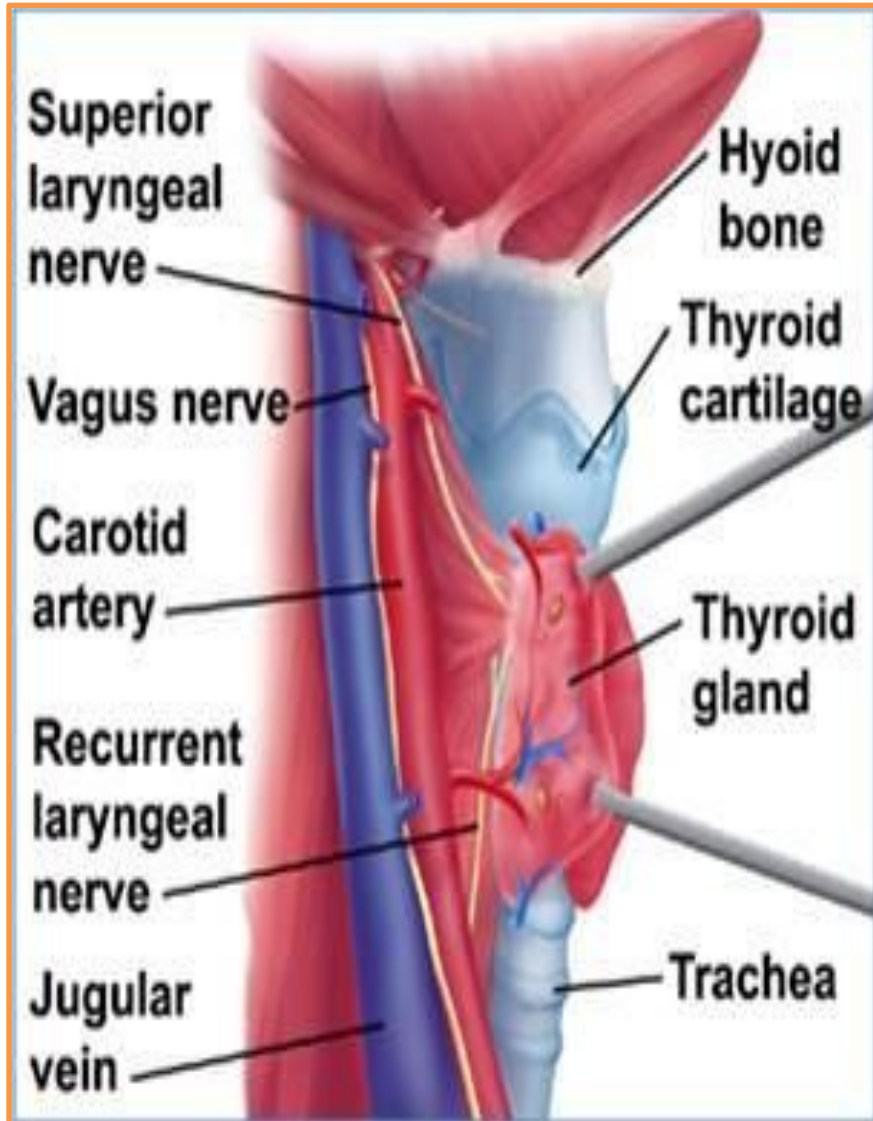
• All the cartilages, are **hyaline** except the **epiglottis** which is **Elastic** cartilage.

• The cartilages are:

- Connected by joints, membranes & ligaments.
- Moved by muscles

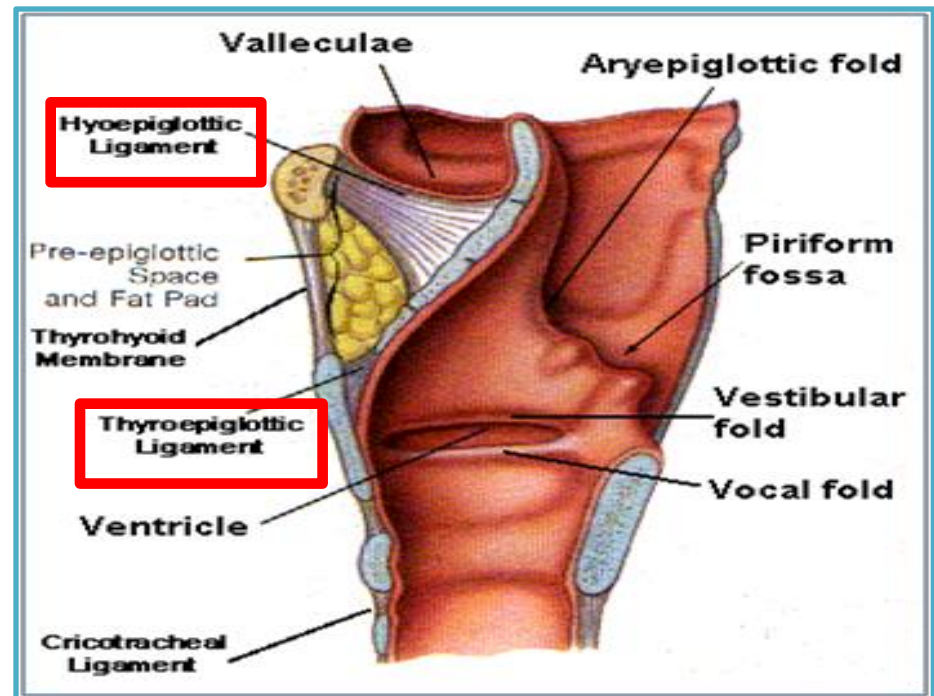
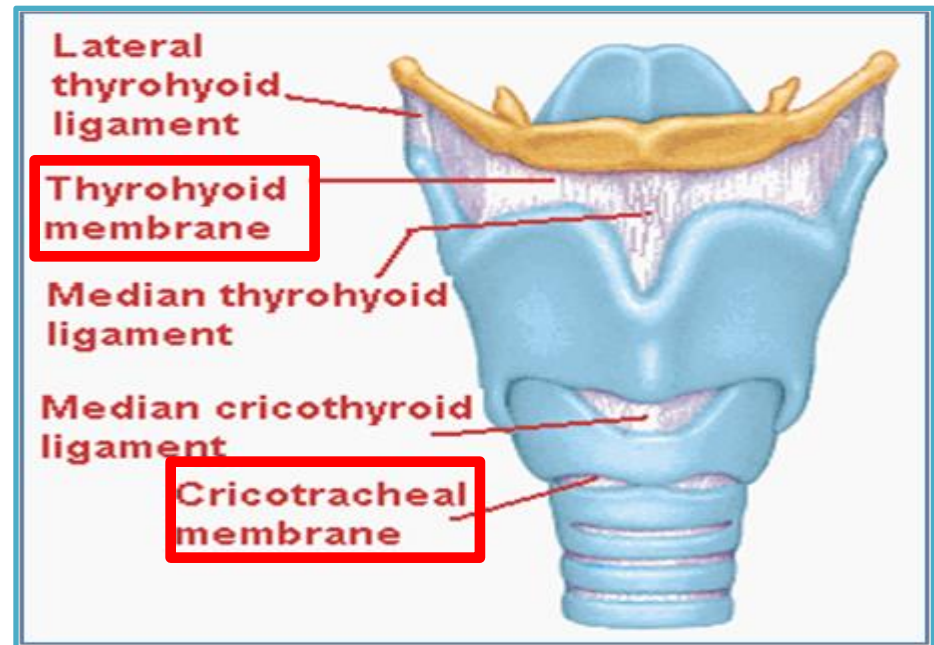


Blood vessels of larynx



LARYNX

- Thyrohyoid membrane.
- Cricothyroid membrane.
- Cricotracheal membrane
- Hyoepiglottic ligament.
- Thyroepiglottic ligament



