

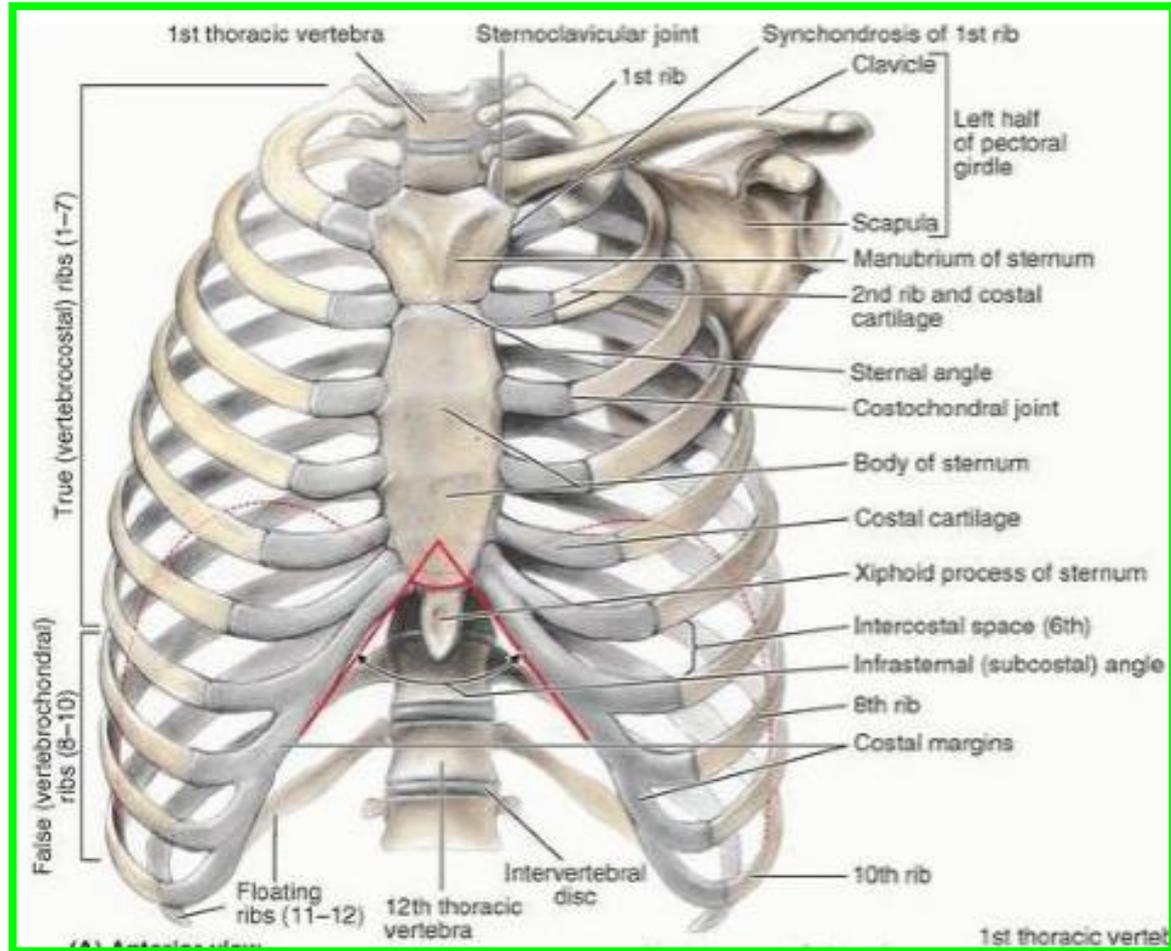


# The Thoracic Wall

The thorax (or chest) is the region of the body between the neck and the abdomen.

It is flattened in front and behind but rounded at the sides.

The framework of the walls of the thorax, which is referred to as the *thoracic cage*

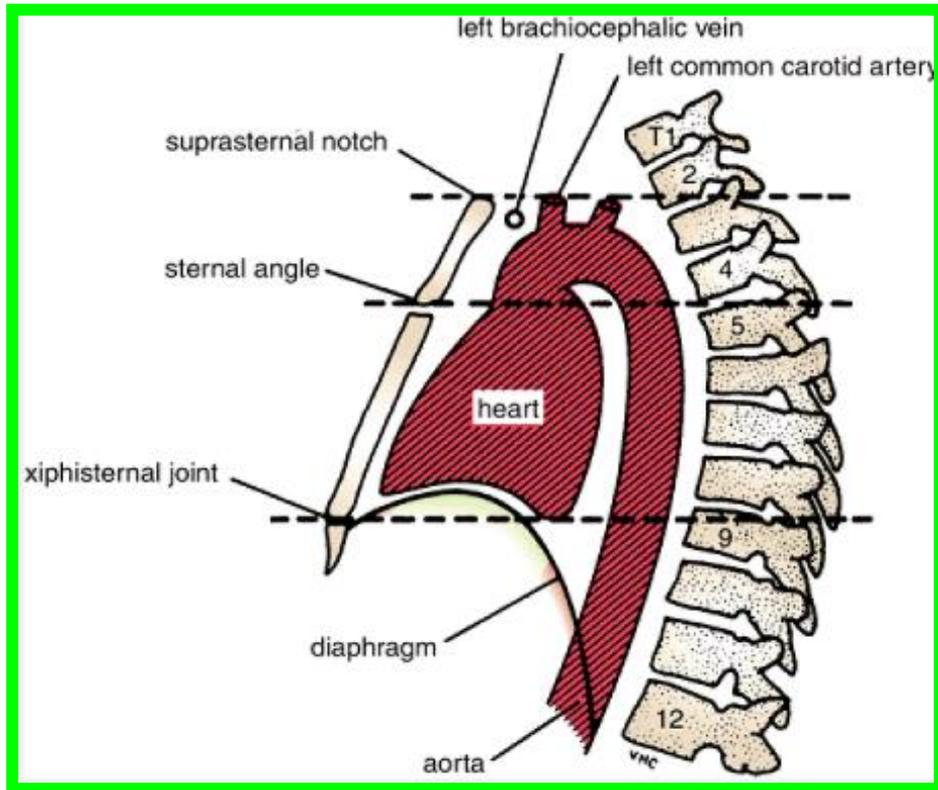


# Sternum

The manubrium is the upper part of the sternum.

✓ It articulates with the body of the sternum at the **manubriosternal joint**,

✓ and articulates with the **clavicles** and with **the first costal cartilage** and the upper part of **the second costal cartilages** on each side



✓ It lies opposite the **third and fourth thoracic vertebrae**

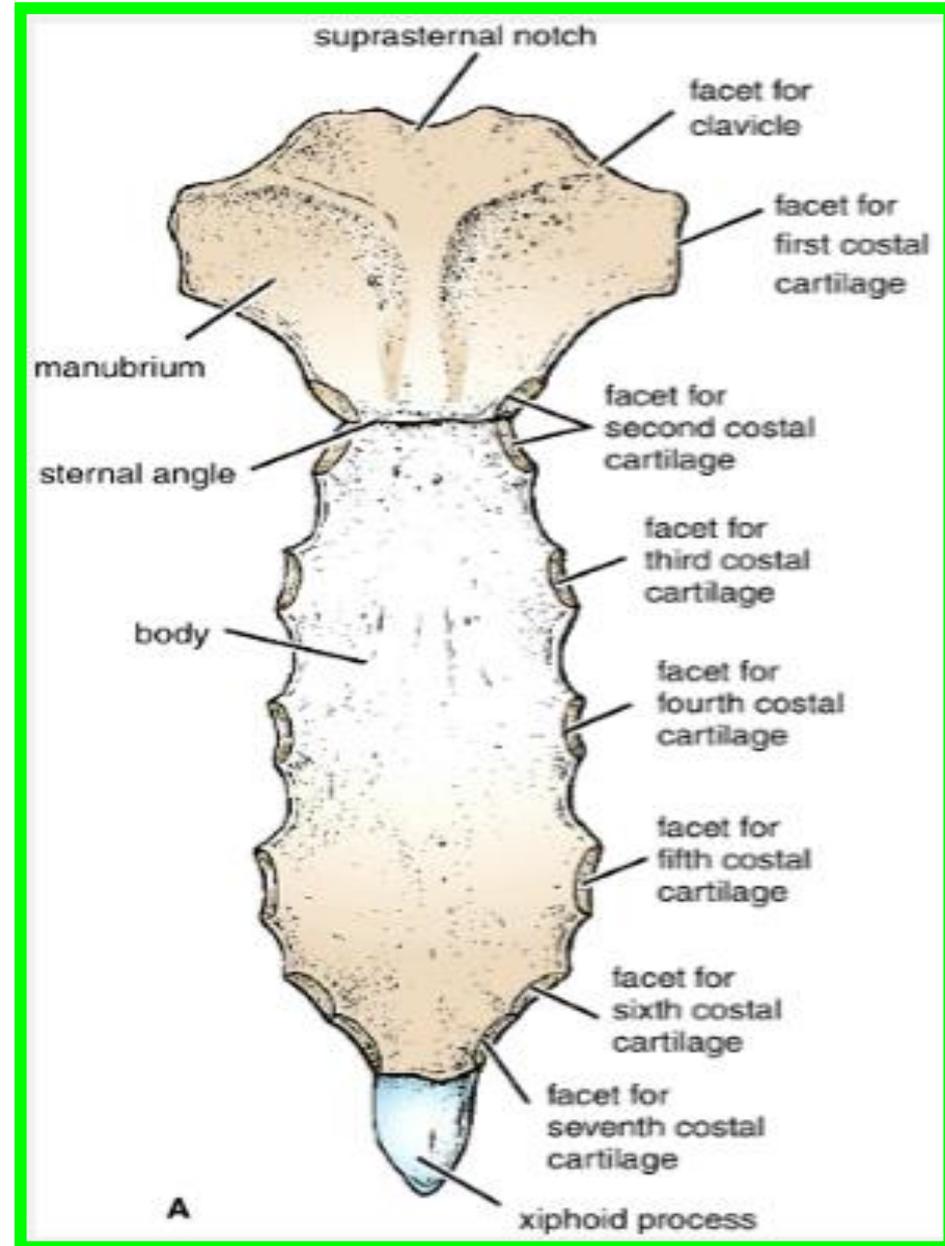
# Sternum

## The body of the sternum

Articulates above with the manubrium at the manubriosternal joint

And below with the xiphoid process at the xiphisternal joint.

On each side it articulates with the second to the seventh costal cartilages

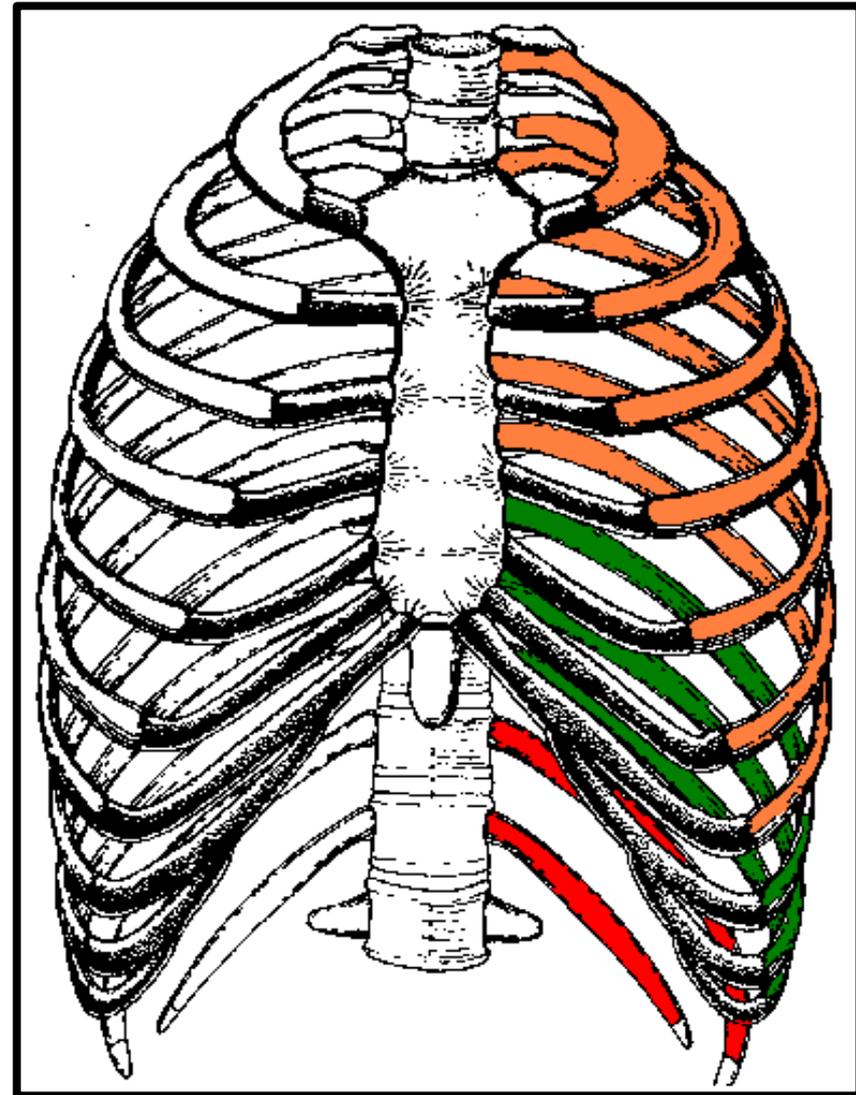


❖ **True ribs:** The **upper seven** pairs are attached anteriorly to the sternum by their **costal cartilages**.

❖ **False ribs:** The **8th, 9th, and 10th** pairs of ribs are attached anteriorly to each other and to the **7th rib** by means of their costal cartilages and small synovial joints.

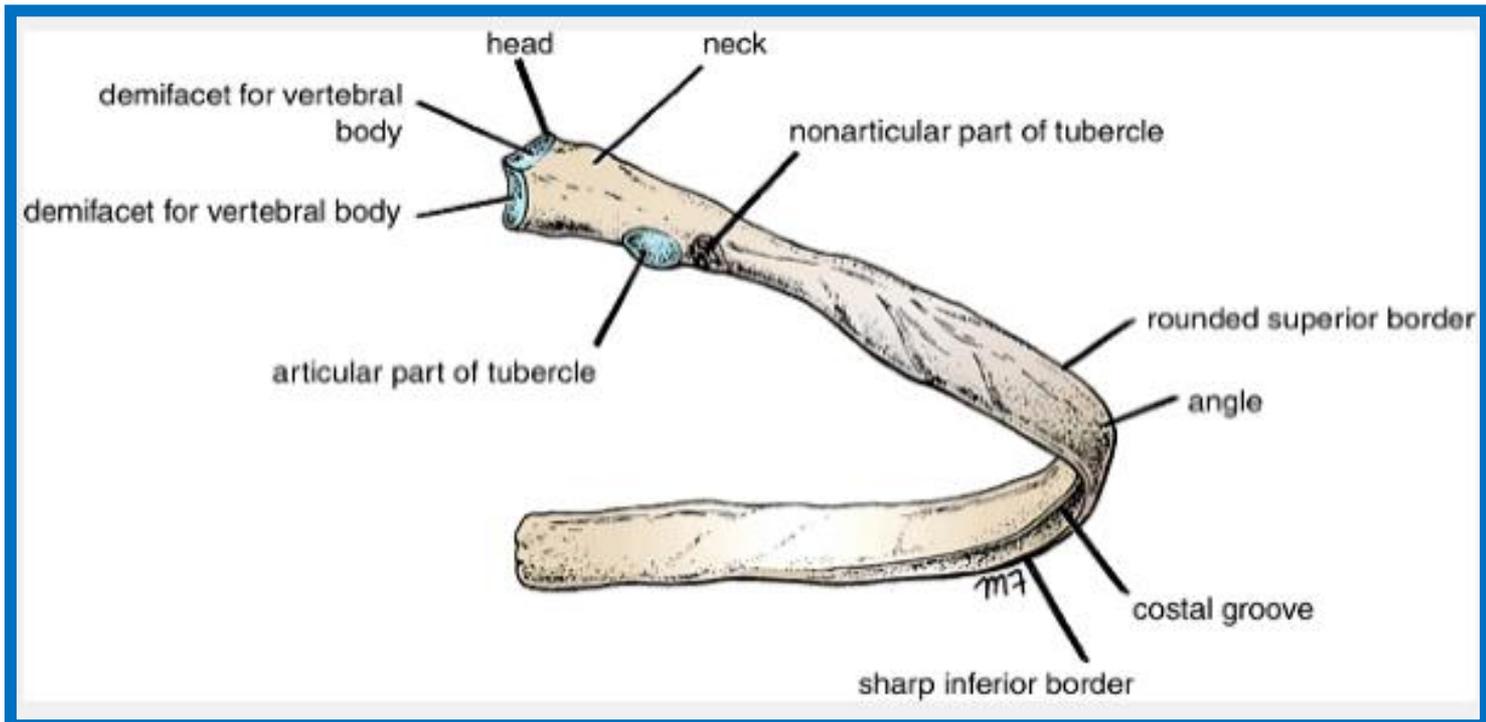
❖ **Floating ribs:** The **11th and 12th** pairs have no anterior attachment

## Thoracic Cage



## □ Typical Rib

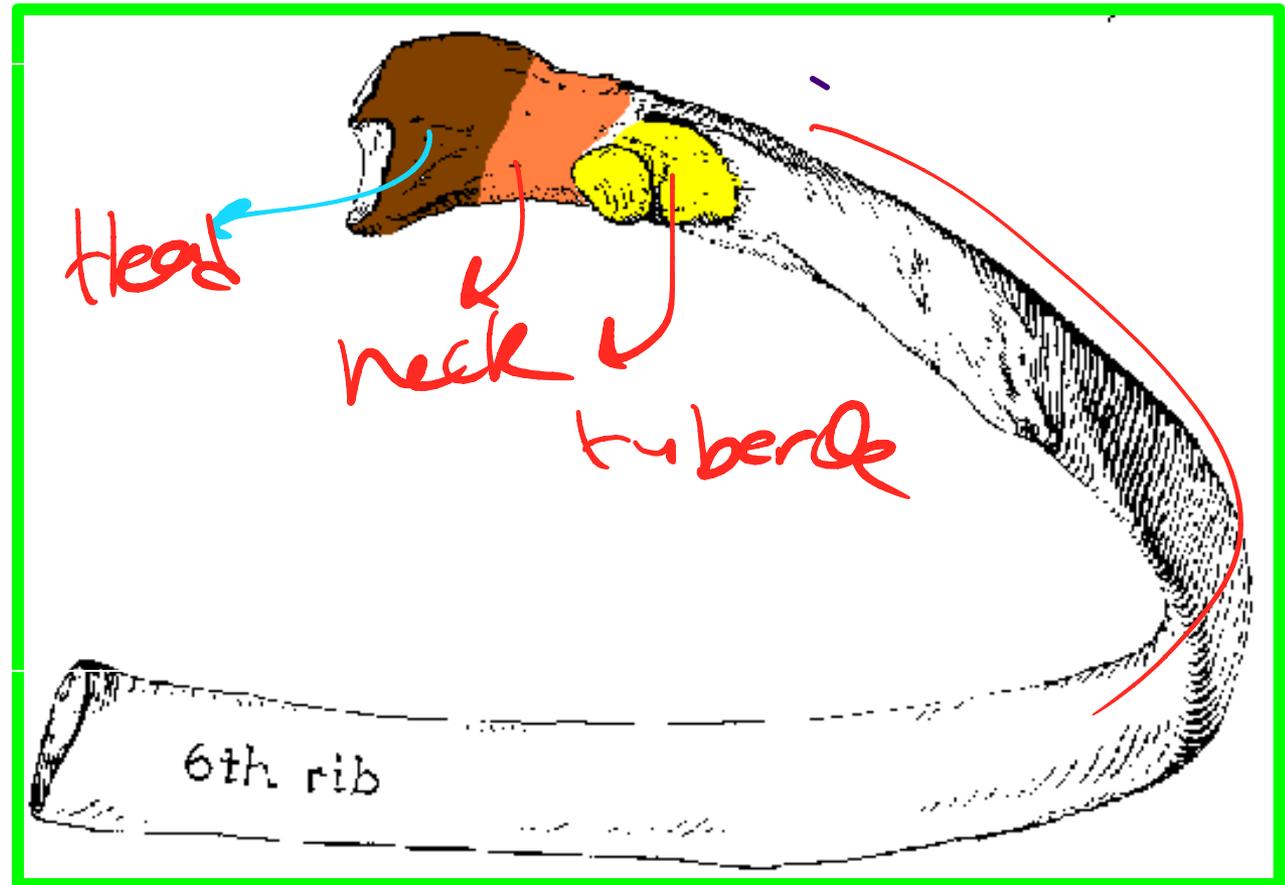
A typical rib is a long, twisted, flat bone having a rounded, smooth superior border and a sharp, thin inferior border. The inferior border overhangs and forms **the costal groove**, which accommodates **the intercostal vessels and nerve**. The anterior end of each rib is attached to **the corresponding costal cartilage**.



## □ Typical Rib

The typical rib has a head, neck, tubercle, shaft, and angle.  
**The neck** is a constricted portion situated between the head and the tubercle.

- ❖ head
- ❖ neck
- ❖ tubercle
- ❖ and a shaft

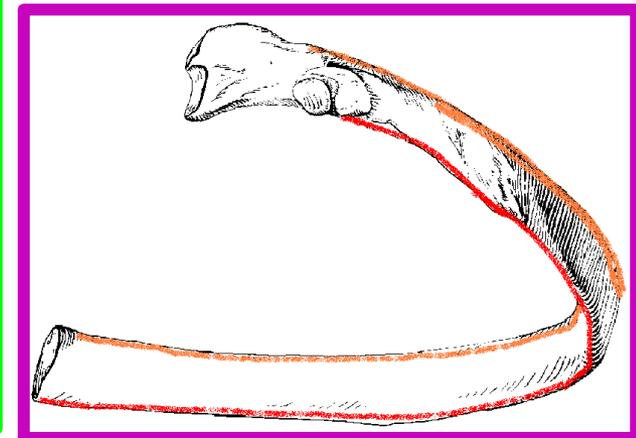
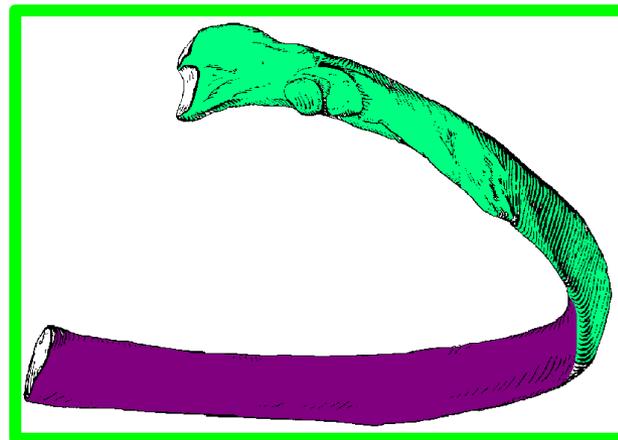
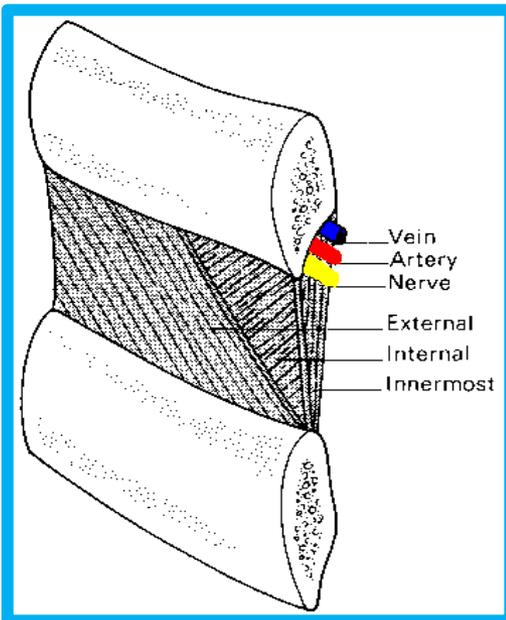


# Typical ribs (3-10) Have

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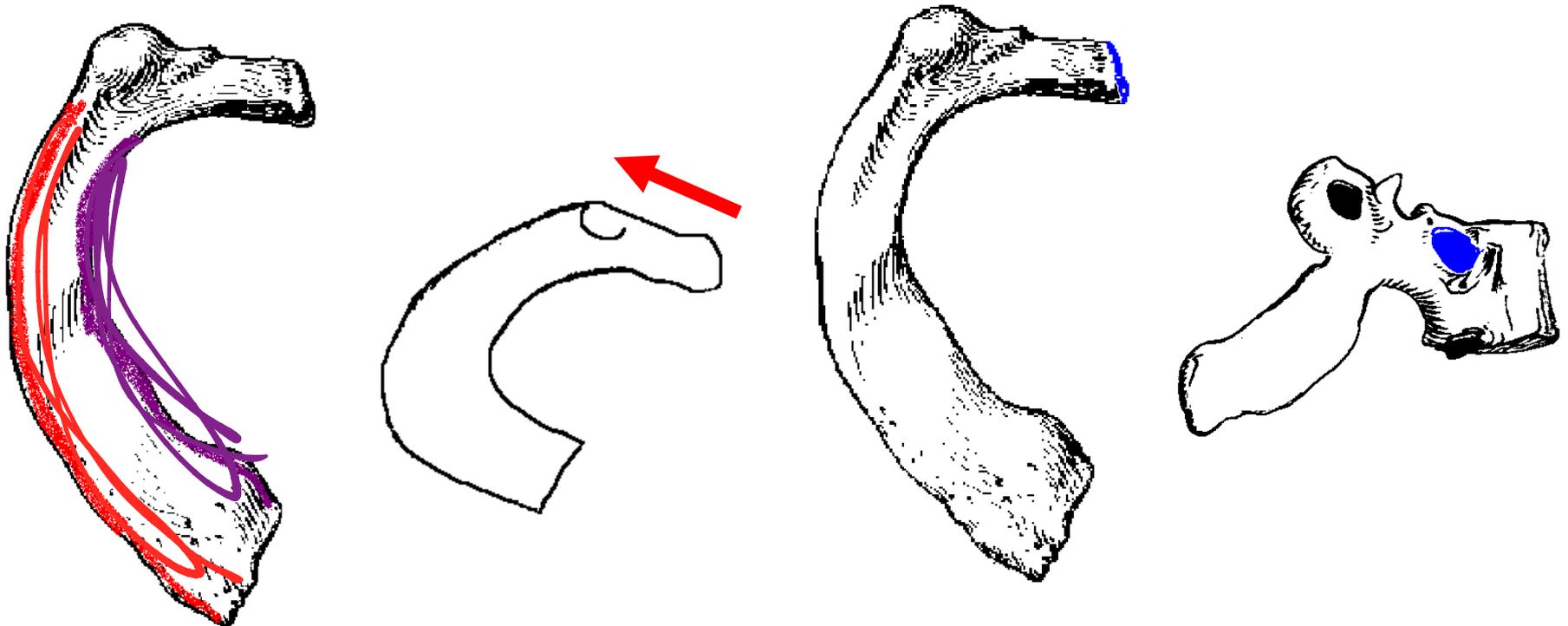
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- **External** and **Internal** surfaces
- **Superior** and **Inferior** borders
- The inferior border is sharp and extends inferior to **the costal groove** on the internal surface of the shaft so that it **protects** the:
- **intercostal neurovascular bundle** located in **the costal groove**.



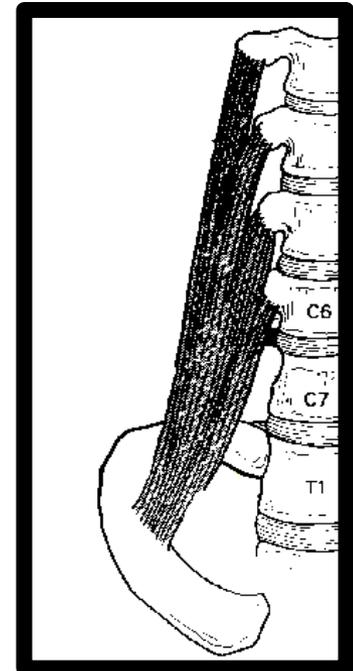
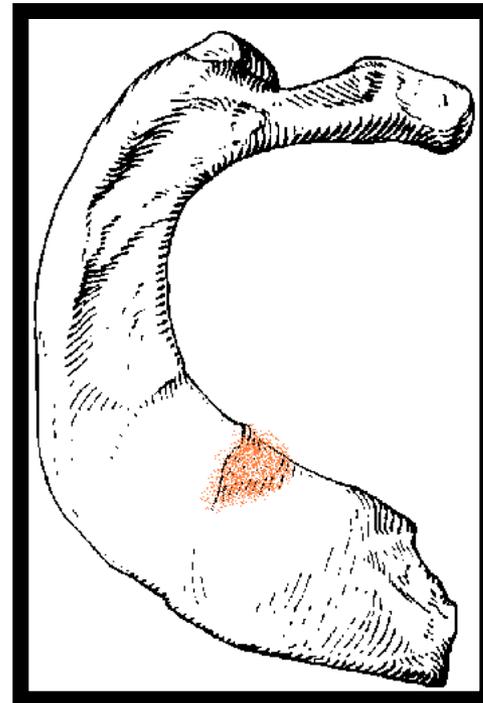
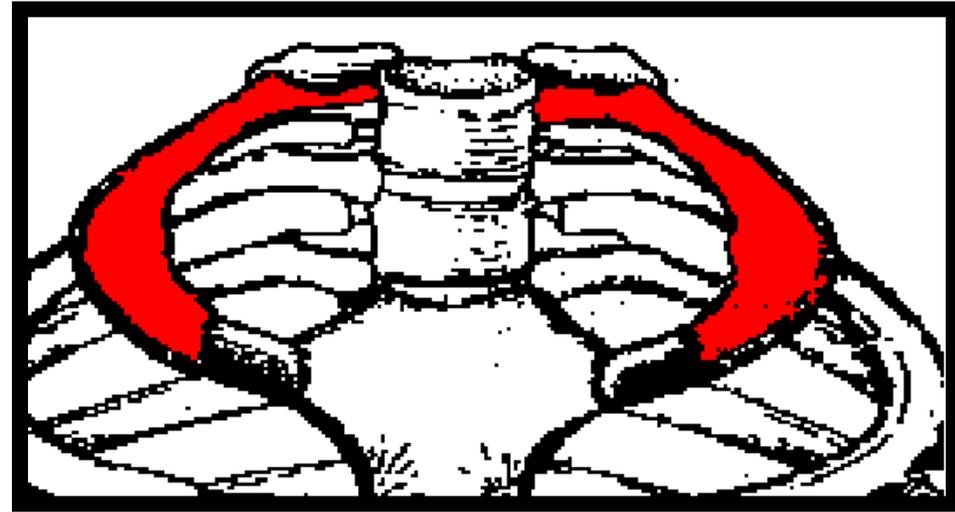
# The first rib

- ❖ is the broadest and most curved rib
- ❖ Its head carries a single facet for articulation with the body of T1 vertebra
- ❖ The neck slopes up from the head towards the shaft
- ❖ The shaft has **inner** and **outer** borders



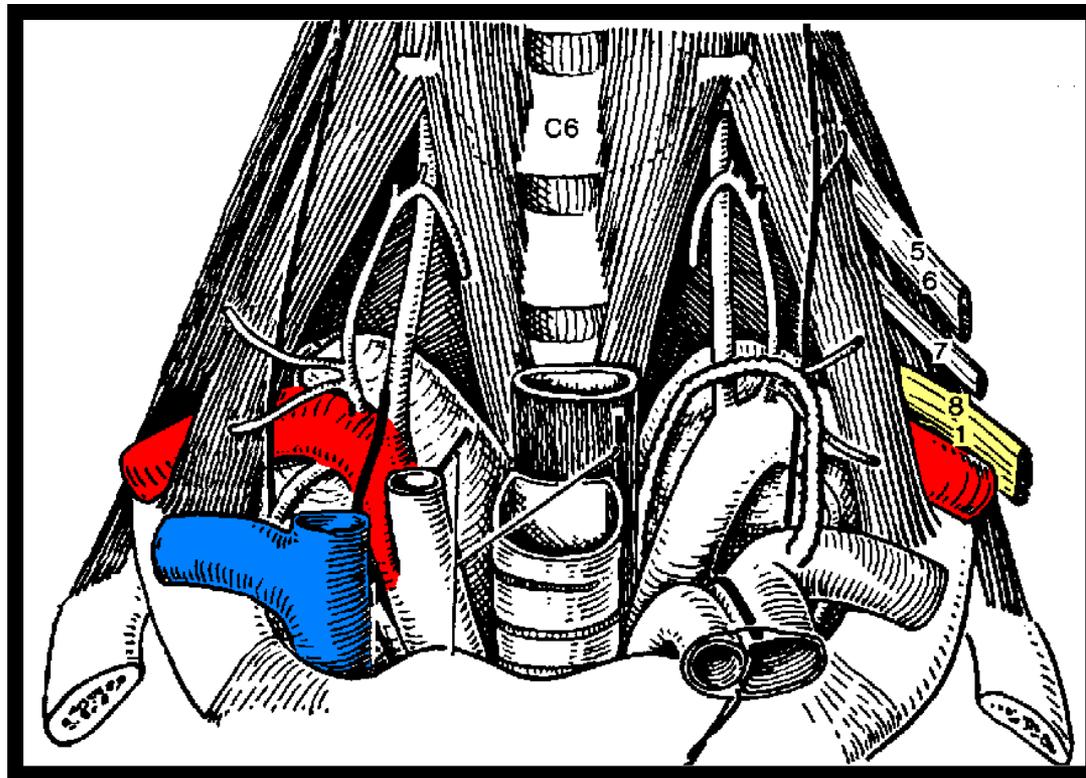
# The first rib

- ❖ The shaft has **superior** and **inferior** surfaces
- ❖ The superior surface carries a prominent **scalene tubercle** on its inner border for the insertion of **scalenus anterior** muscle

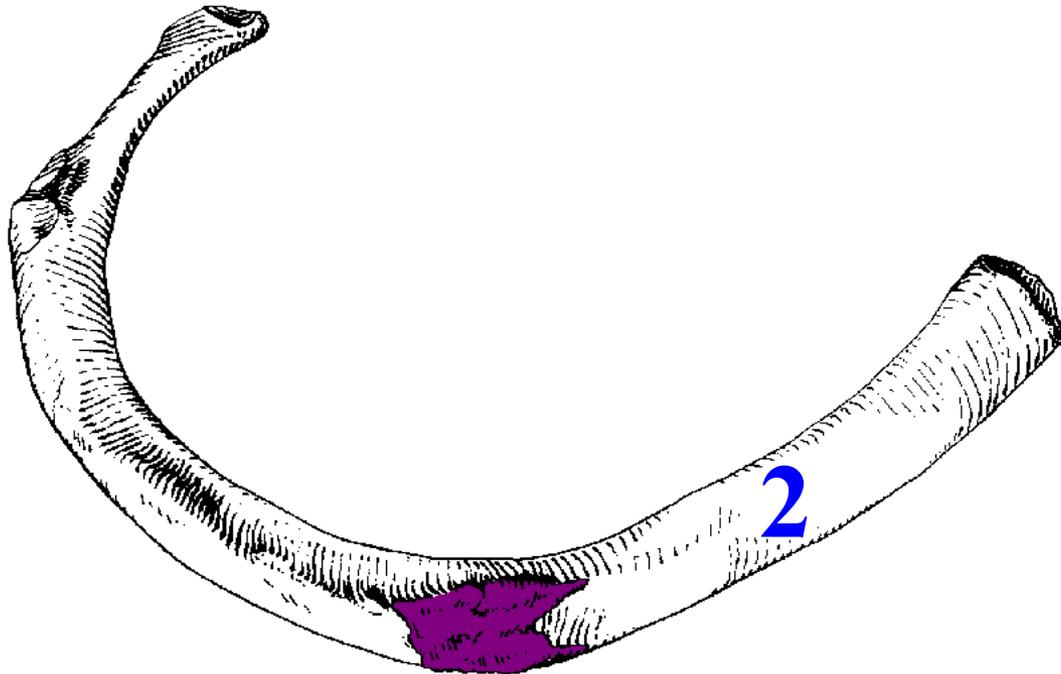
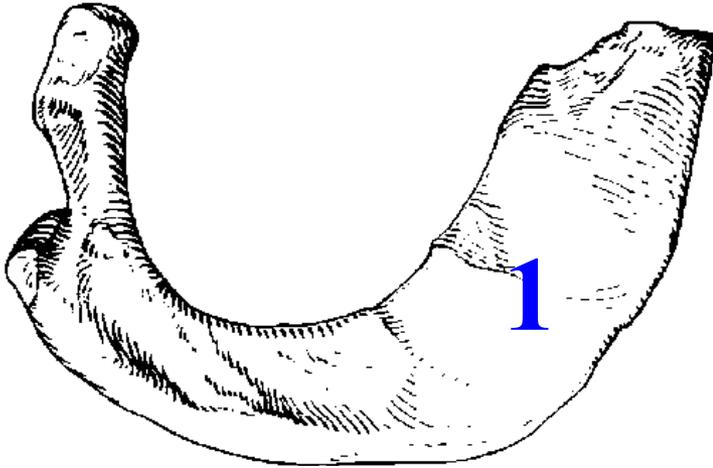


# The first rib

- ❖ The **subclavian vein** crosses anterior to **scalene tubercle**, while the **subclavian artery** and the **inferior trunk of the brachial plexus** pass posterior to it



# The second rib



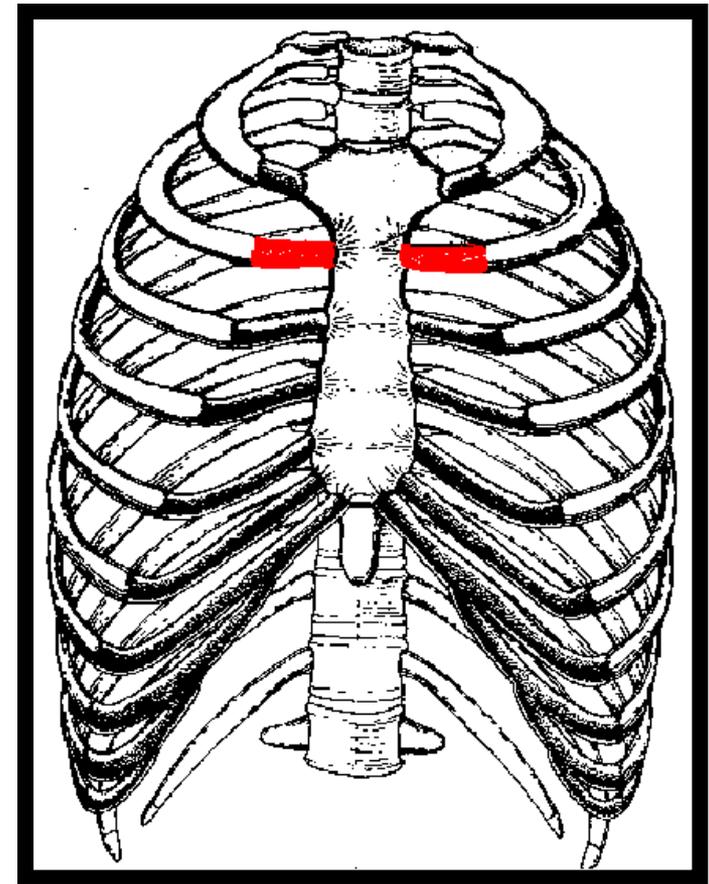
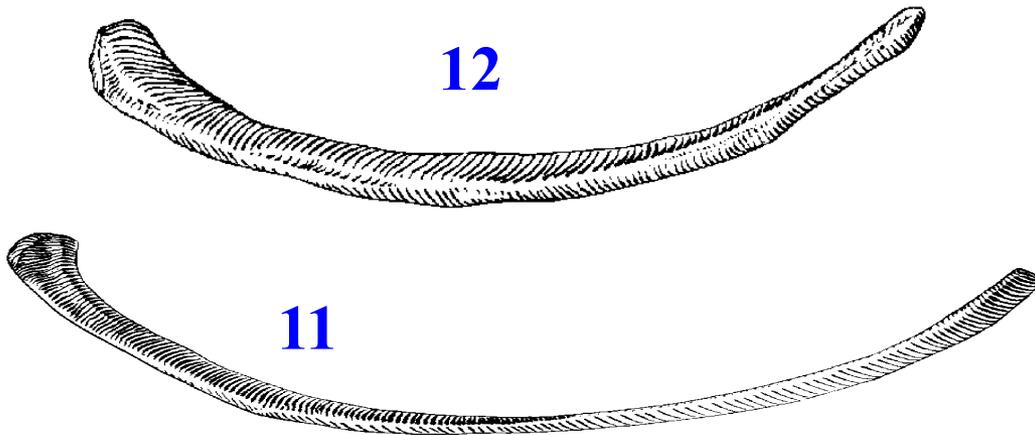
❖ Is longer than the first rib

❖ is characterized by the presence of a tuberosity for the attachment of serratus anterior muscle

# Sternal angle

- ❖ It is here that the **second costal cartilage** joins the sternum
- ❖ It is the starting place where the physician **counts the ribs** to use them as landmarks.

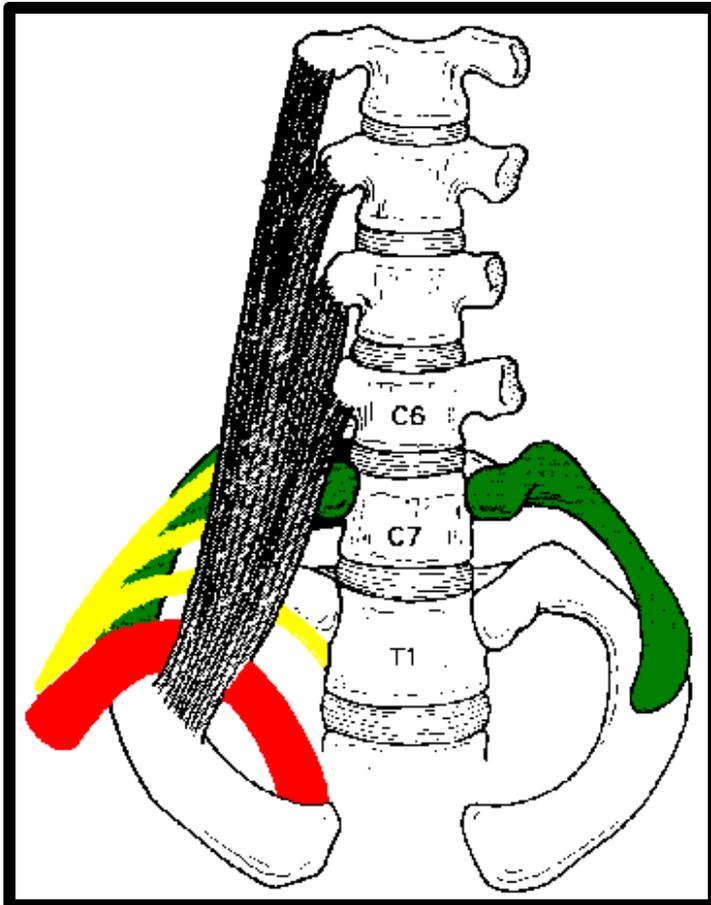
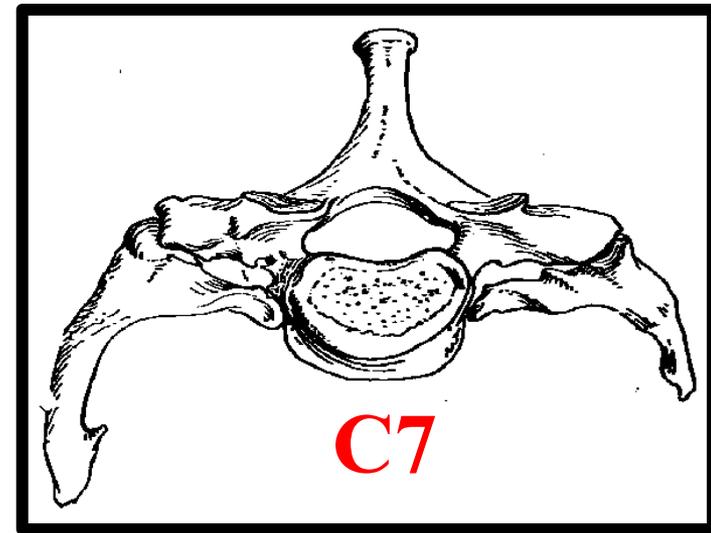
## The 11th & 12th ribs



- ❖ are short and carry a single facet on the head
- ❖ **have neither neck nor tubercle**

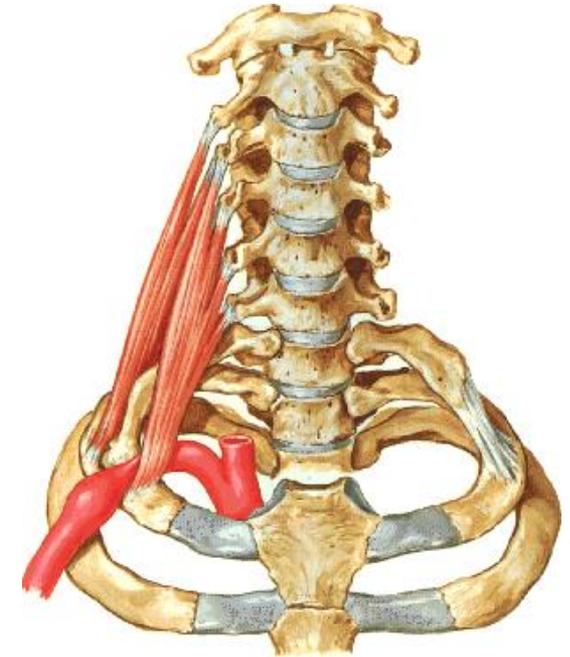
# Cervical rib

- ❖ may articulate with the transverse process of **C7 vertebra** which is directed downward



- ❖ May be symptomless or may cause **neurovascular symptoms** in the upper limb due to **stretching or compression** related to structures on the superior surface of the first rib

# Cervical rib

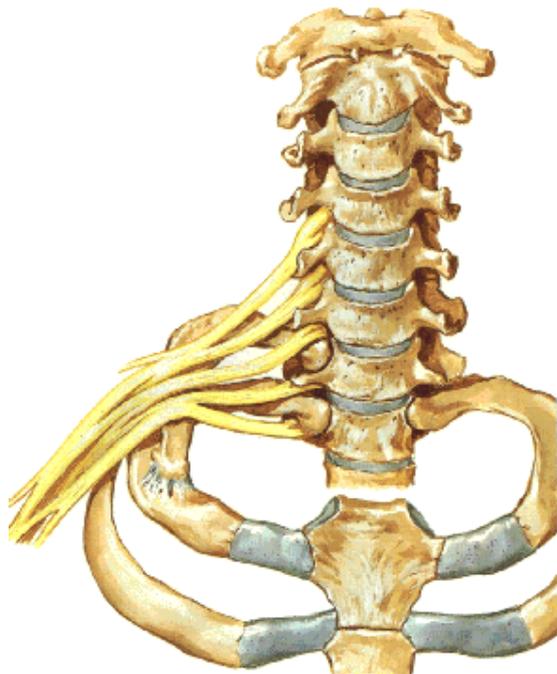


❖ symptoms may be produced by compression

## Vascular symptoms:

The cervical rib compresses the subclavian artery.

Note the poststenotic dilatation



❖ symptoms may be produced by stretching

## Neurological symptoms:

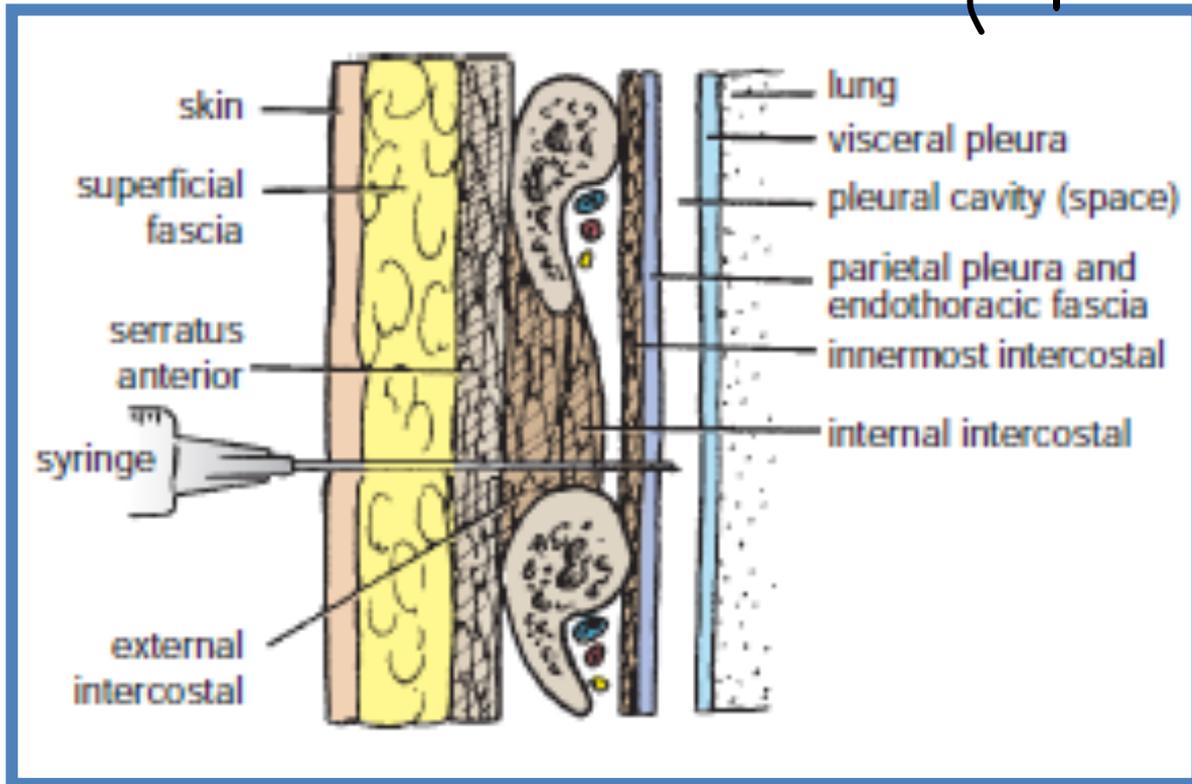
The cervical rib stretches the brachial plexus.

# Intercostal Spaces

The spaces between the ribs contain three muscles of respiration:

the **external intercostal**, the **internal intercostal**, and the **innermost intercostal** muscle.

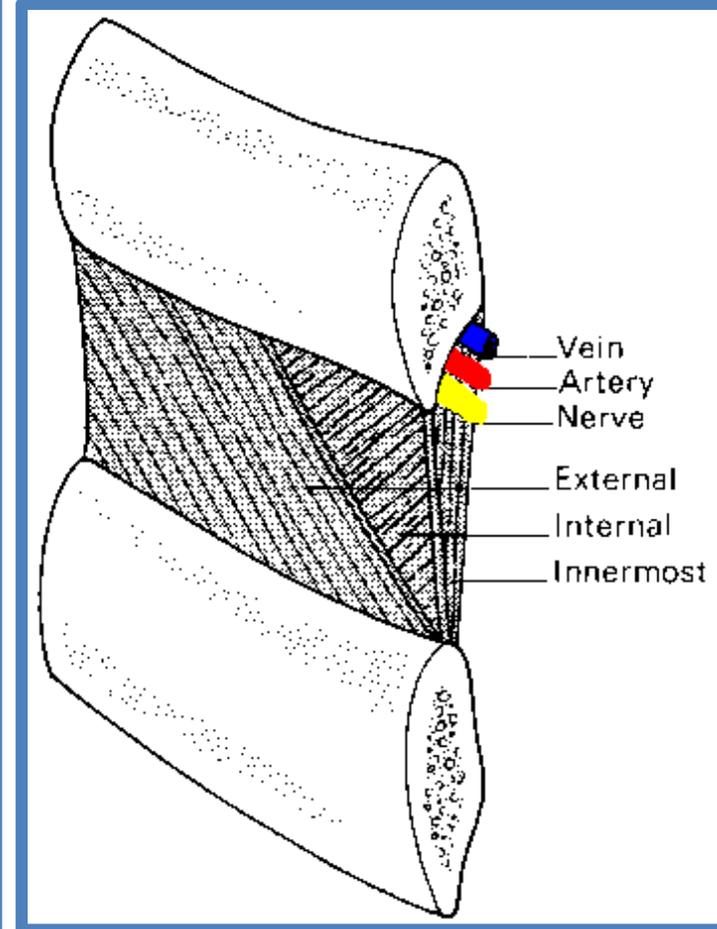
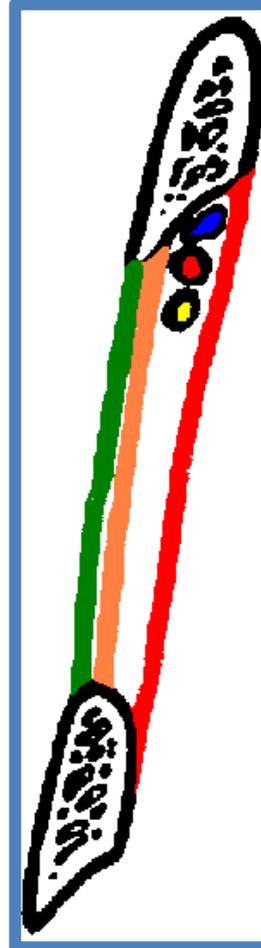
The innermost intercostal muscle is lined internally by the **endothoracic fascia**, which is lined internally by the **parietal pleura**.



# Intercostal Spaces

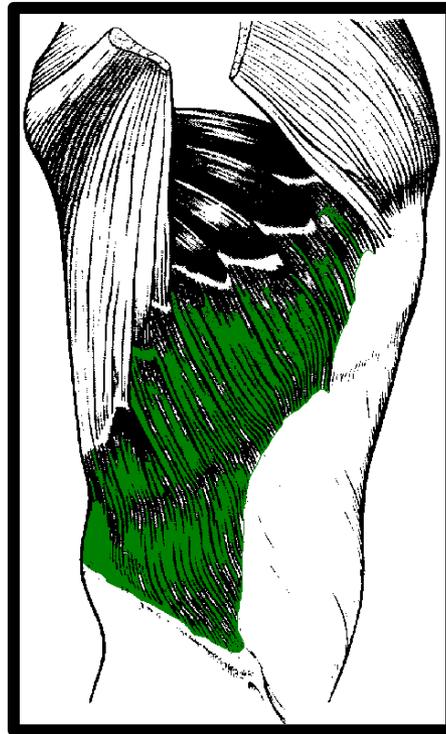
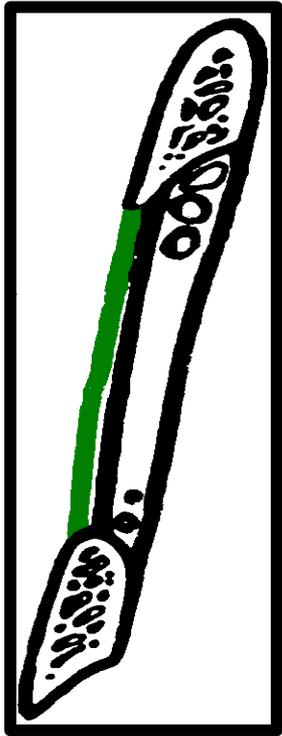
The intercostal nerves and blood vessels run between the **intermediate** and **deepest layers** of muscles

They are arranged in the following order from above downward:  
**intercostal vein**,  
**intercostal artery**, and  
**intercostal nerve** (i.e., **VAN**).

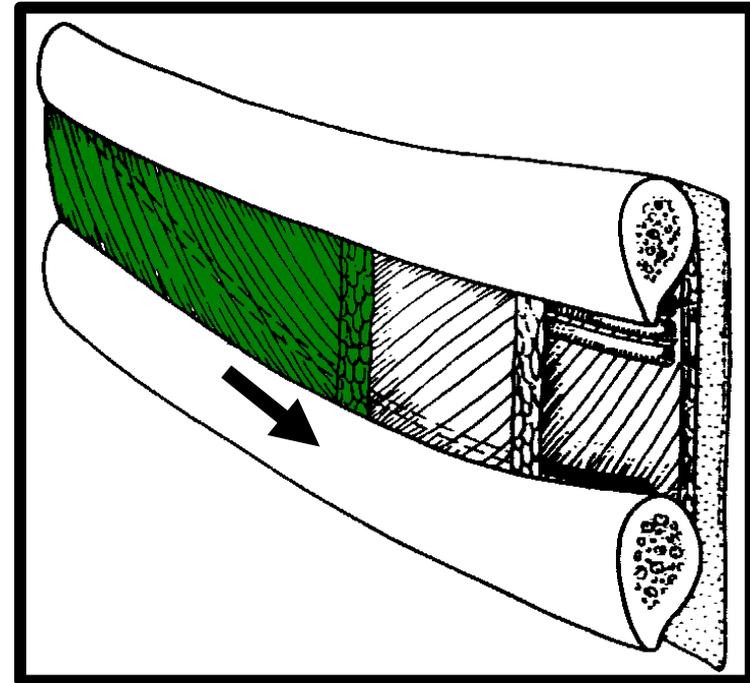


# External intercostal

- ❖ forms the most superficial layer
- ❖ Its fibers are directed downwards and forward (same direction of external oblique muscle of the abdomen)
- ❖ from the inferior border of the rib above to the superior border of the rib below



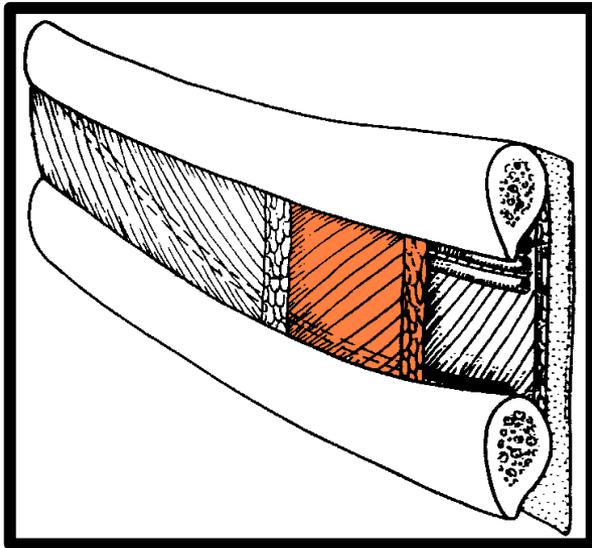
External oblique



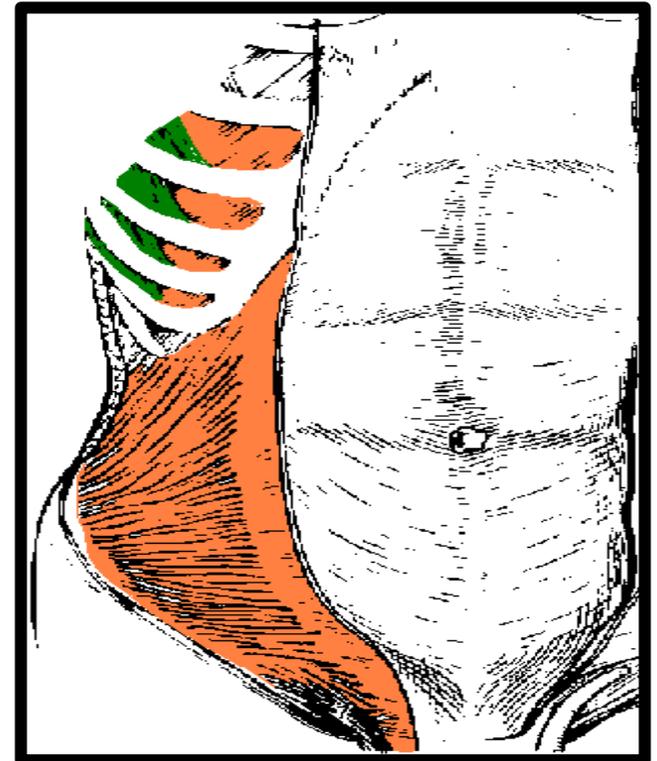
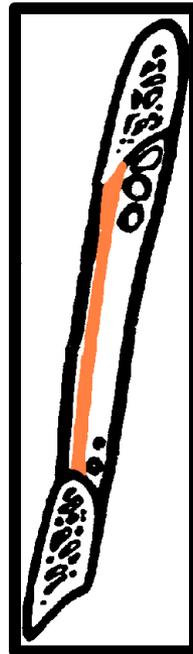
External intercostal

# Internal intercostal

- ❖ forms the intermediate layer
- ❖ Its fibers are directed downwards and backwards (same direction of the internal oblique muscle of the)
- ❖ Extends from the costal groove of the rib above to the upper border of the rib below



Internal intercostal

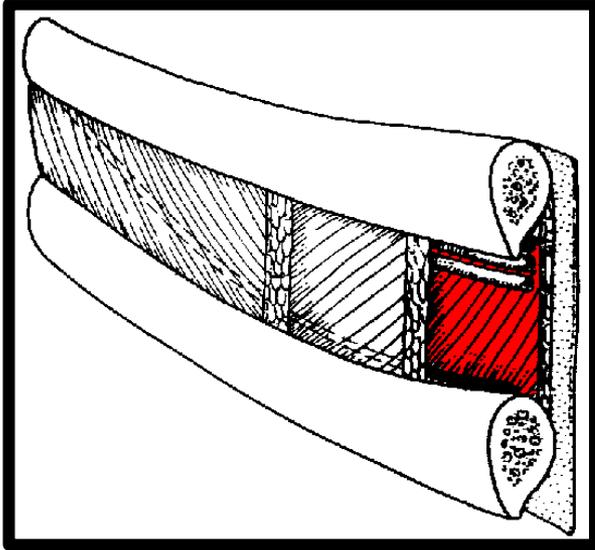


Internal oblique

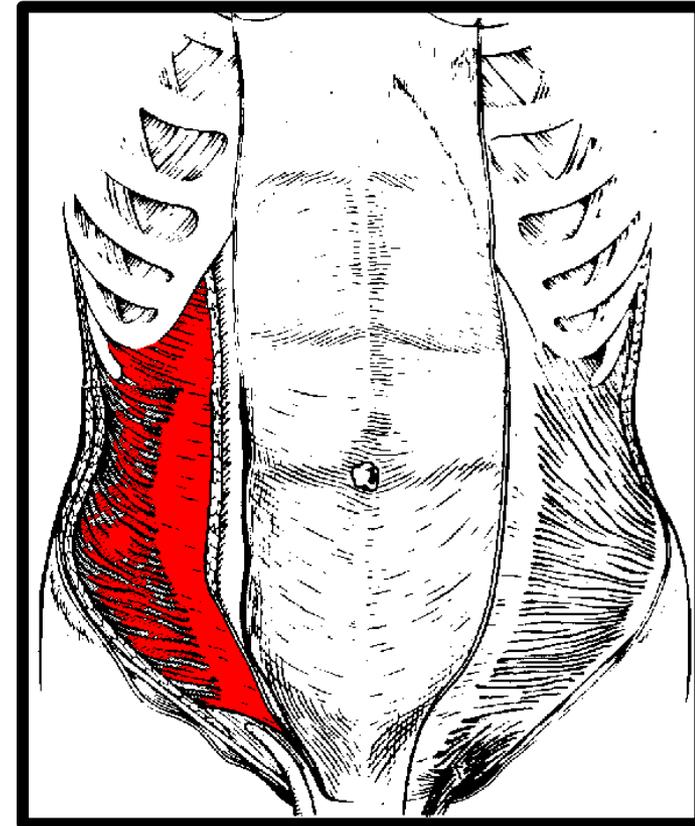
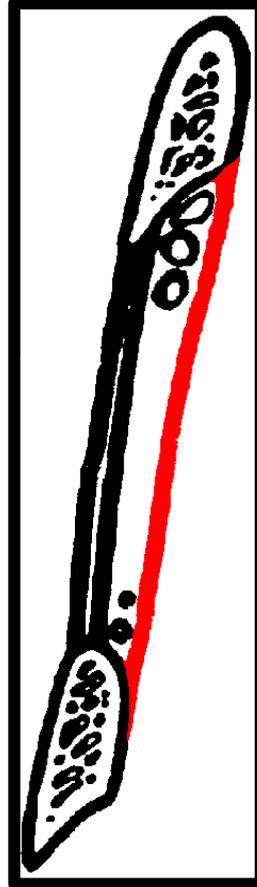
# Innermost intercostal

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Sun. 9 October 2022  
33

- ❖ Extends between internal surfaces of adjacent



Innermost intercostal

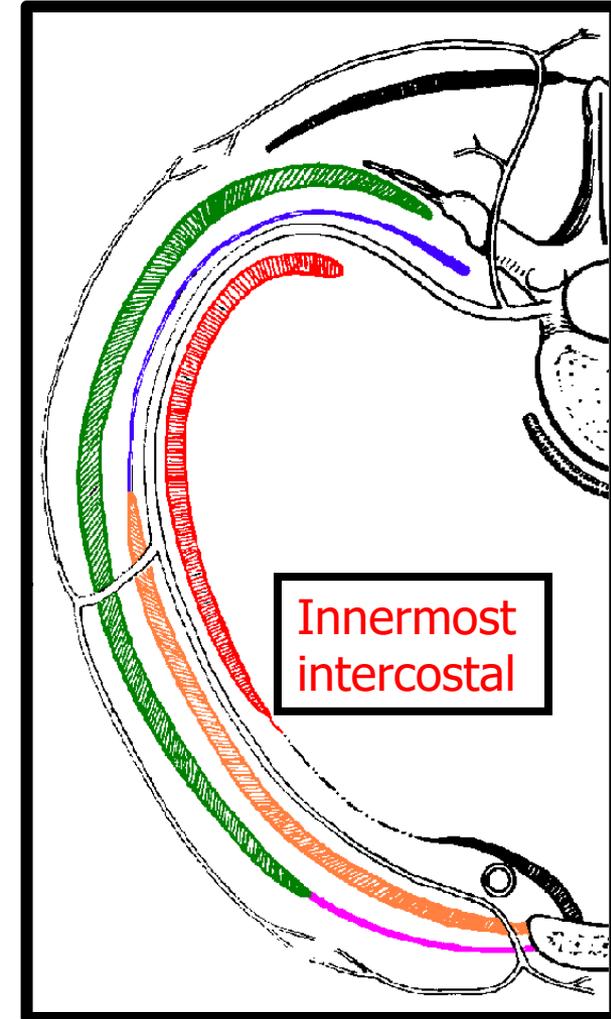


transversus abdominis

- ❖ It corresponds to the **transversus abdominis** muscle of the anterior abdominal wall

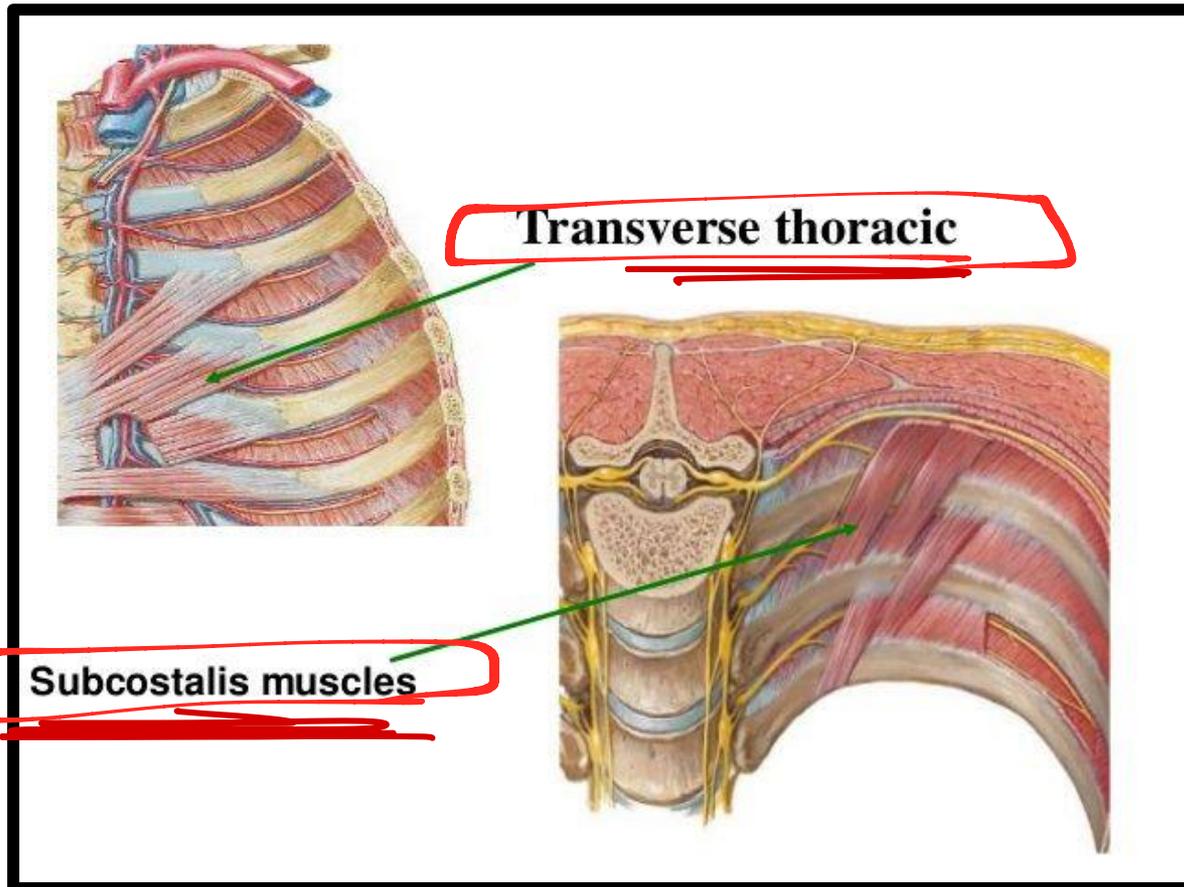
# Innermost intercostal

- ❖ The innermost intercostal fibers cover the middle  $\frac{2}{4}^{\text{th}}$  of the intercostal spaces



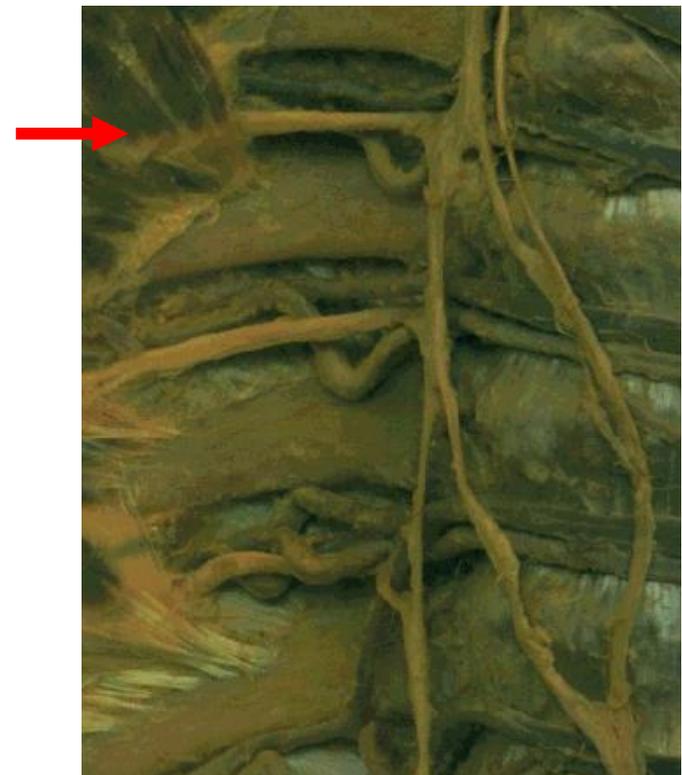
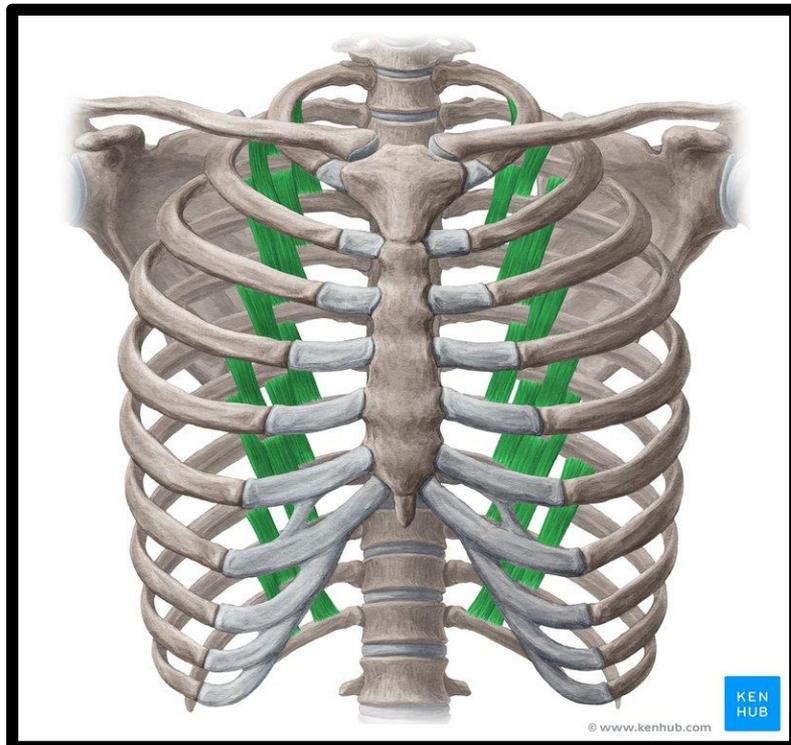
# Subcostalis & Transversus Thoracis

- ❖ Lie in a deeper plane than the innermost intercostal
- ❖ their fibers cross more than one intercostal space



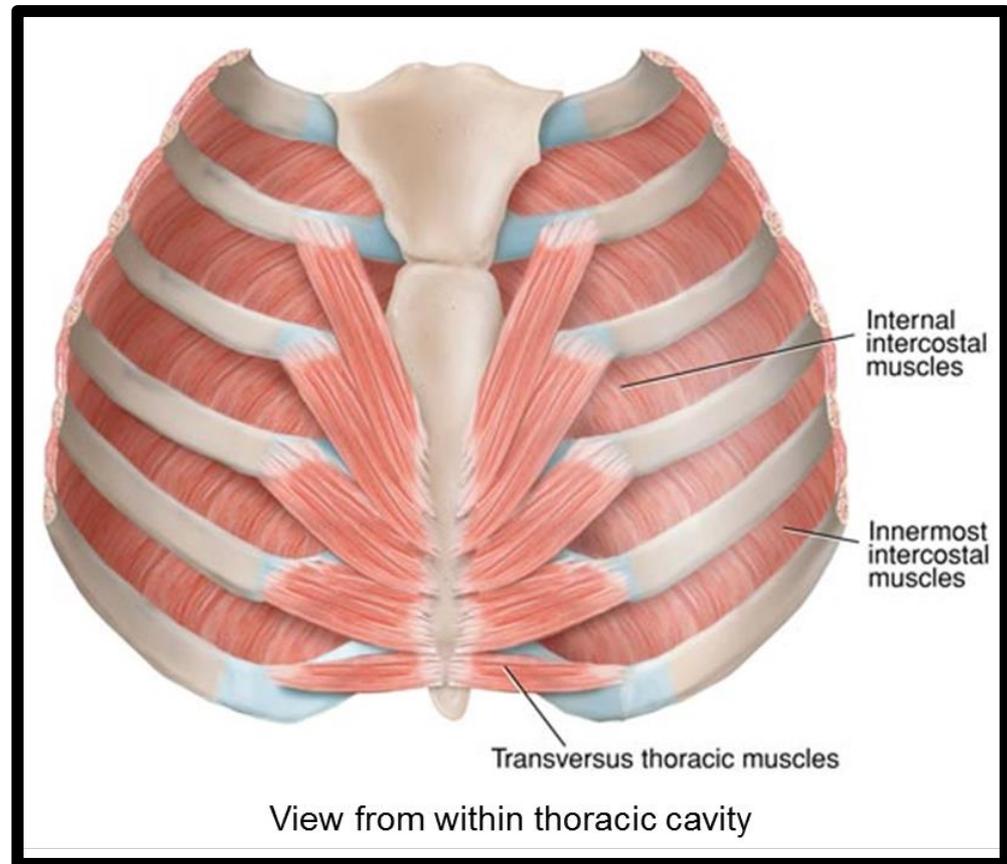
# Subcostalis

- ❖ The Subcostalis slips are located near the angles of the ribs mainly in the lower intercostal spaces
- ❖ Their fibers run parallel with those of the innermost intercostal



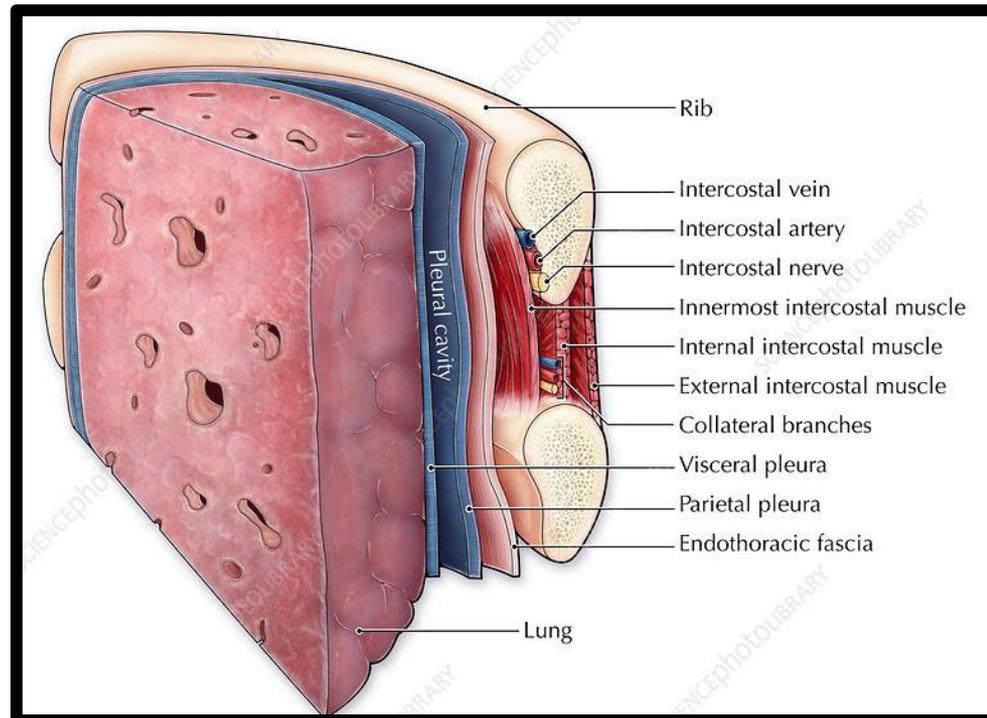
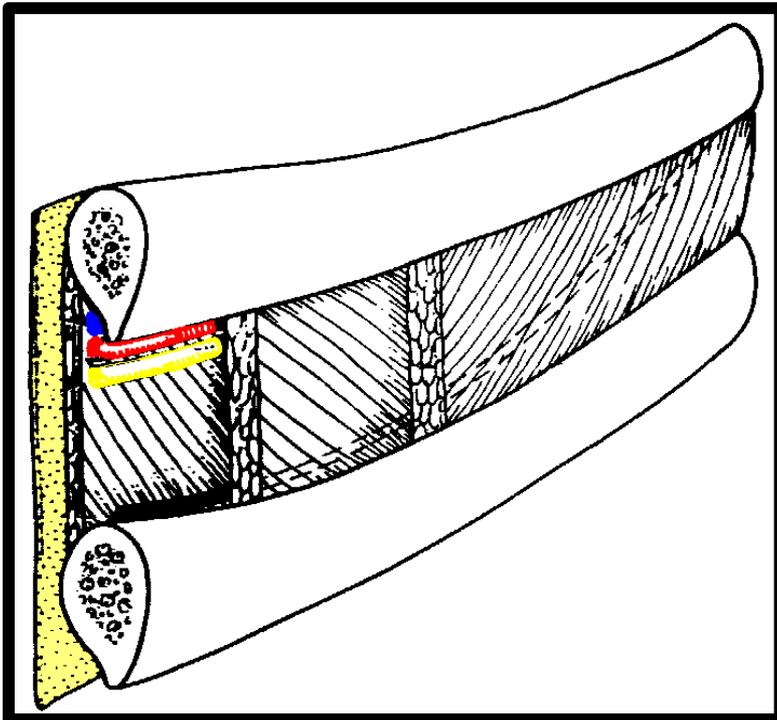
# Transversus thoracis

- ❖ Is also called **sternocostalis** since its fibers extend from **the lower 1/3<sup>rd</sup> of the posterior surface of the sternum and the costal cartilages of the lower true ribs** to **the internal surfaces of the upper costal cartilages**
- ❖ Its fibers have different obliquity
- ❖ the lower fibers are horizontal and become continuous with the transversus abdominis muscle, hence the name **transversus thoracis**



# Endothoracic fascia

❖ The innermost intercostal, Subcostalis, and transversus thoracis separate **the intercostal neurovascular bundle** from the layer of fascia external to the pleura called the **endothoracic fascia**



frontal process of  
the maxilla

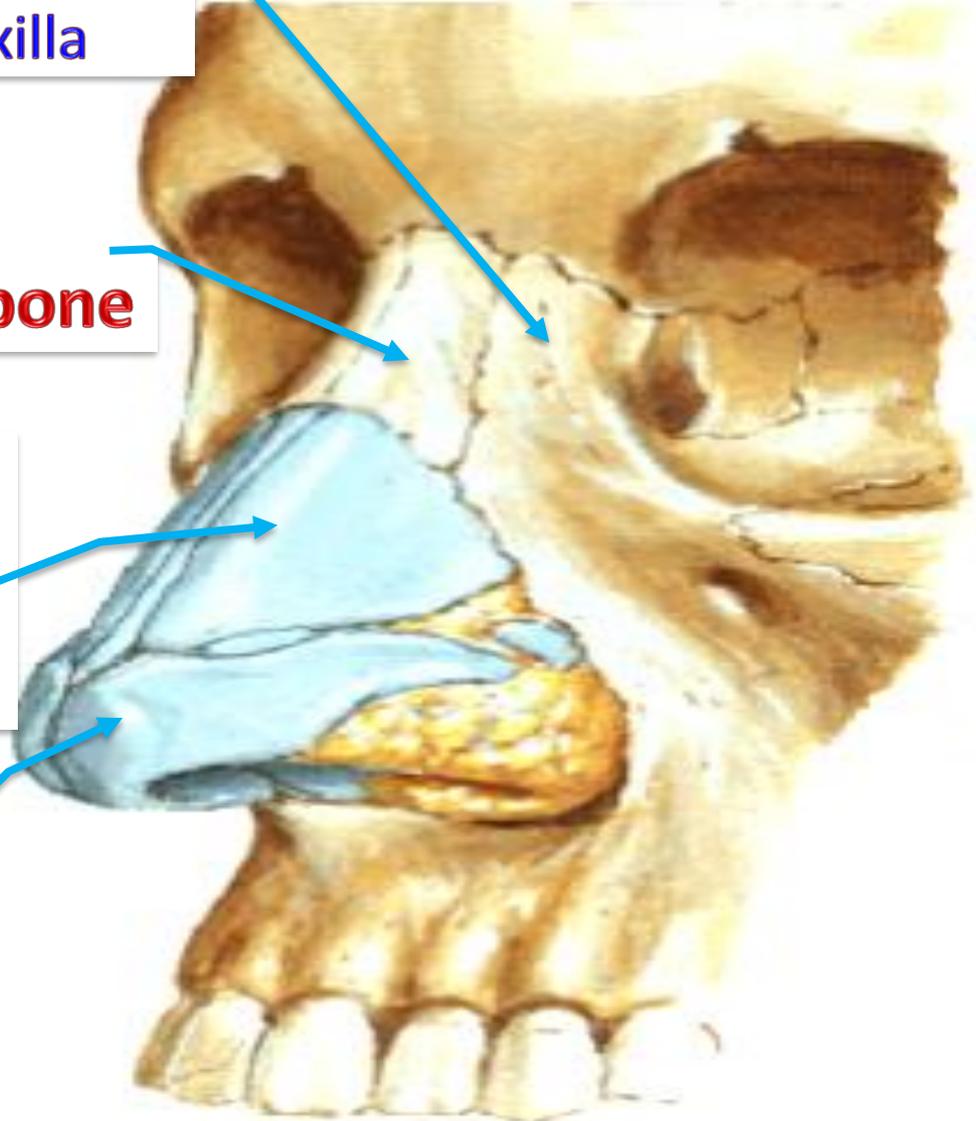
Nasal bone

nasal  
cartilage

Greater  
alar  
cartilage

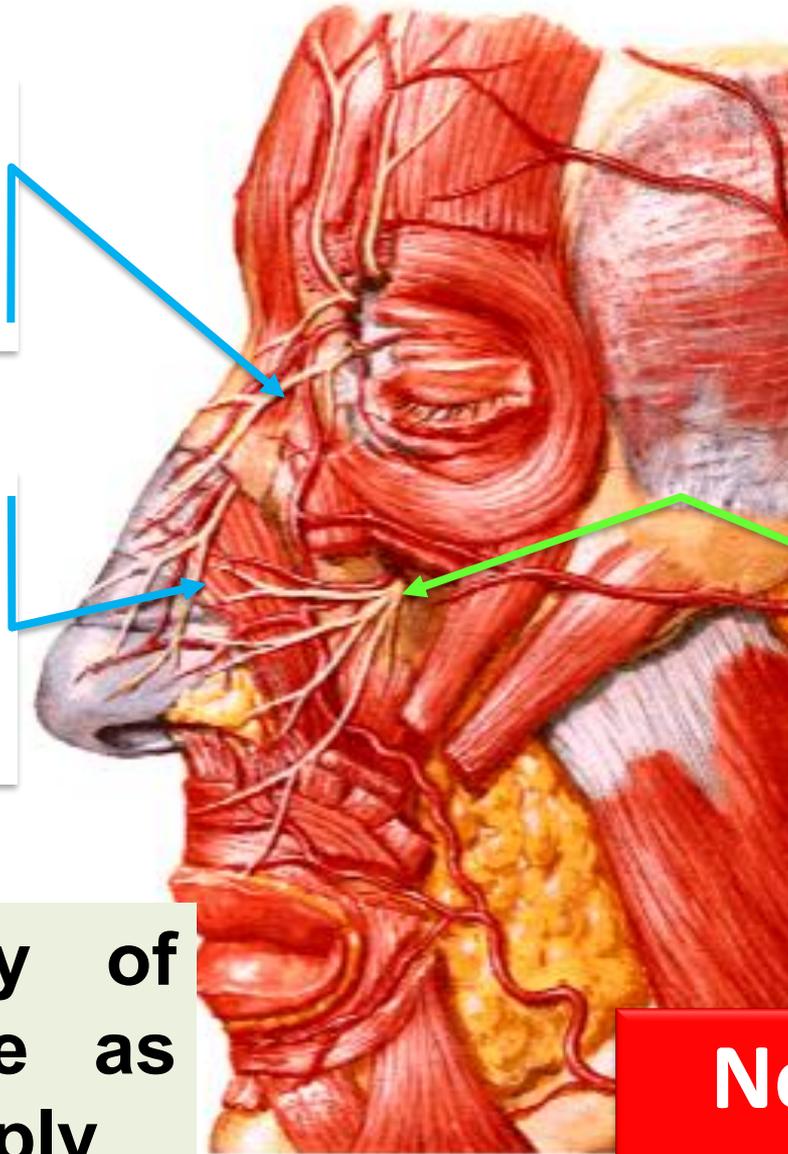
**Boundaries External nose**

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**infratrochlear  
nerve ophth N.**