Posteroanterior chest radiograph

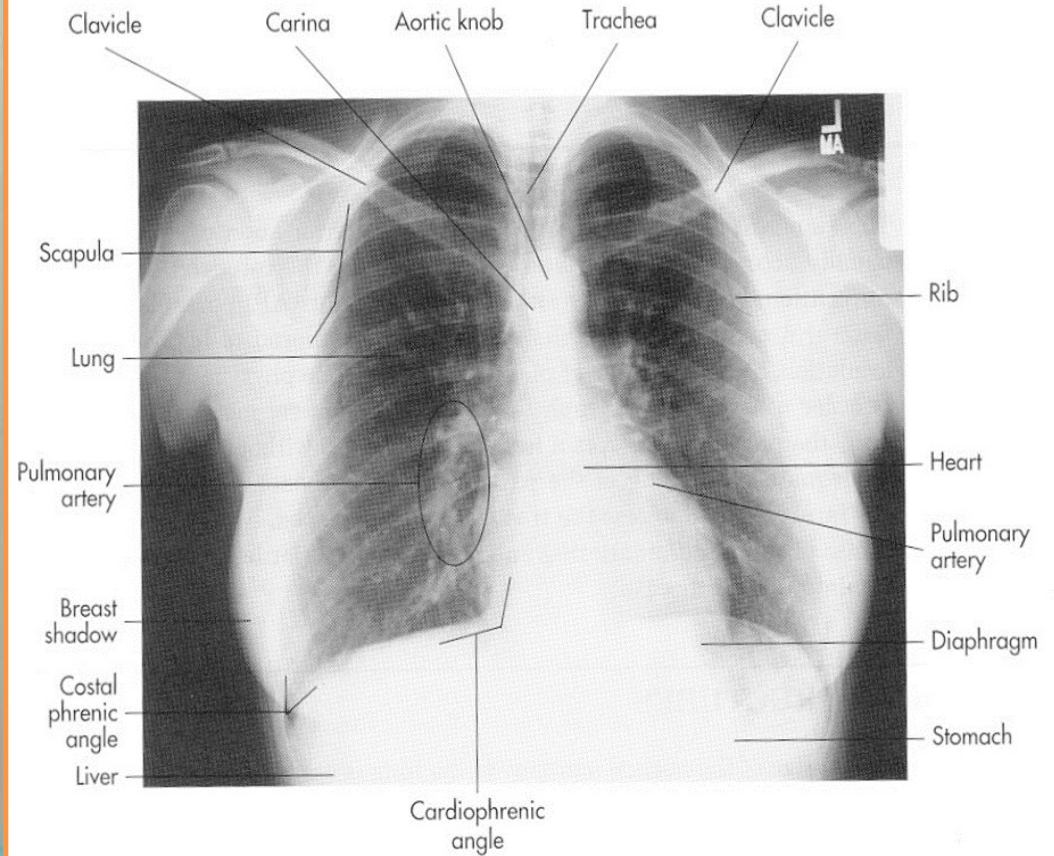
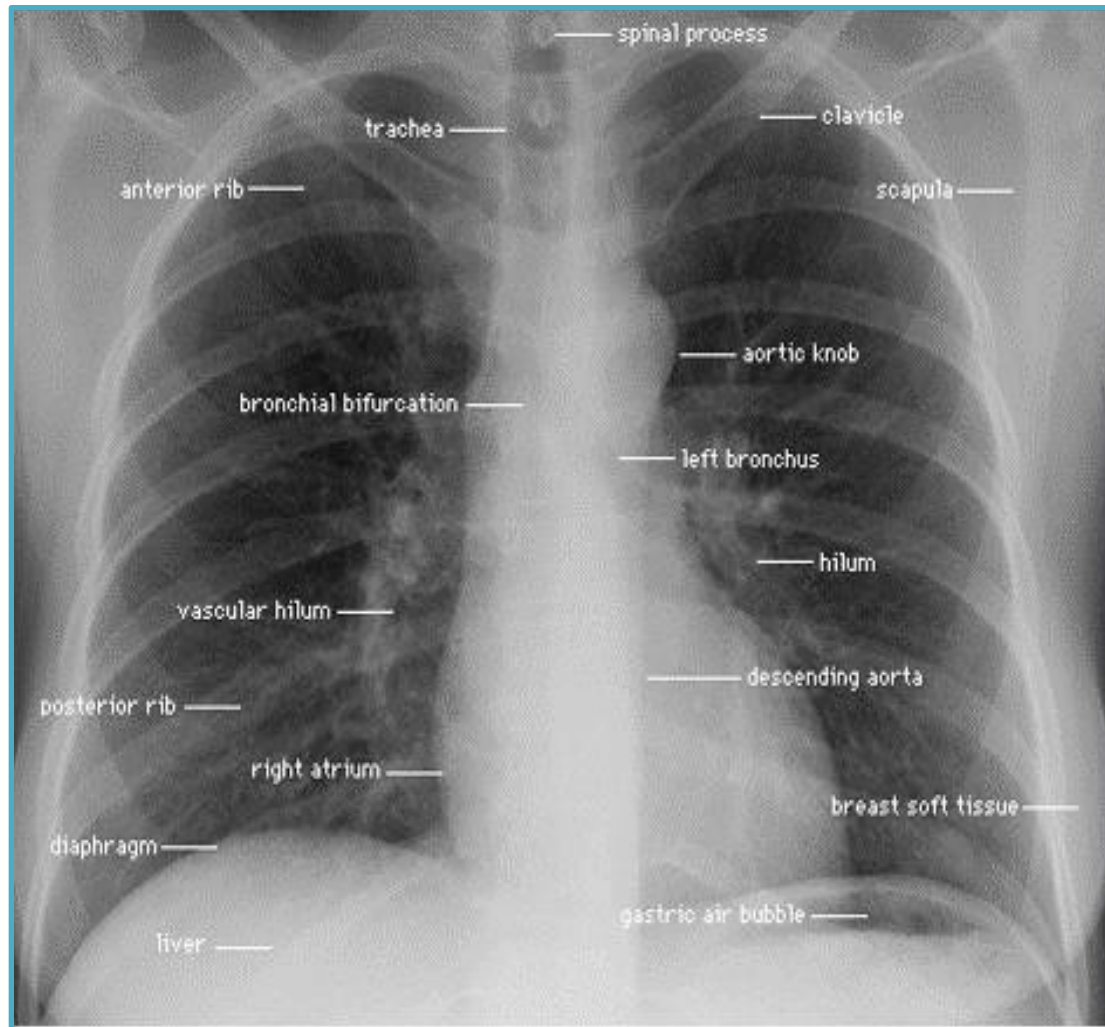
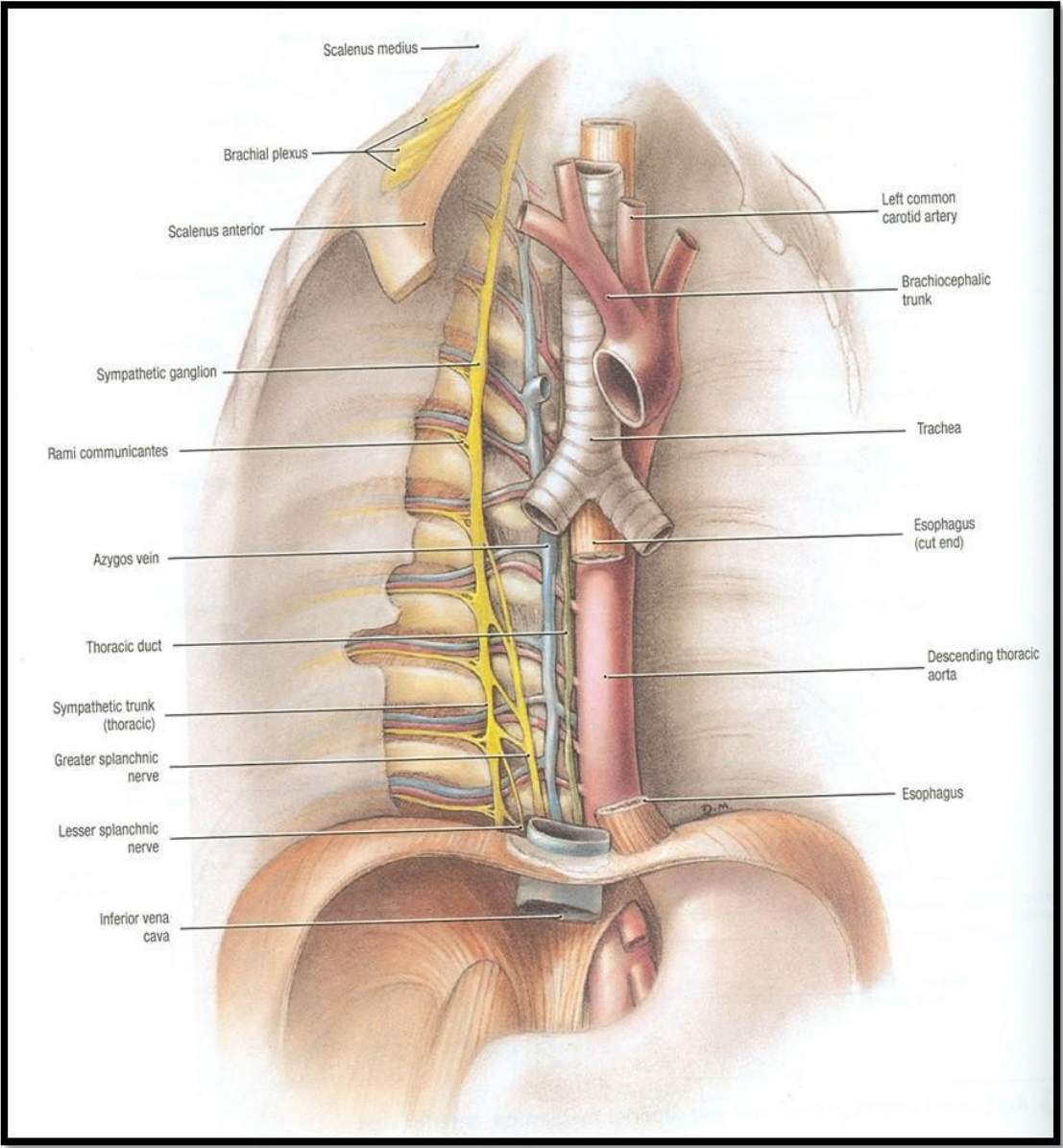
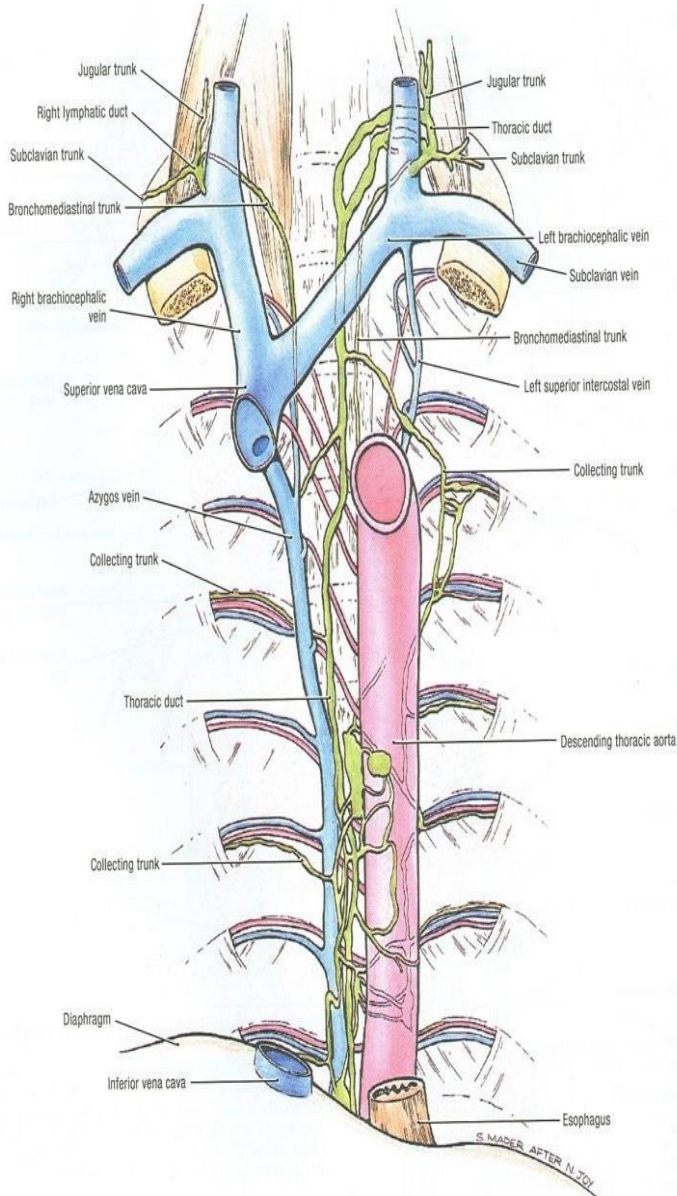


Fig. 3-1 Normal position of anatomical structures on a posterior or anterior chest radiograph.

Posteroanterior chest radiograph (Mediastinum)



Mediastinum



THORACIC DUCT

BEGINNING:

❑ It is the continuation of Cisterna Chyli (at the level of L1).

COURSE:

❑ It passes through aortic opening of diaphragm.

❑ It ascends in **Posterior mediastinum** (posterior to esophagus).

❑ It ascends in **Superior mediastinum** (to the left of esophagus).

Doctor said that he could ask you about The opening of the diaphragm . Or the relationship between the thoracic duct and mediastinum

Also , the doctor focused on the **mediastinum**

Very important, it will come in the exam.

and you should know if there a structure passing in more than one mediastinum

***next slides are from Anatomy team just to remember**

Mediastinum

The mediastinum is subdivided by a Horizontal plane (extending from the Sternal angle to the lower border of T (4)) into:

Superior mediastinum

Boundaries:

Superior: Thoracic outlet.

Inferior: Horizontal plane.

Anterior: Manubrium.

Posterior: Upper (4) thoracic vertebrae.