**external nasal  
nerve ophth.  
N.**

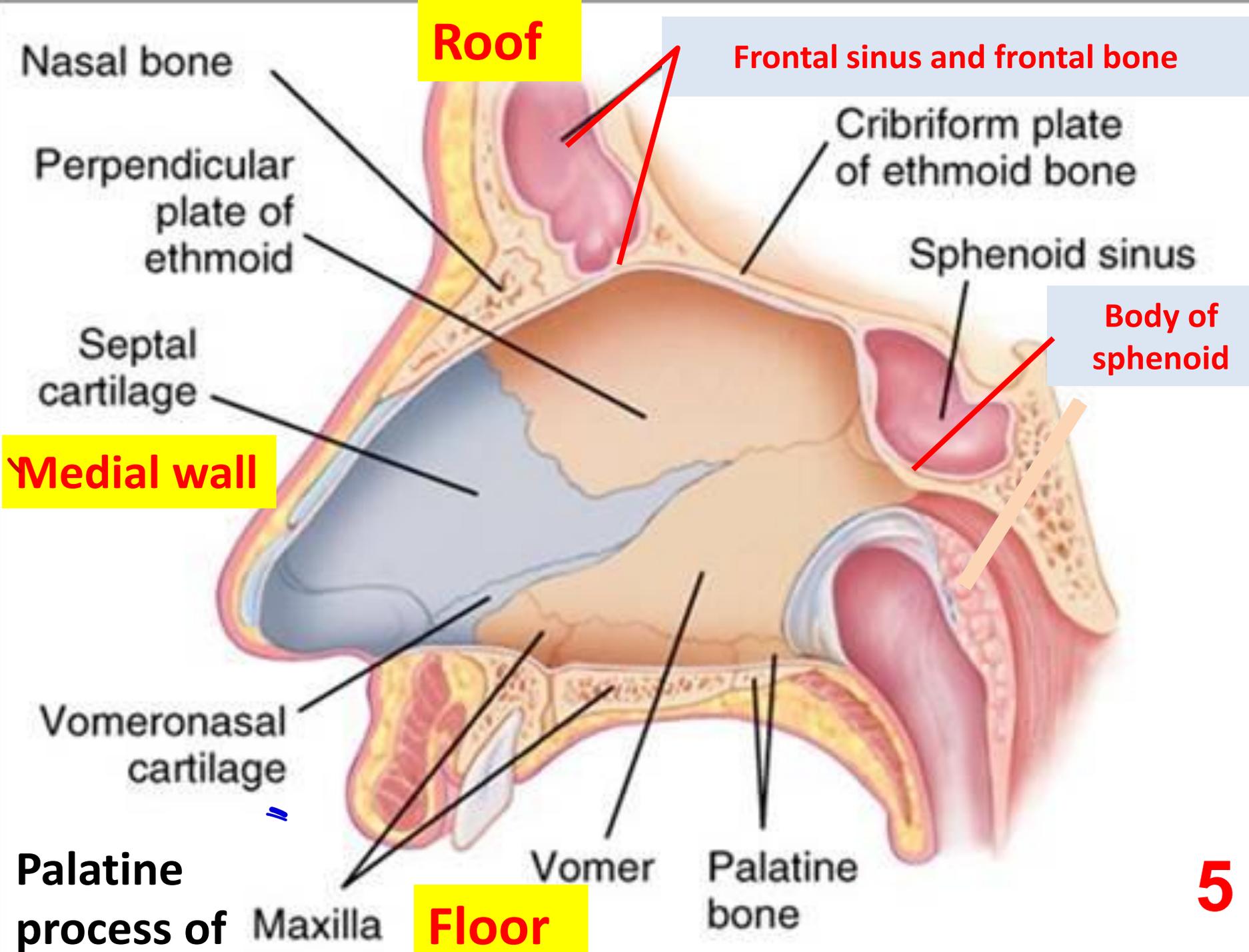


**Infraorbital  
nerve**

**Max. N**

**Blood supply of  
external nose as  
the nerve supply**

**Nerve supply  
of External nose**



# Lateral wall

Anterior

Posterior

Nasal bone

Ethmoid bone

Frontal process of the maxilla

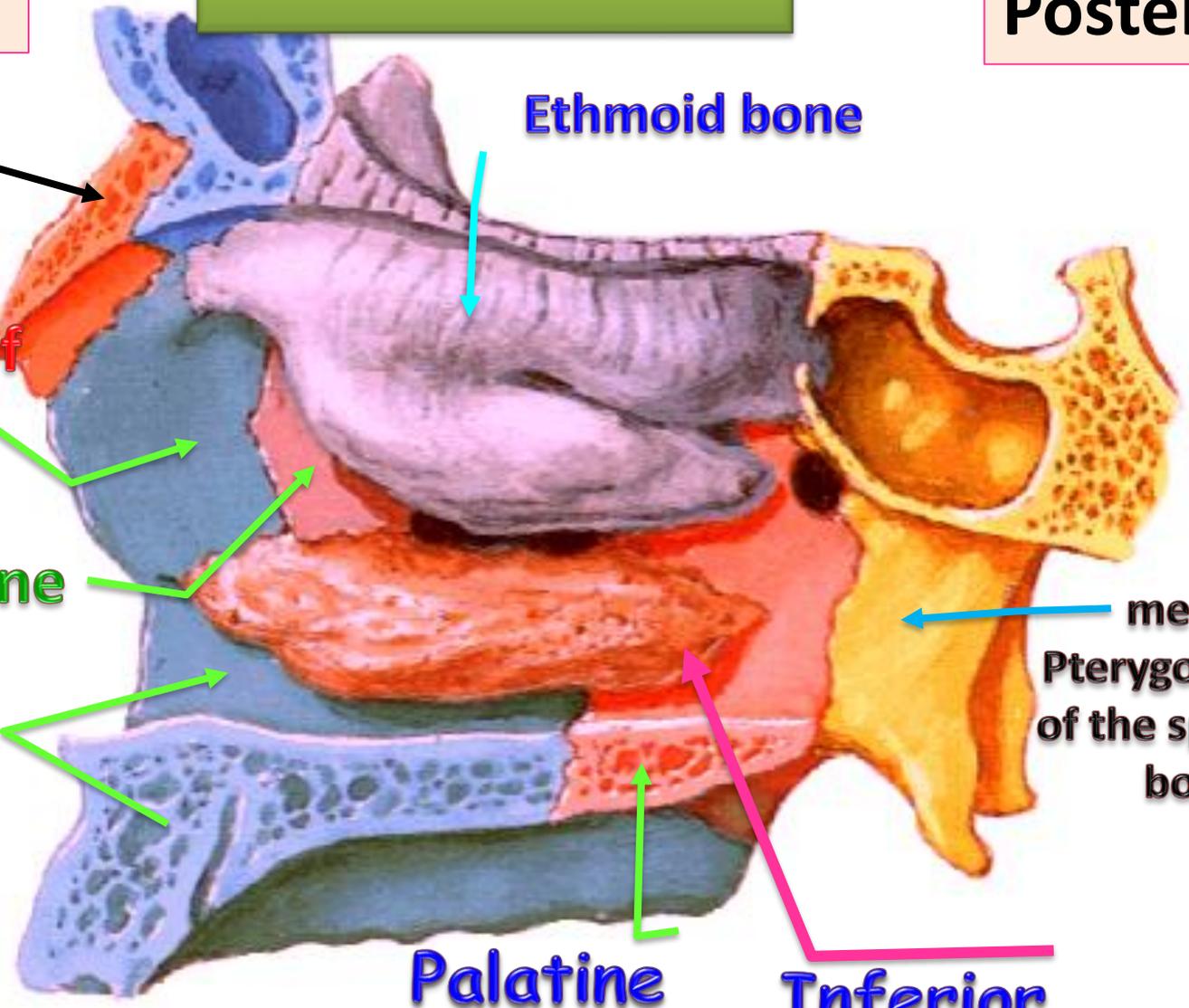
Lacrimal bone

maxilla

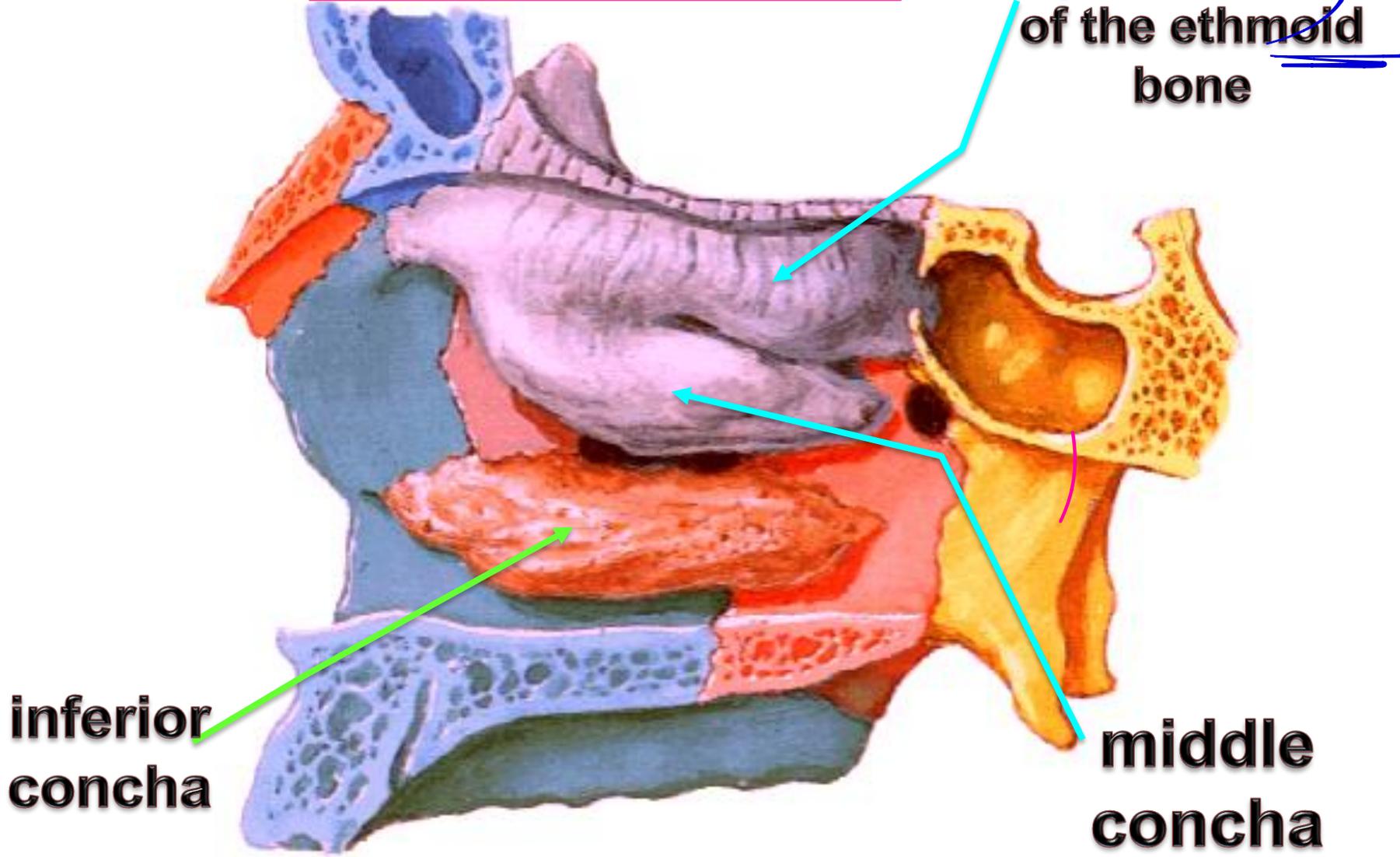
medial Pterygoid plate of the sphenoid bone

Palatine bone

Inferior concha



# Nasal conchae



# Lateral wall

Sphenoethmoidal recess

Frontal sinus

Superior concha

Superior meatus

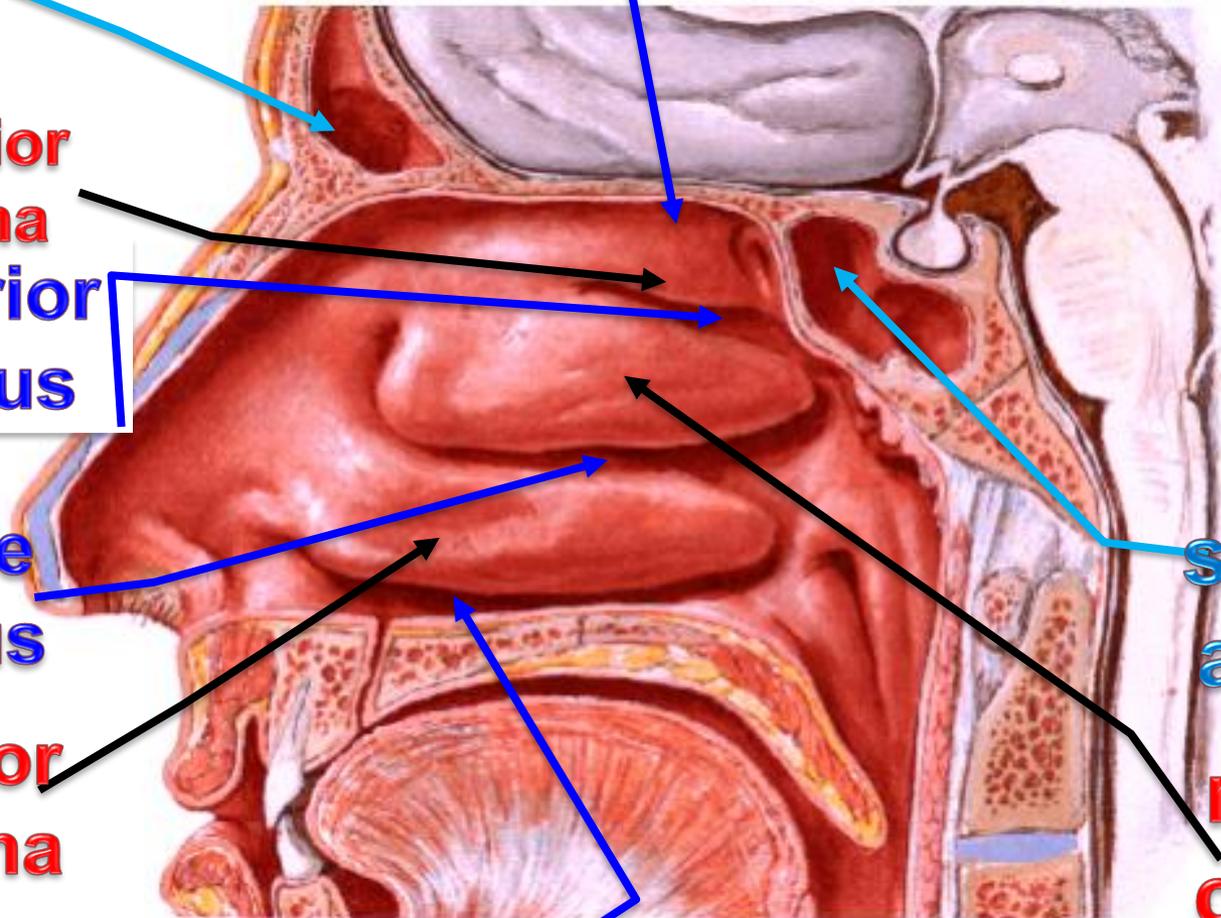
Middle meatus

inferior concha

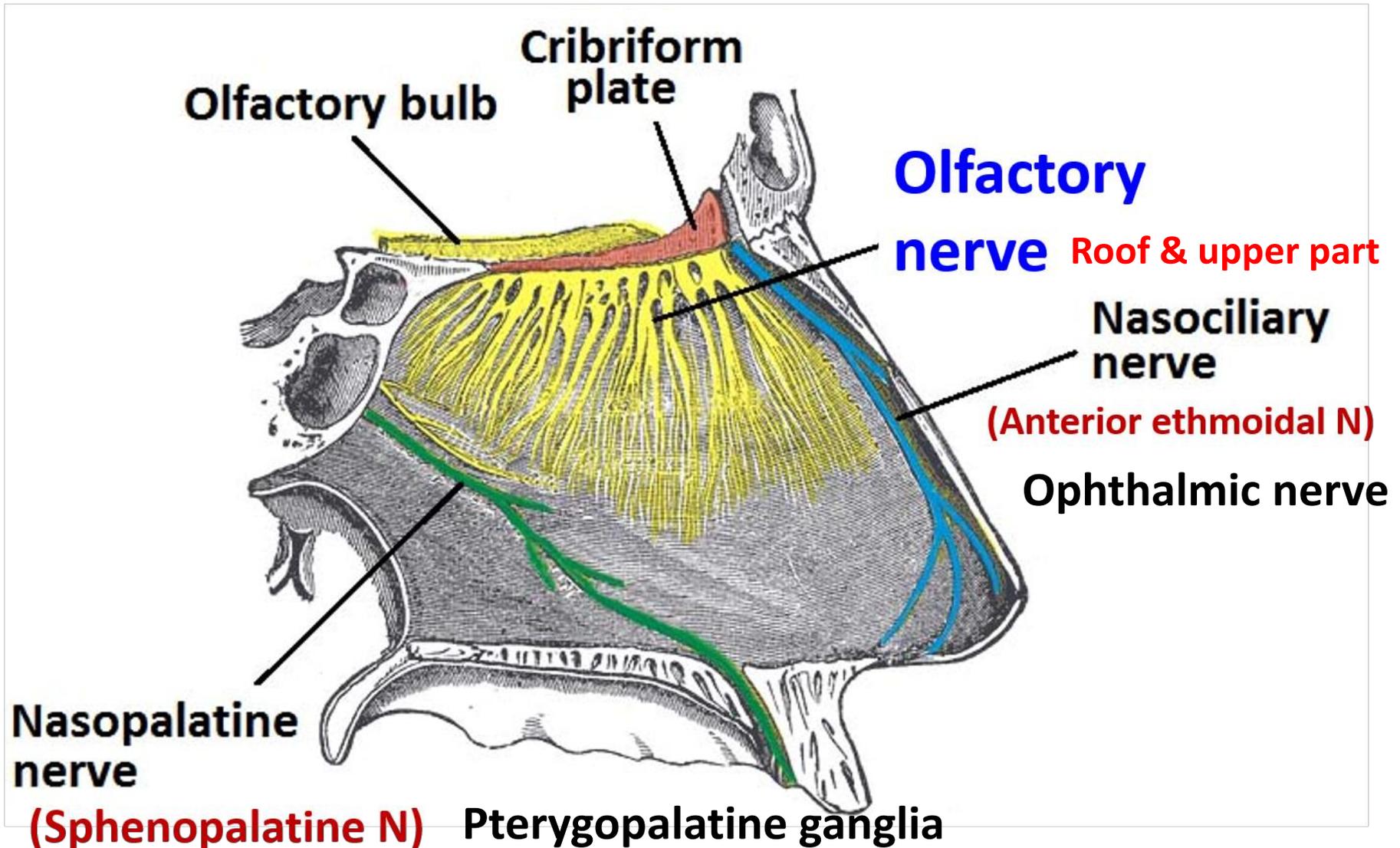
Inferior meatus

sphenoid air sinus

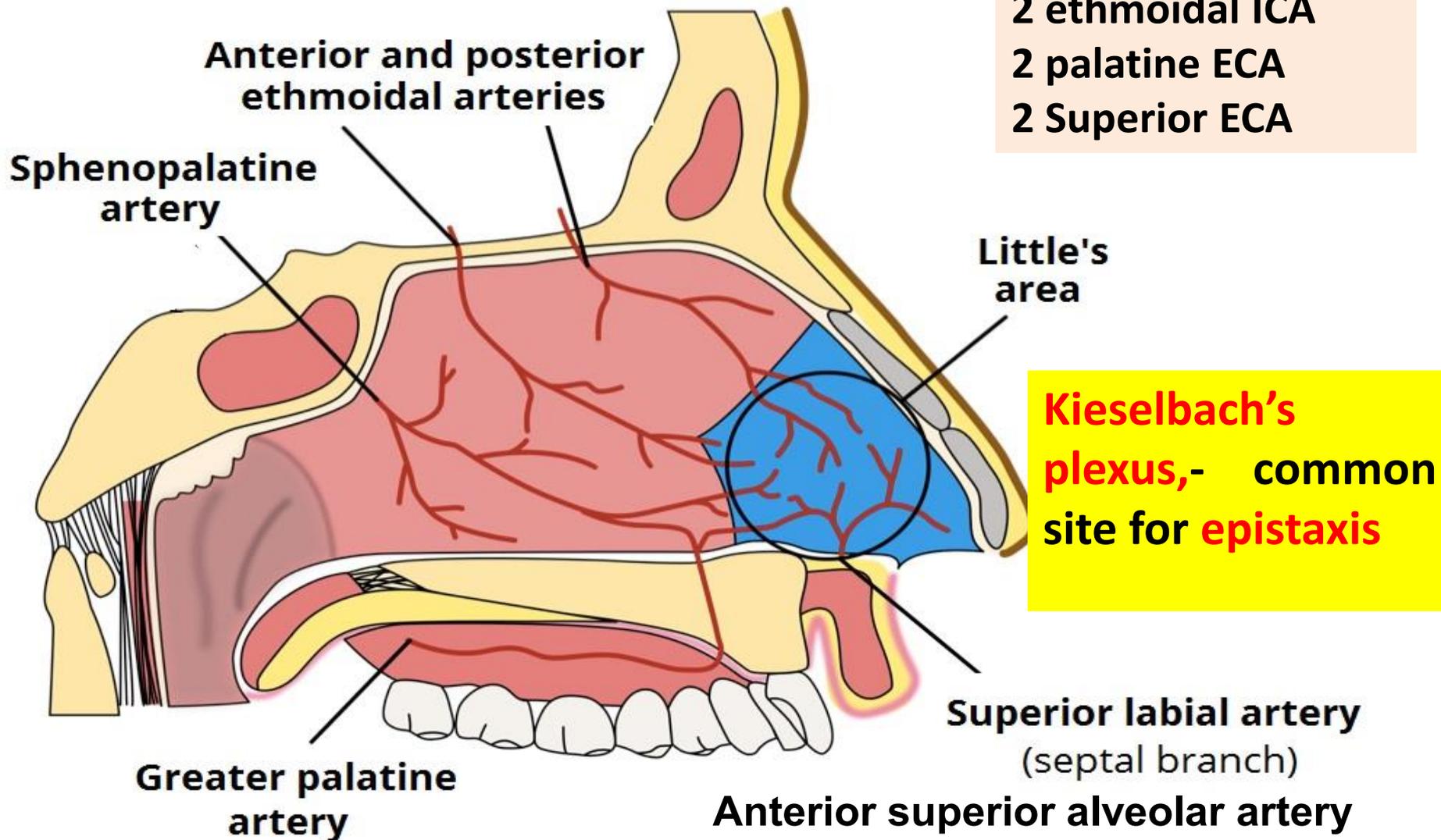
middle concha



# Nerve supply of the nose



# Arterial blood supply of the nose 14



# Paranasal sinuses

20

frontal sinus

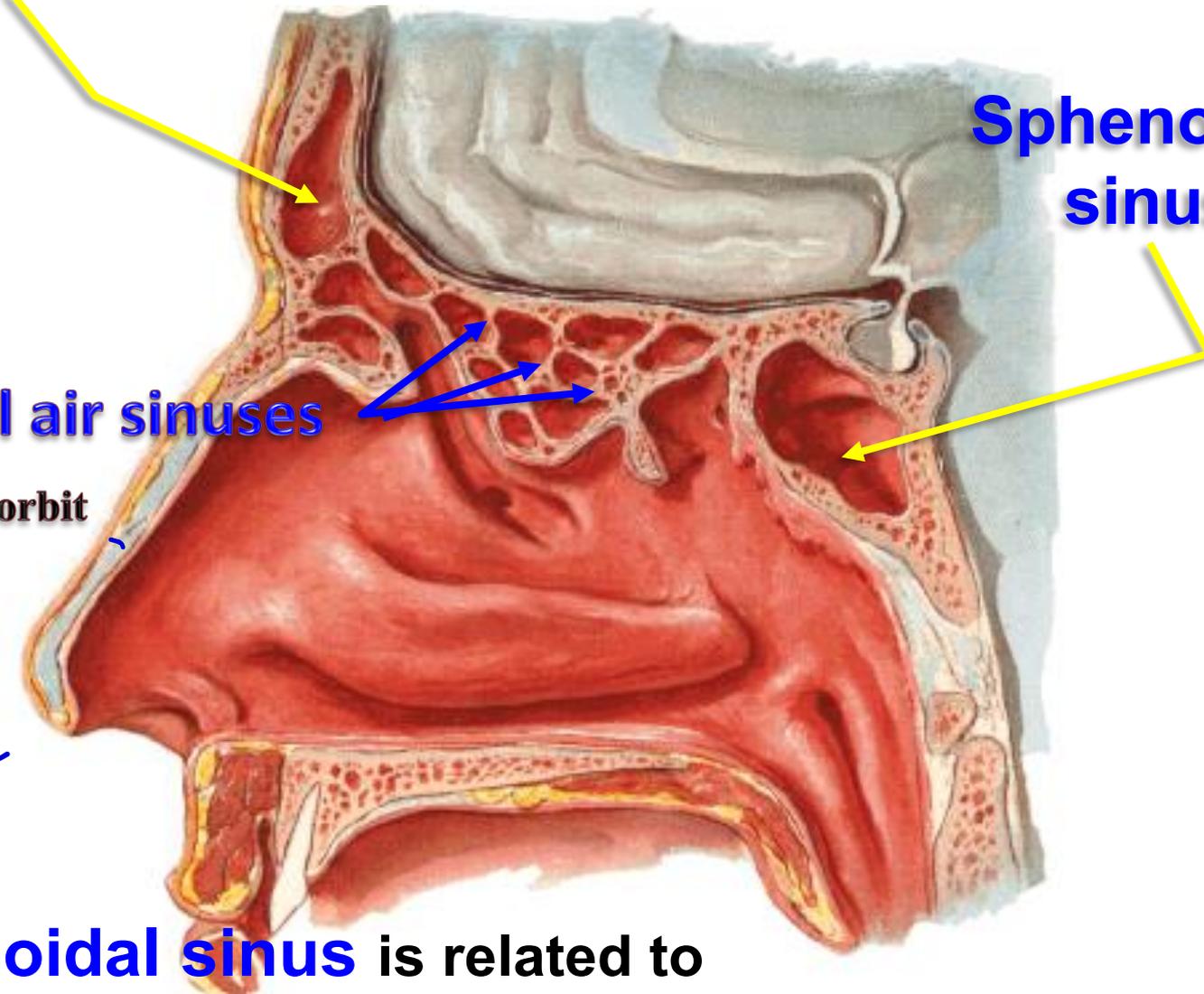
Sphenoidal sinus

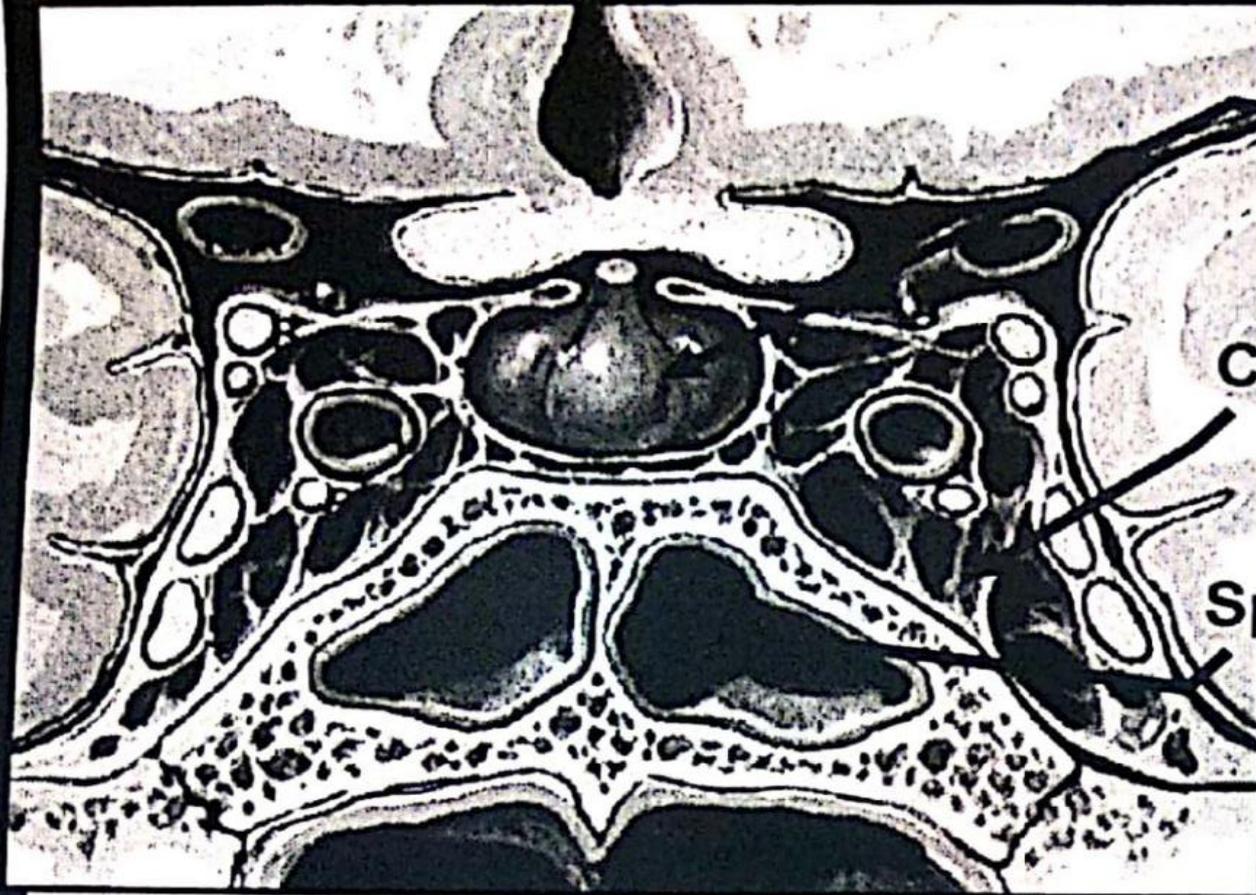
Ethmoidal air sinuses

Between nose & orbit

- Anterior
- Middle
- Posterior

- ❖ **Sphenoidal sinus** is related to
  - Pituitary gland (above)
  - Cavernous sinus (on each side)





Pituitary  
gland

Cavernous  
sinus

Sphenoidal  
sinus

- ❖ Sphenoidal sinus is related to
  - Pituitary gland (above)
  - Cavernous sinus (on each side)

**Maxillary sinus**

**Base**

**Roof**

The floor of the orbit

The lateral wall of the nasal cavity

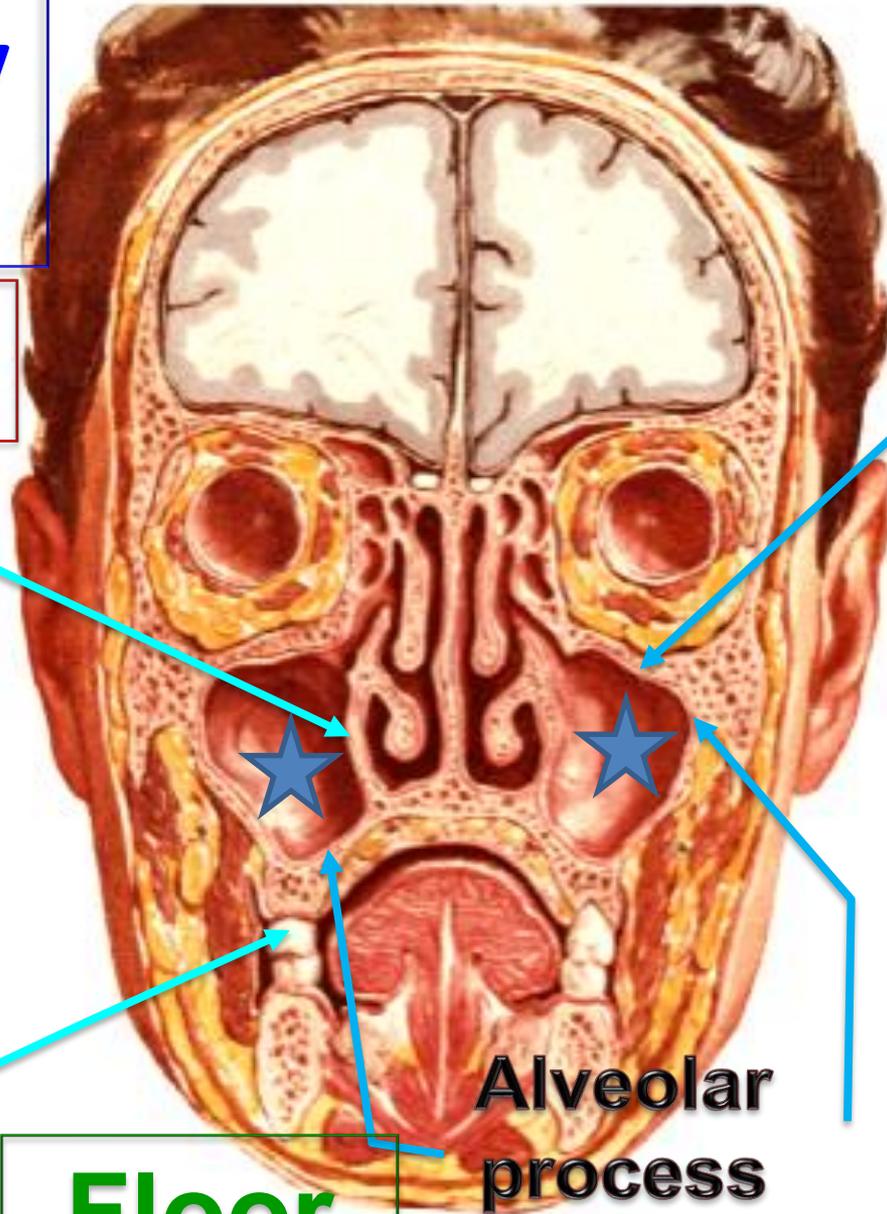
**Apex**

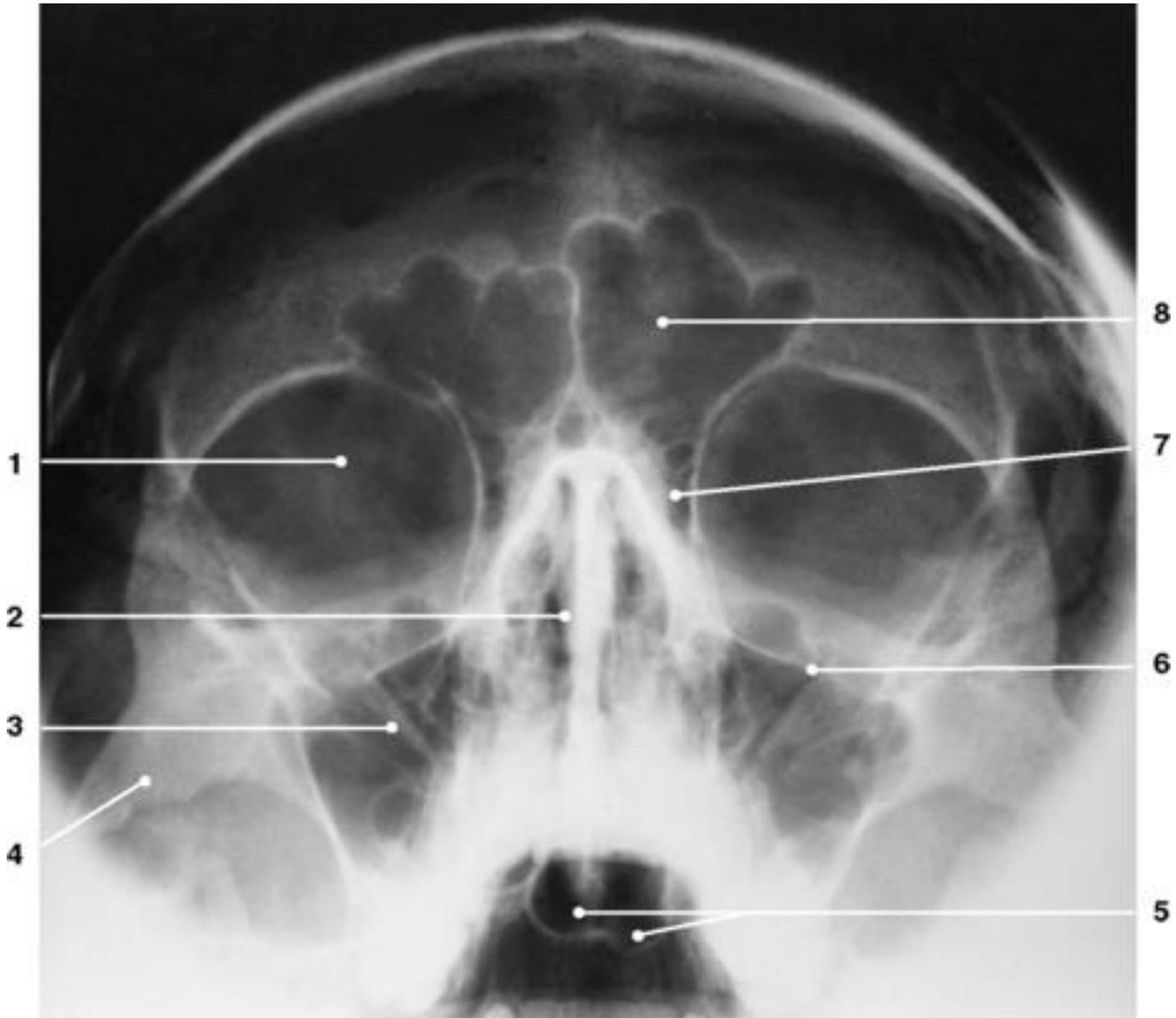
Zygomatic process of maxilla

Roots of upper teeth

**Floor**

Alveolar process of maxilla



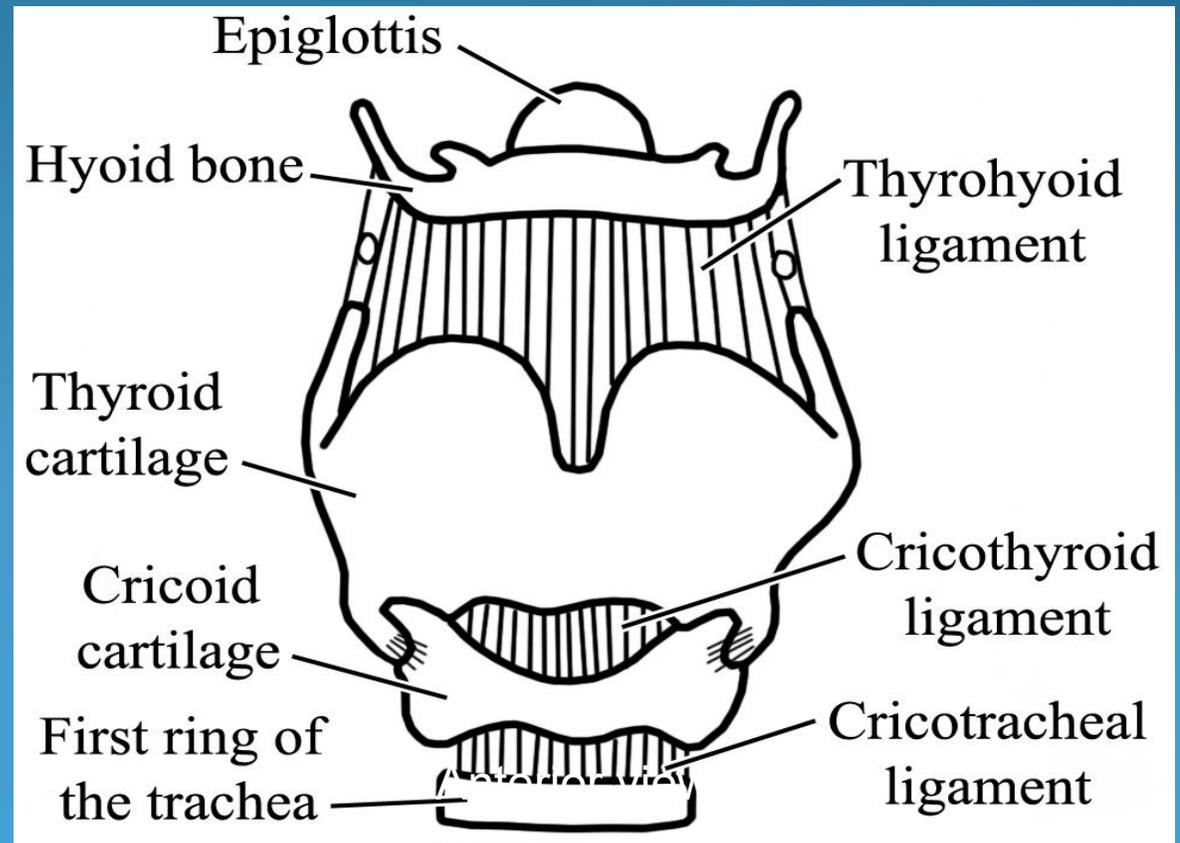
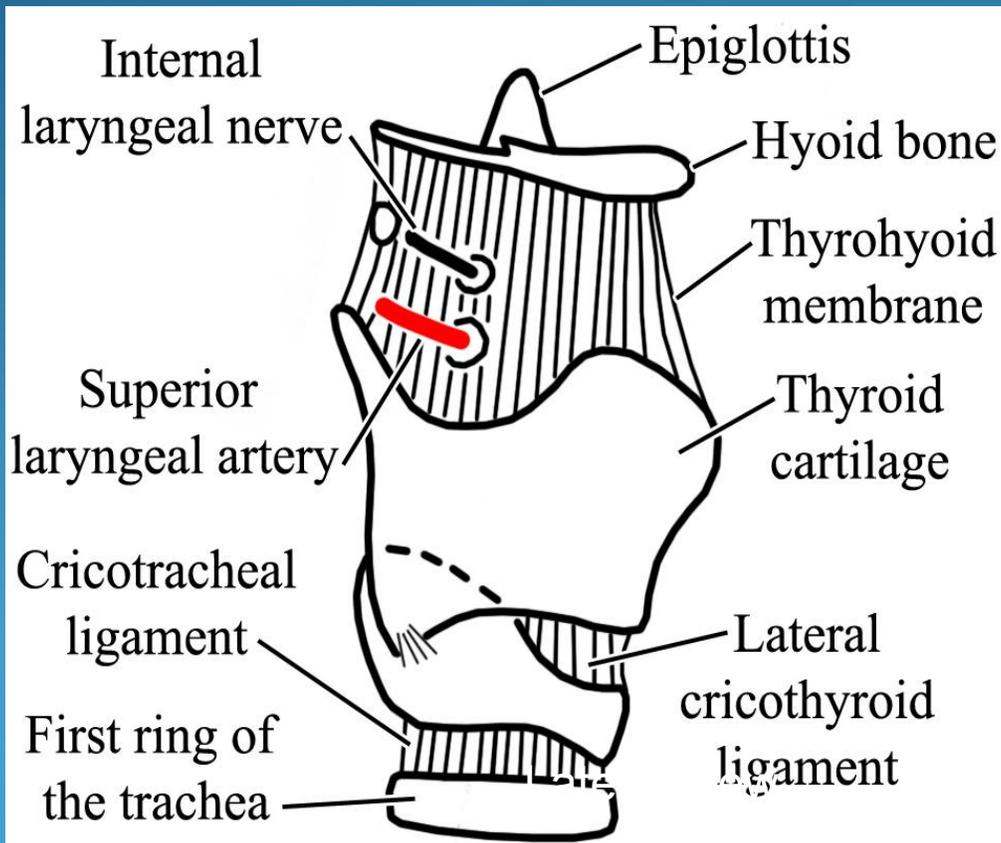


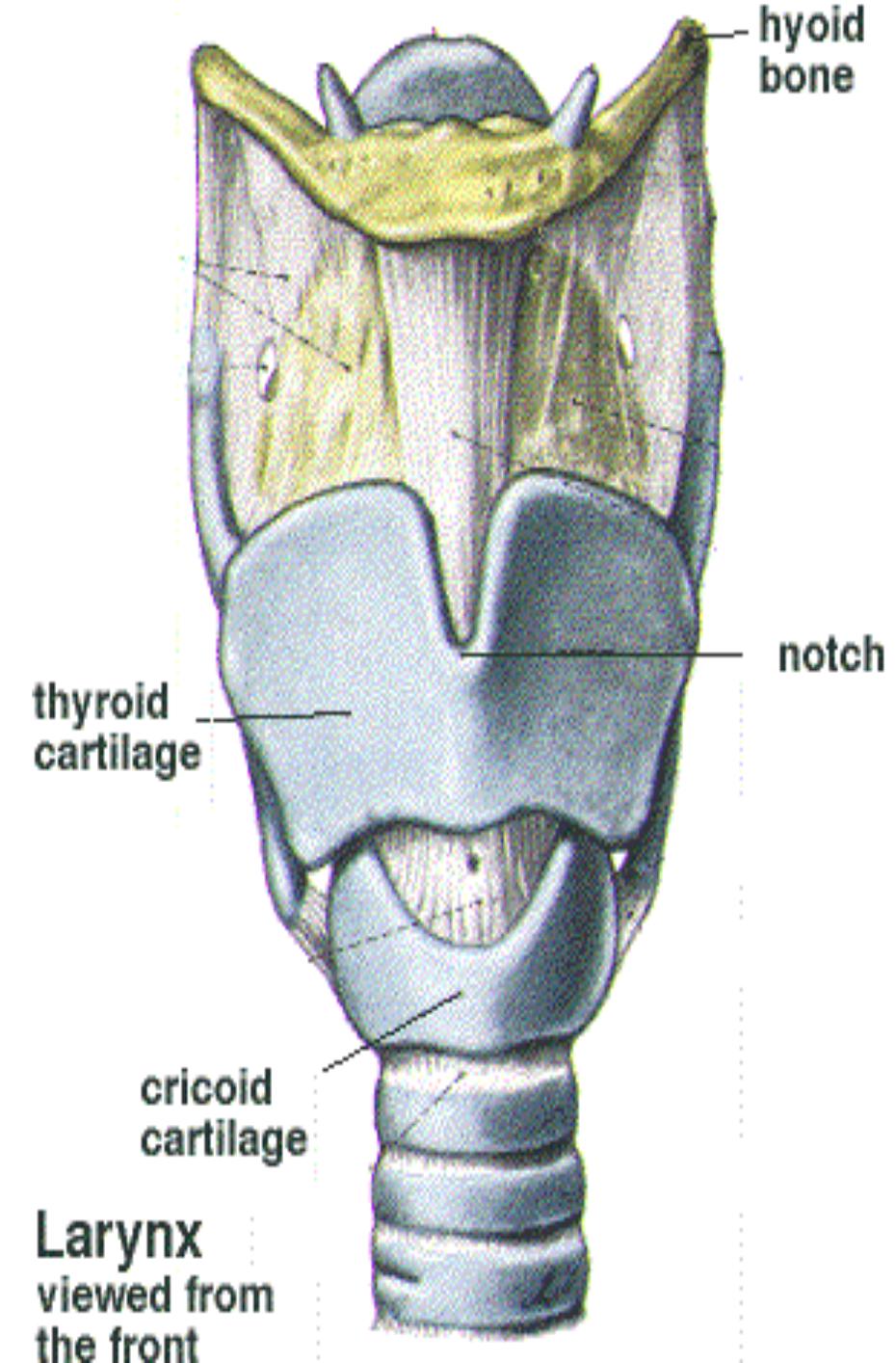
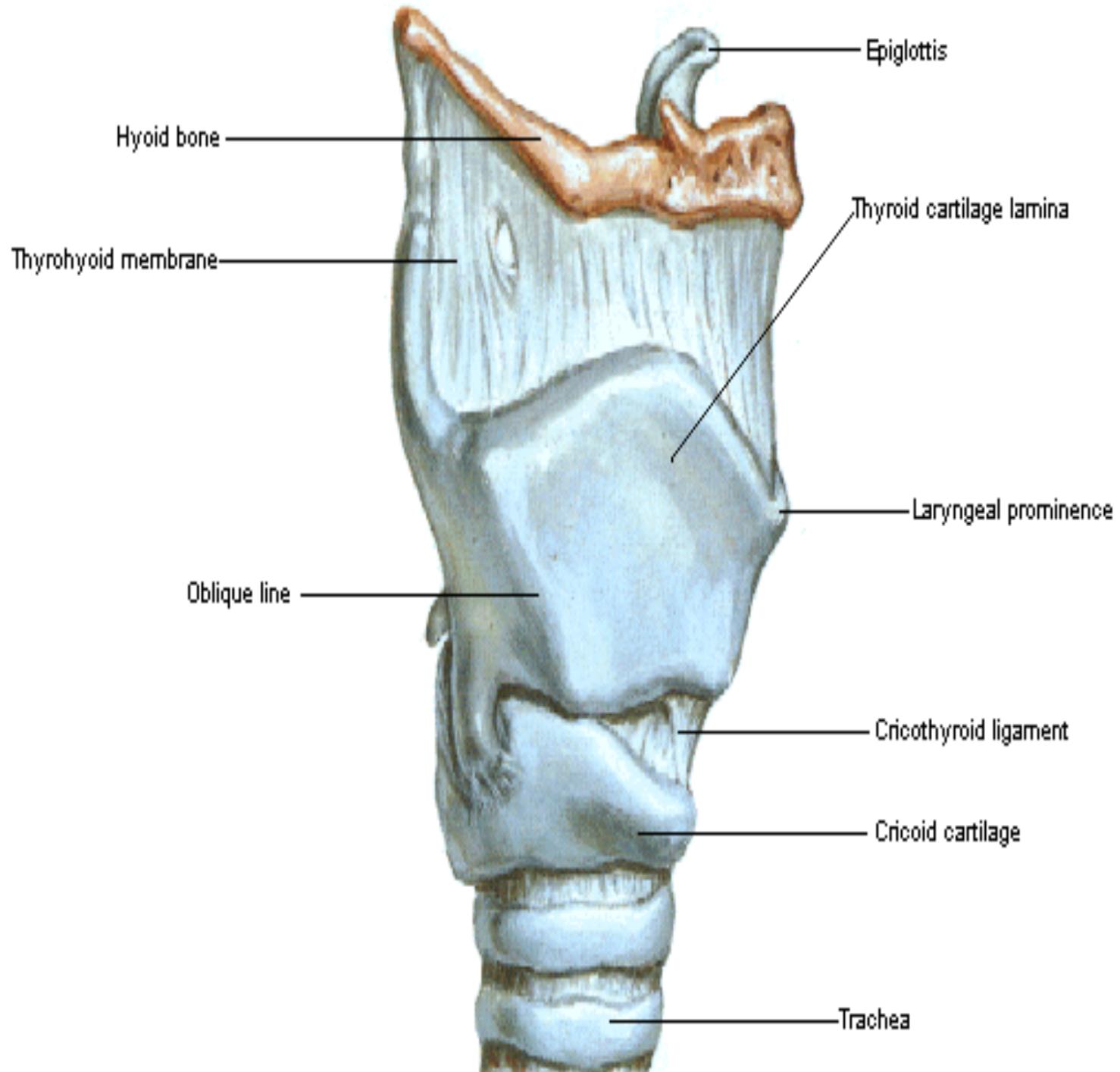


# Larynx

- The larynx is the organ of phonation (voice production) in addition to its respiratory function (air way). It is formed of a group of cartilages connected by Muscles, Ligaments and joints).

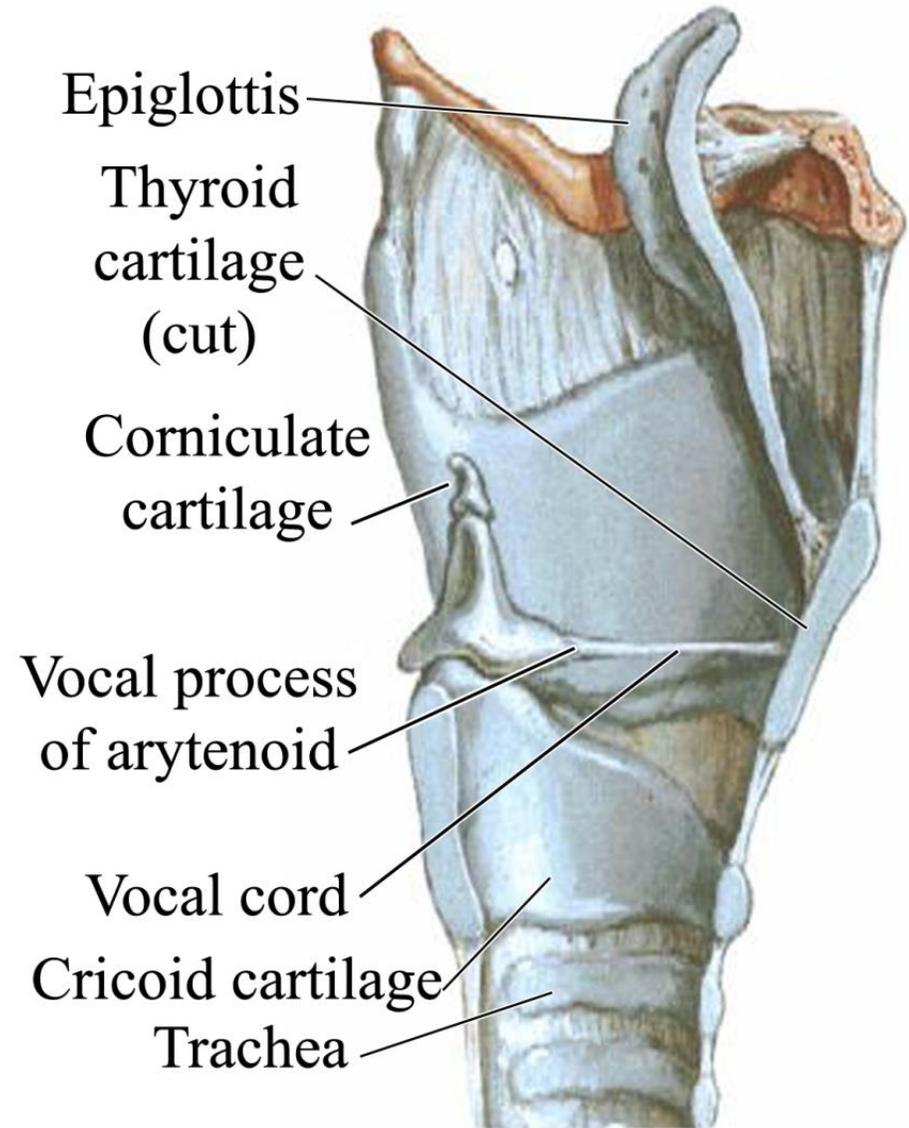
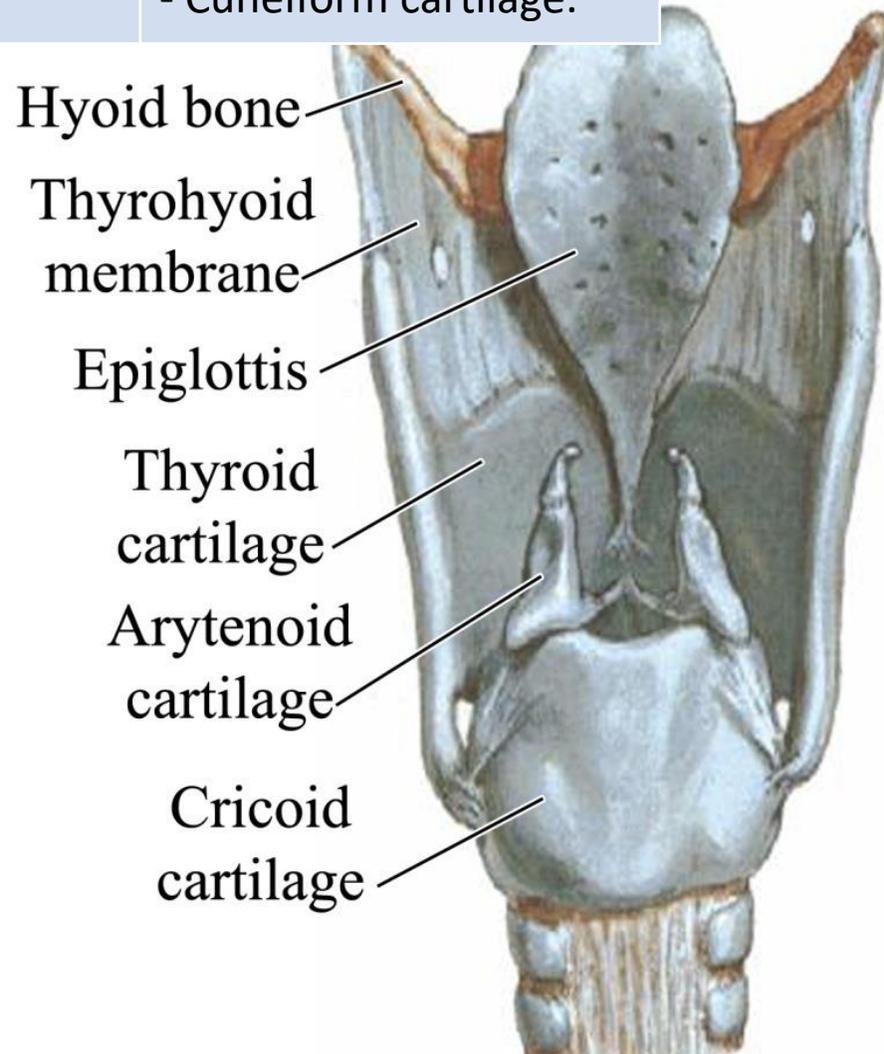
**Site:** It lies below the hyoid bone in the midline of the neck at the level of C. 4 - 6 vertebrae.





Single cartilages	Paired cartilages
- Thyroid cartilage.	- Arytenoid cartilage.
- Cricoid cartilage.	- Corniculate cartilage.
- Epiglottis.	- Cuneiform cartilage.

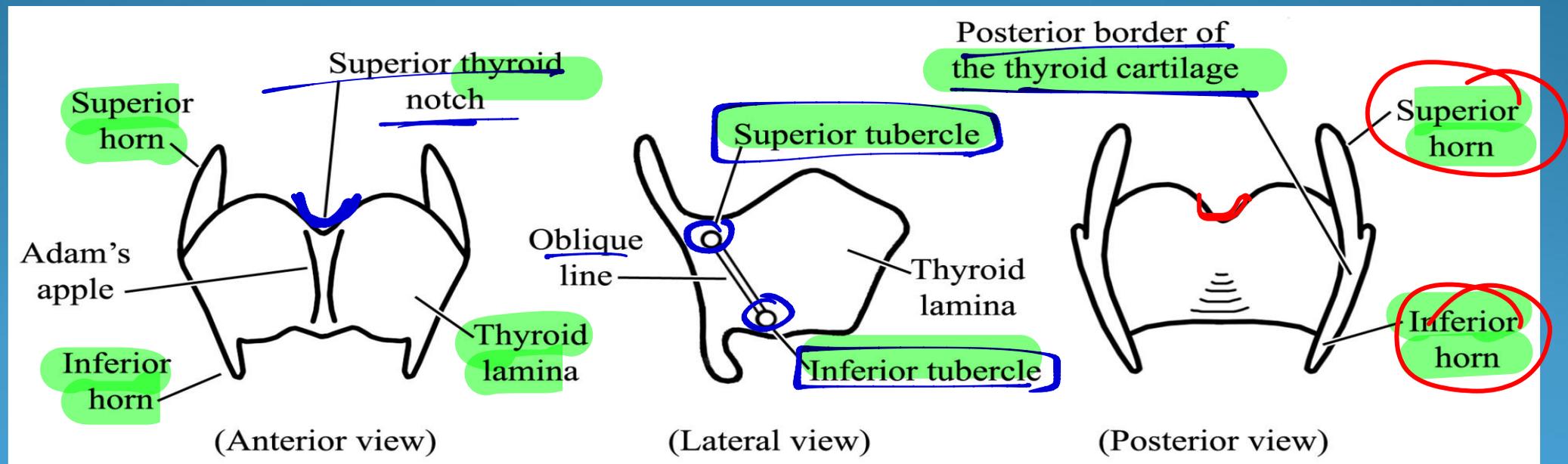
# Cartilages of the Larynx



# 1. Thyroid cartilage

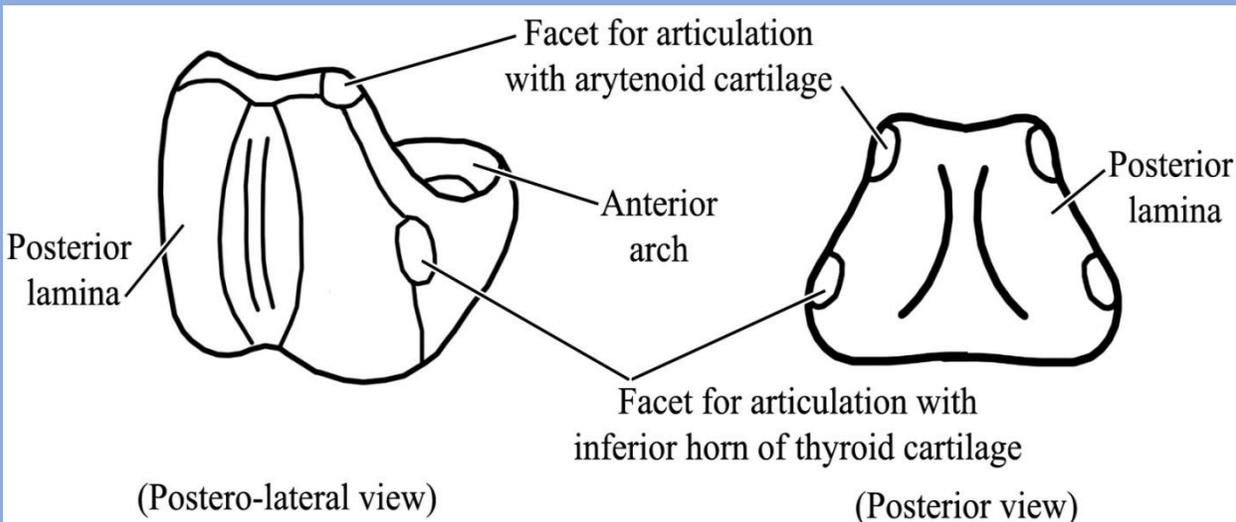
It consists of **two laminae** which are fused anteriorly to form the laryngeal prominence (Adam's apple) but they are separated posteriorly.

- Superiorly the area between the **two laminae** is called the **superior thyroid notch**.
- Each lamina has **two horns** (superior and inferior), and **two tubercles** on its lateral surface (superior and inferior).
- The two tubercles are connected to each other by the **oblique line**.



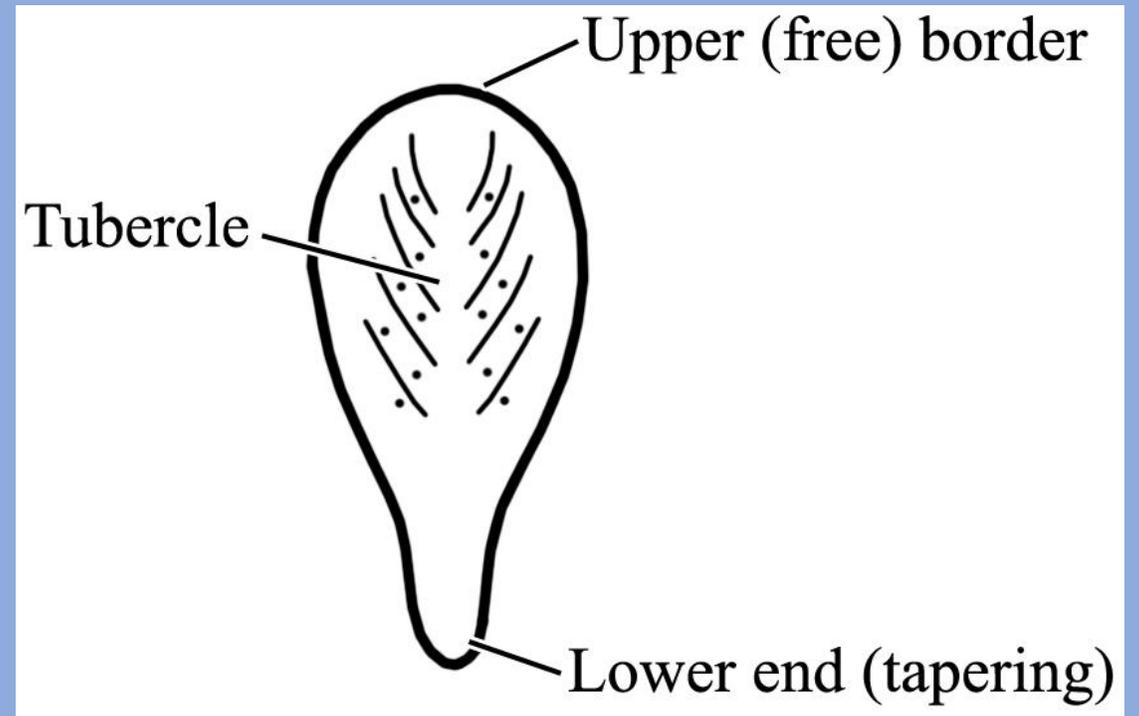
## 2. Cricoid cartilage

- It is signet-ring in shape (it is the only complete cartilaginous ring in the upper respiratory airway).
- It lies at the level of C. 6.
- It is formed of quadrate lamina (posterior) and a narrow arch (anterior).
- The quadrate lamina contains two facets which are:
  - Superior facet: Articulates with the base of the arytenoid cartilage (one on each side).
  - Inferior facet: Articulates with the inferior horn of the thyroid cartilage (one on each side).



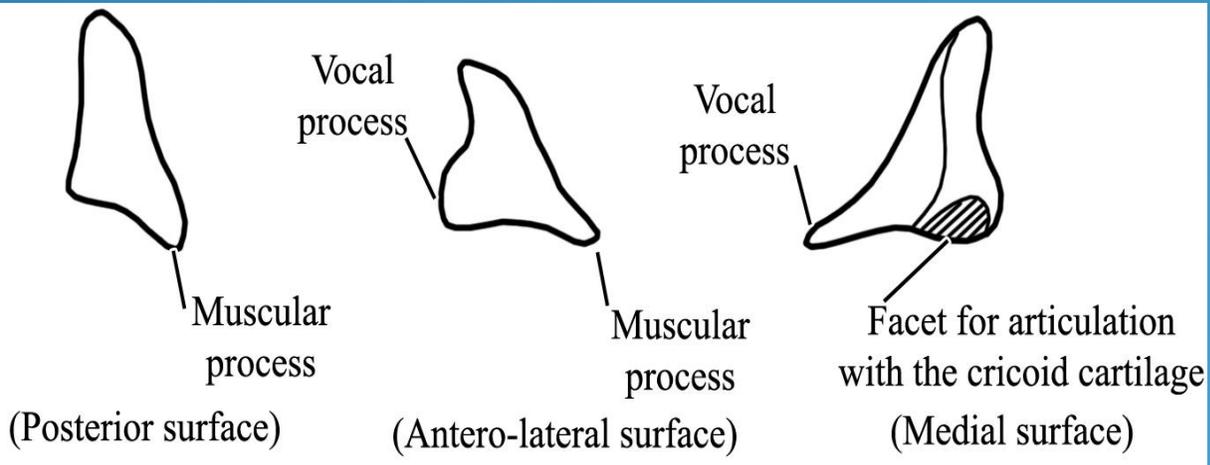
## 3. Epiglottis

- It is leaf-shaped elastic cartilage which lies behind the tongue.
- It has superior rounded free border and an inferior tapering end which is attached to the upper part of the thyroid notch.



## 4. Arytenoid cartilage

- It is **pyramidal** in shape with antero-lateral, medial and posterior surfaces.
- Its **base** has a forward projection (vocal process) and a lateral projection (muscular process).
- The **base** articulates with the upper facet of the quadrate lamina of the cricoid cartilage.



## 5. Corniculate cartilage

- It is a small cartilaginous nodule.
- It articulates with the apex of each arytenoid and lies in **the aryepiglottic fold**.

## 6. Cuneiform cartilage

- It is another small cartilaginous nodule which articulates with the upper surface of the corniculate cartilage and lies in the aryepiglottic fold

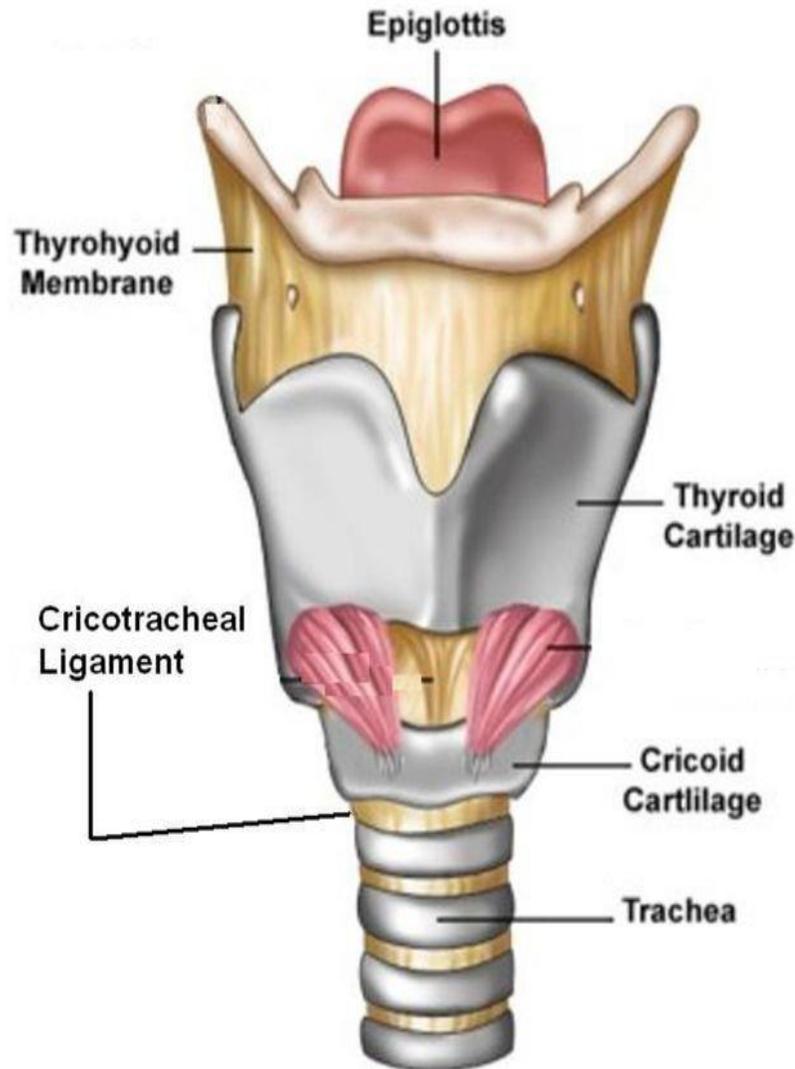
# Ligaments and Membranes of the larynx

## Extrinsic

Thyrohyoid  
membrane

Hyoepiglottic  
ligament

Cricotracheal  
ligament



## A. EXTRINSIC LIGAMENTS

### 1. Thyrohyoid membrane:

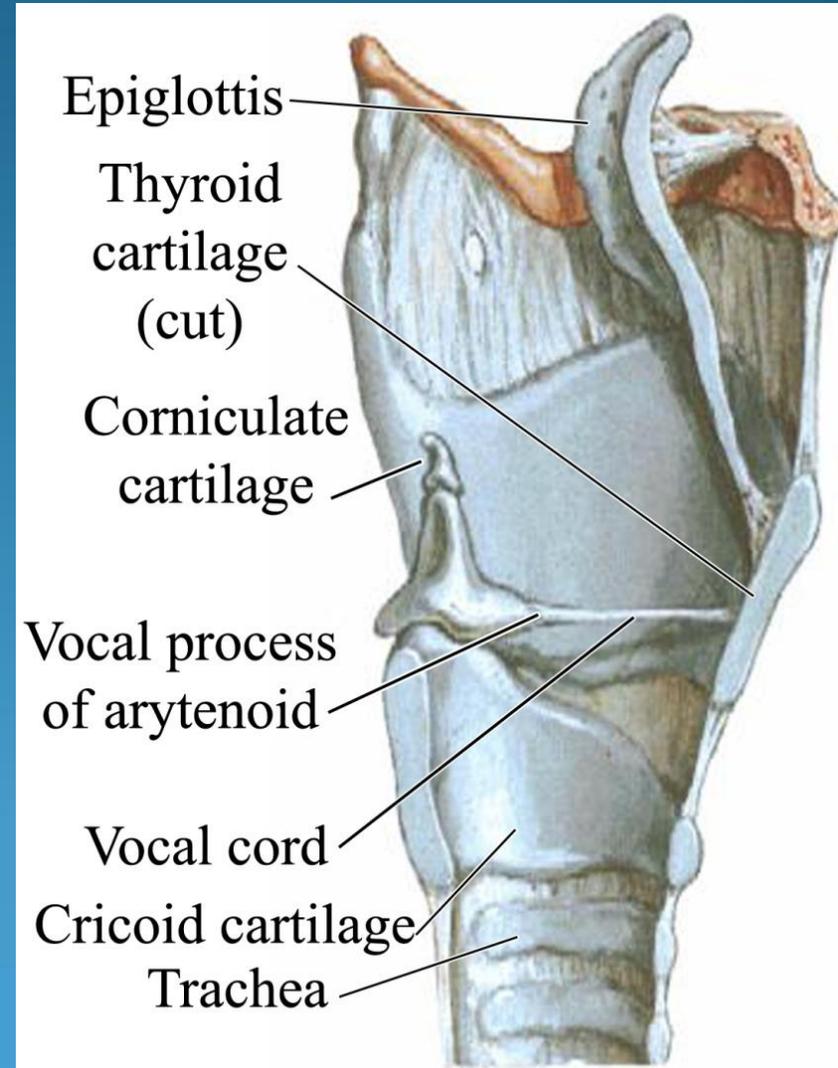
- It connects the upper border of the thyroid lamina to the body and the greater horns of the hyoid bone.

## 2. Hyoepiglottic ligament

- It is a small elastic ligament which connects the upper part of the anterior surface of the epiglottis to the hyoid bone.

## 3. Cricotracheal ligament

- It is an elastic ligament which connects the lower border of the cricoid cartilage to the first ring of the trachea.



## INTRINSIC



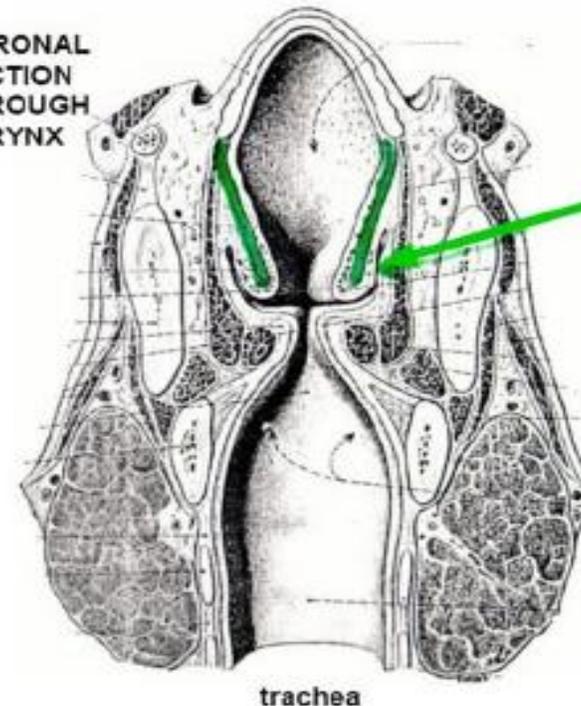
Sagittal section of left side of larynx showing laryngeal membranes

## B. INTRINSIC LIGAMENTS

### 1. Thyroepiglottic ligament

- It is a small elastic ligament which connects the tapering lower end of the epiglottis to the inner surface of the thyroid cartilage.

### CORONAL SECTION THROUGH LARYNX



Lower free edge of Quadrangular membrane is called Vestibular Ligament; deep to Vestibular (False Vocal) Folds

### 3. Cricothyroid membrane (conus elastics) (cricovocal)

- It is formed of two parts: ✌️

#### **a. Median part**

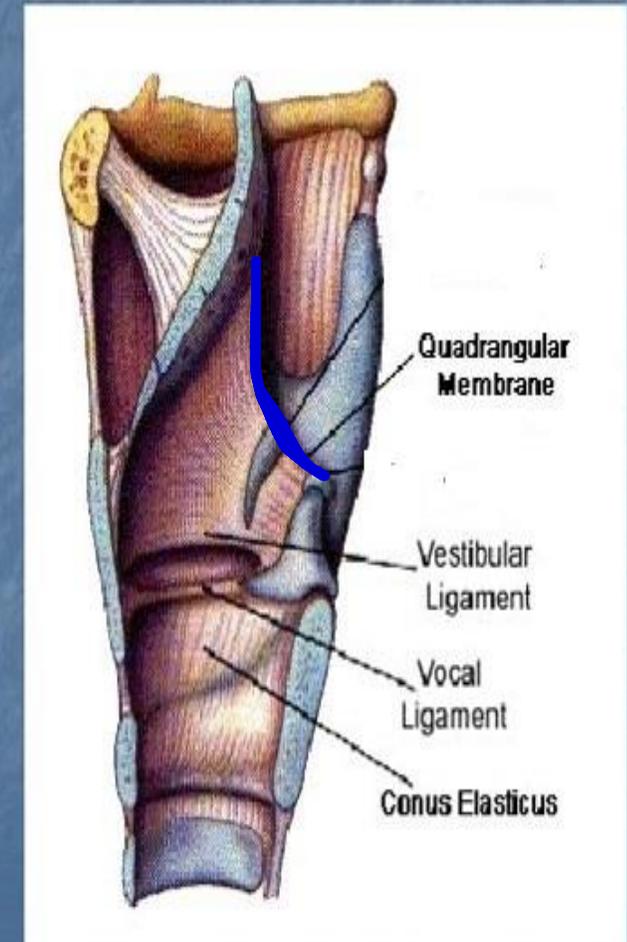
- Between the *upper border of the cricoid cartilage* and the *lower border of the thyroid cartilage*.

#### **b. Lateral part**

- Inferiorly, it is attached to the upper border of the arch of the cricoid cartilage.

## 2 Quadrangular Membrane

- It extends from the lateral margins of the epiglottis within the aryepiglottic fold and attaches to the arytenoid and corniculate cartilages. The inferior free edge is thickened to form the **vestibular ligament** (false vocal cord). The superior edge is also free and it is covered with aryepiglottic fold of mucosa.



# نس الاسامي

## Joints

1. Cricothyroid joint (one on each side)

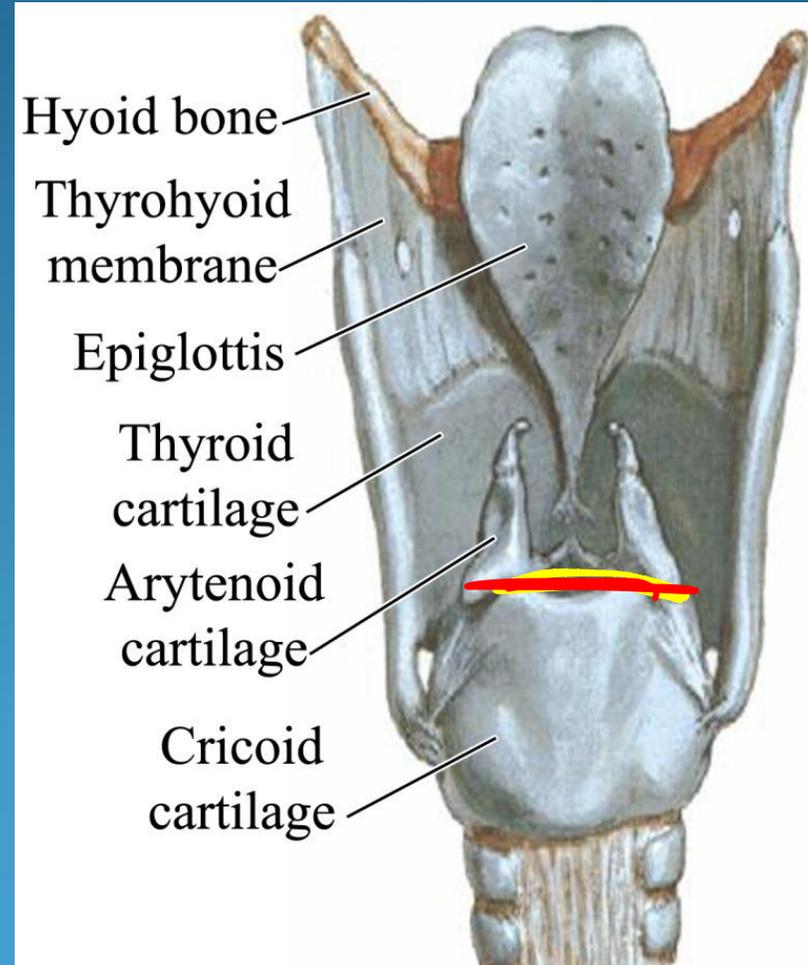
Type: Plane synovial joint.

Articulation: Between the *inferior horn of the thyroid cartilage* and the *lower facet on the arch of cricoid cartilage*.

2. Cricoarytenoid joint (one on each side)

Type: Plane synovial joint.

Articulation: Between the *base of the arytenoid cartilage* and the *superior facet of the quadrata lamina of the cricoid cartilage*.



# Inlet of the larynx

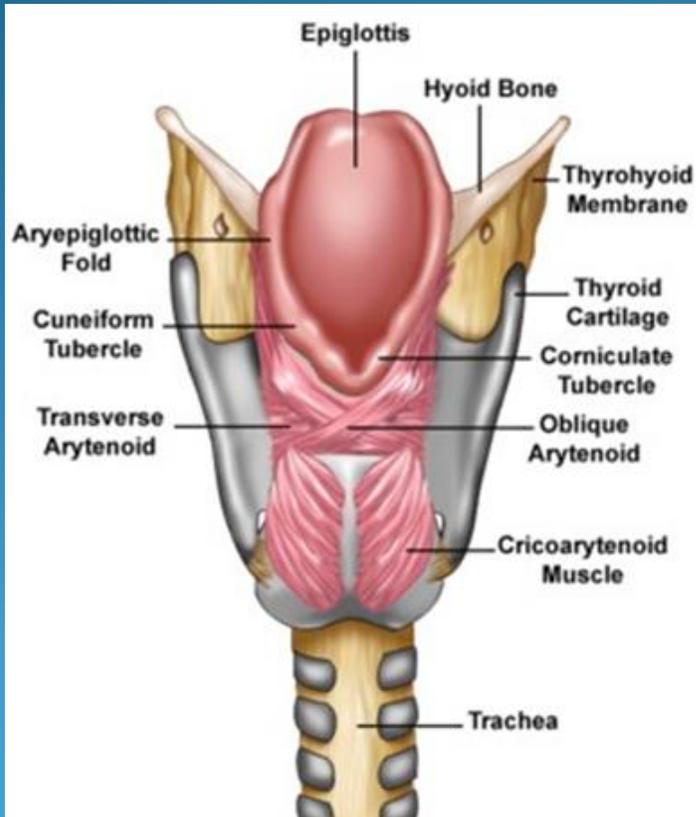
## *Boundaries:*

### a. Anterior:

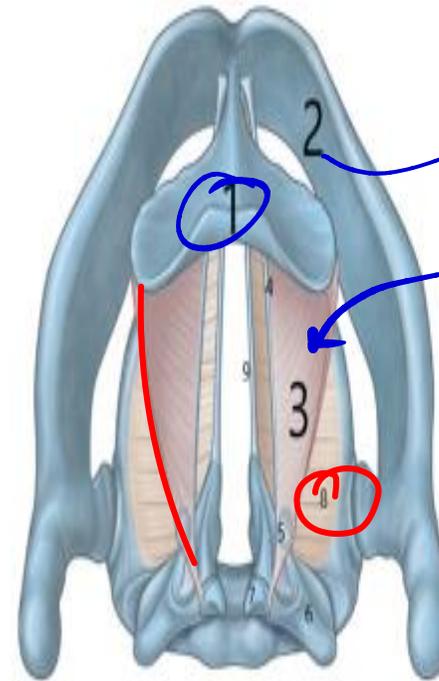
Upper edge of the epiglottis.

### b. On each side: Aryepiglottic folds.

### c. Posterior: Mucous fold between the arytenoids.



## SUPERIOR VIEW OF VOCAL LIGAMENTS



- 1. Epiglottis
- 2. Thyroid cartilage
- 3. Quadrangular membrane
- 4. Vestibular ligament
- 5. Cuneiform cartilage
- 6. Arytenoid cartilage
- 7. Corniculate cartilage
- 8. Cricothyroid (cricovocal) ligament
- 9. Vocal ligament

- **The vocal ligament** is the upper, free, thickened margin of the **cricothyroid (cricovocal) membrane**, and the **vestibular ligament** is the lower, free, thickened margin of the **quadrangular membrane**.

When viewed from above, the vocal ligaments are more medial in position than are the vestibular ligaments.

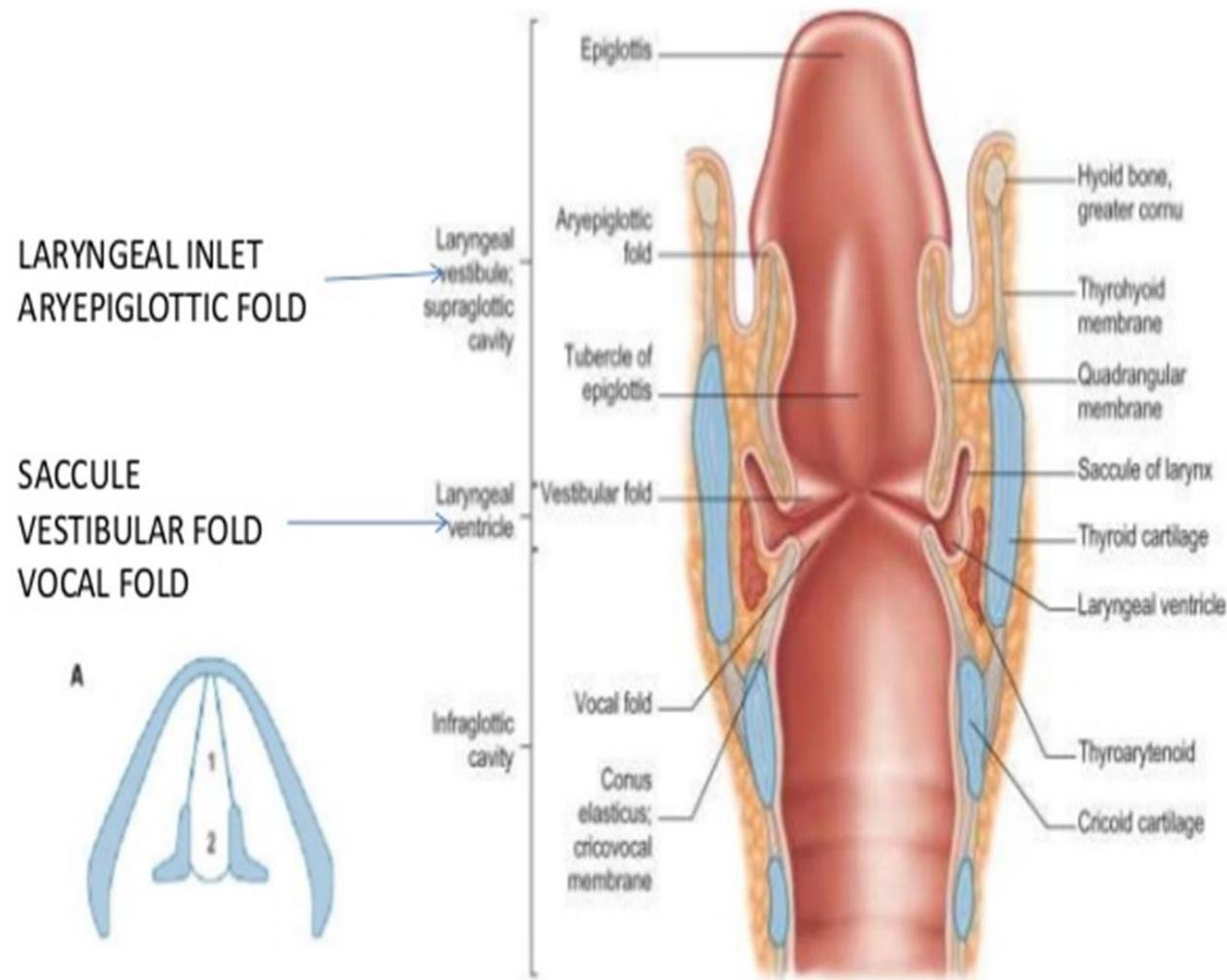
**The cavity of the larynx is divided into**

1-vestibule

2- middle part (the narrowest)

3- Infraglottic part

## SUBDIVISIONS OF LARYNGEAL CAVITY



Coronal section through the larynx and cranial end of trachea  
Posterior aspect

# Side wall of the larynx

## 1. Vestibular fold

- It is the lower free margin of the quadrangular membrane on each side.

## 2. Vestibule of the larynx

- It is the area between the *inlet* and the *vestibular folds*.

## 3. Vocal folds

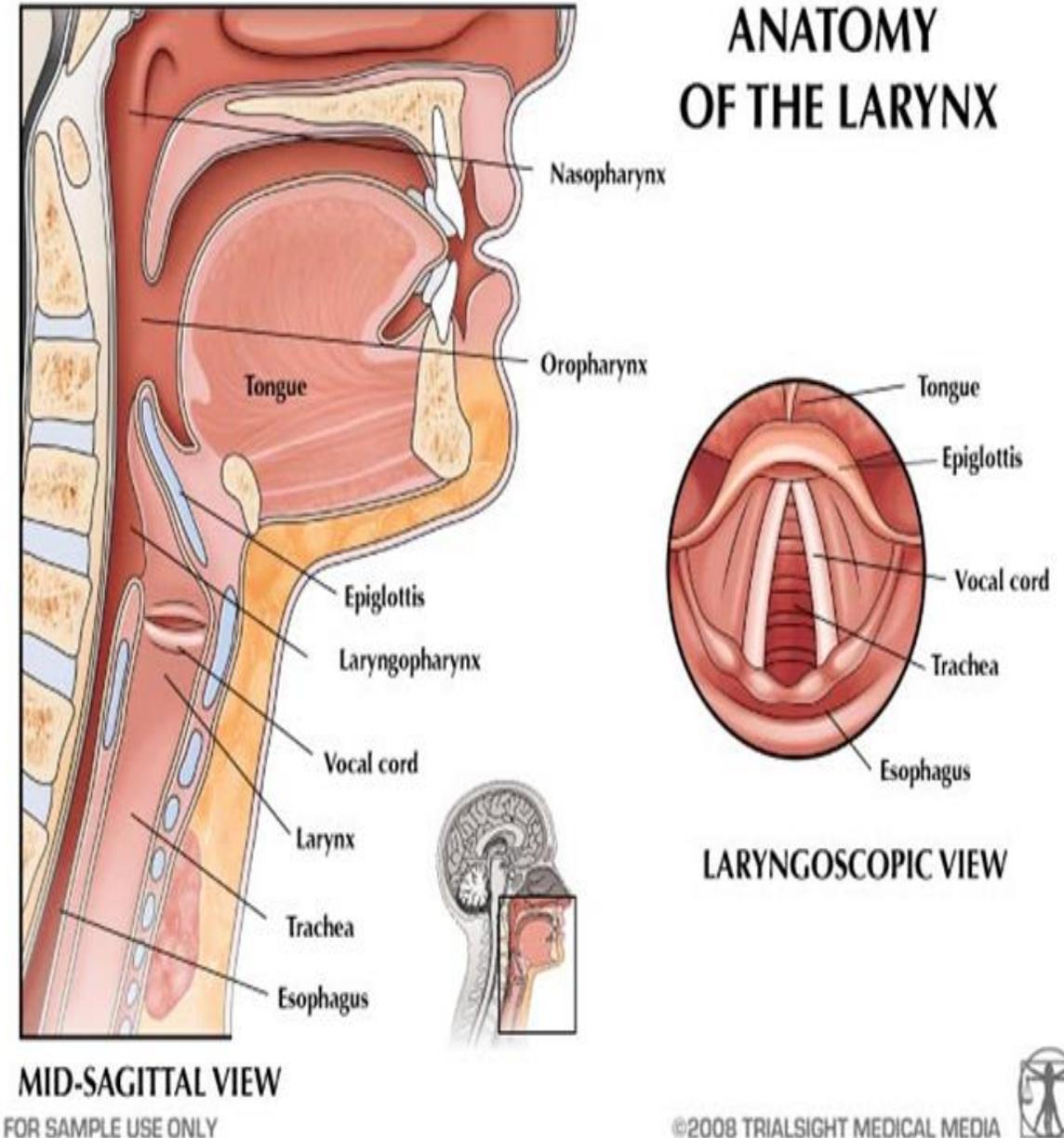
- It is the upper free margin of the cricovocal ligament.
- It extends between the *angle of the thyroid cartilage* and the *vocal process of the arytenoid cartilage*.