Superficial: thymus gland ,Three veins: L&R brachiocephalic veins and the Superior vena cava

Intermediate: Arch of aorta & its three branches:

Brachiocephalic artery ,L common carotid artery ,

L Subclavian artery

Nerves: : Phrenic and Vagus

Deep: Trachea , Esophagus and Thoracic Duct

Inferior mediastinum

Middle mediastinum: contains Heart

Anterior mediastinum: in front of Heart

Posterior mediastinum: behind Heart

Anterior Mediastinum

Boundaries:

Superior: Horizontal plane
Inferior: Diaphragm
Anterior: Body & xiphoid process of sternum
Posterior: Heart
Lateral: Lungs & pleurae

Contents:

Thymus gland
Lymph nodes

Middle Mediastinum

Site:

Between anterior & posterior mediastina

Contents:

1. Heart & pericardium
2. Ascending Aorta
3. Pulmonary trunk
4. Superior & Inferior vena cava
5. Right & left pulmonary veins
6. Right & left phrenic nerves
7. Lymph nodes

Posterior Mediastinum

Boundaries:

Superior: Horizontal plane
Inferior: Diaphragm
Anterior: Heart
Posterior: Thoracic vertebrae from T5 -T12
Lateral: Lungs & pleurae

Contents:

1. Esophagus,
2. Azygos system of veins, posterior & to the right of esophagus
3. R & L Thoracic Sympathetic trunks,
4. Mediastinal lymph nodes
5. Vagus nerves
6. Thoracic duct: (posterior to esophagus).
7. Descending aorta: posterior & to the left of esophagus

PHRENIC NERVES

Root Value:

C3,4,5

They pass through the Superior & Middle mediastina

Course in Thorax:

The **right phrenic** descends on the right side of SVC & heart.

The **left phrenic** descends on the left side of heart

Both nerves terminate in the diaphragm

Branches :

- 1) Motor & Sensory fibers to Diaphragm
- 2) Sensory fibers to pleurae & pericardium

VAGUS NERVE

Root Value:

It is the 10th cranial nerve.

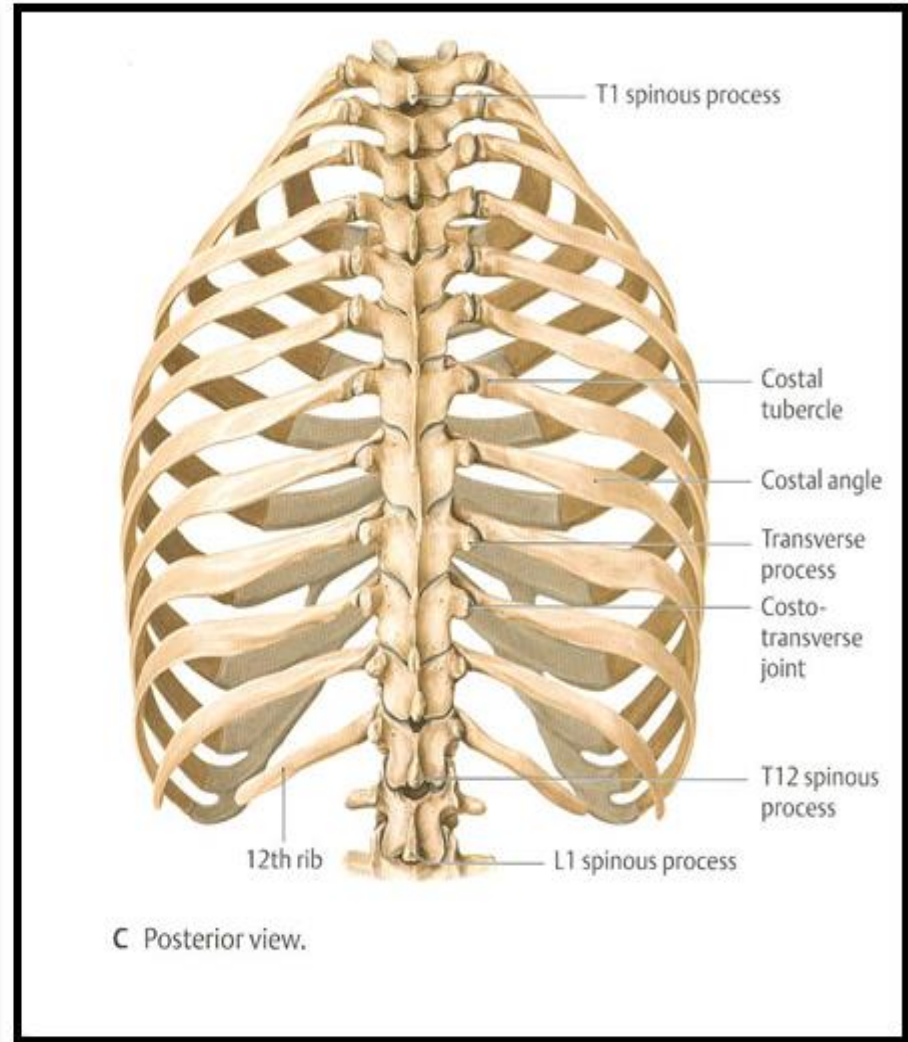
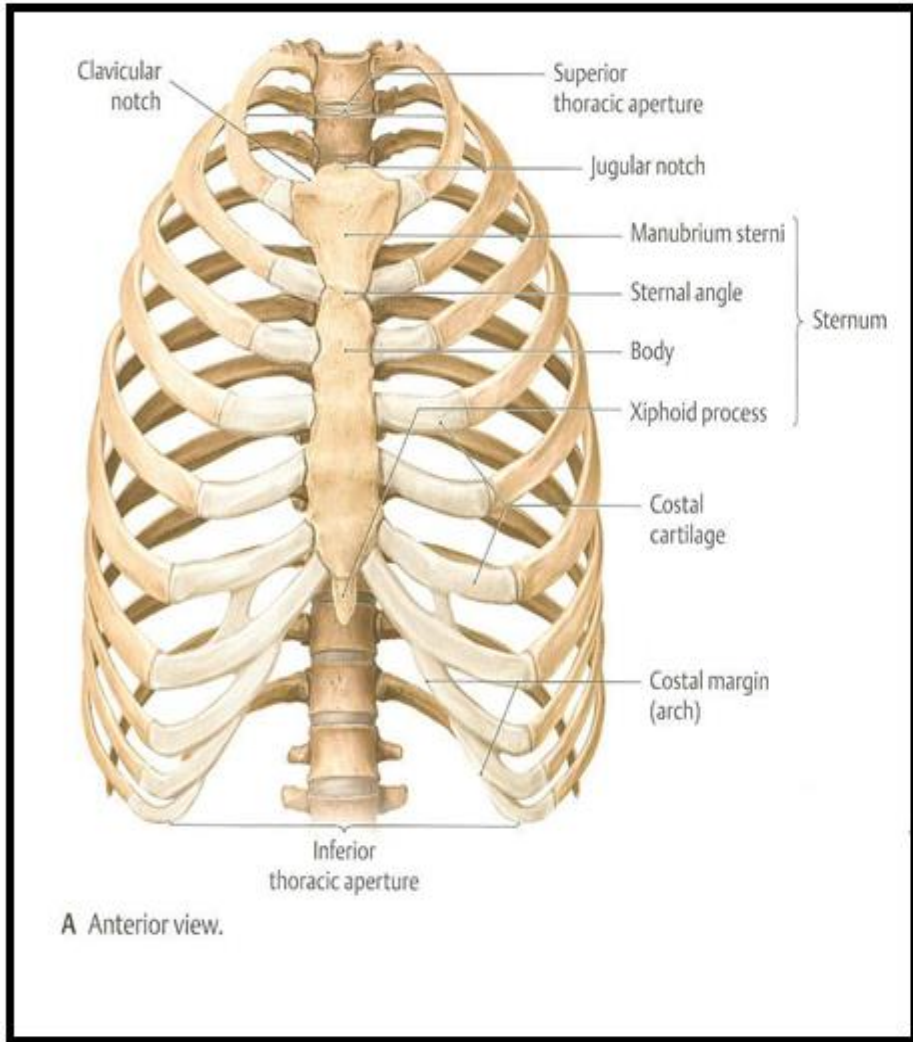
It descends through the Superior & Posterior mediastina

Course:

The **right vagus** descends to the right side of trachea, forms the **posterior esophageal plexus** & continues in abdomen as **posterior gastric nerve**.