## 4. Sinus (ventricle) of the larynx

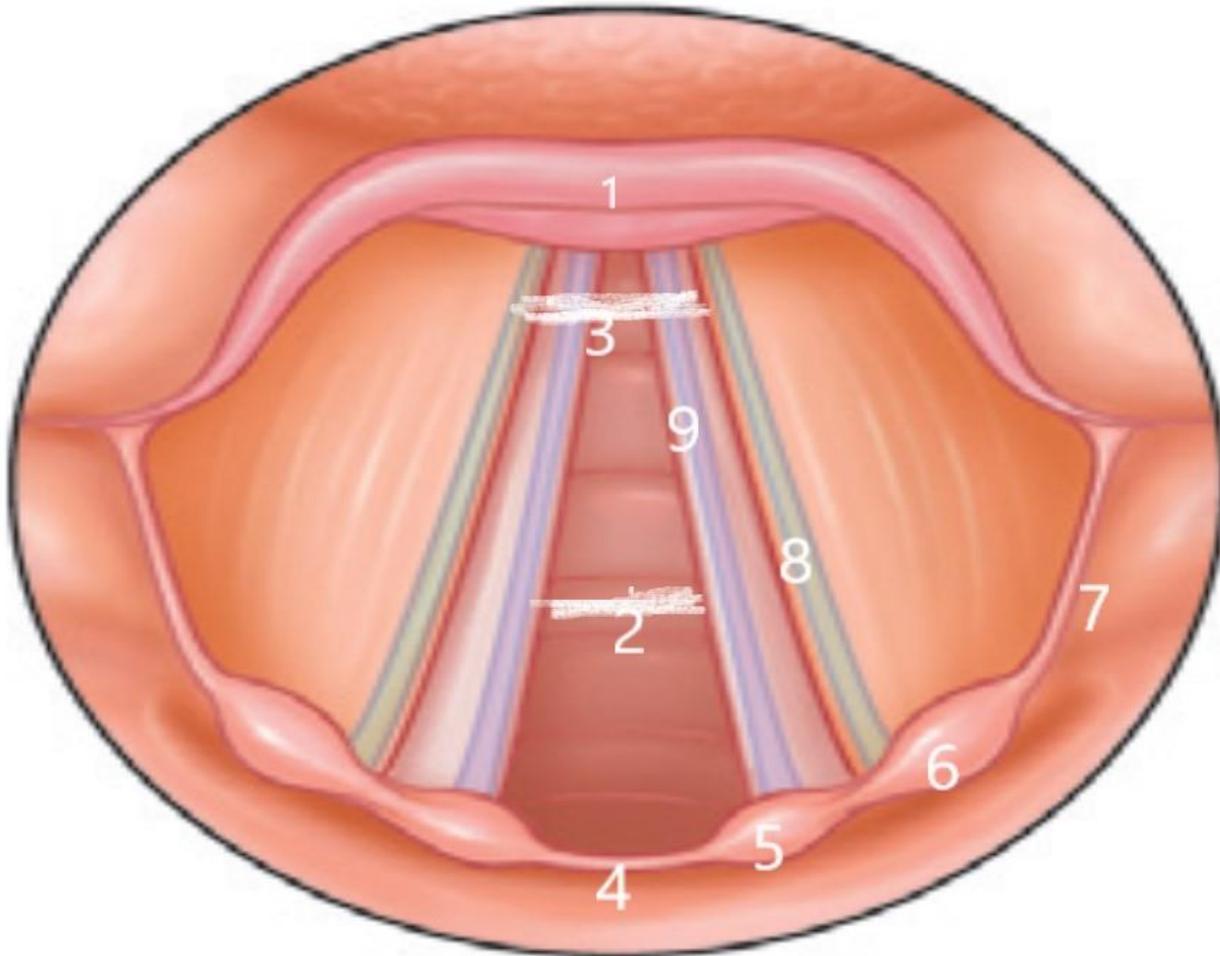
- It is the area between the vocal fold and the vestibular fold on each side.

## 5. Sacculle of the larynx

- It is an upward recess deep to the vestibular folds.
- **Rima vestibuli:** is the space between the two vestibular folds.

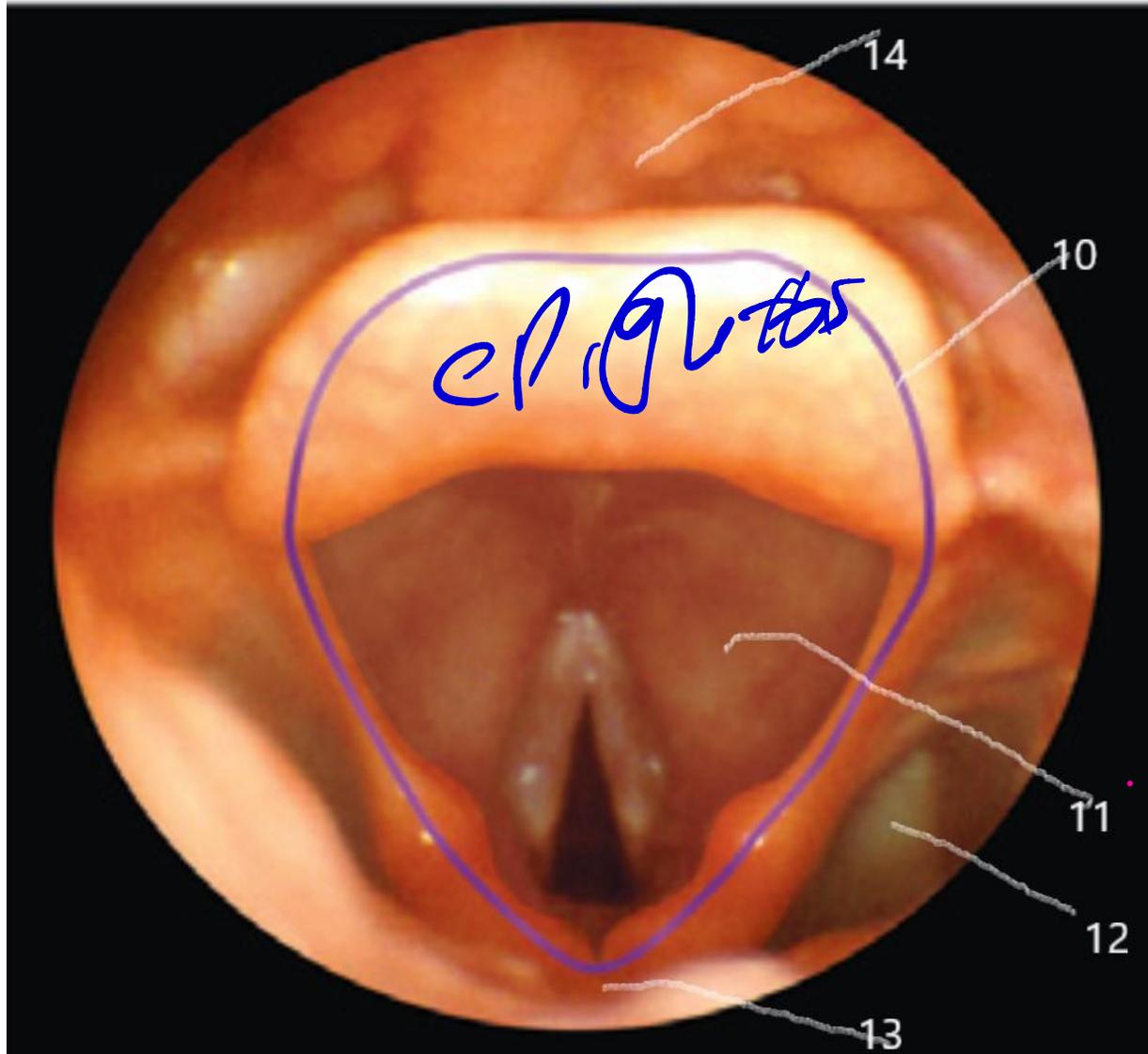


*features in this laryngoscopic view of the larynx.*



- 1. Epiglottis**
- 2. Rima glottidis**
- 3. Rima vestibuli**
- 4. Interarytenoid fold**
- 5. Corniculate tubercle**
- 6. Cuneiform tubercle**
- 7. Ary-epiglottic fold**
- 8. Vestibular fold**
- 9. Vocal fold**

*features in this laryngoscopic view of the larynx.*



- 10. Laryngeal inlet
- 11. Vestibule
- 12. Piriform recess
- 13. Laryngopharynx (closed)
- 14. Tongue

# I. Muscles acting on the laryngeal inlet

## A: Muscles closing the laryngeal inlet:

### 1. Aryepiglottic muscles :

They extend from the arytenoid cartilages to the lateral edges of the epiglottis.

**Action:** Closure of the laryngeal inlet.

### 2. Thyro-epiglottic:

They extend from the upper border of the thyroid lamina. to the lateral border of the epiglottis.

**Action:** Closure of the laryngeal inlet.

### 3. Transverse arytenoid :

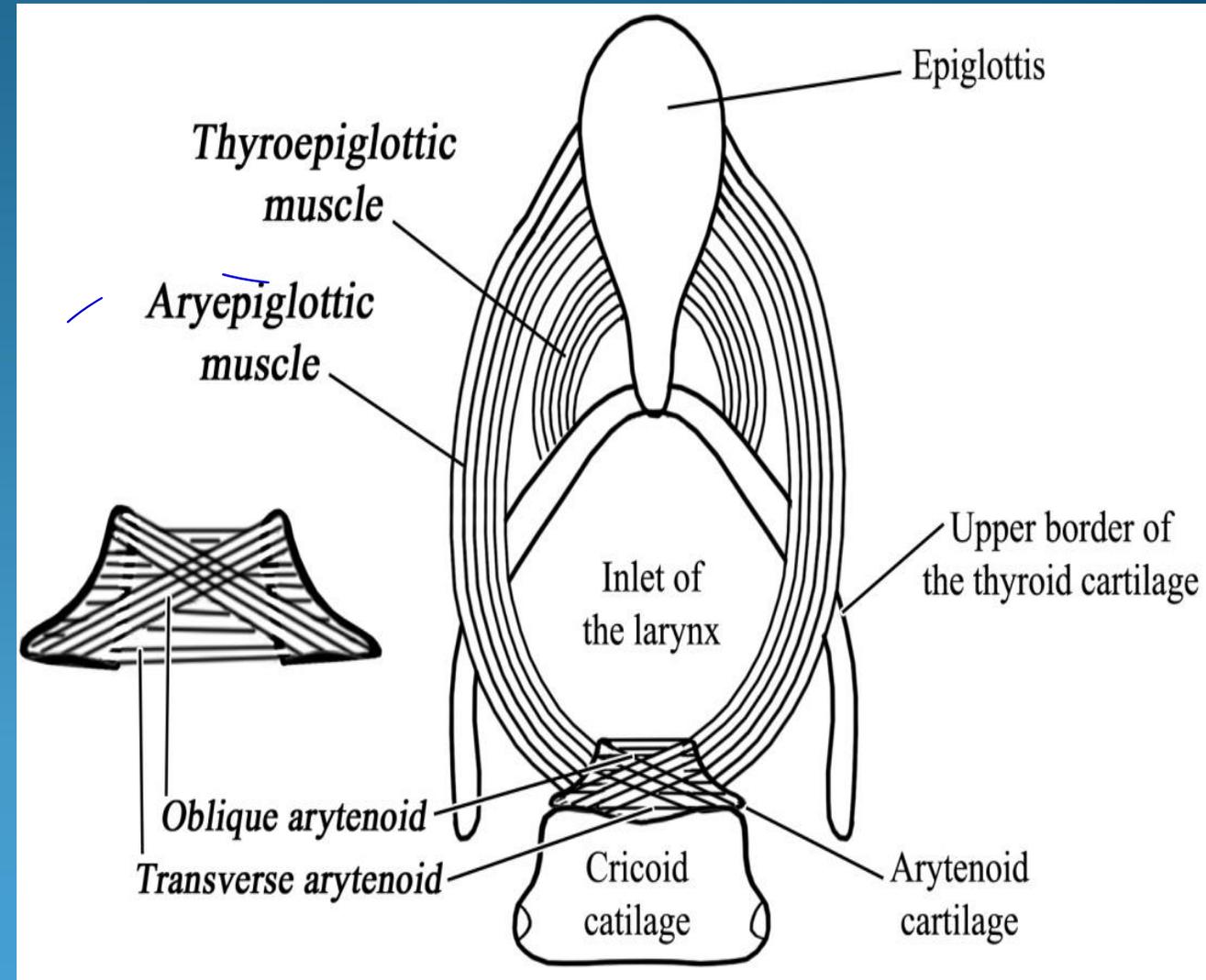
- It connects the posterior and lateral surfaces of both arytenoid cartilages.

**Actions:** (narrowing the laryngeal inlet) and adducts the vocal cords.

### 4. Oblique arytenoids :

They extend from the back of the muscular process of one arytenoid cartilage to the apex of the opposite arytenoid cartilage. (crossing each others).

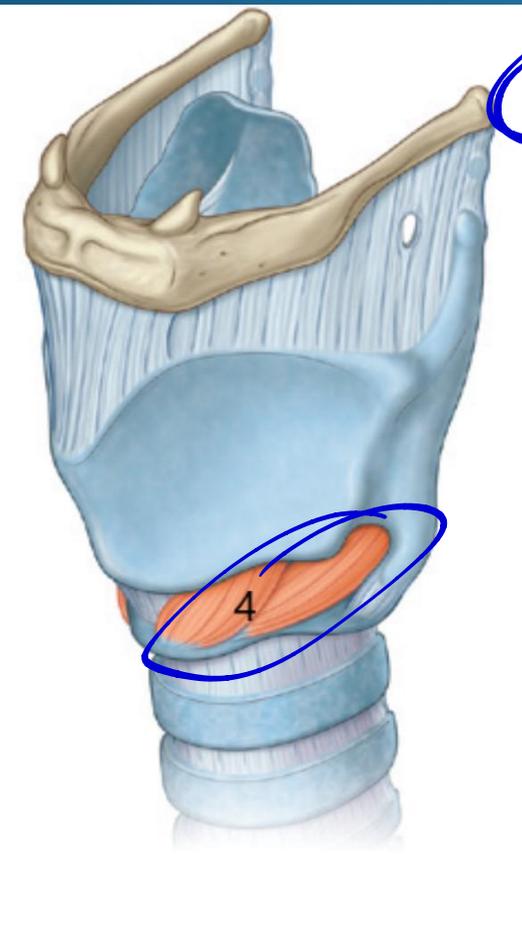
**Actions:** They narrow the laryngeal inlet) and adducts the vocal cords.



# II-Intrinsic Muscles acting on the vocal cords

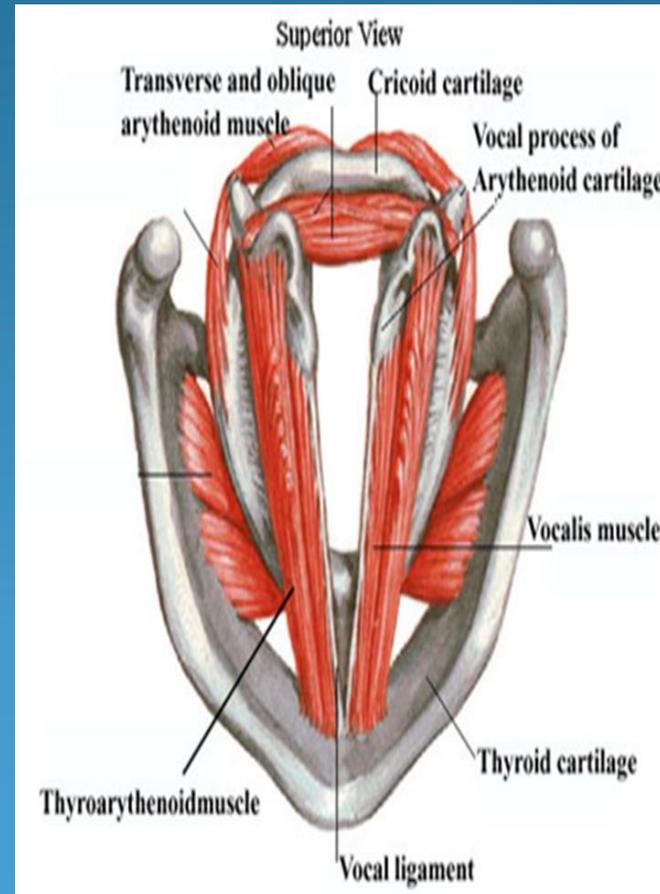
## 1- Muscles stretching (tensing) the vocal cord

## 2- Muscles relaxing the vocal cords



### Cricothyroid muscle

**Actions:** It draws the thyroid cartilage downwards and forwards, so it lengthens and tenses the vocal cords (responsible for the sharp loud voice).



### 1. Thyroarytenoid muscle

**Origin:** Thyroid angle (lower part).  
**Insertion:** Into the anterolateral surface of the arytenoid.  
**Actions:** It shortens and relaxes the vocal cords, so it changes the pitch of the voice.

### 2. Vocalis muscle (it is the lower fibers of the thyro-arytenoid muscle)

**Origin:** Thyroid angle.  
**Insertion:** Vocal process of the arytenoid cartilage.  
**Action:** Relaxation of the vocal cords.

# III. Muscles acting on the vocal cords

## A: Muscles producing abduction of the vocal cords:

### \* Posterior crico-arytenoid:

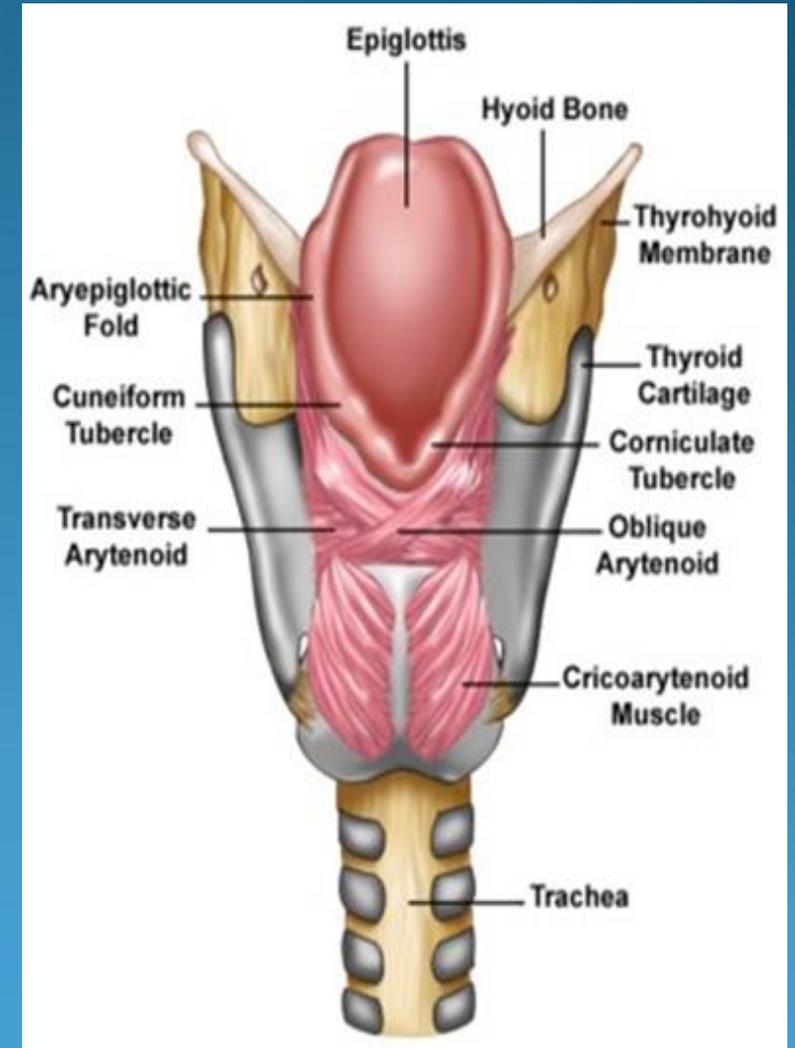
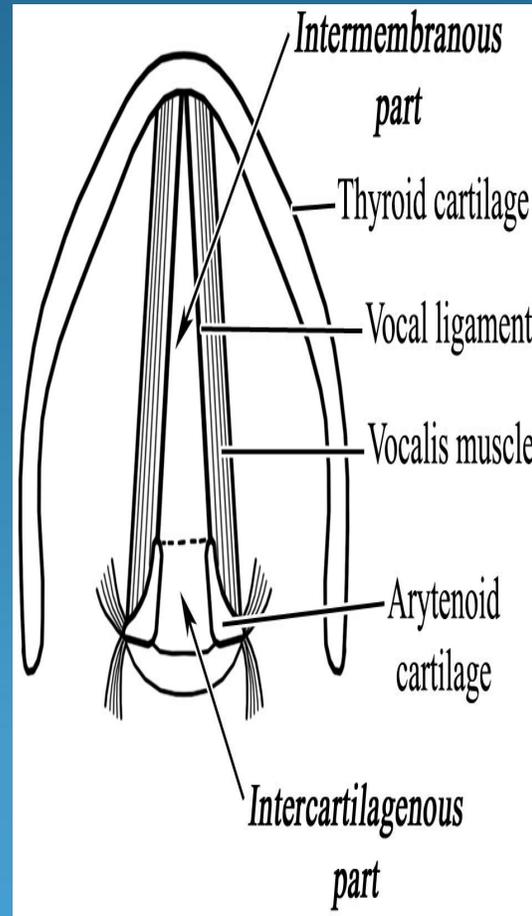
- It is the only abductor to the vocal cords

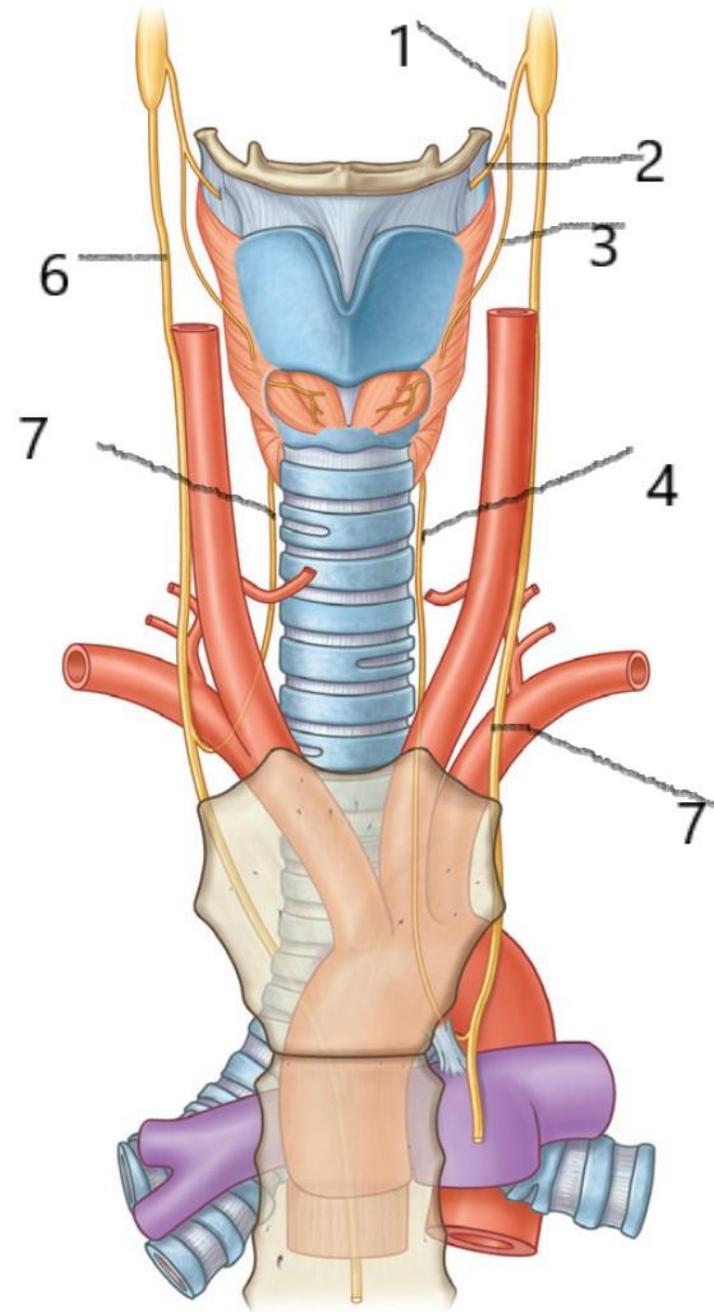
**Origin:** Posterior surface of the lamina of the cricoid cartilage.

**Insertion:** Muscular process of the arytenoid.

**Actions:**

- Abduction of the vocal cords.





# NERVES OF THE LARYNX

- 1. Superior laryngeal nerve
- 2. Internal laryngeal nerve
- 3. External laryngeal nerve
- 4. Left recurrent laryngeal nerve
- 5. Left vagus nerve
- 6. Right vagus nerve
- 7. Right recurrent laryngeal nerve

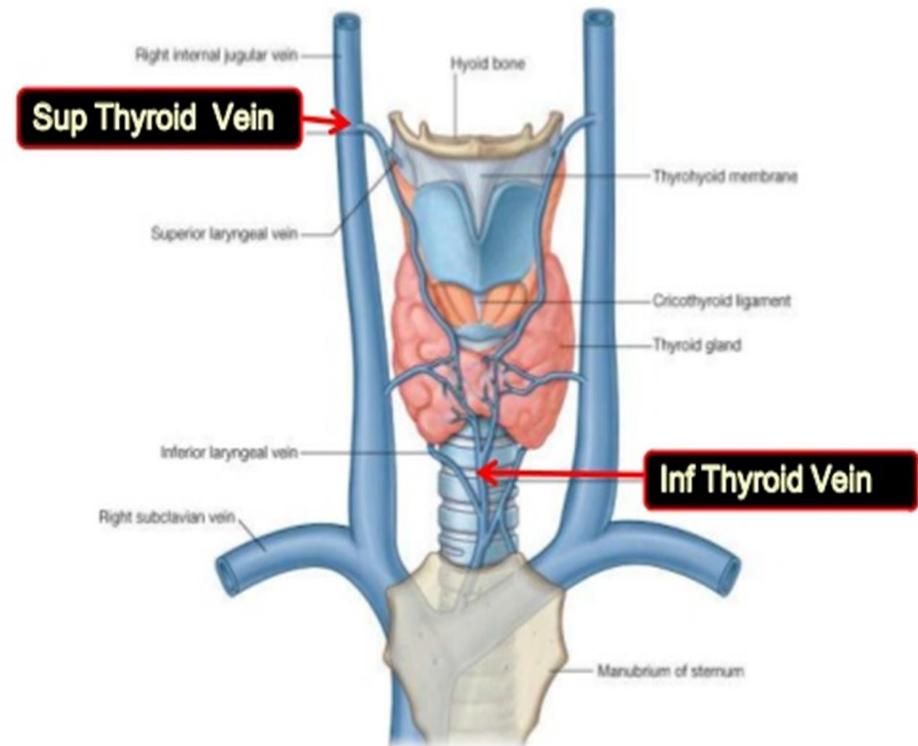
# Blood supply

## Blood supply:

### . Arterial supply:

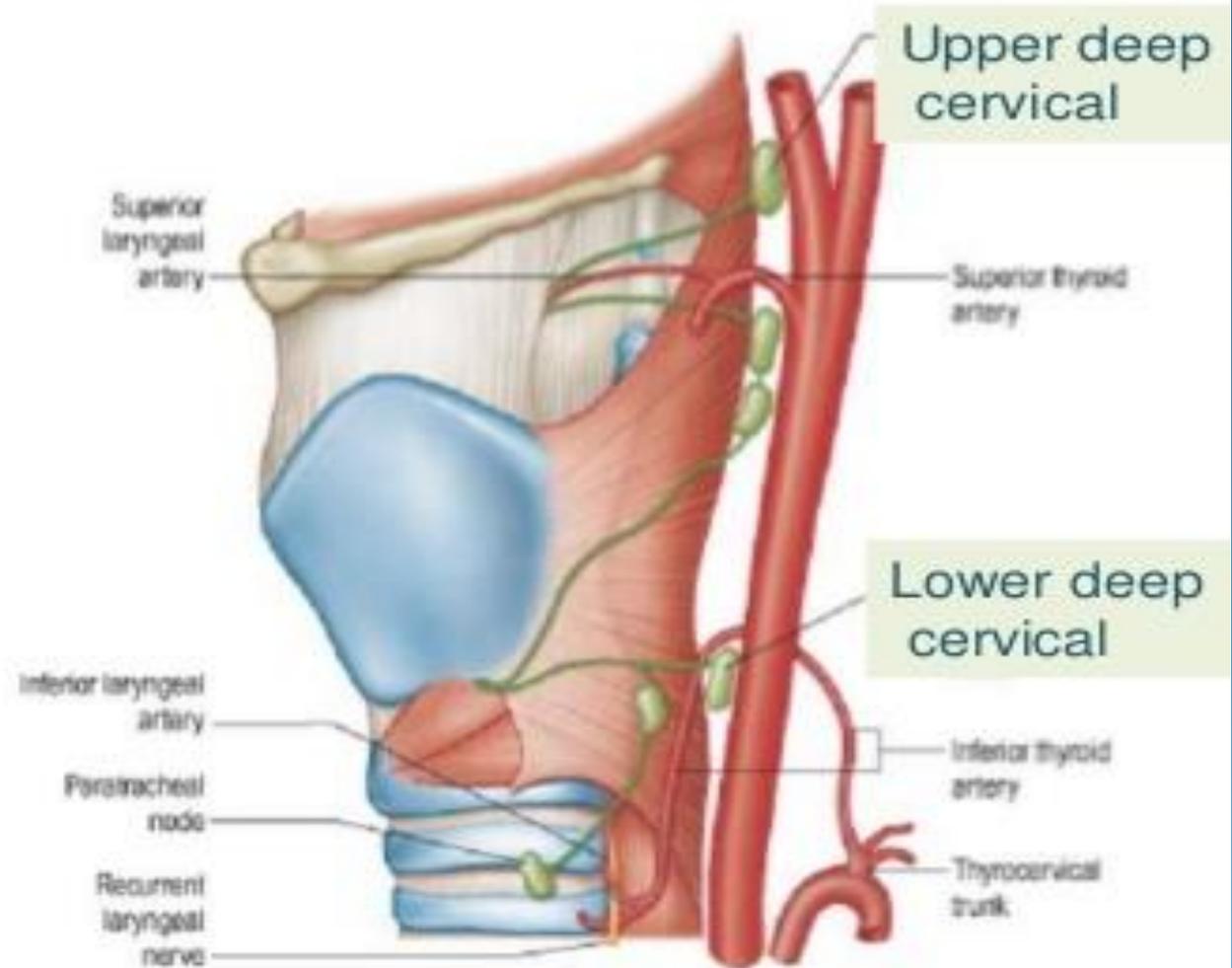
1. Above the vocal cords: Superior laryngeal artery (from the superior thyroid artery).
2. Below the vocal cords: Inferior laryngeal artery (from the inferior thyroid artery).

## VENOUS DRAINAGE



# LYMPHATIC DRAINAGE

- Above **VC** upper deep cervical {anterosuperior group}
- Below **VC** lower deep cervical {posteroinferior group}



# TRACHEA

## DEF.

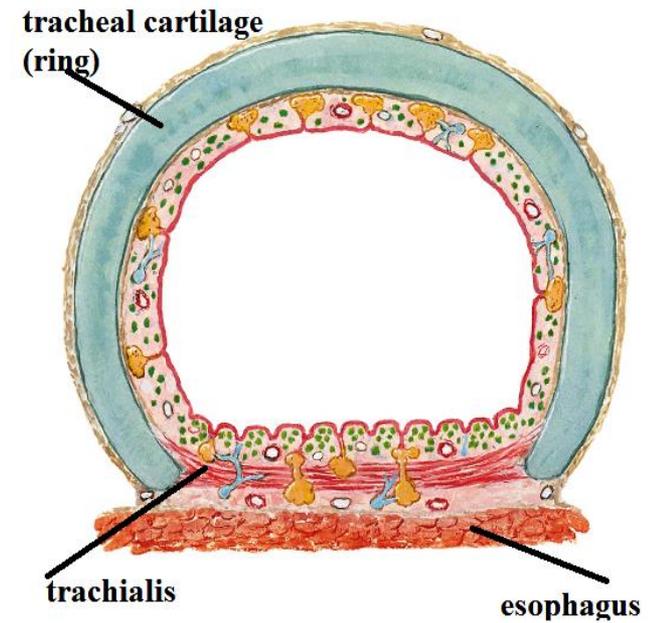
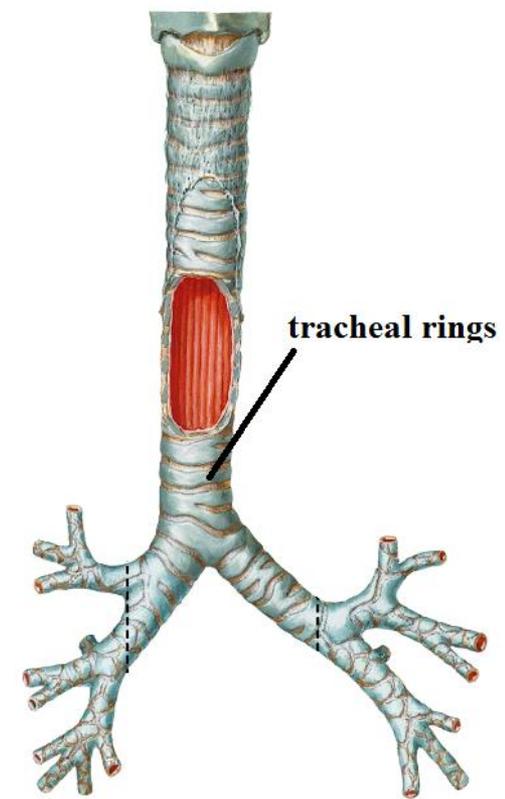
- Elastic tube conveys air into & out of the lungs

## Structure

- The wall of the trachea is formed of 16-20 cartilaginous rings connected by fibromuscular membrane
- The rings are C-shaped, deficient posteriorly where they are replaced by smooth muscle fibers (trachialis) to allow distention of the esophagus during swallowing

## Size

- Length: 10-11 cm
- External transverse diameter: 2 cm
- Lumen: 1.2 cm



# TRACHEA

## Beginning:-

- at lower border of cricoid cartilage (C6) as continuation of larynx

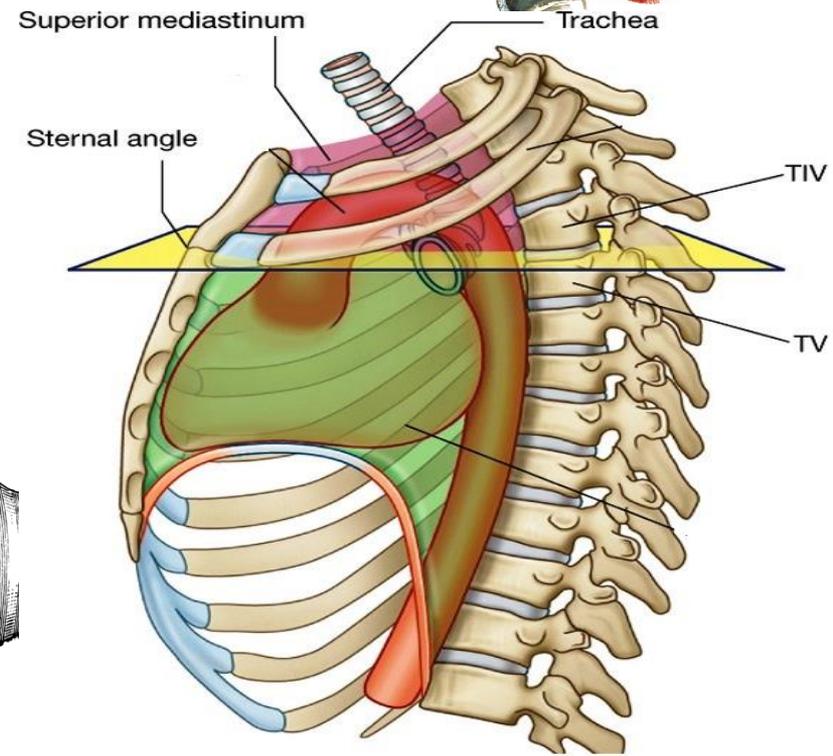
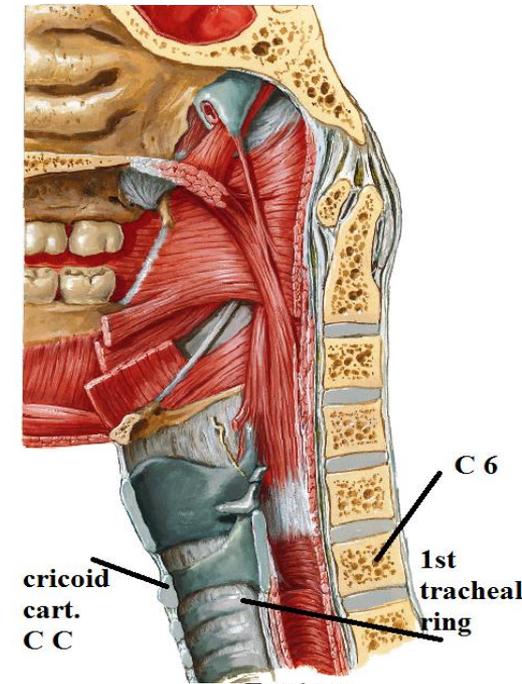
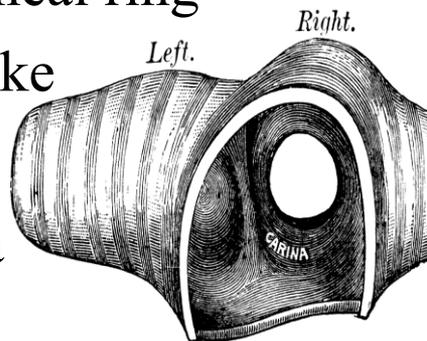
## Course:-

- descends in midline of neck (cervical part)
- Descends in sup. mediastinum (thoracic part) with slight deviation to the right

## End:

- at T4/T5 to divide into RT & Lt main bronchi

N.B.:- the last tracheal ring has a keel like extension called carina



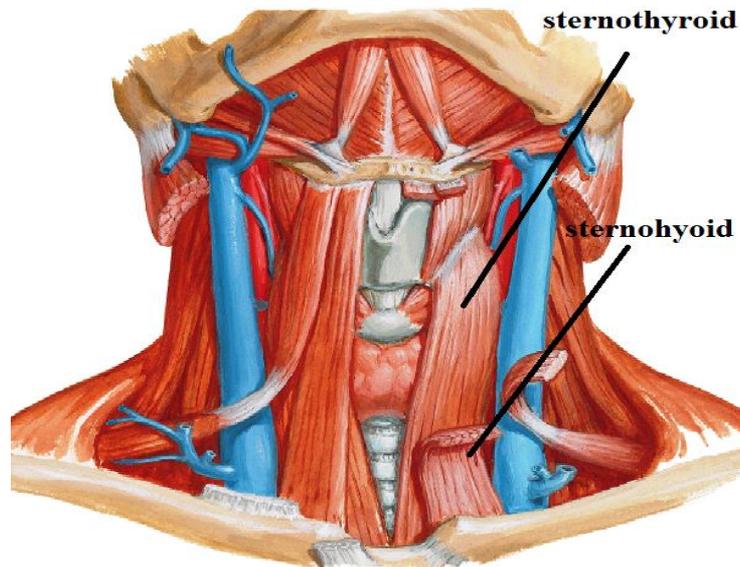
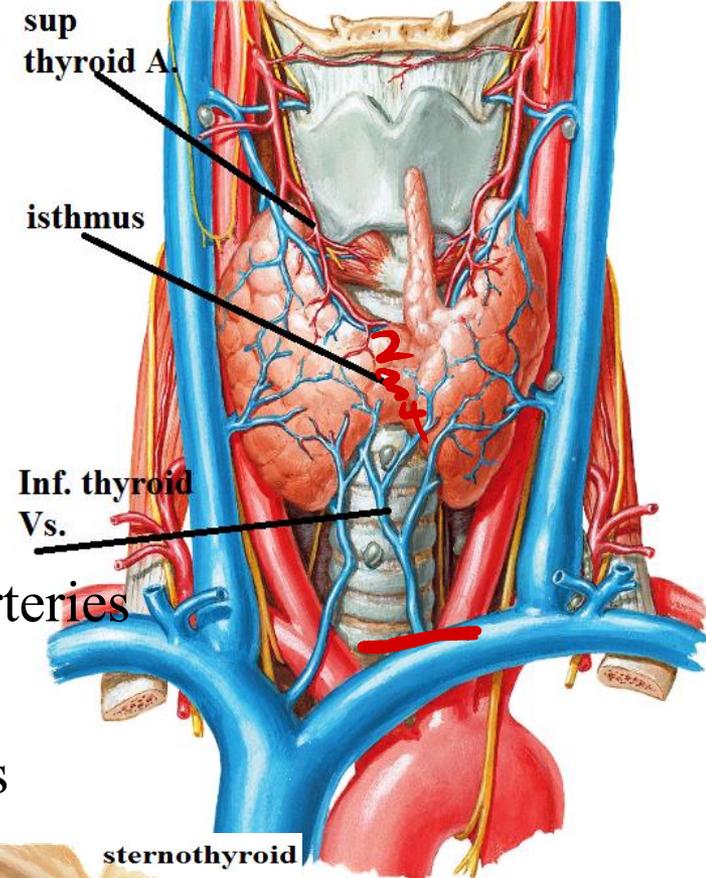
# TRACHEA

## Relations:-

### **Cervical part**

#### Anteriorly:-

- Isthmus of thyroid gland  
(opposite 2nd, 3rd, 4th rings)
- Anastomosis ( ) 2 superior thyroid arteries
- Inferior thyroid veins
- Sternothyroid & Sternohyoid muscles  
(strap muscles)



# TRACHEA

## Relations:-

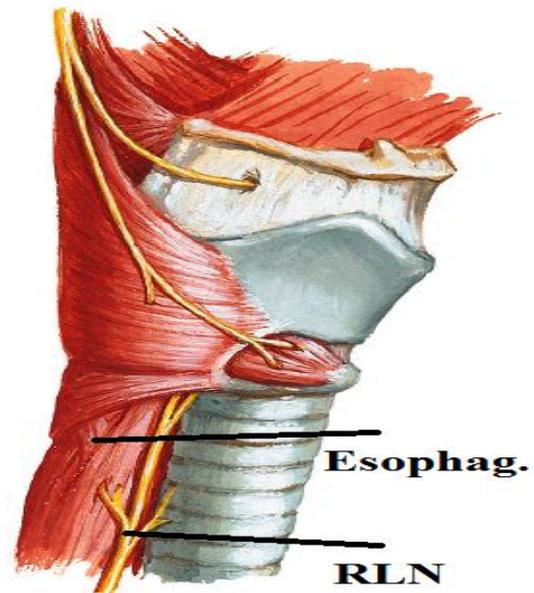
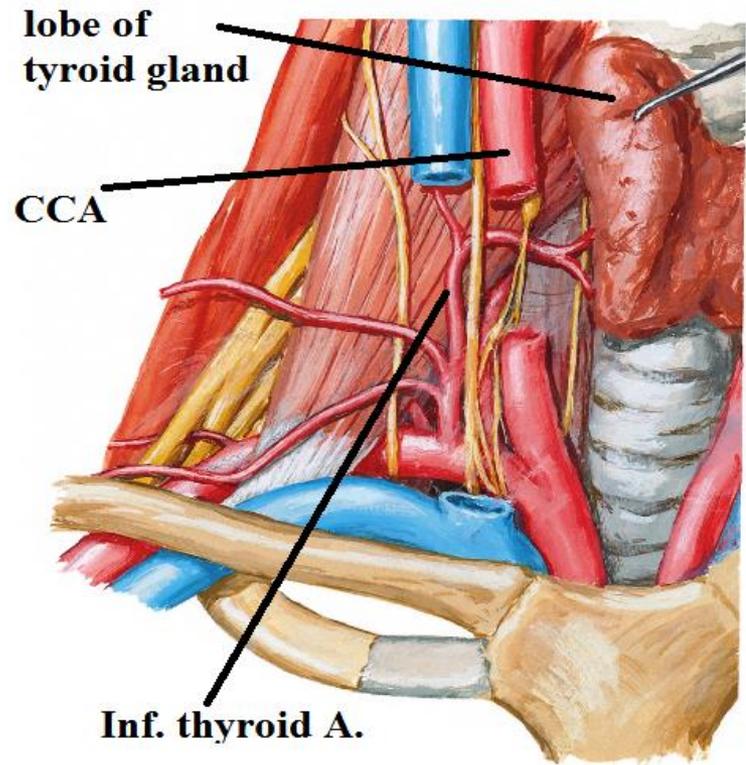
### **Cervical part**

#### On each side:-

- Lobe of thyroid gland
- Carotid sheath
- inf thyroid artery

#### Posteriorly-

- Esophagus
- Recurrent laryngeal nerves



# TRACHEA

## Relations:-

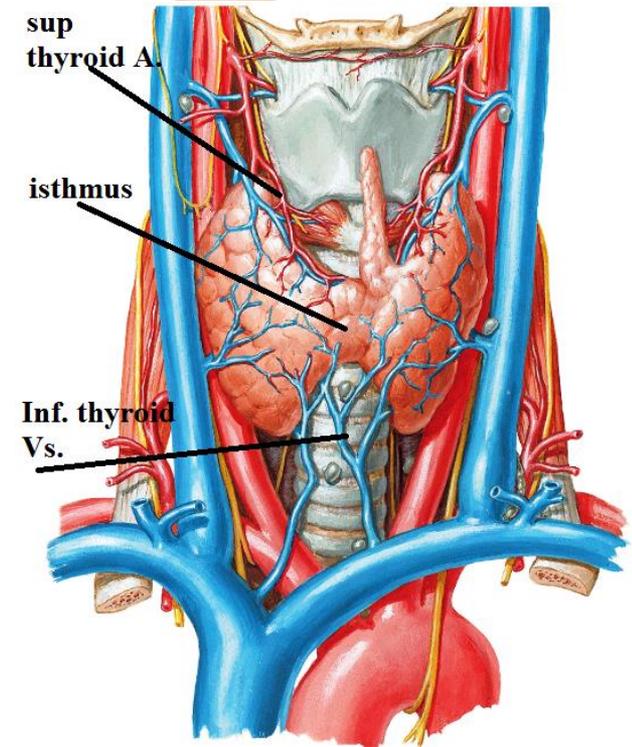
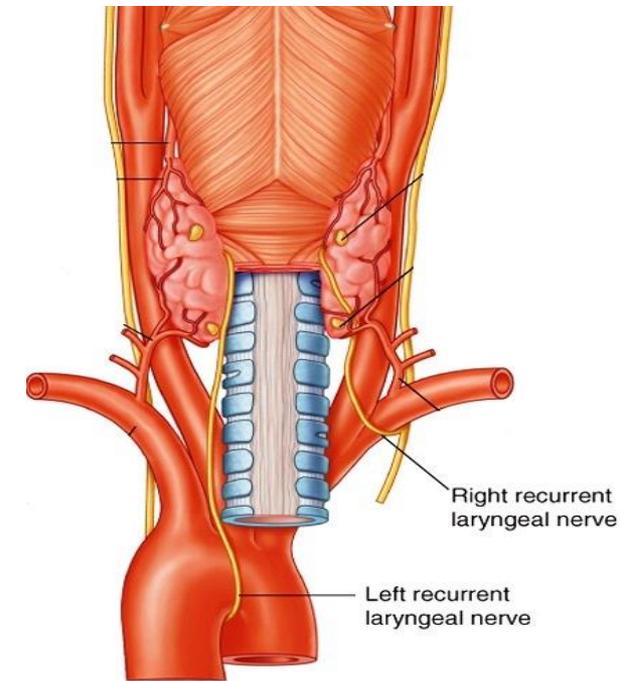
### **Thoracic part**

#### Posteriorly: -

- Esophagus
- Lt recurrent laryngeal nerve

#### Anteriorly:-

- Aortic arch
- Beginning of  
( brachiocephalic artery & Lt CCA )
- Lt brachiocephalic vein & thymus
- Manubrium & origin of strap muscles



# TRACHEA

## Relations:-

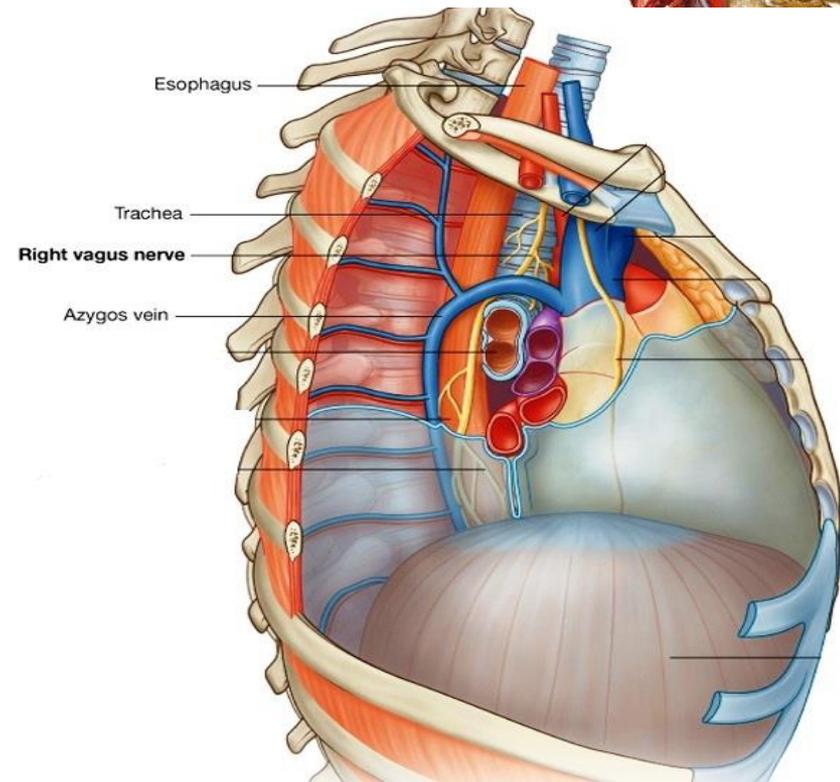
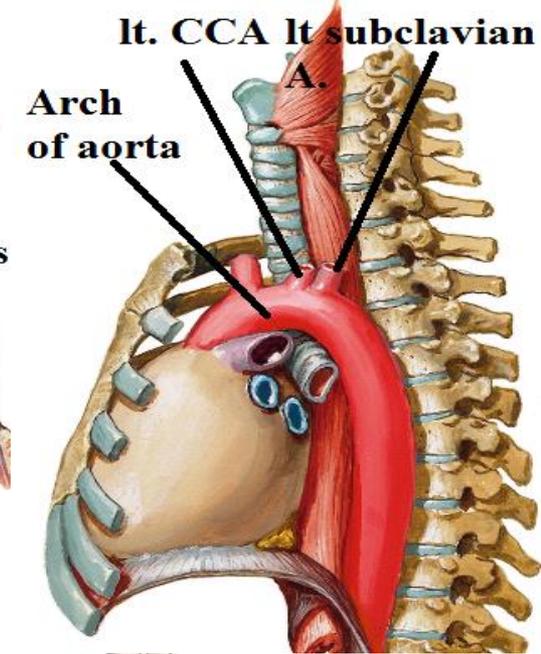
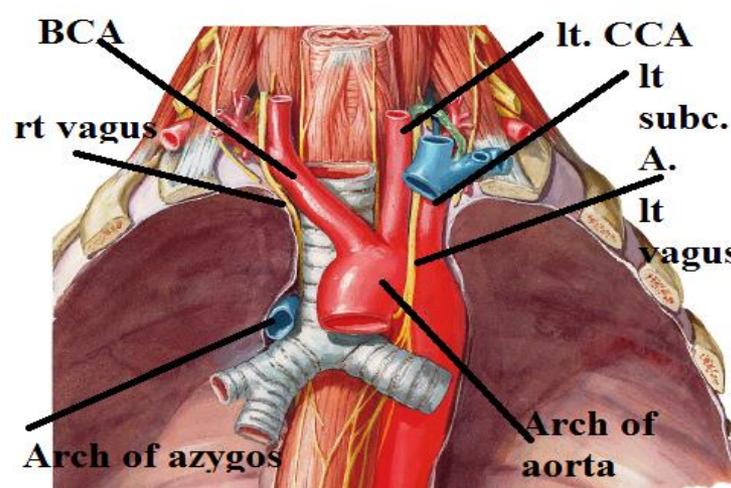
### Thoracic part

#### Lt Side:-

- Aortic arch  
& Lt common carotid  
& Lt subclavian arteries
- Lt Vagus
- Lt Lung & pleura

#### Rt side:-

- Arch of azygos  
& brachiocephalic artery
- Rt vagus nerve
- Rt lung & pleura



# TRACHEA

## Constrictions:-

- 1- upper part by thyroid gland
- 2-middle by brachiocephalic artery
- 3-lower part by arch of aorta

## Blood supply:-

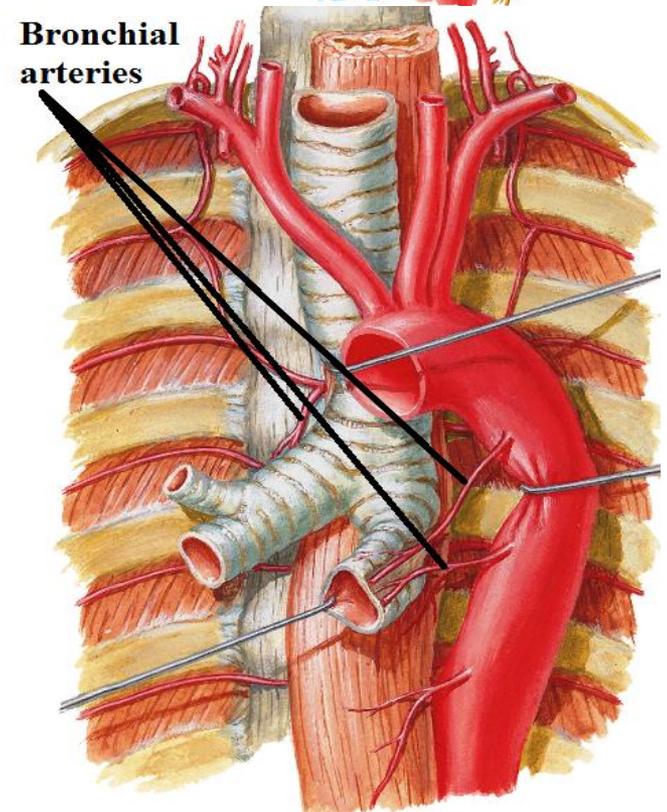
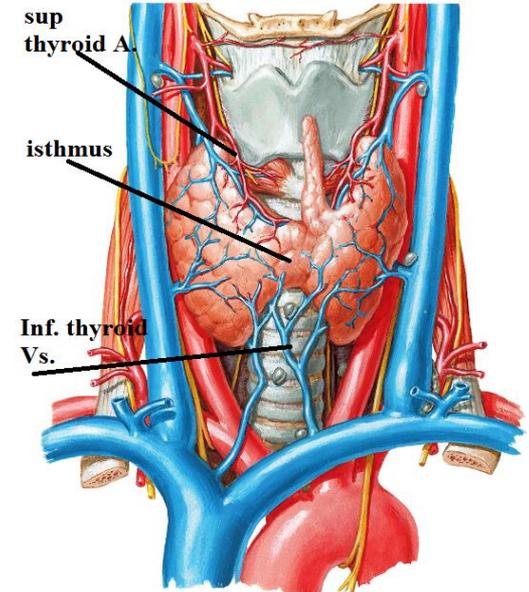
- cervical part:- inferior thyroid artery
- Thoracic part:- bronchial arteries

## L.N.:-

pretracheal & paratracheal l.n.s

## N.S.:-

- parasympathetic from both vagi
- sympathetic fibers from both sympathetic chains



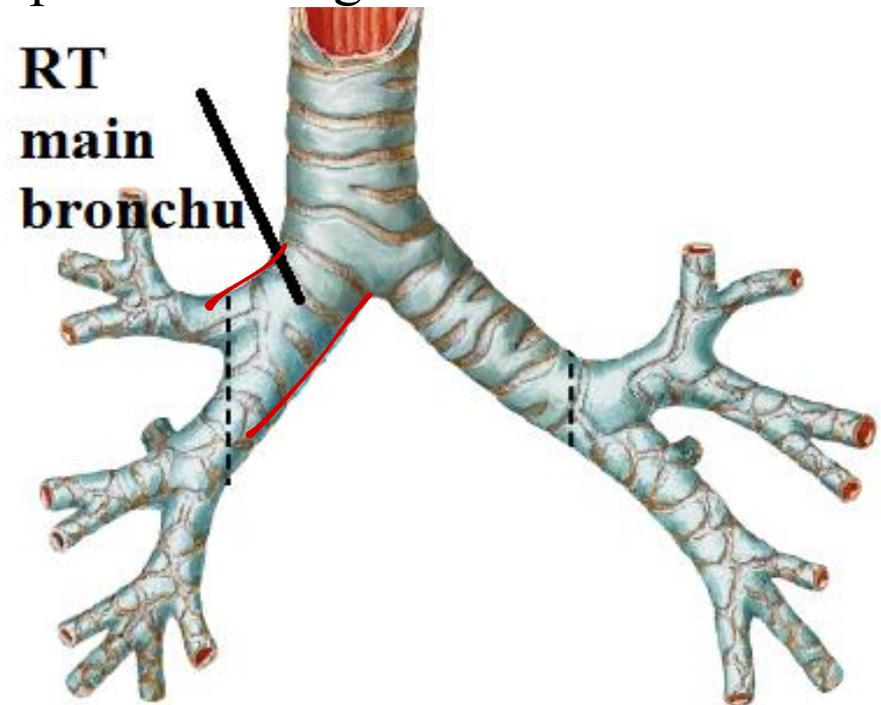
# BRONCHI

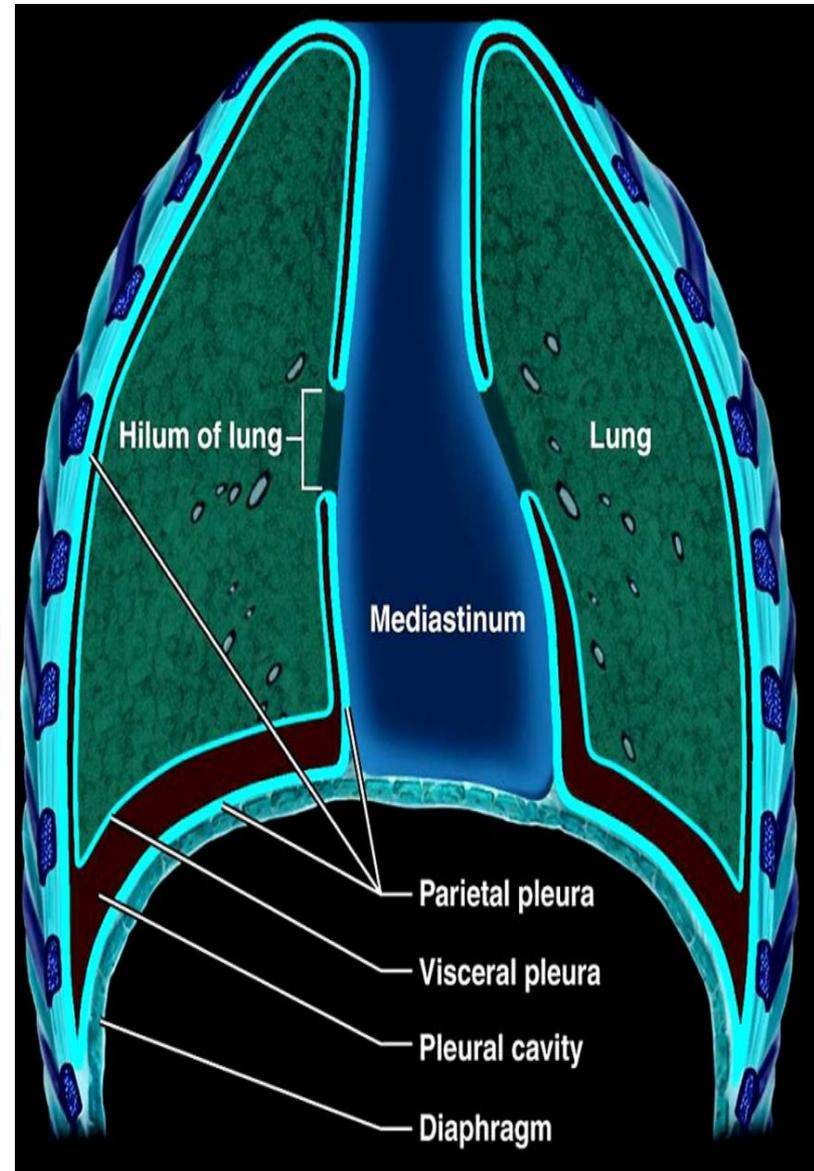
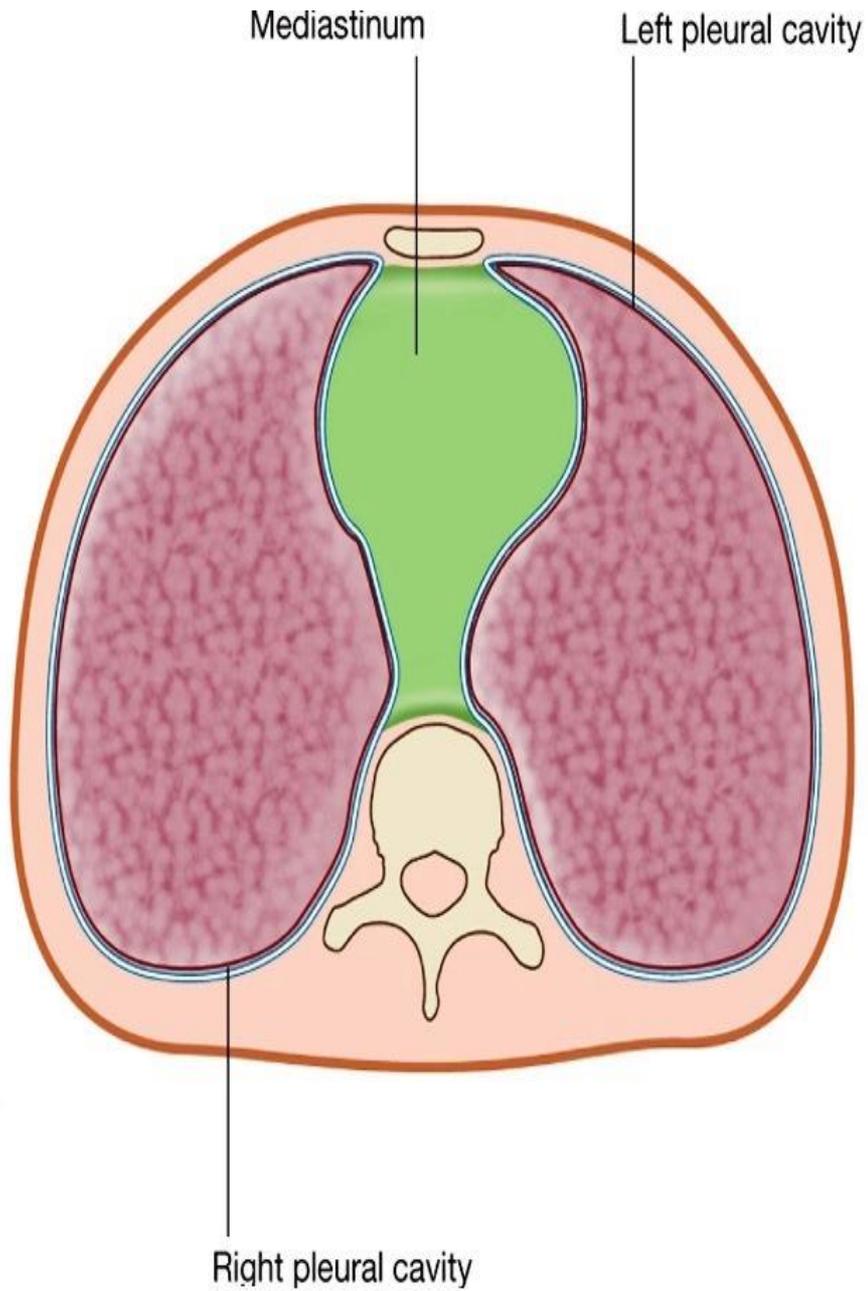
N.B.:-

the RT main bronchus is wide, short (2.5 cm) – vertical,  
Before the lung it gives superior lobar bronchus then inside the lung  
it divided into middle, inferior lobar bronchus

N.B.:-the Lt main bronchus is narrow, long (5 cm) – nearly horizontal,  
Inside the lung it divided into superior, inferior lobar bronchus

So inhaled foreign body tends to pass to rt lung





# PLEURA

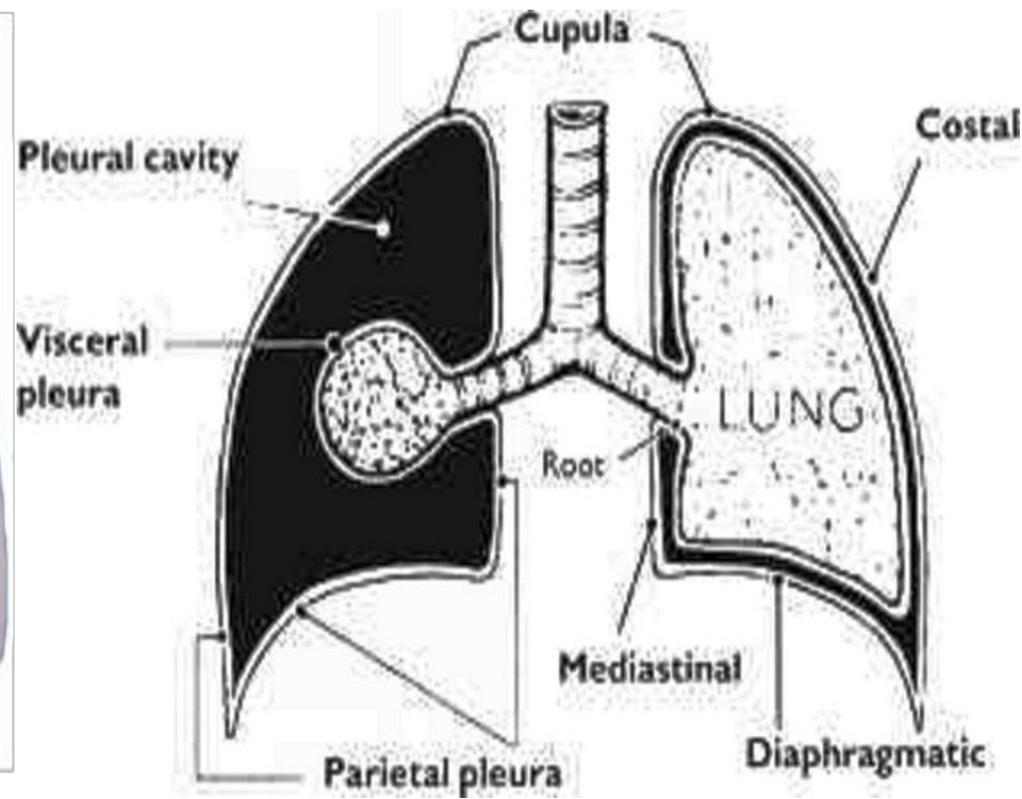
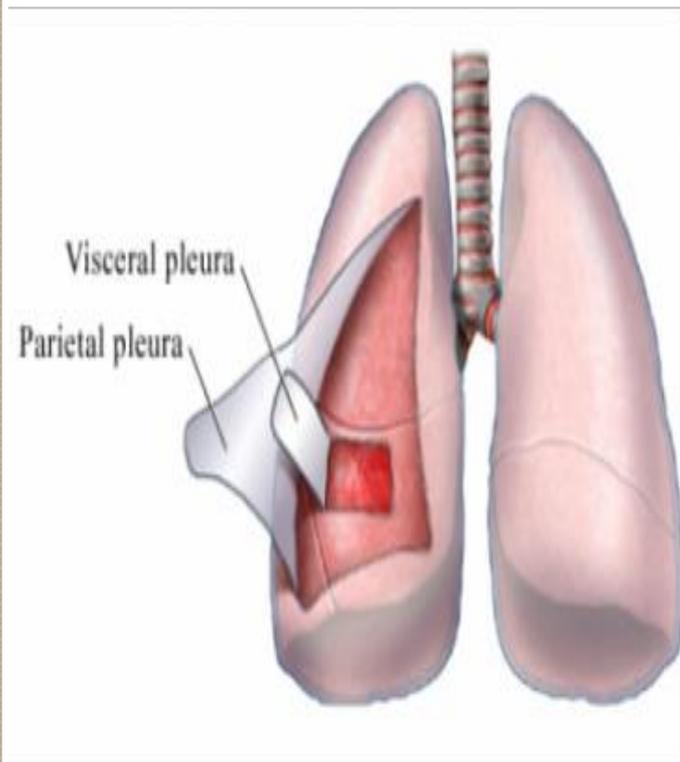
**Def.:** closed serous sac invaginated from its medial side by the lung so it's divided into

1-visceral pleura: - covers the lung & lines lung fissures

2-parietal pleura: - lines the thoracic cavity

3-pleural cavity: -closed space in between,

Contain thin film of serous fluid allow layers to move on each other



# PLEURA

## Parts of parietal pleura

### 1-Cervical=dome=pleural cupula :

Cover apex of lung & projects into root of neck

### 2-costal :

Lines the sides of vertebrae, the ribs, intercostal spaces, sternum

### 3-diaphragmatic :

Cover diaphragm

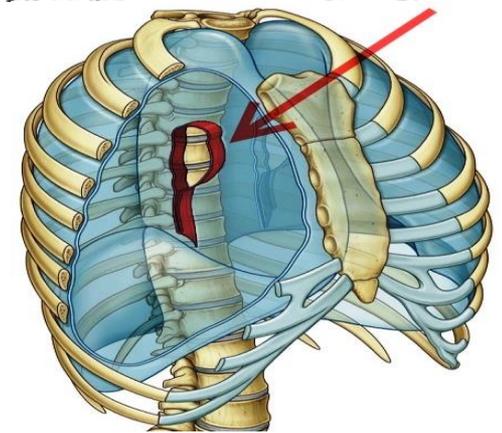
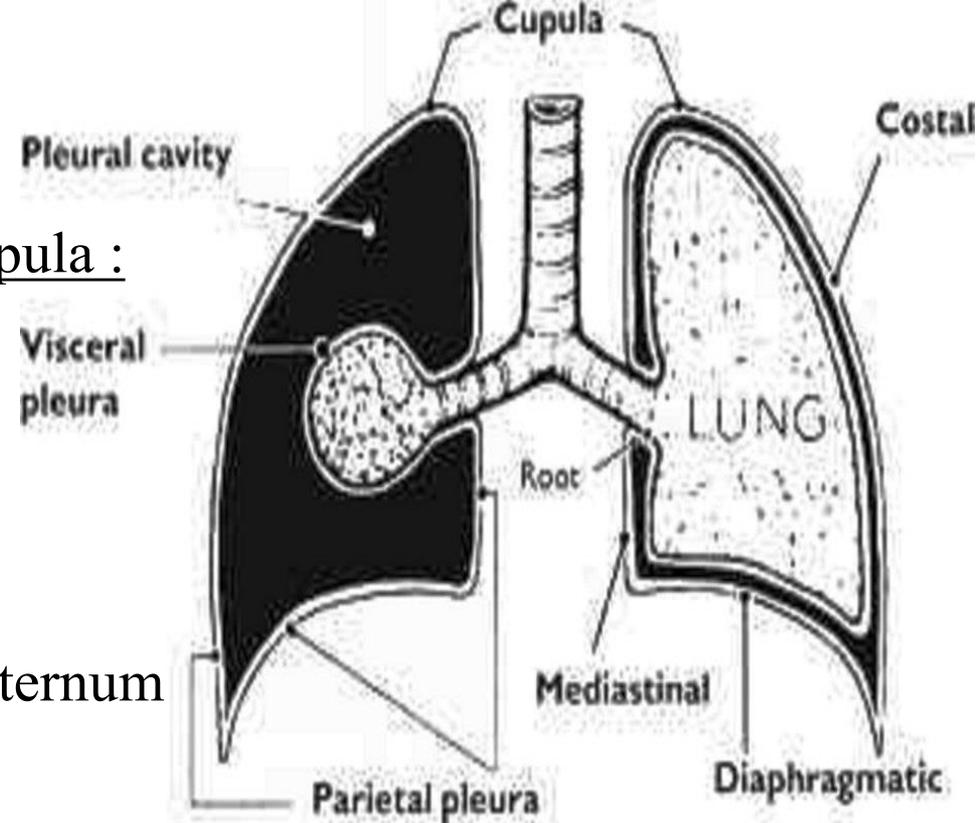
### 4-mediastinal :

Cover lateral side of mediastinum

& sends a sleeve like extension

(called pleural cuff) around root of the lung

to be continuous with visceral pleura at hilum of lung. This pleural cuff hangs downwards as a loose fold called pulmonary ligament



# PLEURA

## Pleural recesses:

Def.:- parts of pleural cavity at lines of pleural reflection not occupied by lung except in full inspiration

Sites: -

### 1- Costo mediastinal: -

( ) chest wall & mediastinum

-receive ant border of lung

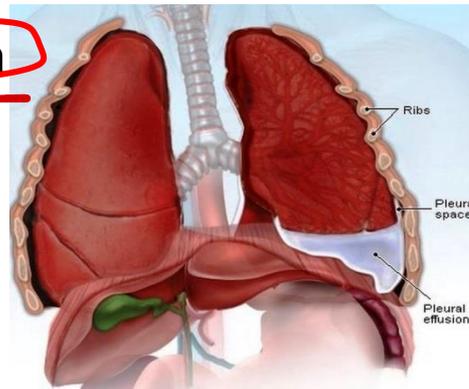
### 2-Costo diaphragmatic: -

( ) chest wall & diaphragm

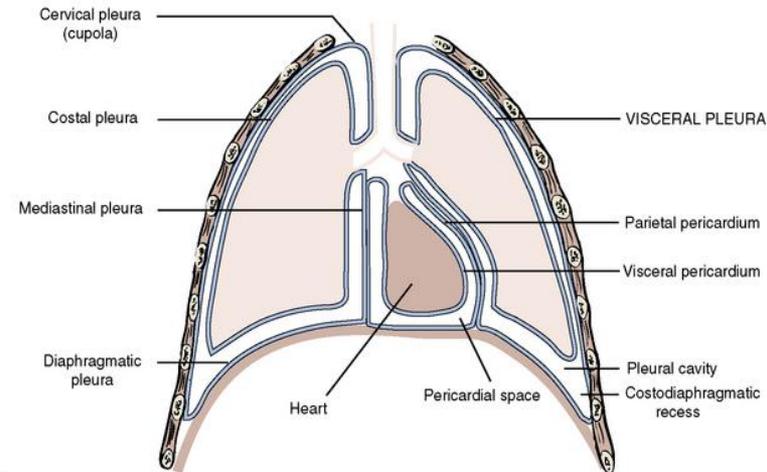
receive inf. border of lung

It is the 1st part to be filled

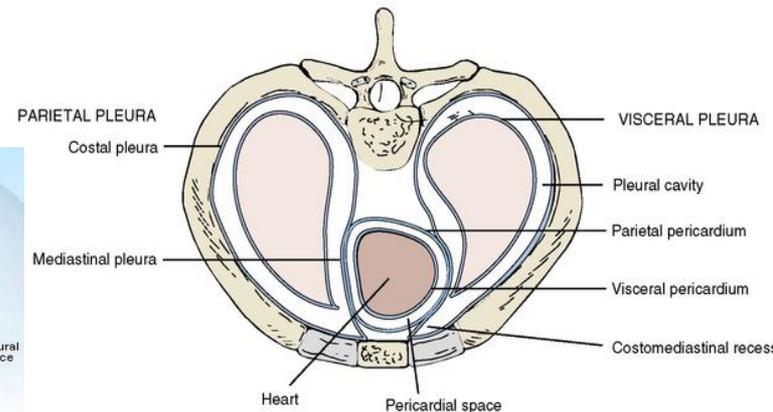
in pleural effusion



PARIETAL PLEURA



A



# PLEURA

## Blood SUPPLY

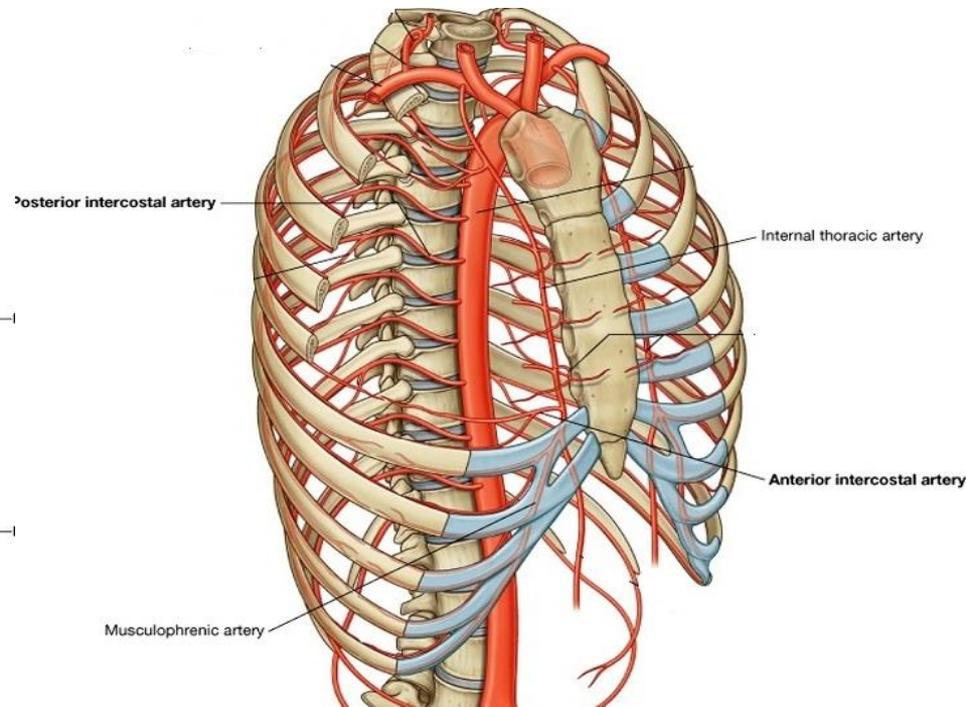
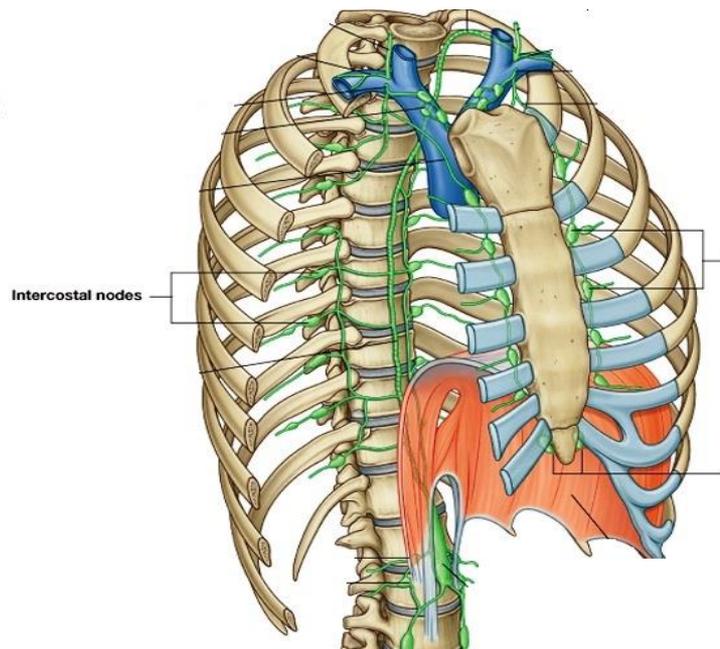
1-Visceral pleura: - bronchial arteries

2-Parietal pleura: - intercostal, internal mammary (thoracic), musculophrenic vessels

## Lymphatic drainage

1-Visceral pleura: - Broncho pulmonary l.n.

2-Parietal pleura: - intercostal, parasternal, diaphragmatic, posterior mediastinal l.n.

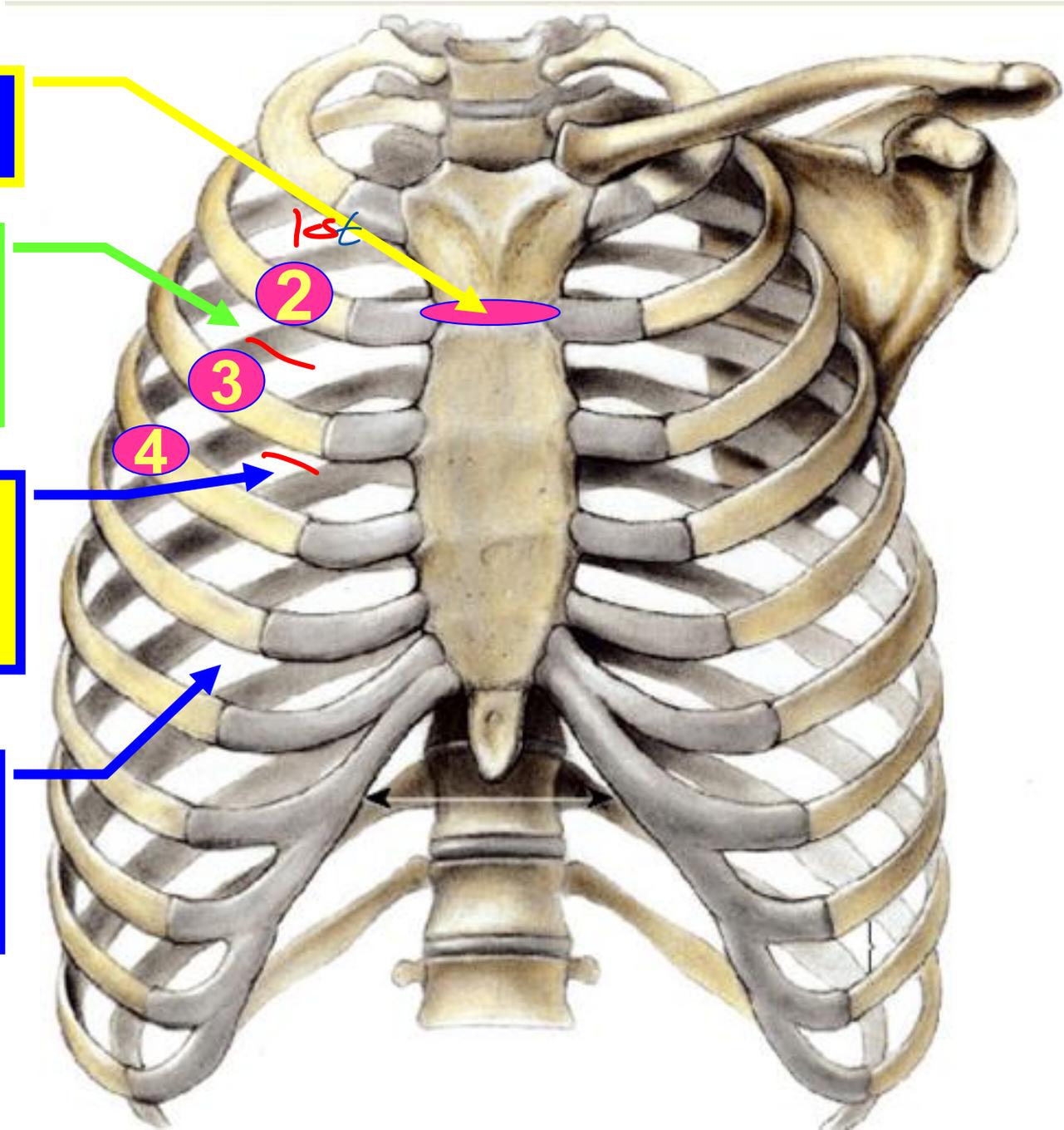


**Sternal angle**

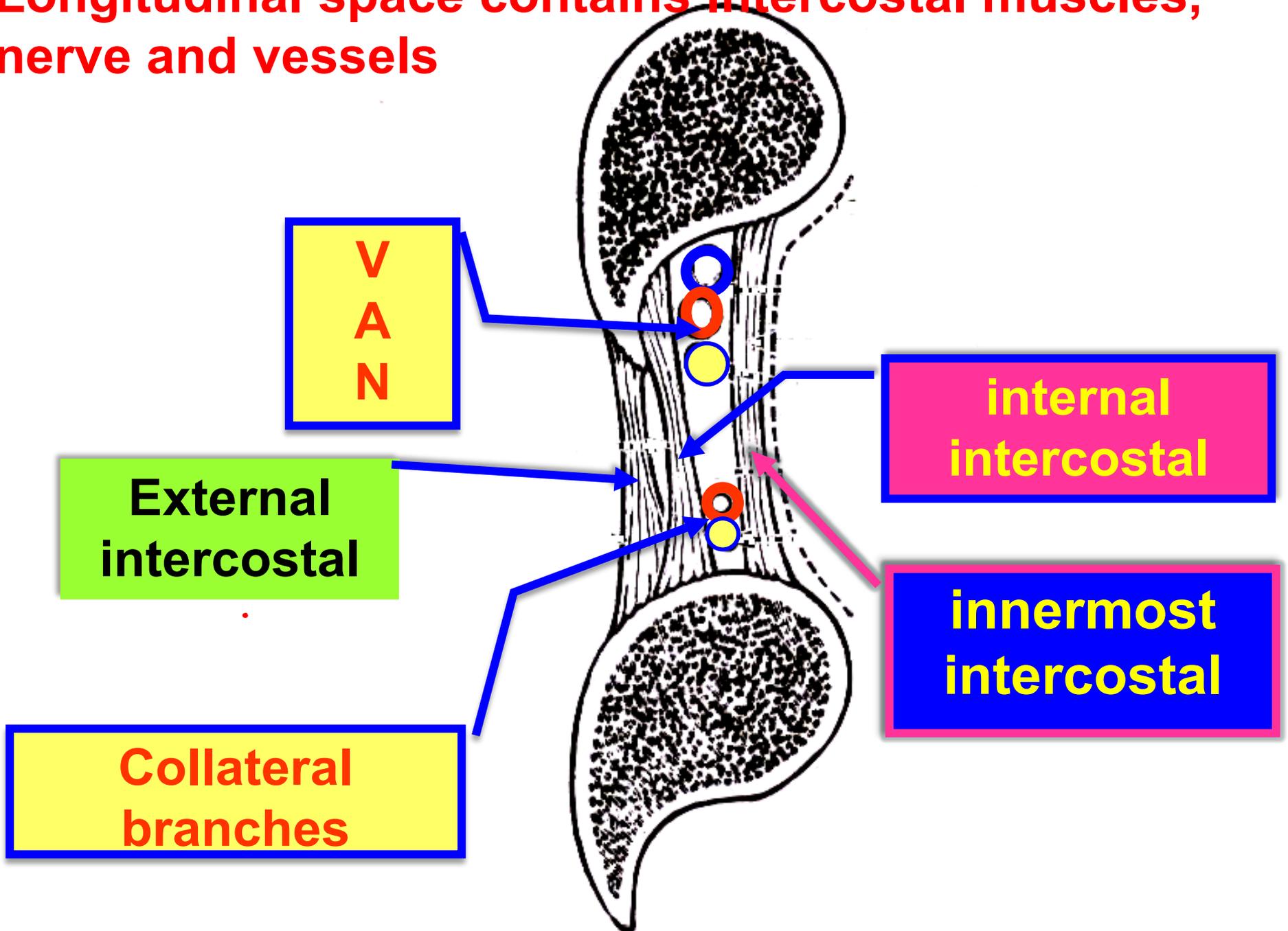
**2<sup>nd</sup> Intercostal space**

**3<sup>rd</sup> Intercostal space**

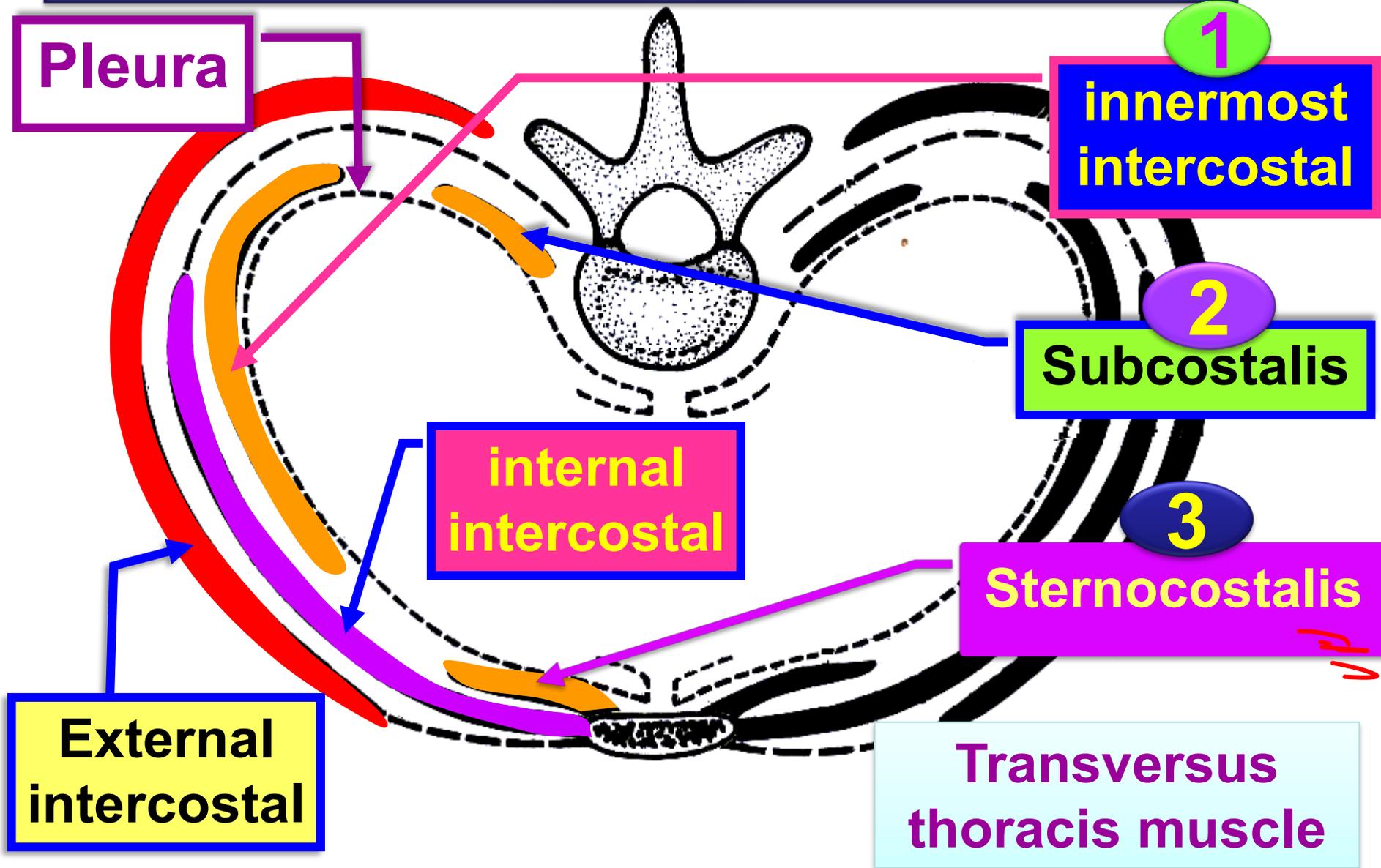
**Intercostal space**



# Longitudinal space contains Intercostal muscles, nerve and vessels



# Transverse section of the thoracic wall



# Thoracic spinal nerves

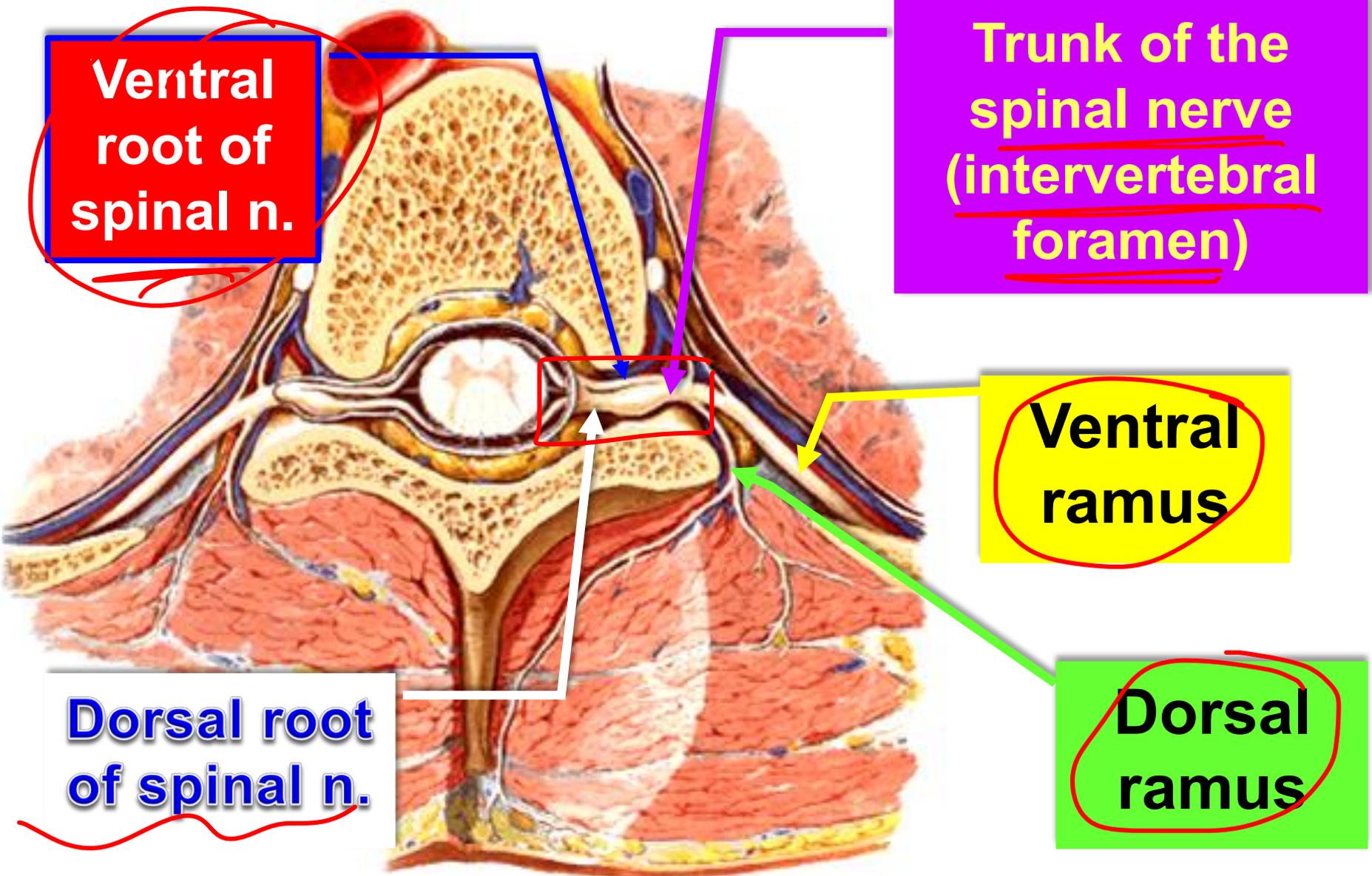
Ventral root of spinal n.