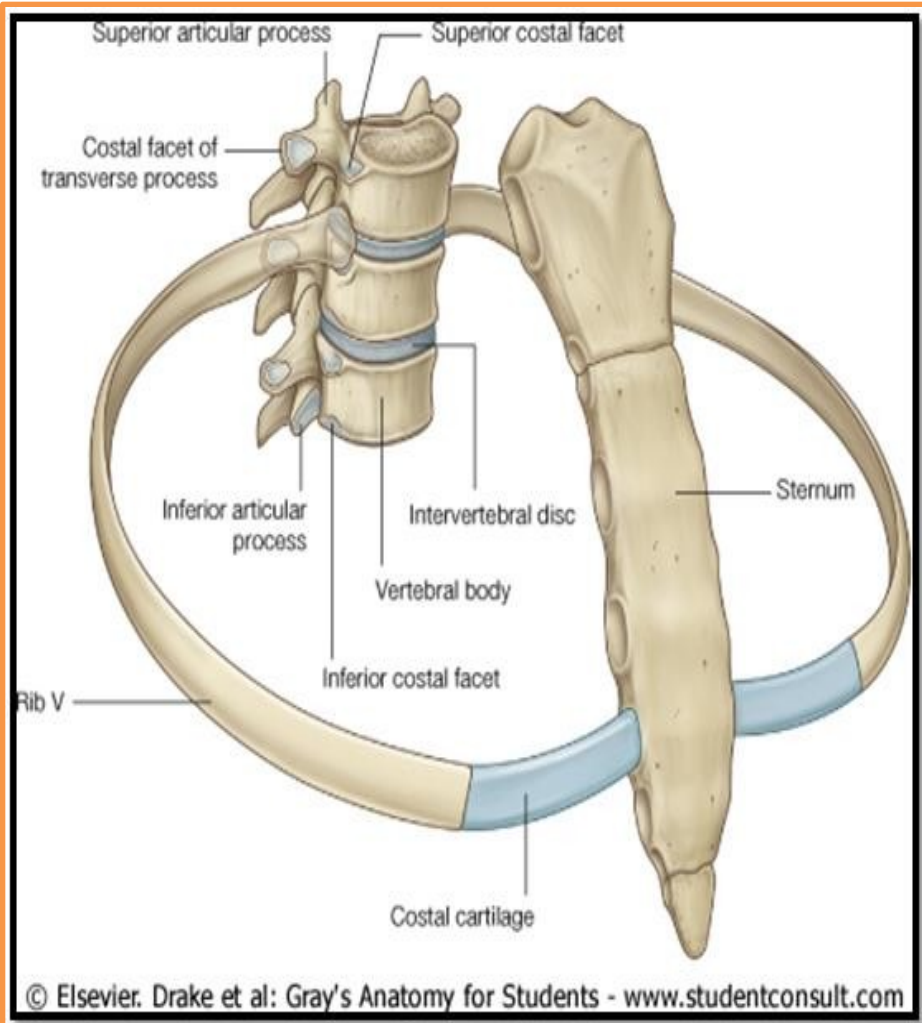
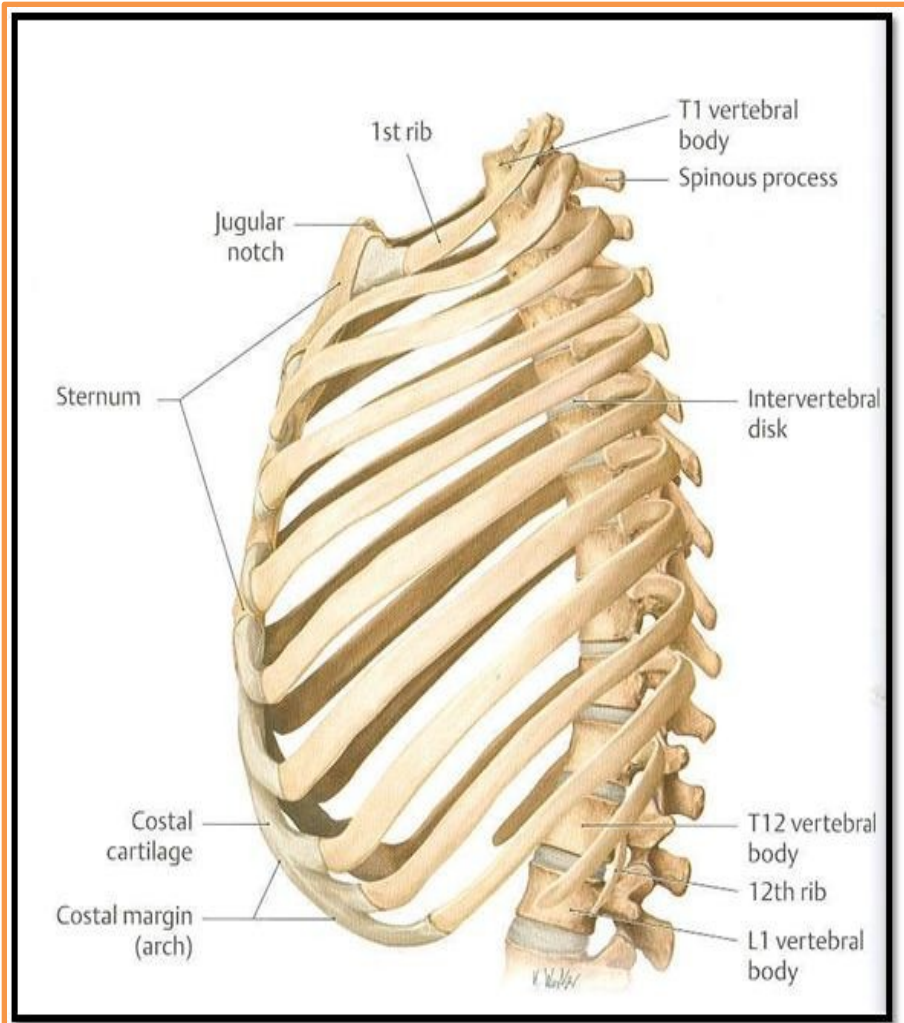
The **left vagus** descends between left common carotid & left subcalavian arteries, forms the **anterior esophageal plexus** & continues in abdomen as **anterior gastric nerve**.

Thoracic cage

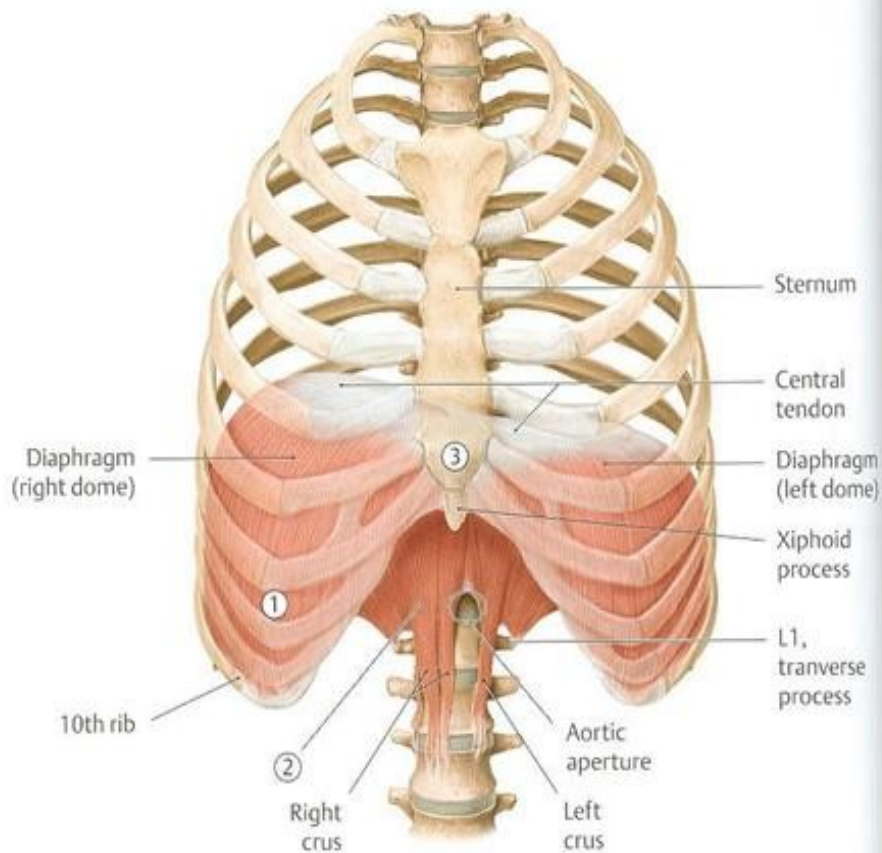


Note :Thoracic cage is conical in shape and contains two apertures (above and below)

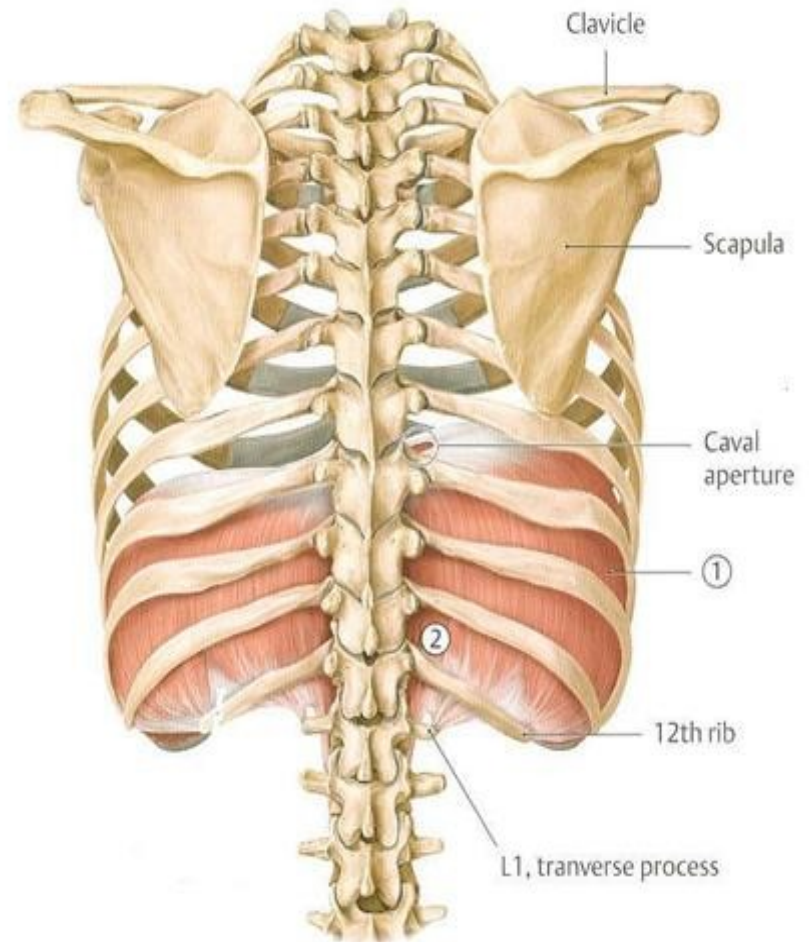
Articulations



origin of diaphragm



A Anterior view.



Note : caval aperture of diaphragm muscle is associated with inferior vena cava while aortic aperture is associated with abdominal aorta. This muscle is supplied by phrenic nerve and its root c3,4,5.

apertures through the diaphragm

(opening of diaphragm)

1. Vena caval hiatus (vena caval foramen)

Lies in the central tendon of the diaphragm at the level of T8 and transmits the IVC and occasionally the phrenic nerve.

2. Esophageal hiatus

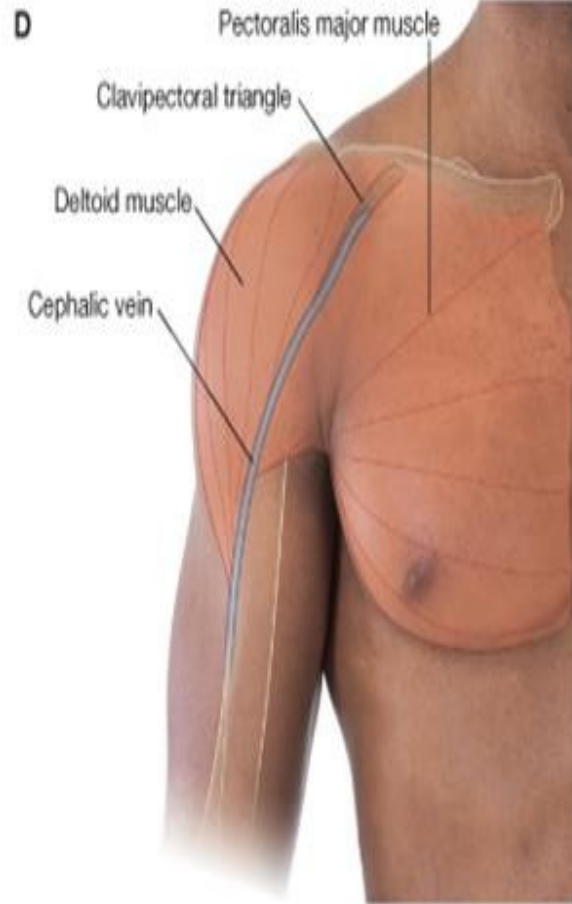
Lies in the muscular part of the diaphragm (right crus) at the level of T10 and transmits the esophagus and anterior and posterior trunks of the vagus nerves.