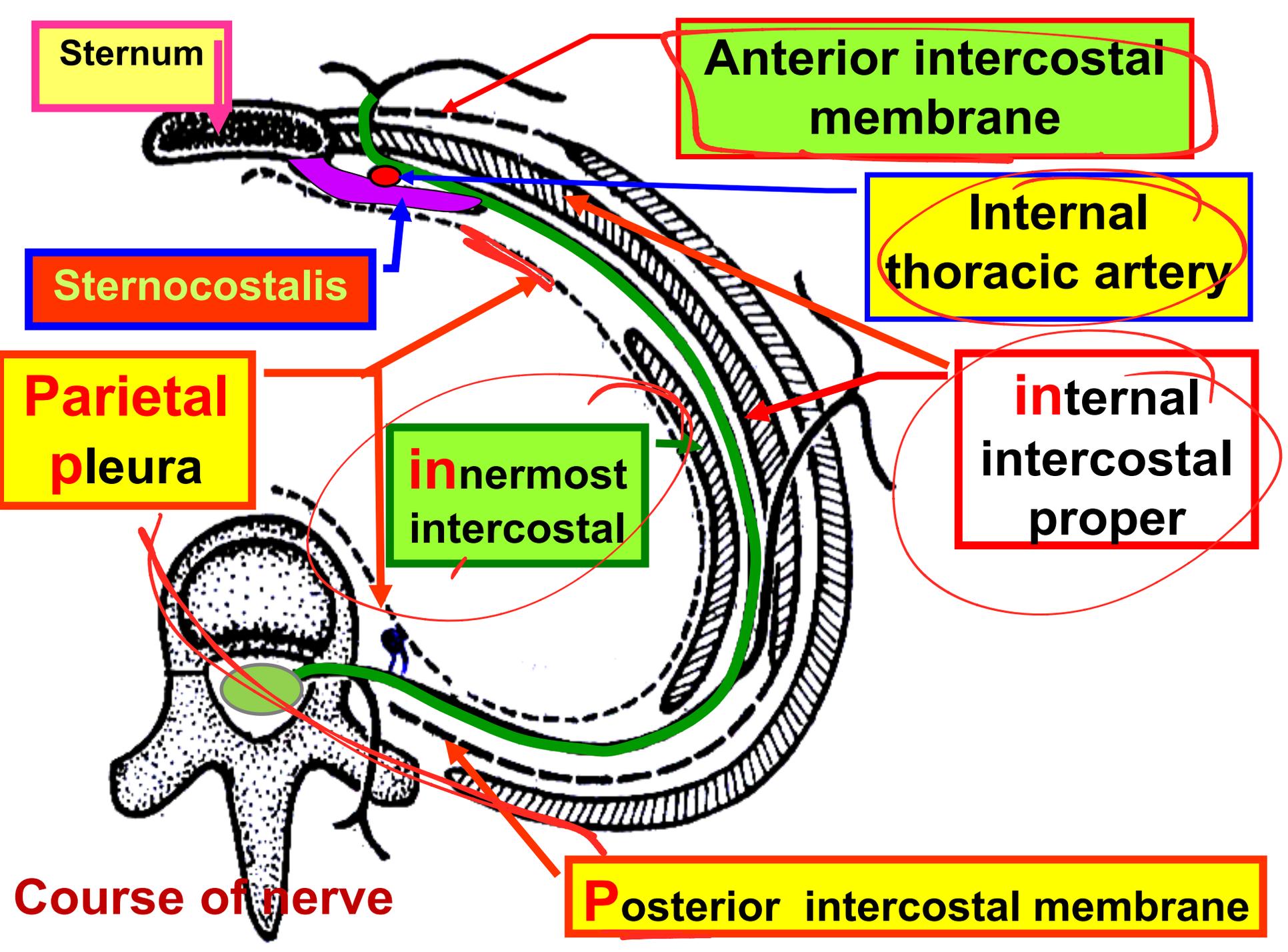
Trunk of the spinal nerve  
(intervertebral foramen)

Ventral ramus

Dorsal root of spinal n.

Dorsal ramus





Sternum

Anterior intercostal membrane

Sternocostalis

Internal thoracic artery

Parietal pleura

internal intercostal

internal intercostal proper

Course of nerve

Posterior intercostal membrane

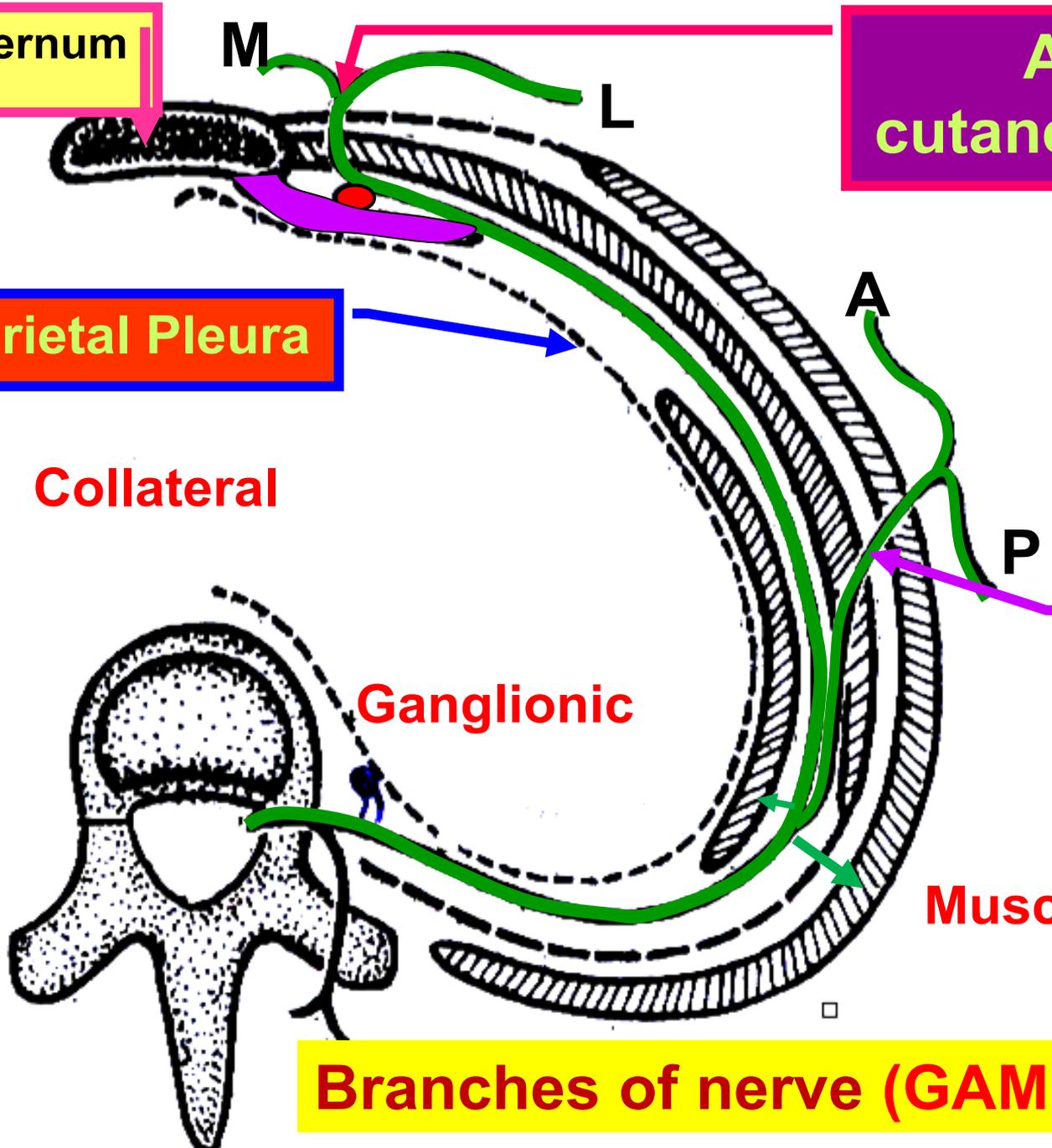
**Sternum**

**Anterior cutaneous branch**

**Parietal Pleura**

**Lateral cutaneous branch**

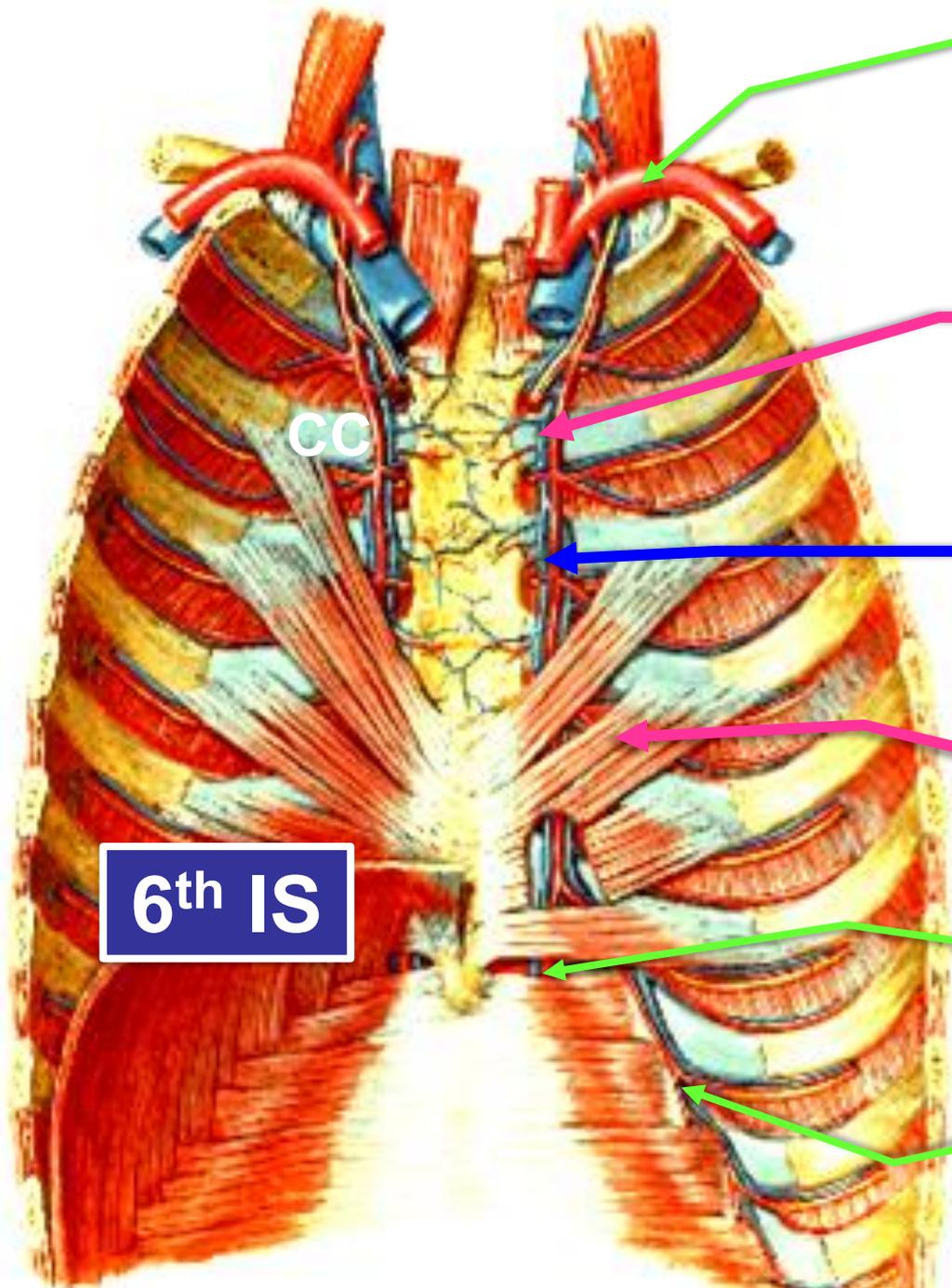
**Branches of nerve (GAML CP)**



**Collateral**

**Ganglionic**

**Muscular**



1<sup>st</sup> part of subclavian artery

Internal thoracic vein

Internal thoracic artery

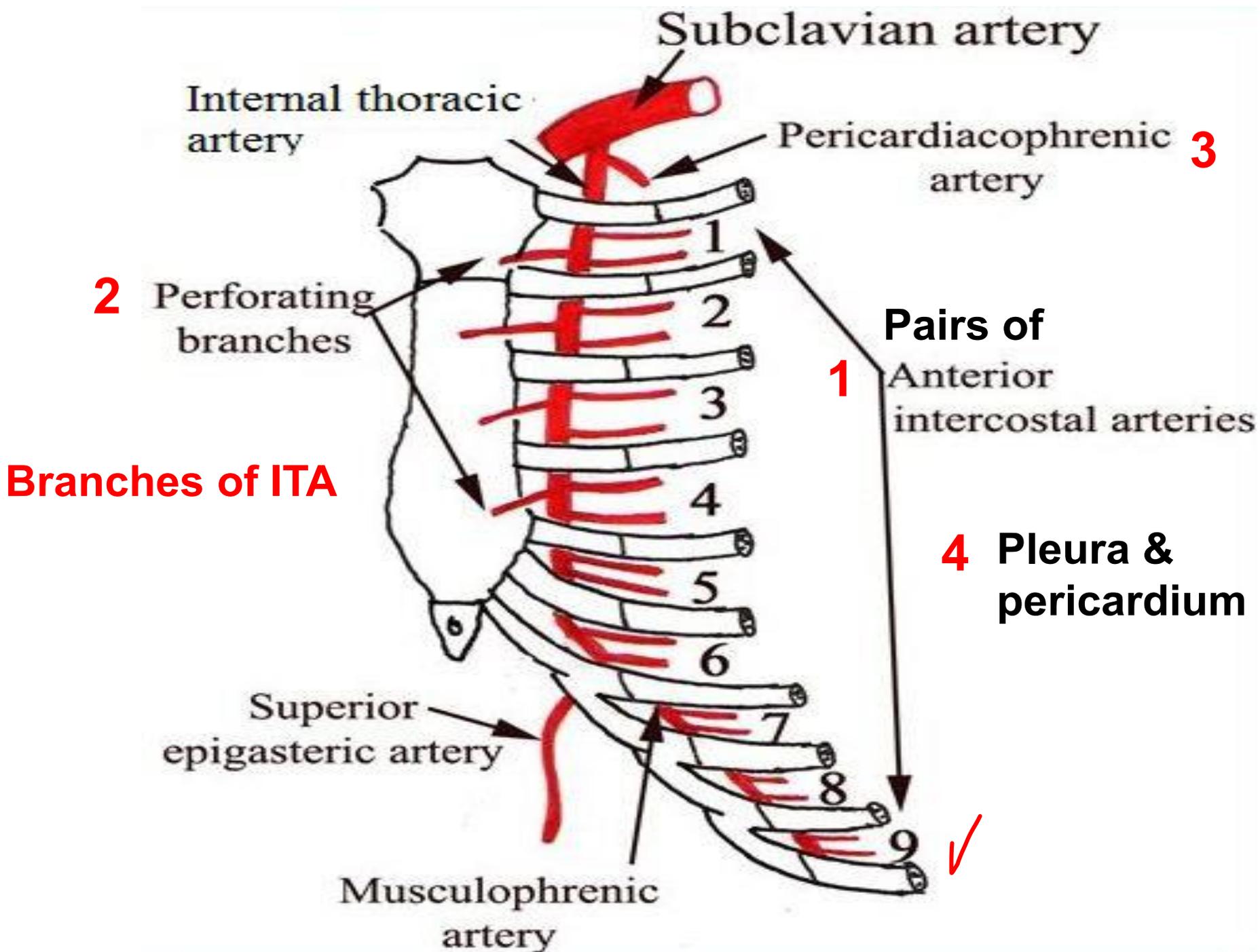
Sternocostalis

Superior epigastric A

Musculophrenic A

6<sup>th</sup> IS

CC



## Posterior Intercostal Arteries

**\*\* Number;** one artery in each 11 intercostal spaces and subcostal artery.

**\*\* Origin;**

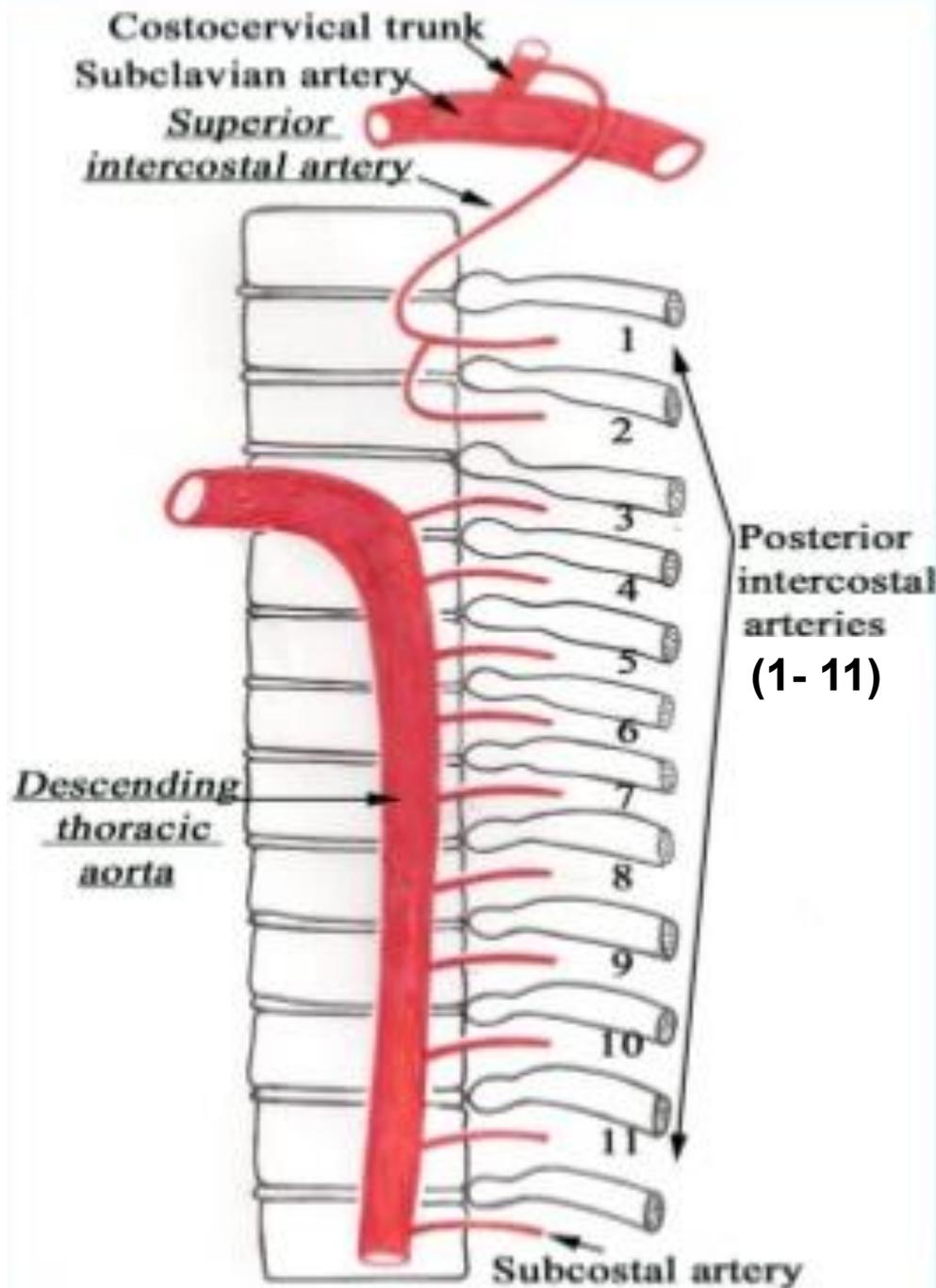
1- The 1<sup>st</sup> and 2<sup>nd</sup> arteries from superior intercostal artery.

- From costocervical trunk of 2<sup>nd</sup> part of subclavian artery.

2- From the 3<sup>rd</sup> to 11<sup>th</sup> arteries from descending thoracic aorta.

2- Subcostal artery from descending thoracic aorta.