3. Aortic hiatus

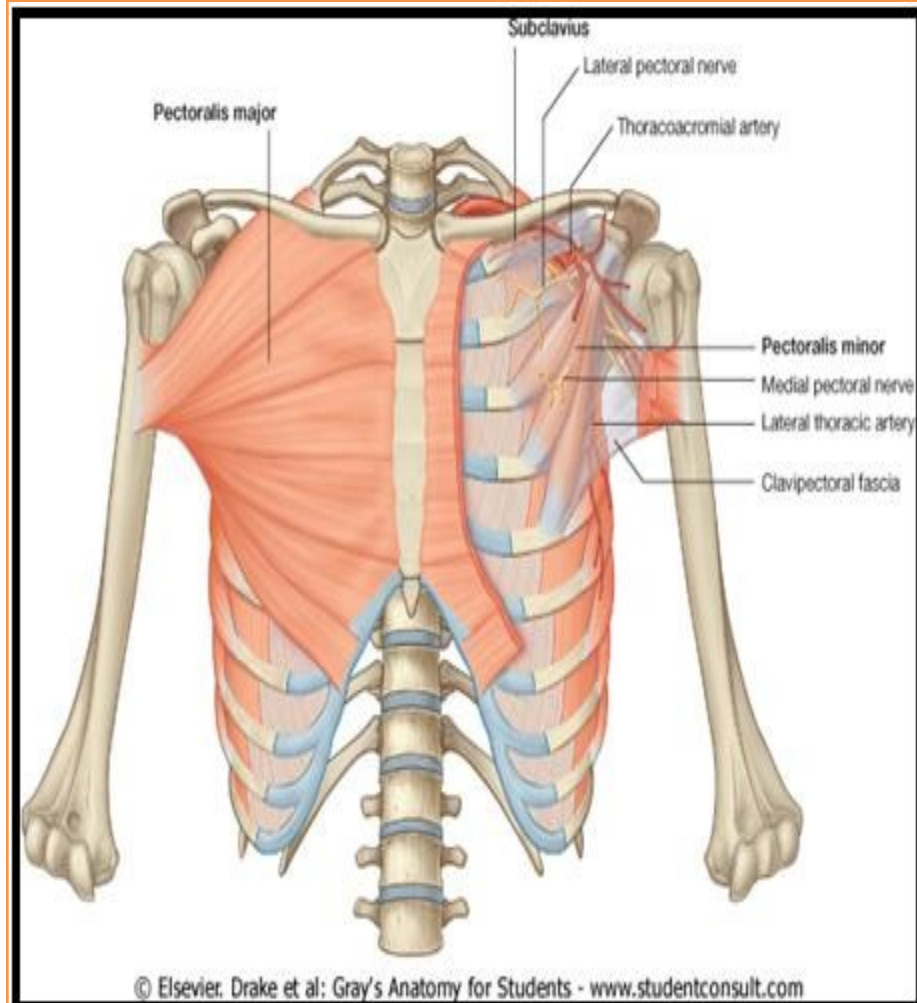
Lies behind or between two crura at the level of T12 and transmits the aorta, thoracic duct, azygos vein, and occasionally greater splanchnic nerve.

Doctor said it is important to know the opening of diaphragm and structures passing through it.

pectoralis major



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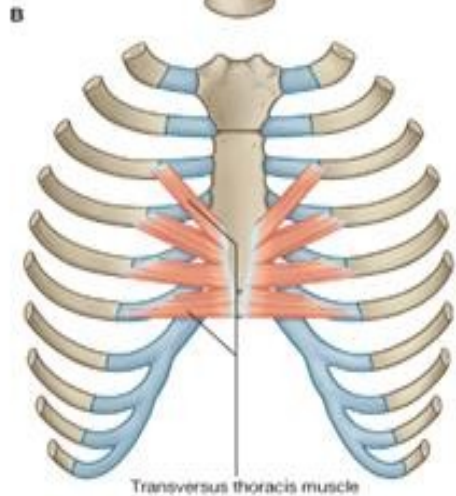
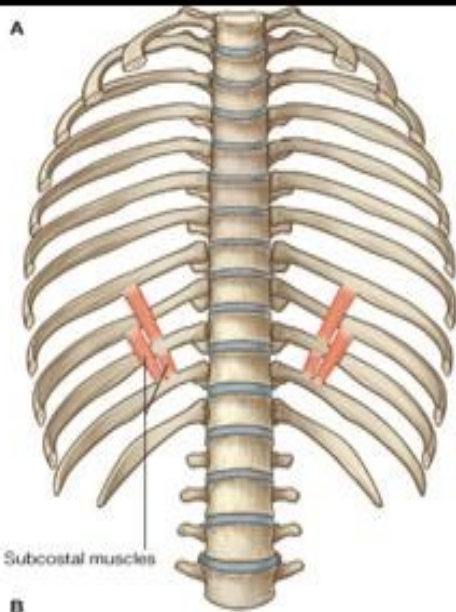


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Note : pectoralis major connects thoracic cage with humerus,so it plays role in deep inspiration



Rin depressor muscles

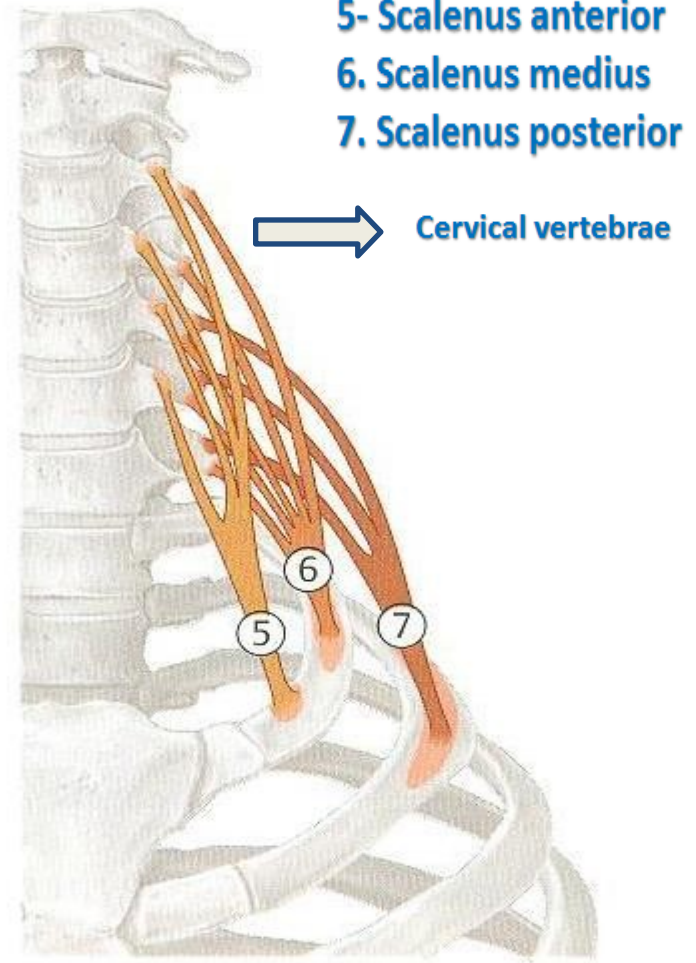


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nerve : ventral rami of intercostal nerve (T1-T11)

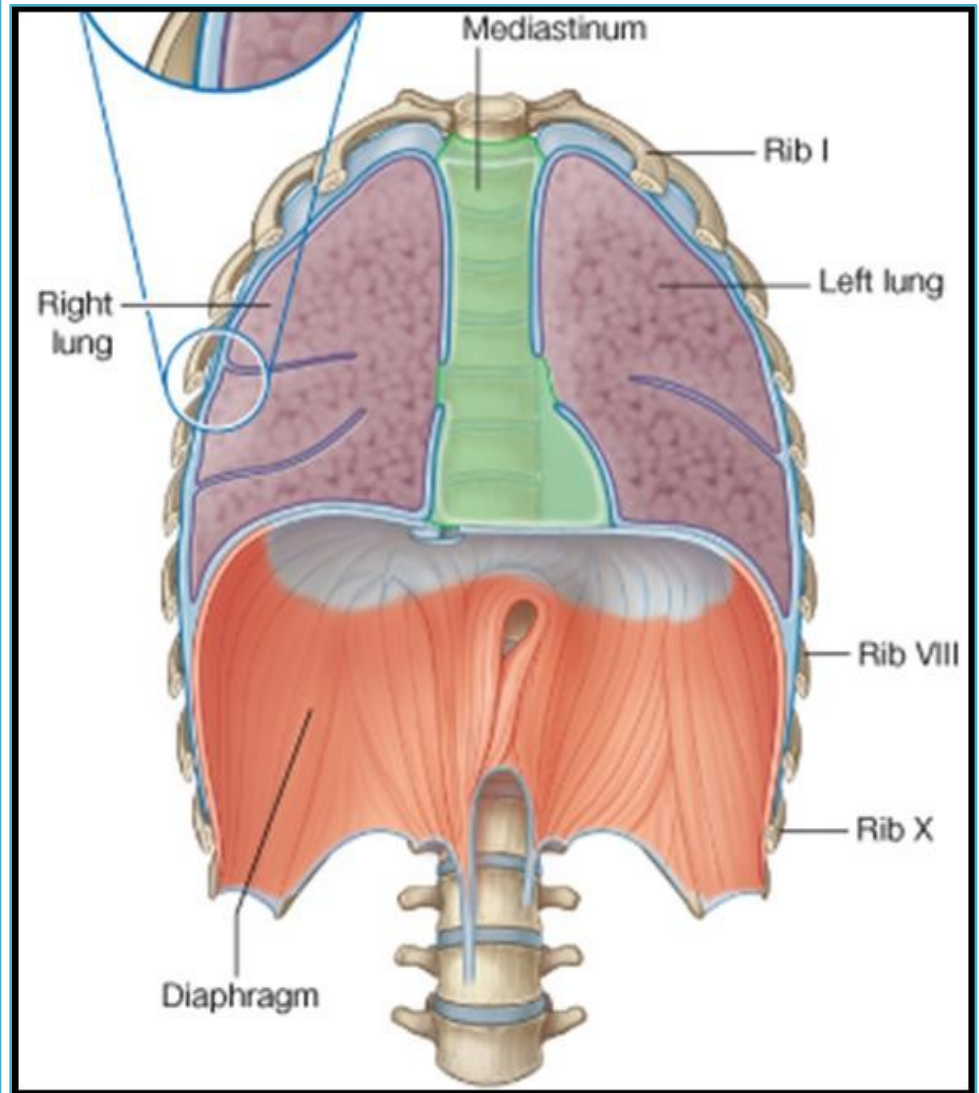
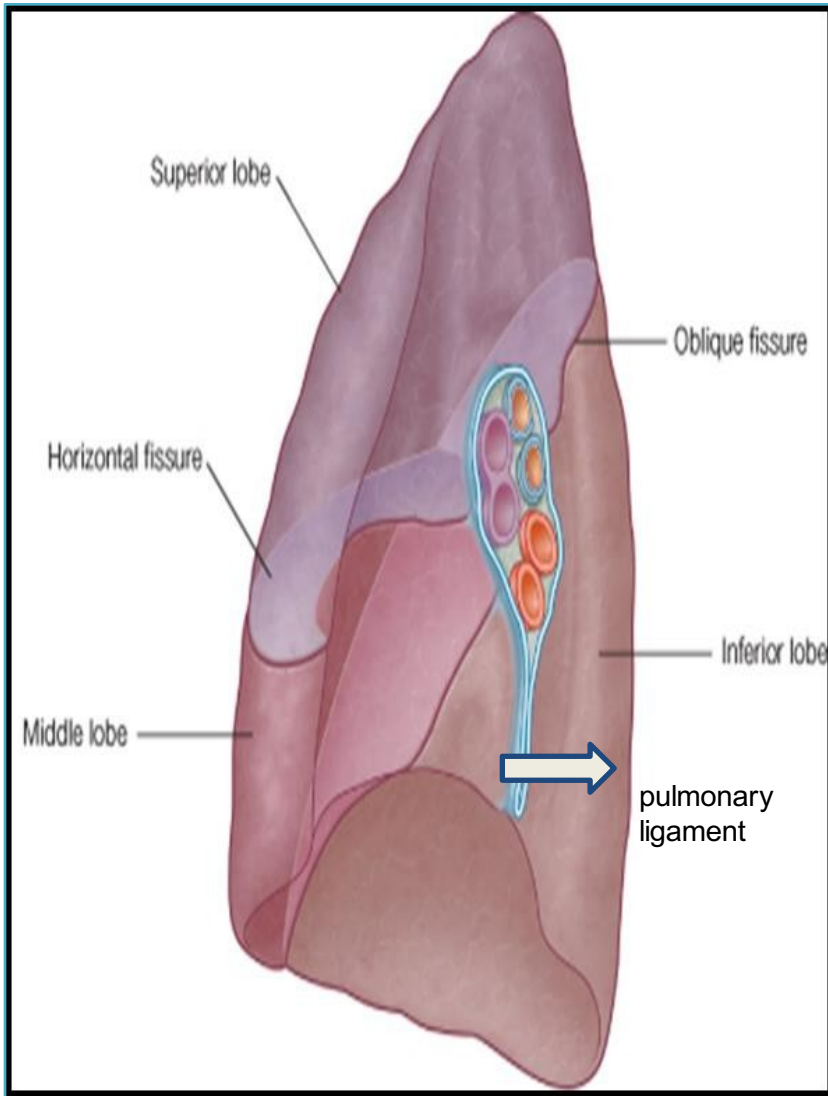
Scalene muscles

Action : elevate first and second ribs during deep inspiration



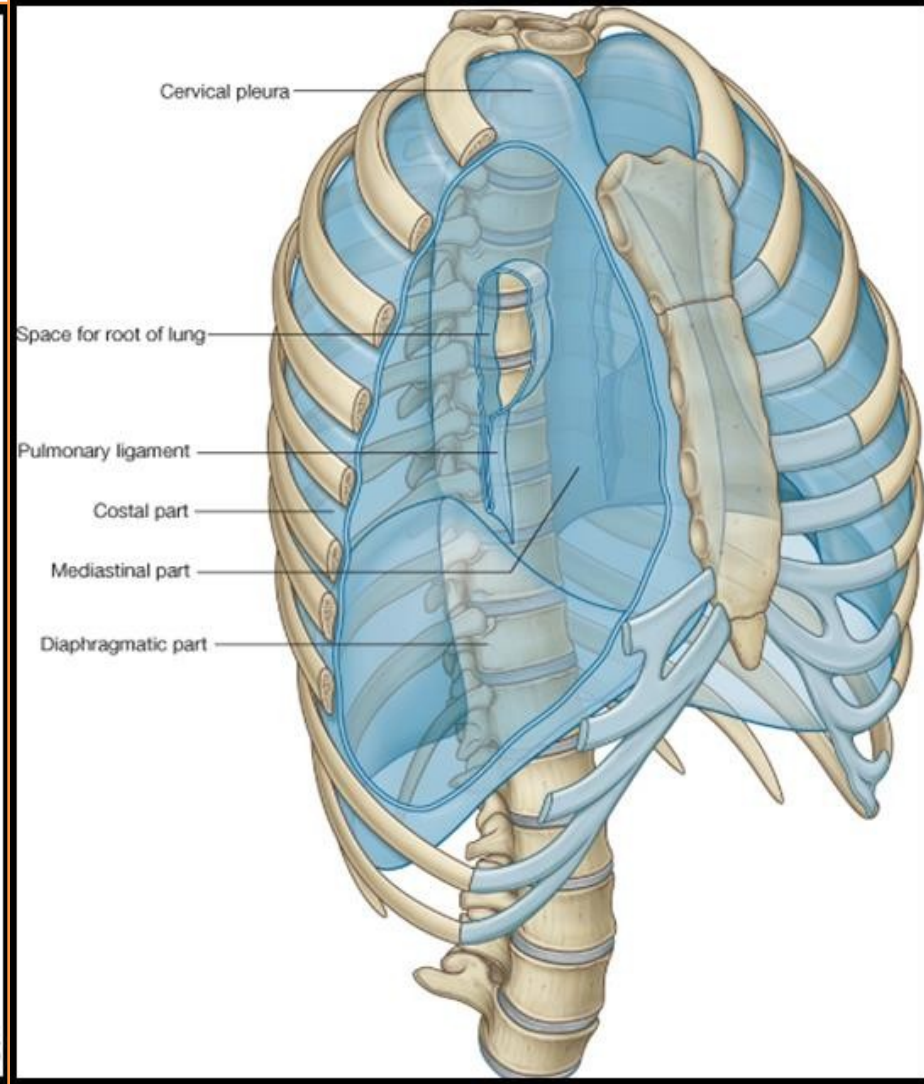
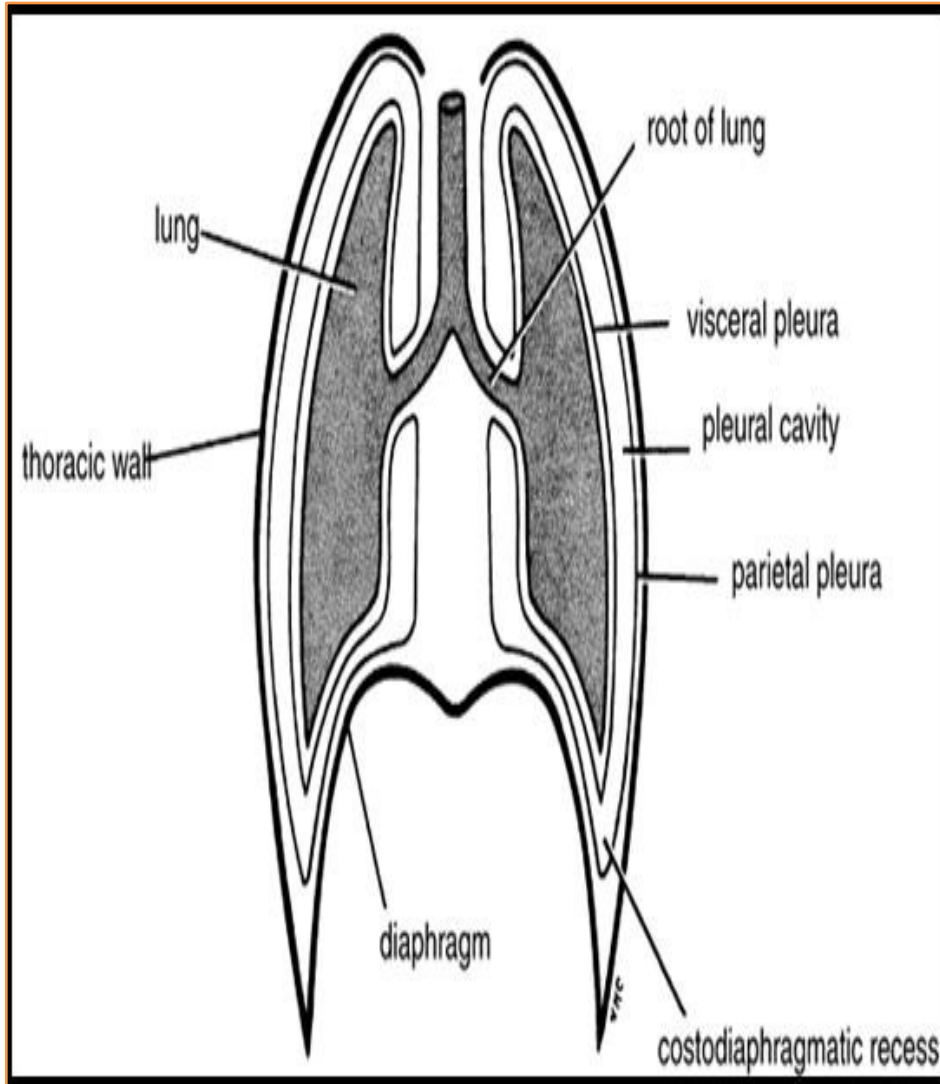
B Scalene muscles, anterior view.

lung



Note : the right lung is shorter than left lung due present the liver in right side but it is larger

Pleura



Note : it contains two layers. The layer that cover lung surface are called visceral layer

Pleura: Nerve Supply

- Parietal pleura:

- It is sensitive to pain, pressure, temperature, and touch.

- It is supplied as follows:

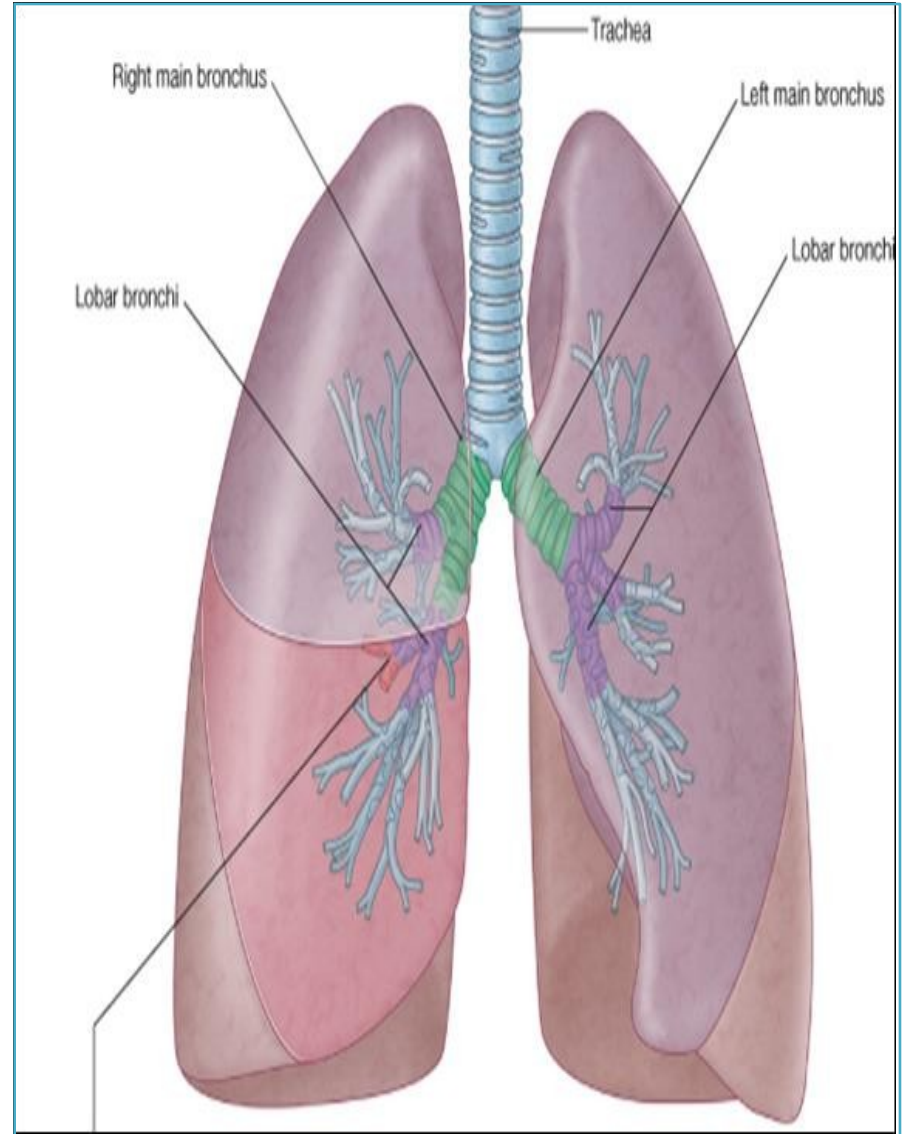
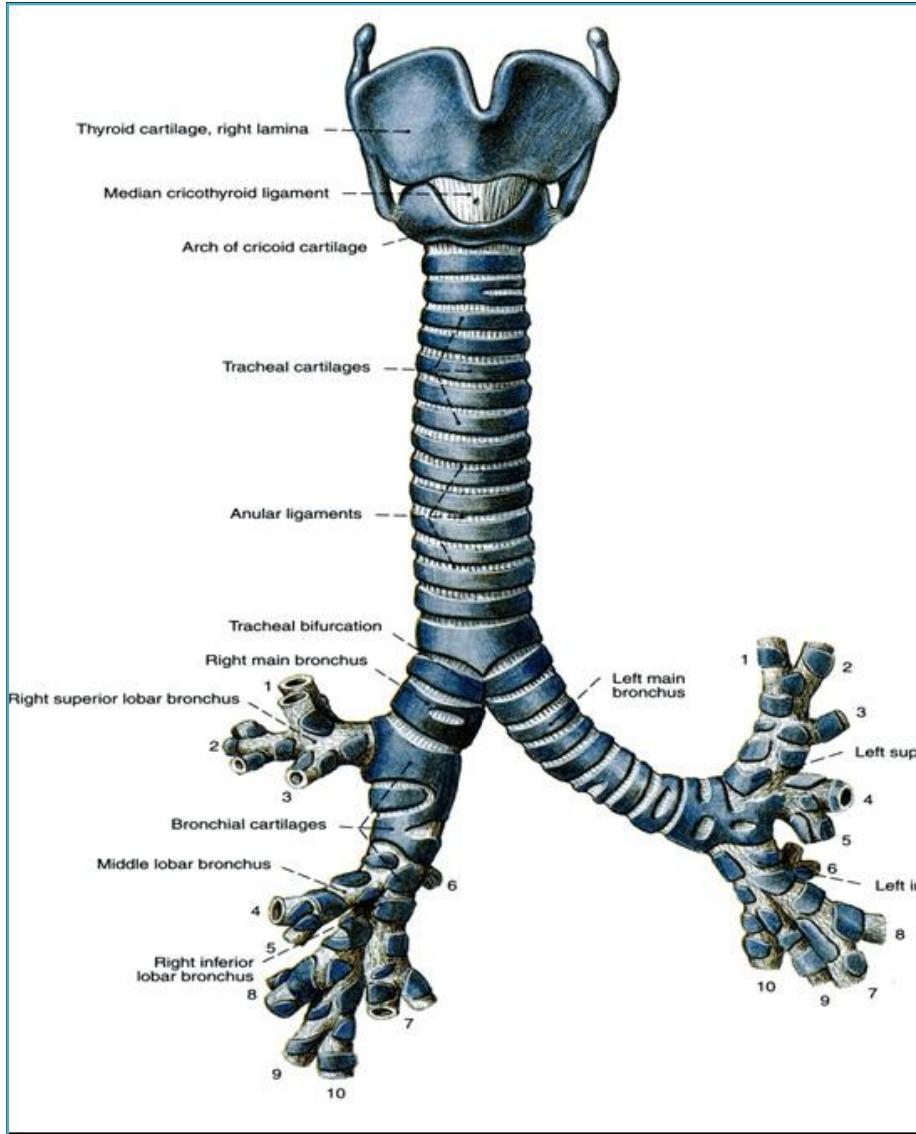
- ❖ **Costal pleura** is segmentally supplied by the intercostal nerves.

- ❖ **Mediastinal pleura** is supplied by phrenic nerves.

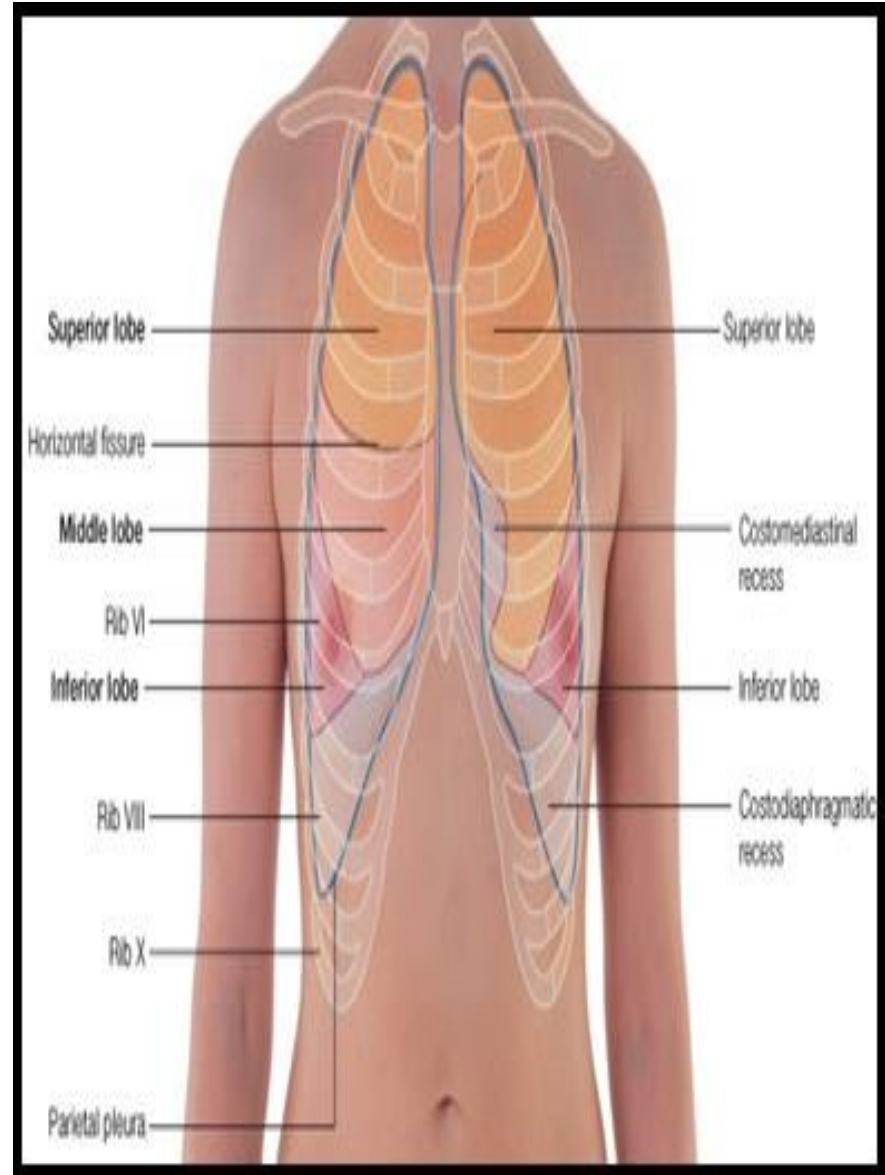
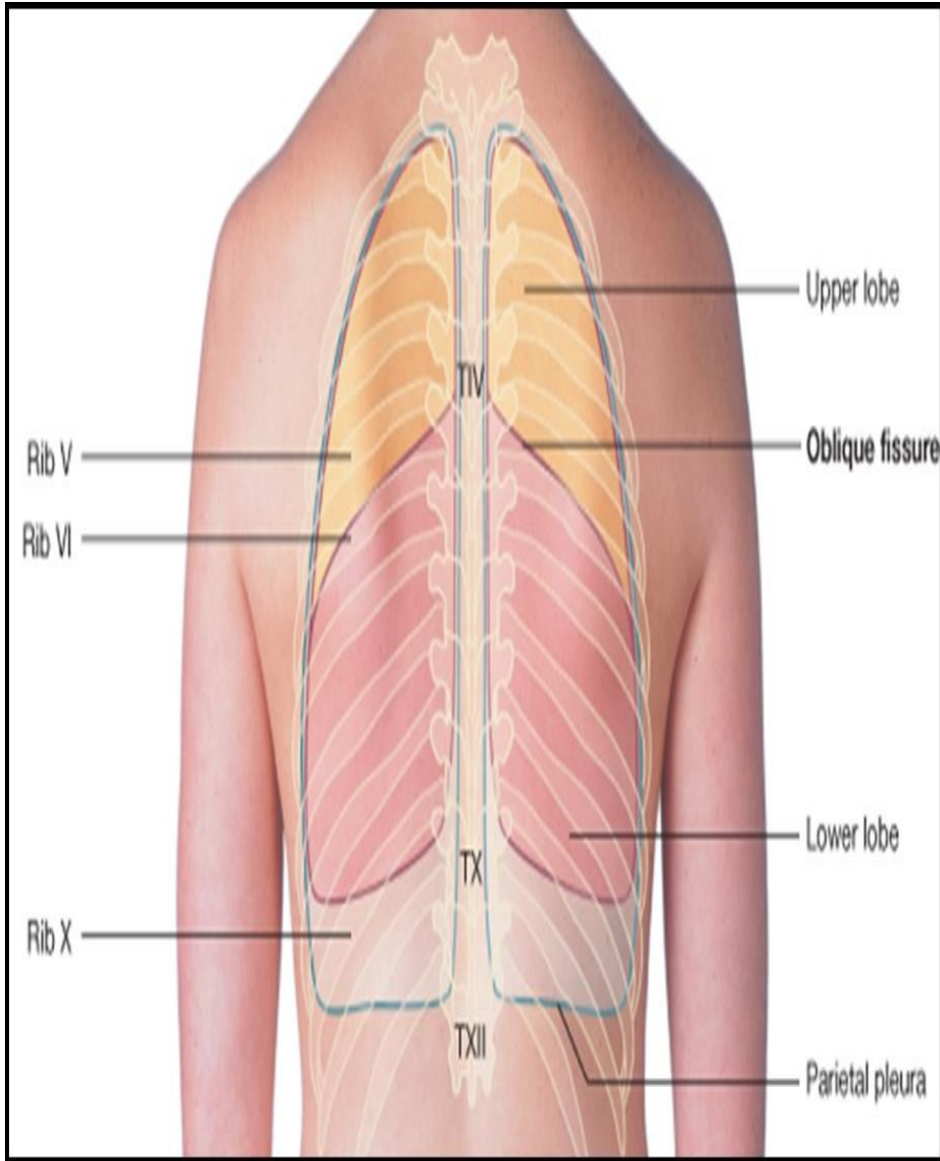
- ❖ **Diaphragmatic pleura** is supplied over the domes by phrenic nerves, around the periphery by lower 6 intercostal nerves.

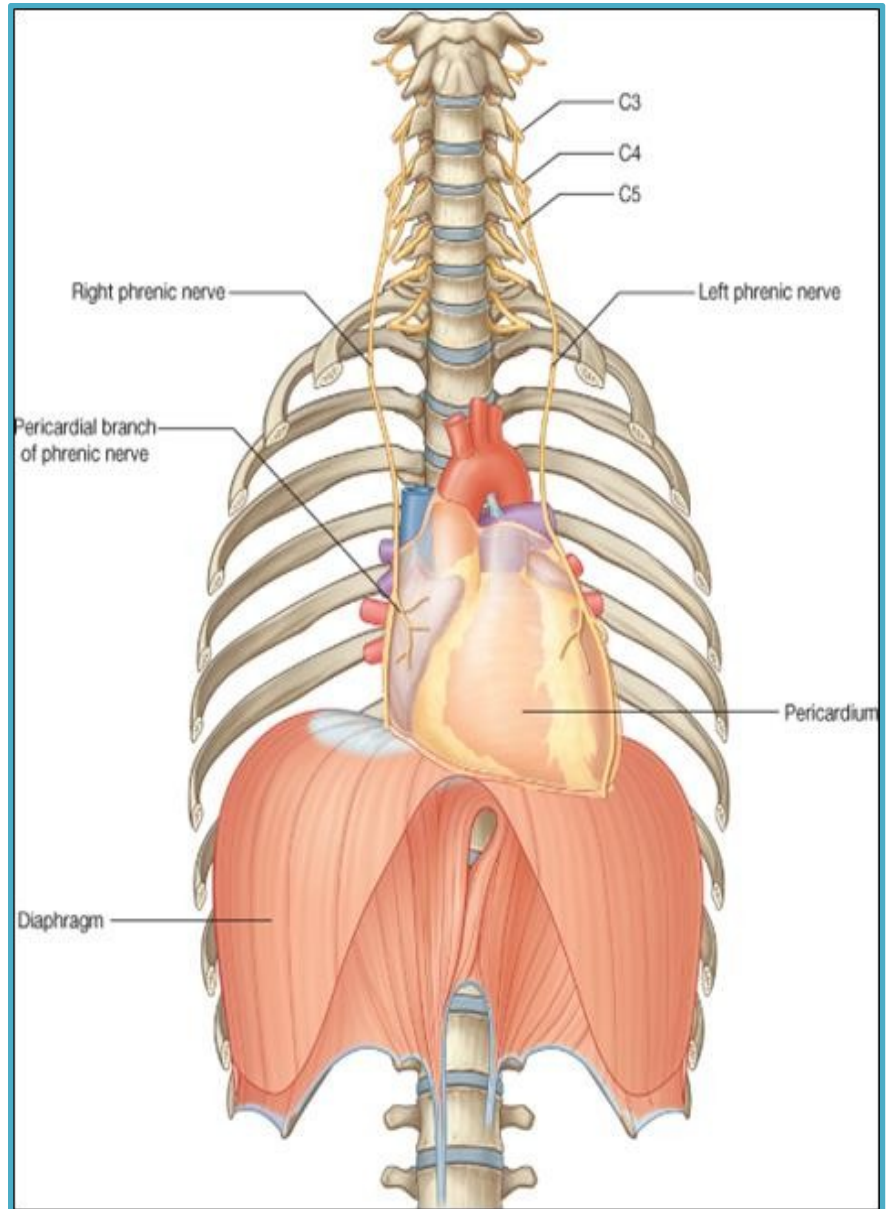
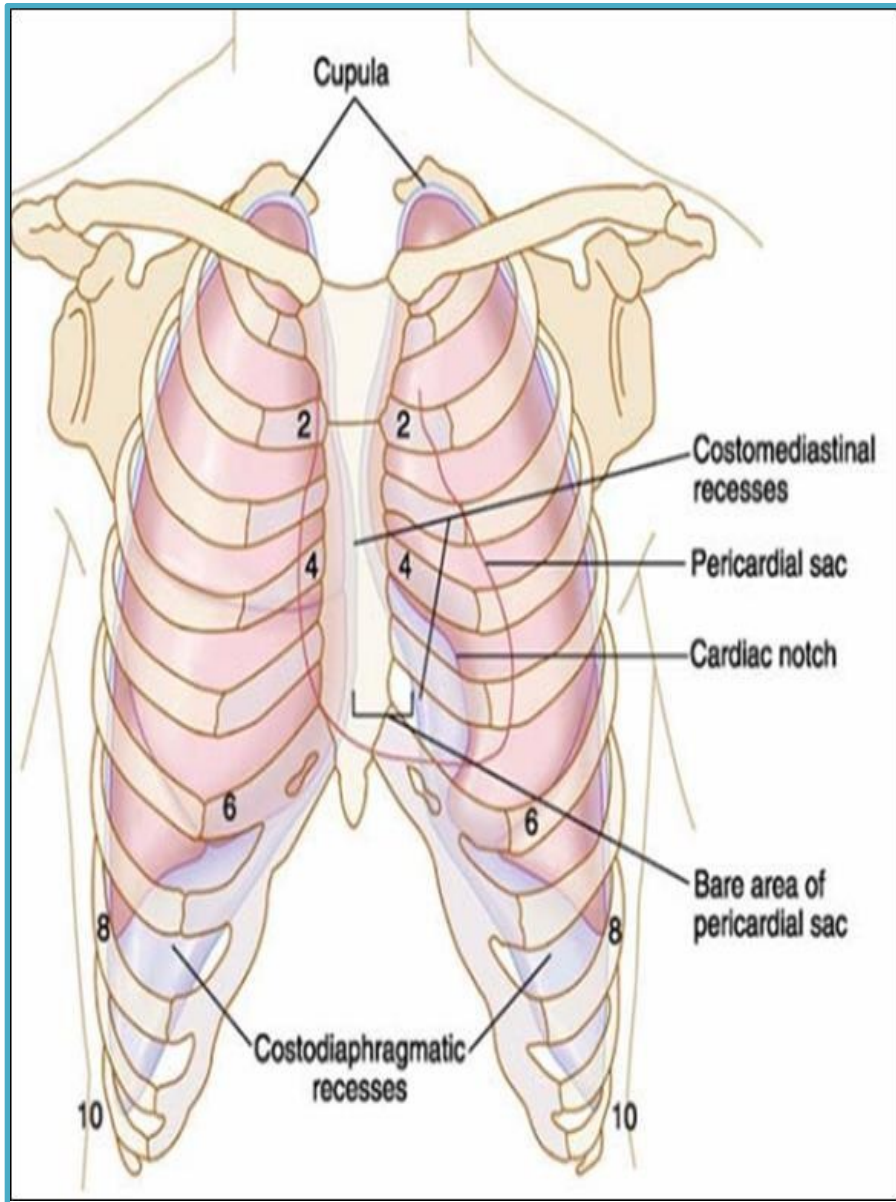
- Visceral pleura sensitive to stretch only and is supplied by the **autonomic fibers** from the **pulmonary plexus**.

lung and bronchi



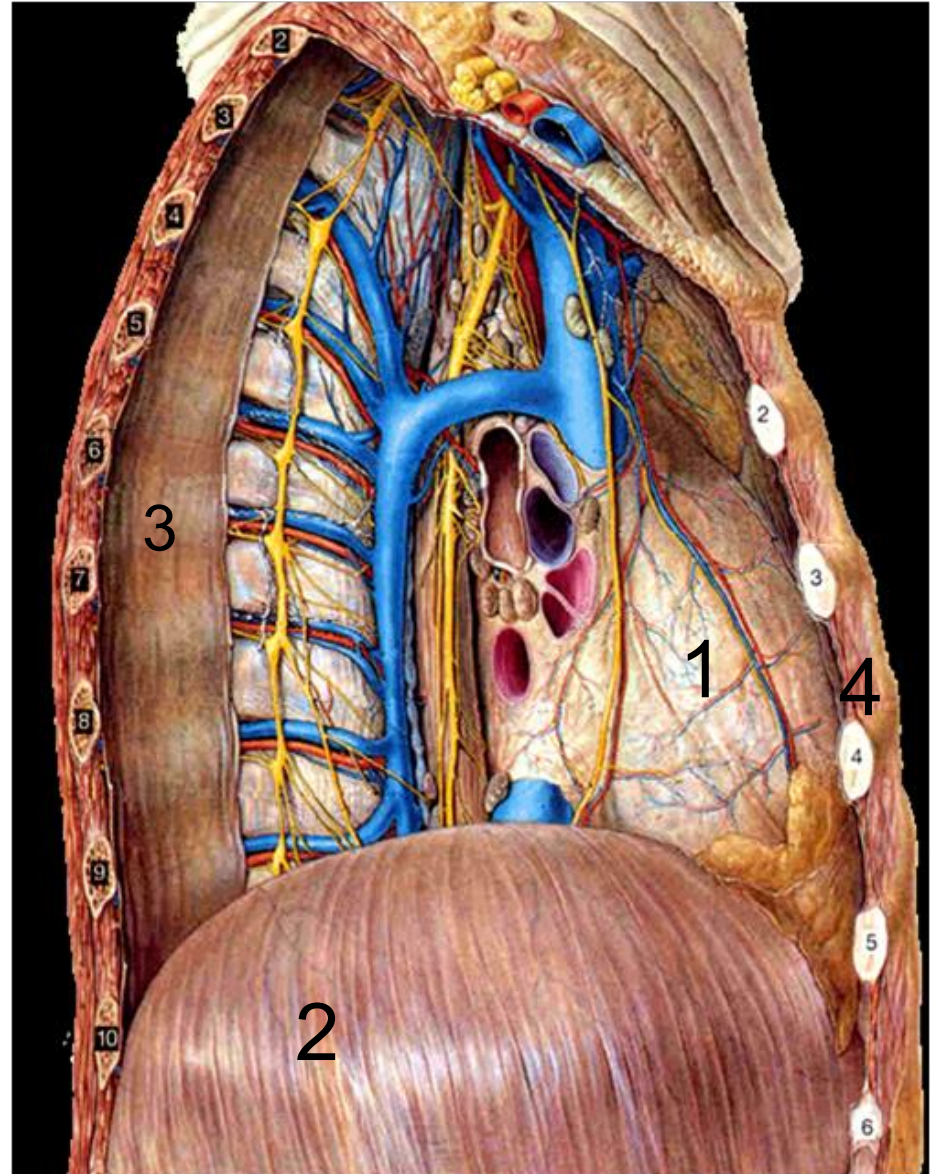
Surface anatomy





Mediastinum

- 1 Heart
- 2 Diaphragm
- 3 thoracic vertebra
- 4 sternum



Good luck!

Thanks for 434 radiology team.

Edited by:

Nouf AlRushaid

Ghaida Aljamili