- The posterior intercostal artery gives collateral branch



➤ **Beginning**  
➤ **End**

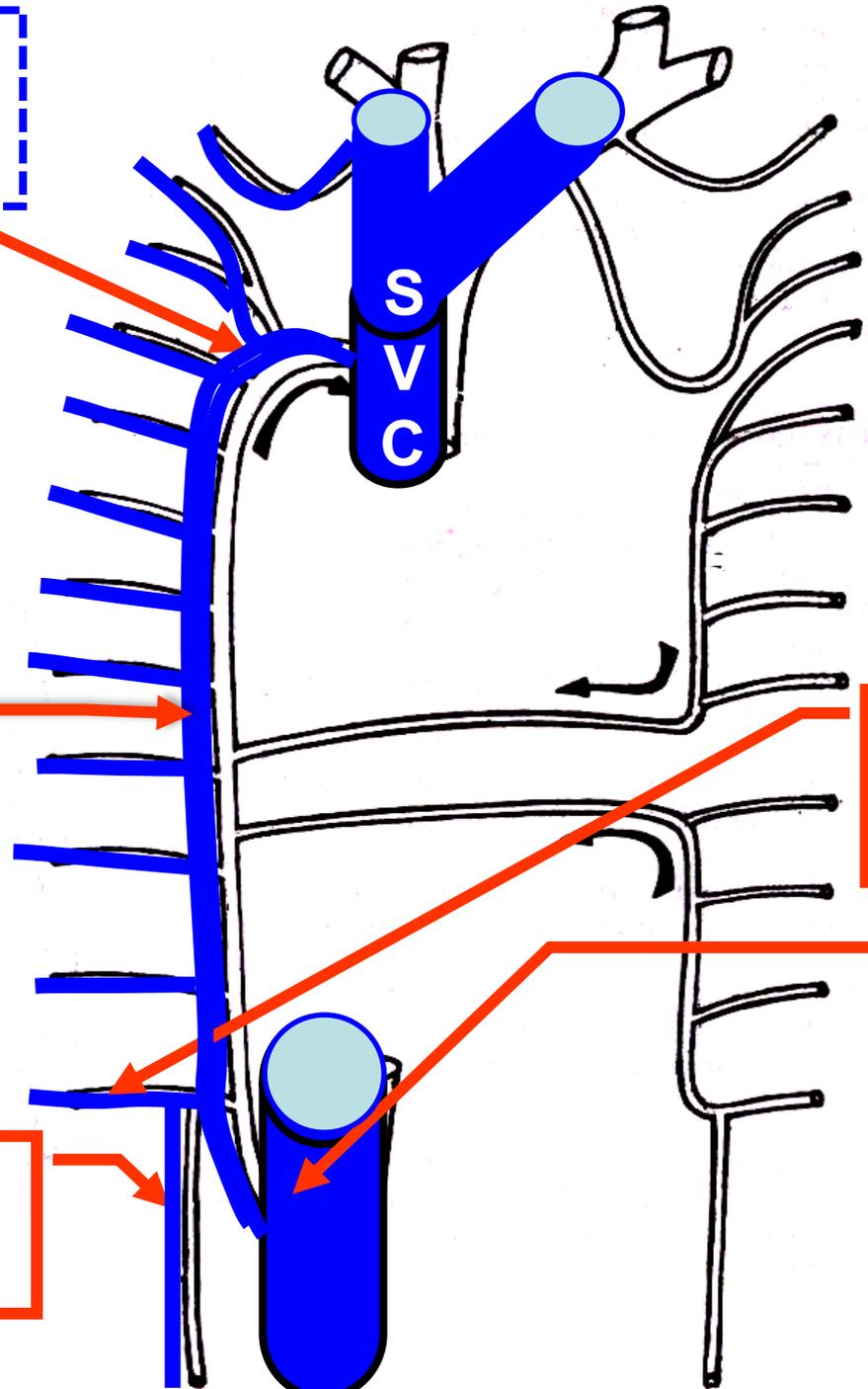
**Arch of azygos vein**

**azygos vein**

**Rt. ascending lumbar vein**

**Rt. subcostal vein**

**Inferior vena cava**



Esophagus

Trachea  
Rt. vagus

arch of  
azygos vein

T4

azygos  
vein

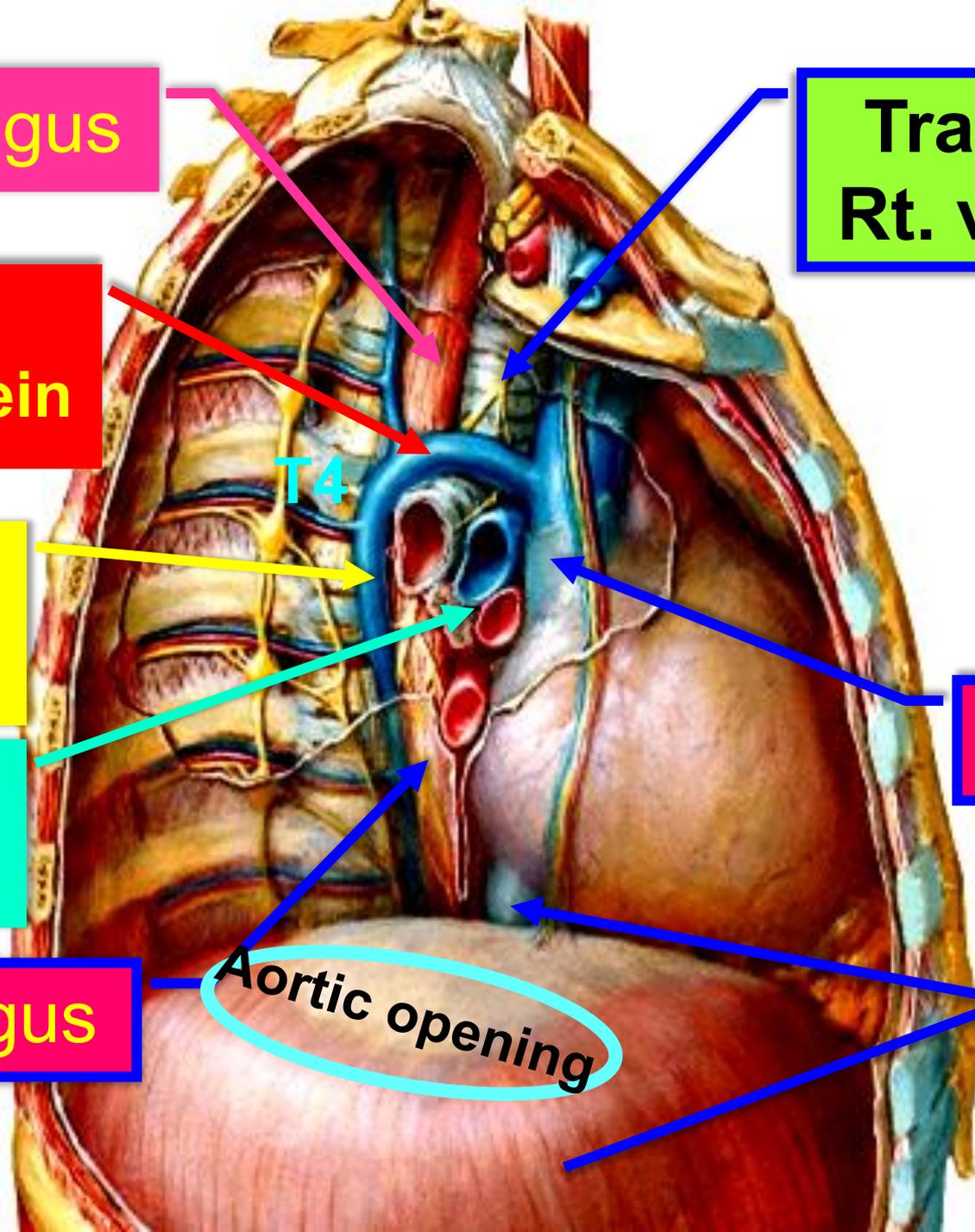
Root of  
right lung

SVC

Esophagus

Aortic opening

IVC



**2nd,3th**

**Arch of azygos vein**

**Right Superior intercostal vein**

**4th -11th**

**azygos vein**

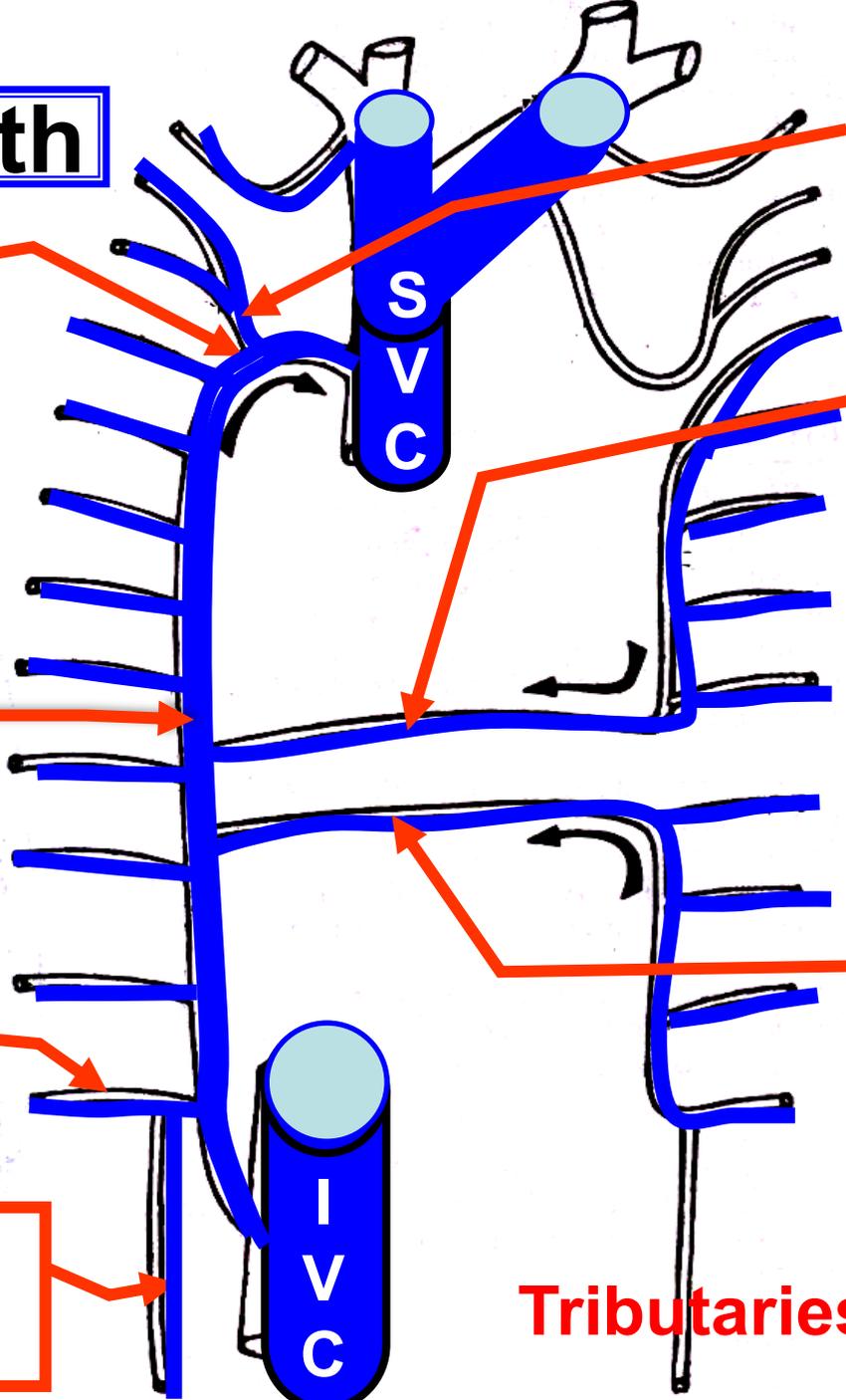
**Accessory hemiazygos vein**

**Rt. subcostal vein**

**Hemiazygos vein**

**Rt. ascending lumbar vein**

**Tributaries of Azygos vein**



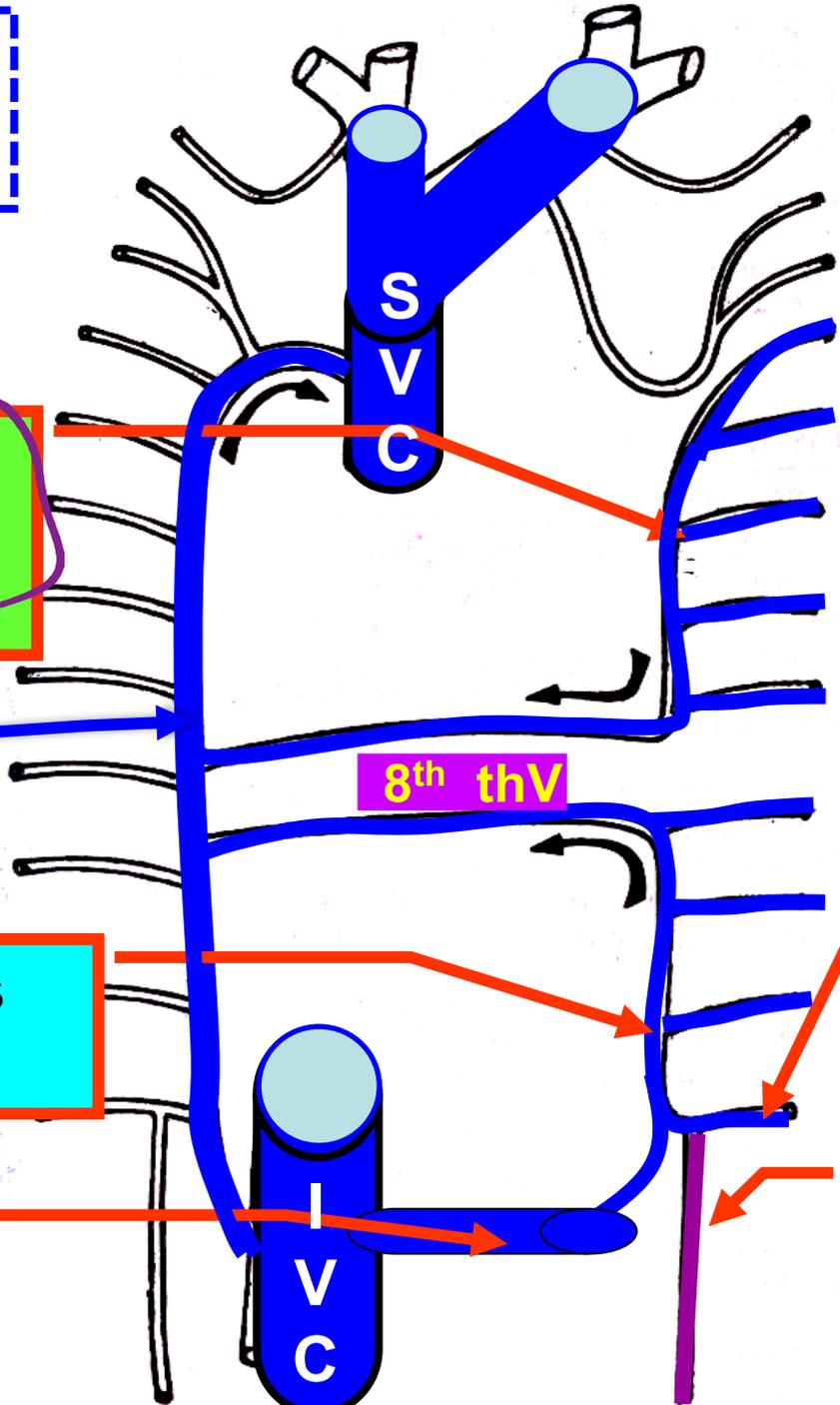
- Beginning
- End

Accessory hemiazygos vein

Azygos vein

Hemiazygos vein

Left renal vein



4<sup>th</sup> -8<sup>th</sup>

9<sup>th</sup> -11<sup>th</sup>

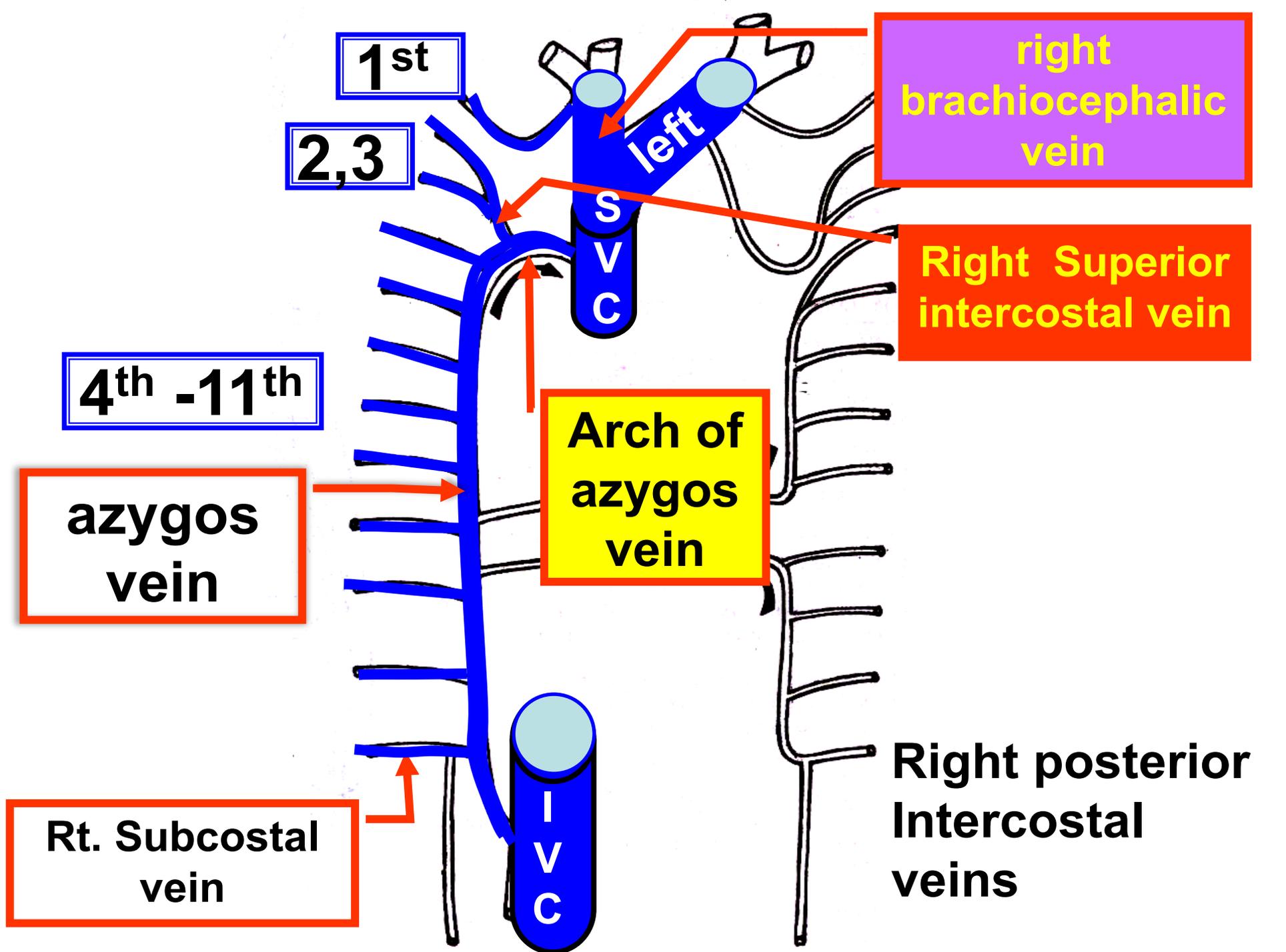
left subcostal vein

Lt. ascending lumbar vein

SVC

IVC

8<sup>th</sup> thV



**Left Superior  
intercostal  
vein**

**1<sup>st</sup>**

**2,3**

**Accessory  
hemiazygos  
vein**

**4<sup>th</sup> -8<sup>th</sup>**

**Azygos vein**

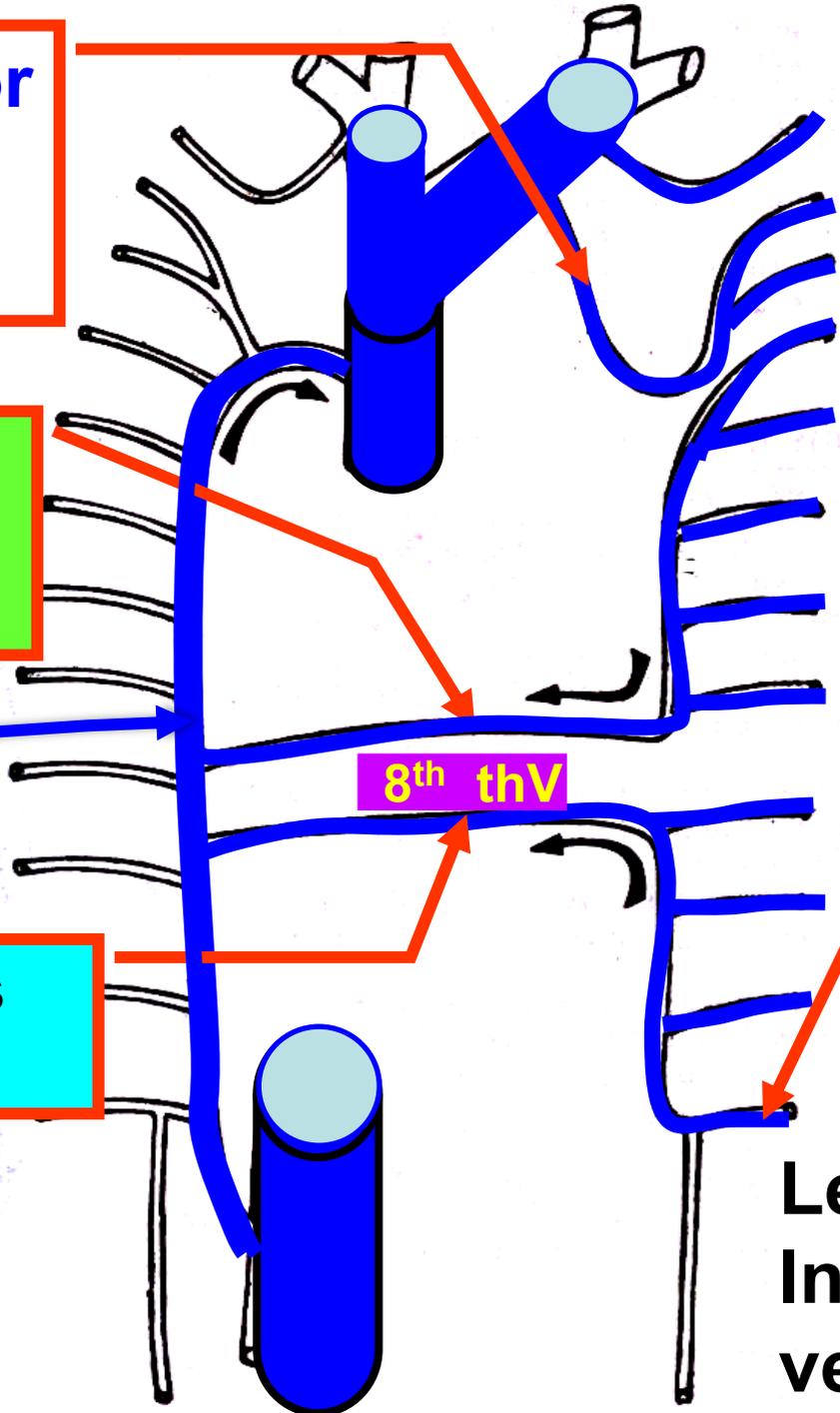
**8<sup>th</sup> thV**

**9<sup>th</sup> -11<sup>th</sup>**

**Hemiazygos  
vein**

**left subcostal  
vein**

**Left posterior  
Intercostal  
veins**

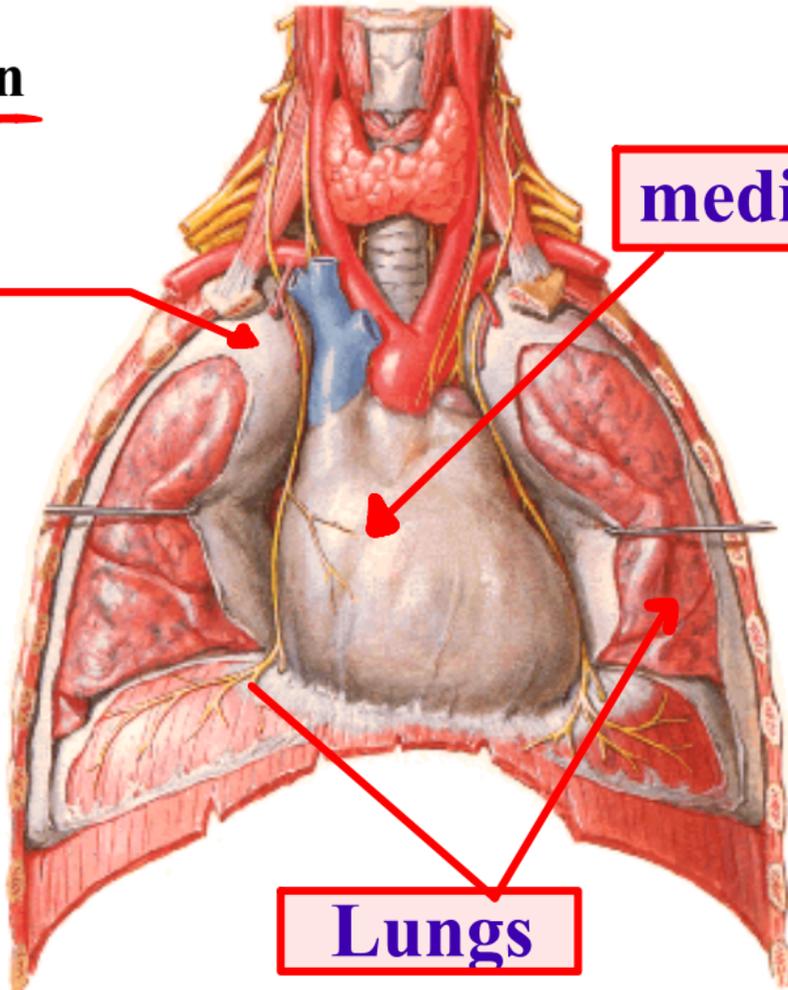


## Position

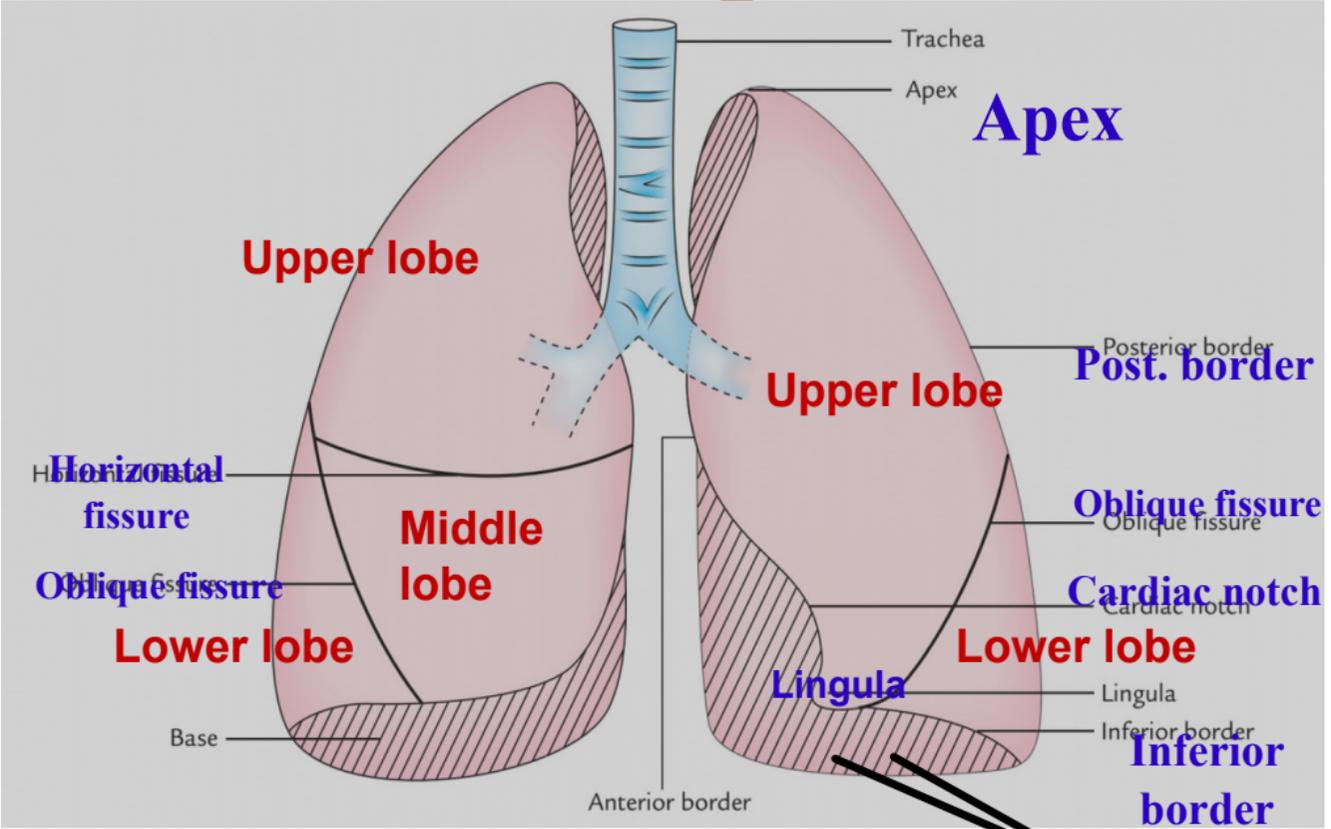
**Pleura**

**mediastinum**

**Lungs**



# Lobes and borders Lungs



**Anterior border**

**Base**

**Medial  
surf**

**e**

**Anterior  
border**

**Costal surface**

**TF**

**Right  
lung**

**Apex of  
the lung**

**U**

**M**

**L**

**OF**

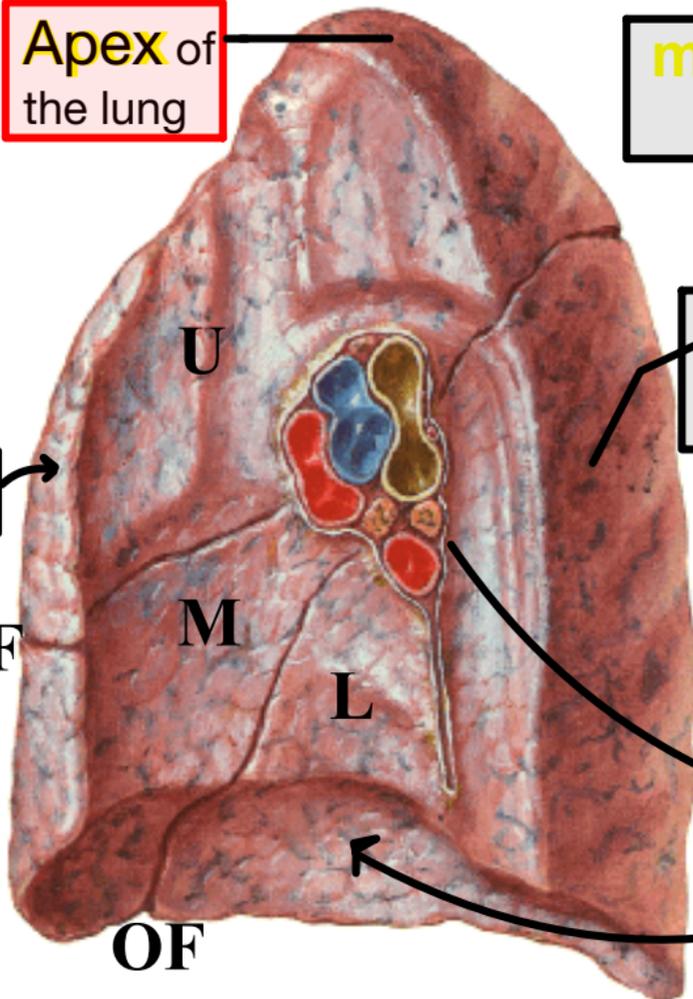
**mediastinal  
surface**

**Vertebral  
surface**

**Posterior  
border**

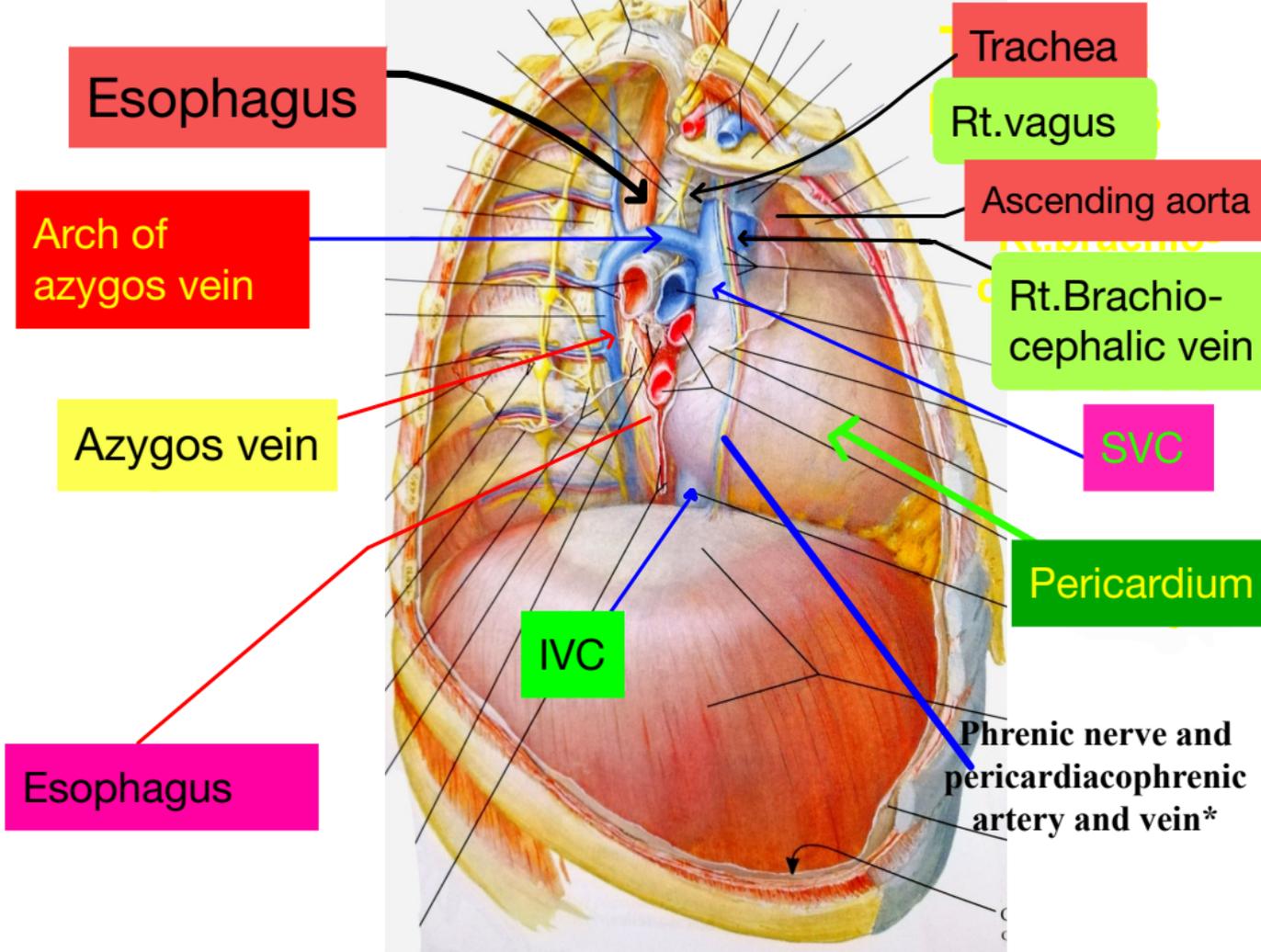
**Hilum of  
lung**

**Base of  
lung**



**1**

**2**



Esophagus

Arch of azygos vein

Azygos vein

Esophagus

Trachea

Rt.vagus

Ascending aorta

Rt.Brachio-  
cephalic vein

SVC

Pericardium

IVC

Phrenic nerve and  
pericardiophrenic  
artery and vein\*

# Right lung

Groove for ascending aorta & thymus gland

Groove for SVC

Cardiac impression

Groove for IVC

Groove of arch of azygos vein

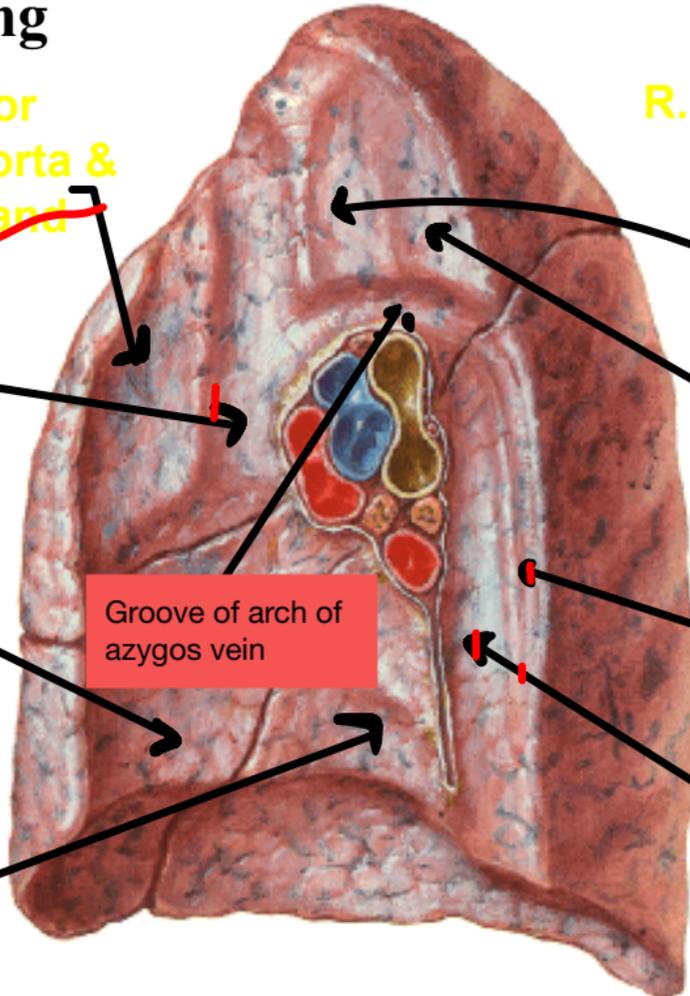
Groove for R.brachiocephalic vein

Groove for trachea & R.vagus

Groove for esophagus

Groove for azygos vein

Groove for esophagus



# Left lung

Groove for  
esophagus,  
thoracic duct

Groove for  
arch of aorta

Groove for  
descending  
thoracic aorta

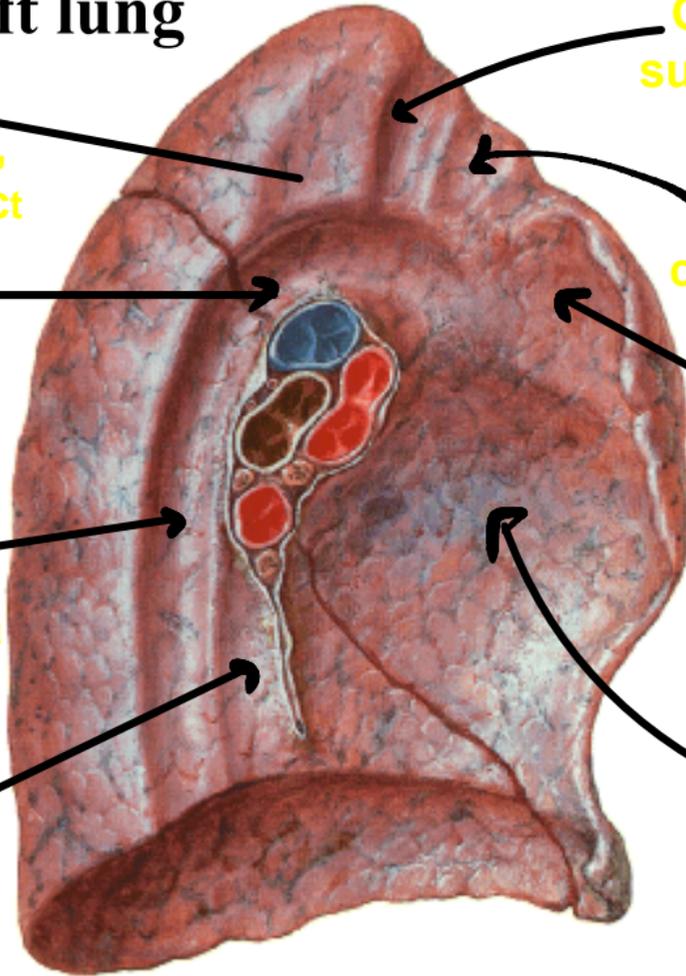
Groove for  
esophagus

Groove for left  
subclavian artery

Groove for left  
common carotid  
a

Groove for  
pulmonary  
trunk &  
thymus gland

Cardiac  
impression



Left common carotid a

left subclavian artery

Arch of aorta

Esophagus  
Thoracic duct

left superior intercostal v.

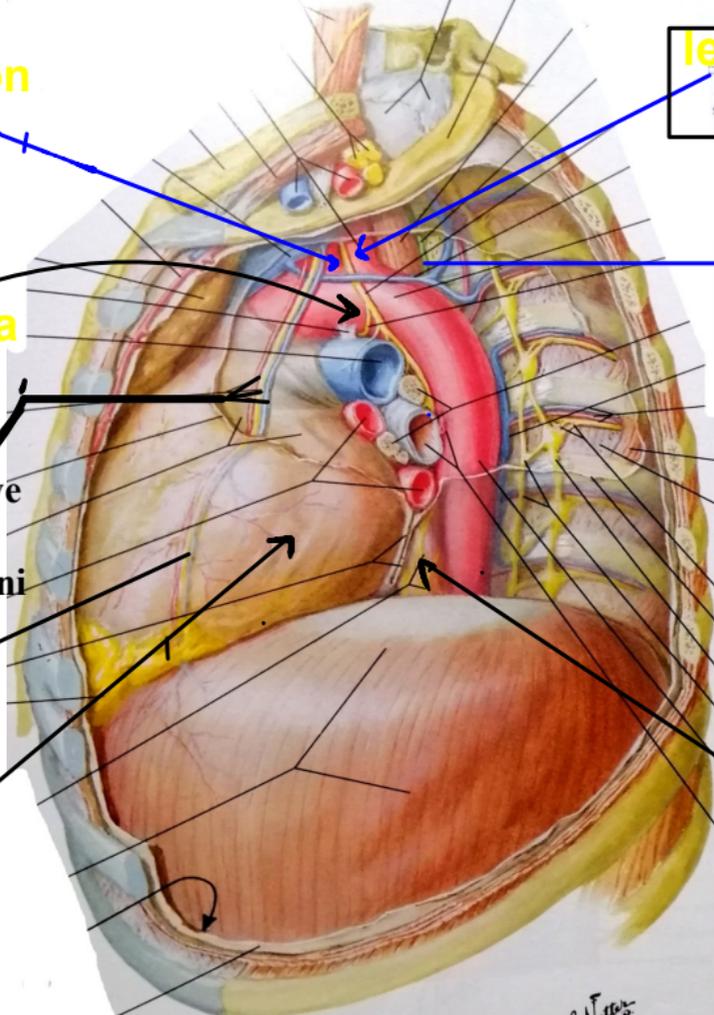
Left phrenic nerve & pericardiophrenic A & V

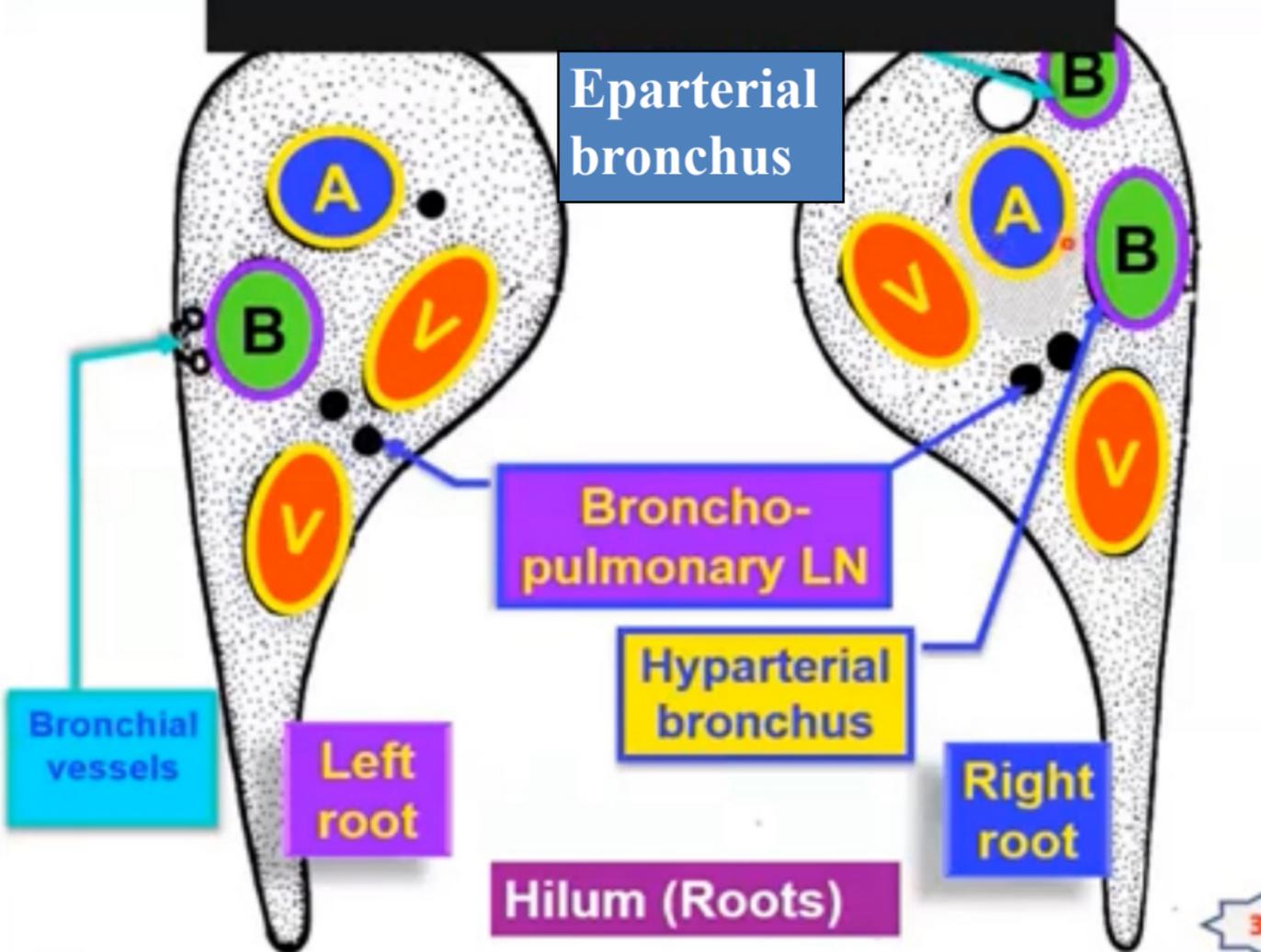
left vagus nerve

Phrenic N / Pericardiophrenic vs

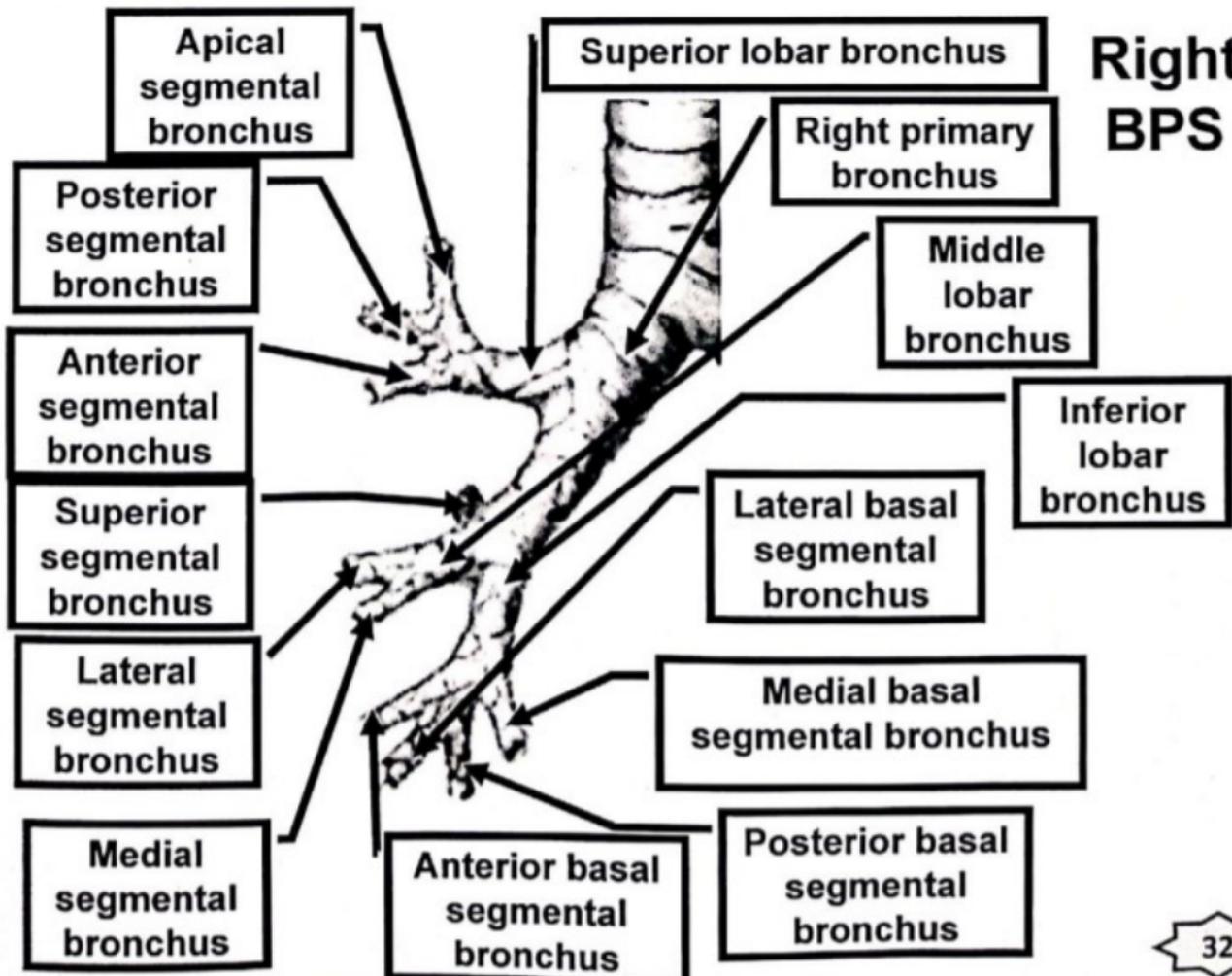
Esophagus

Pericardial bulging



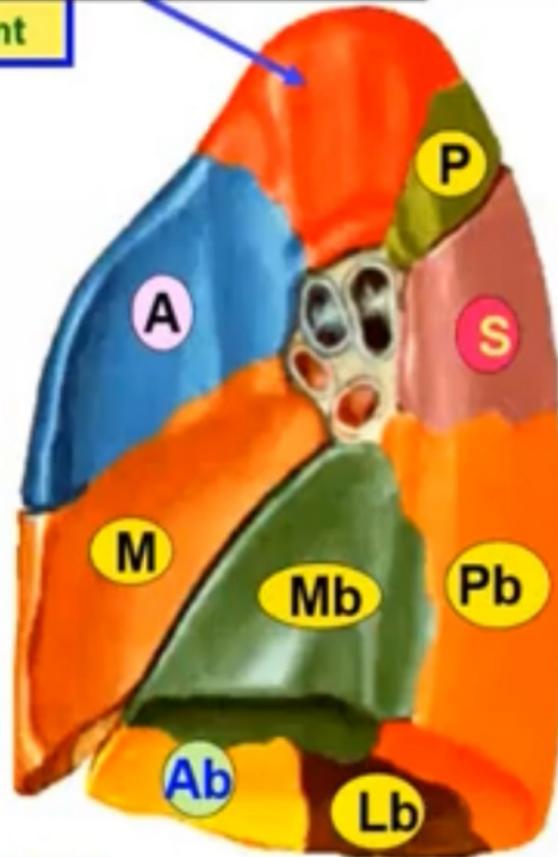
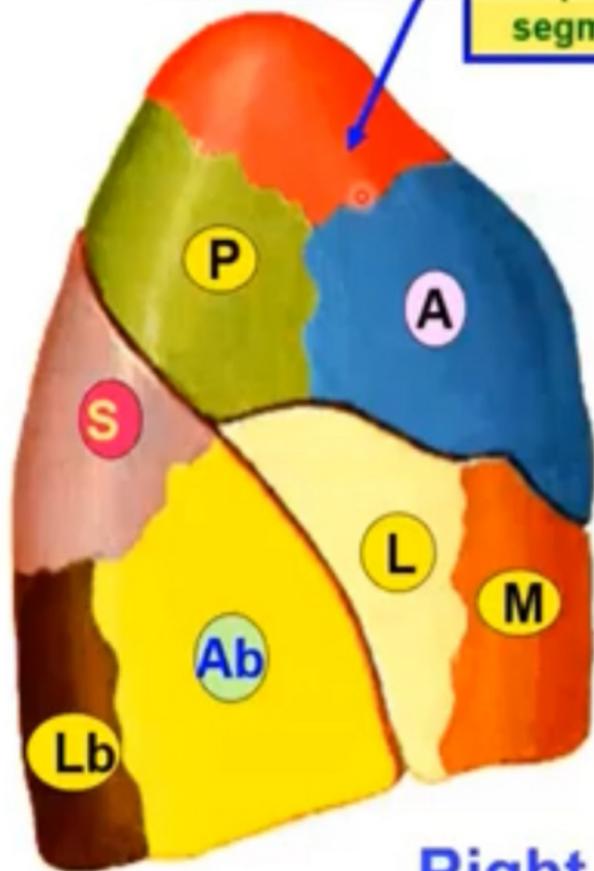


# Right BPS

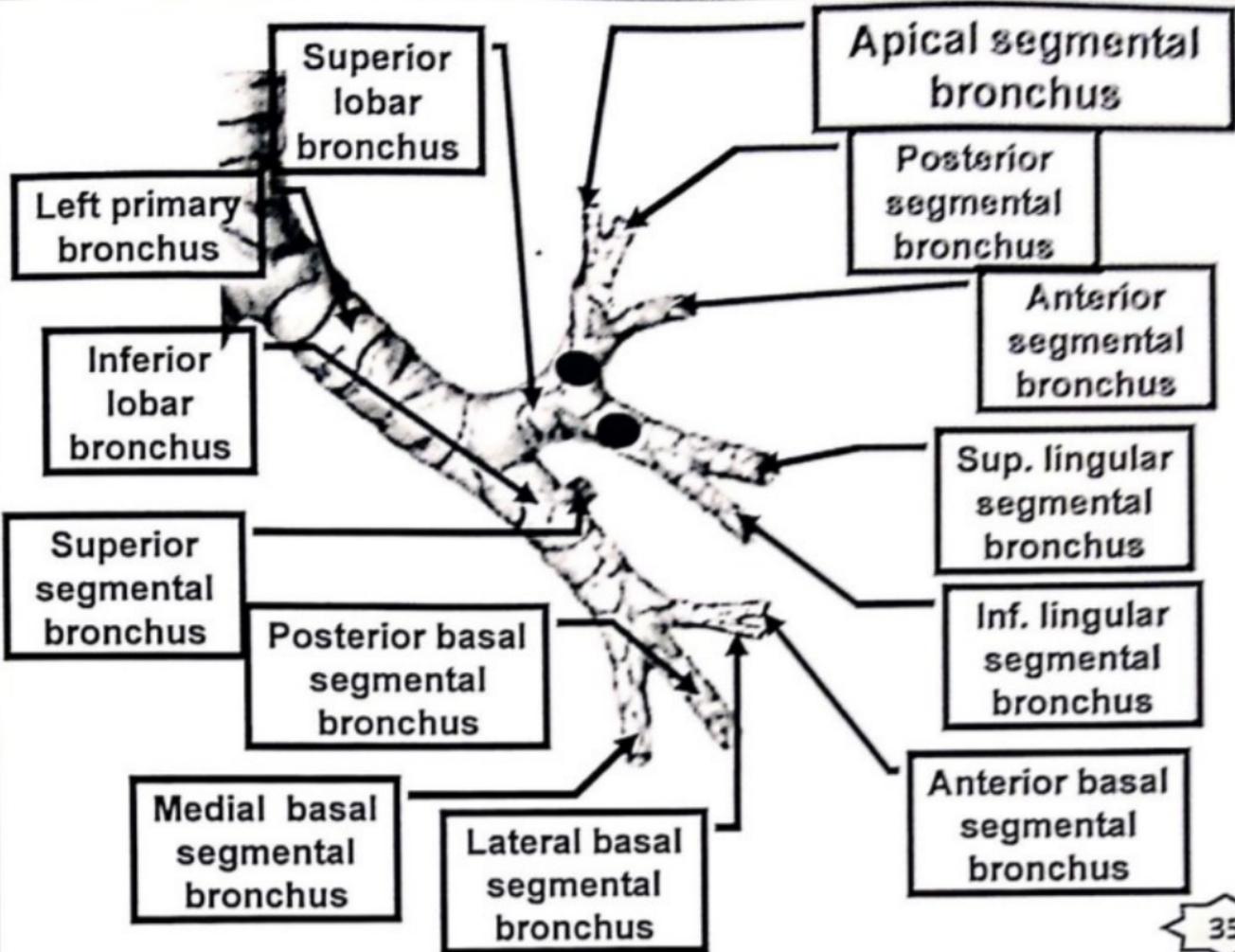


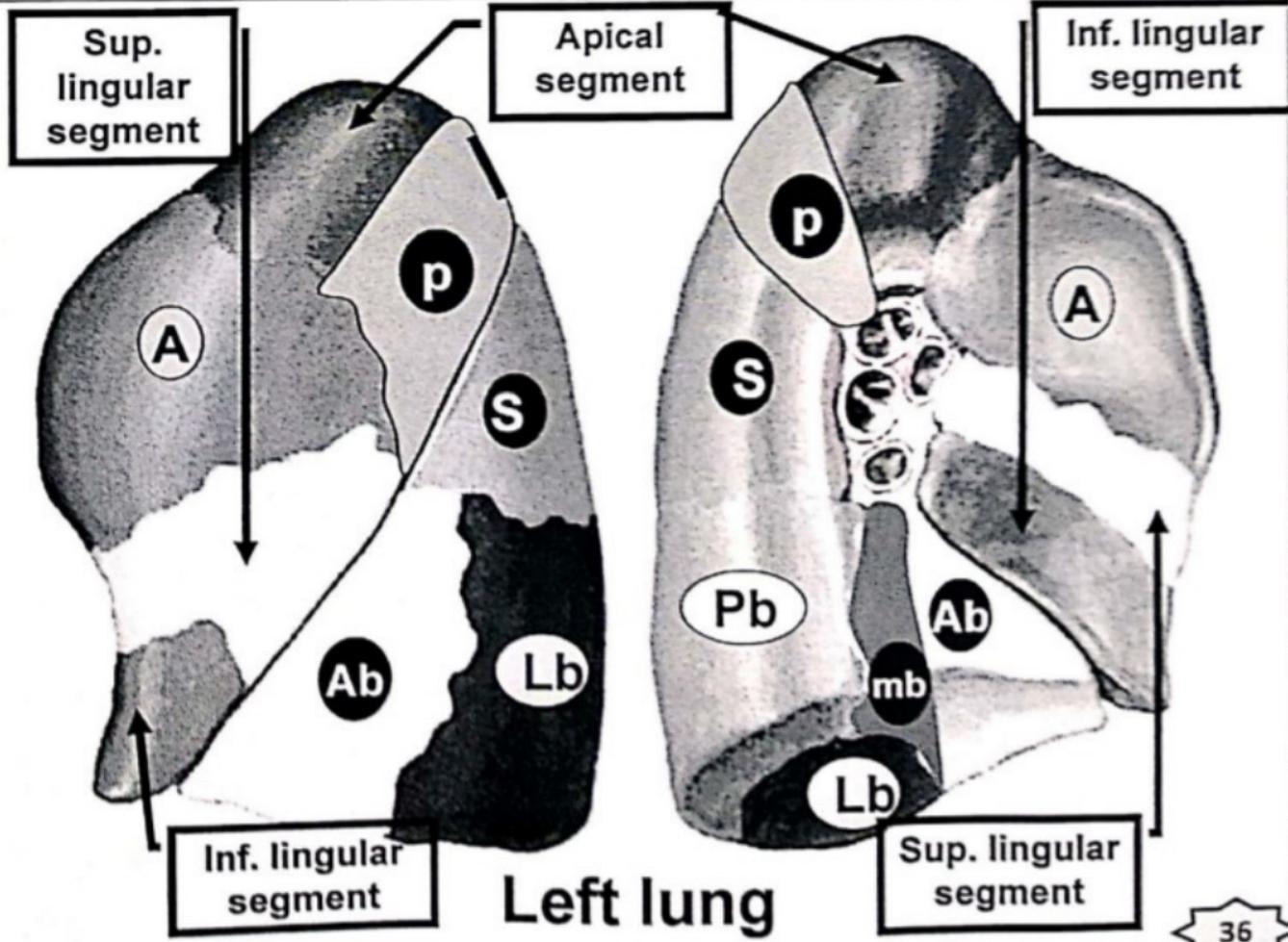
Apical

segment



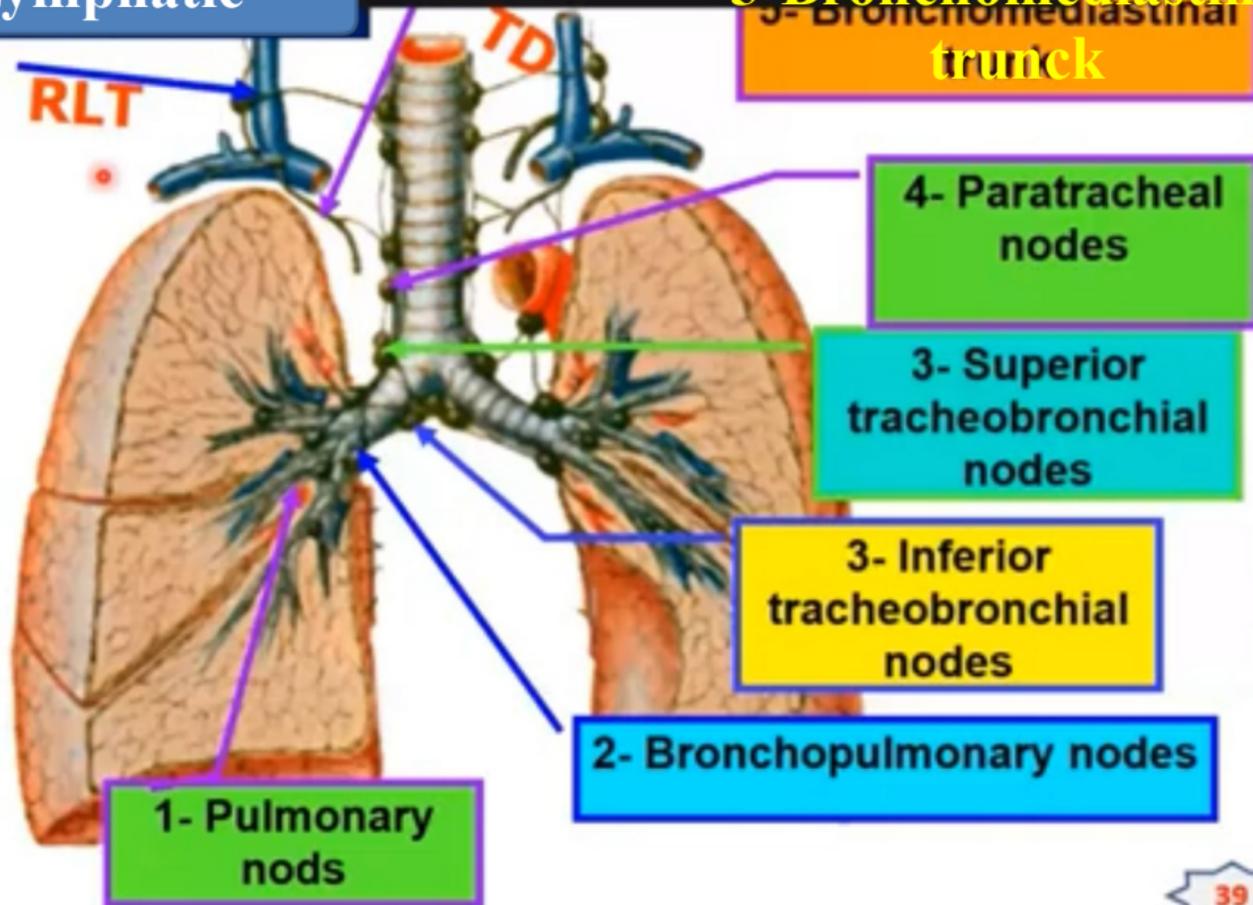
Right lung

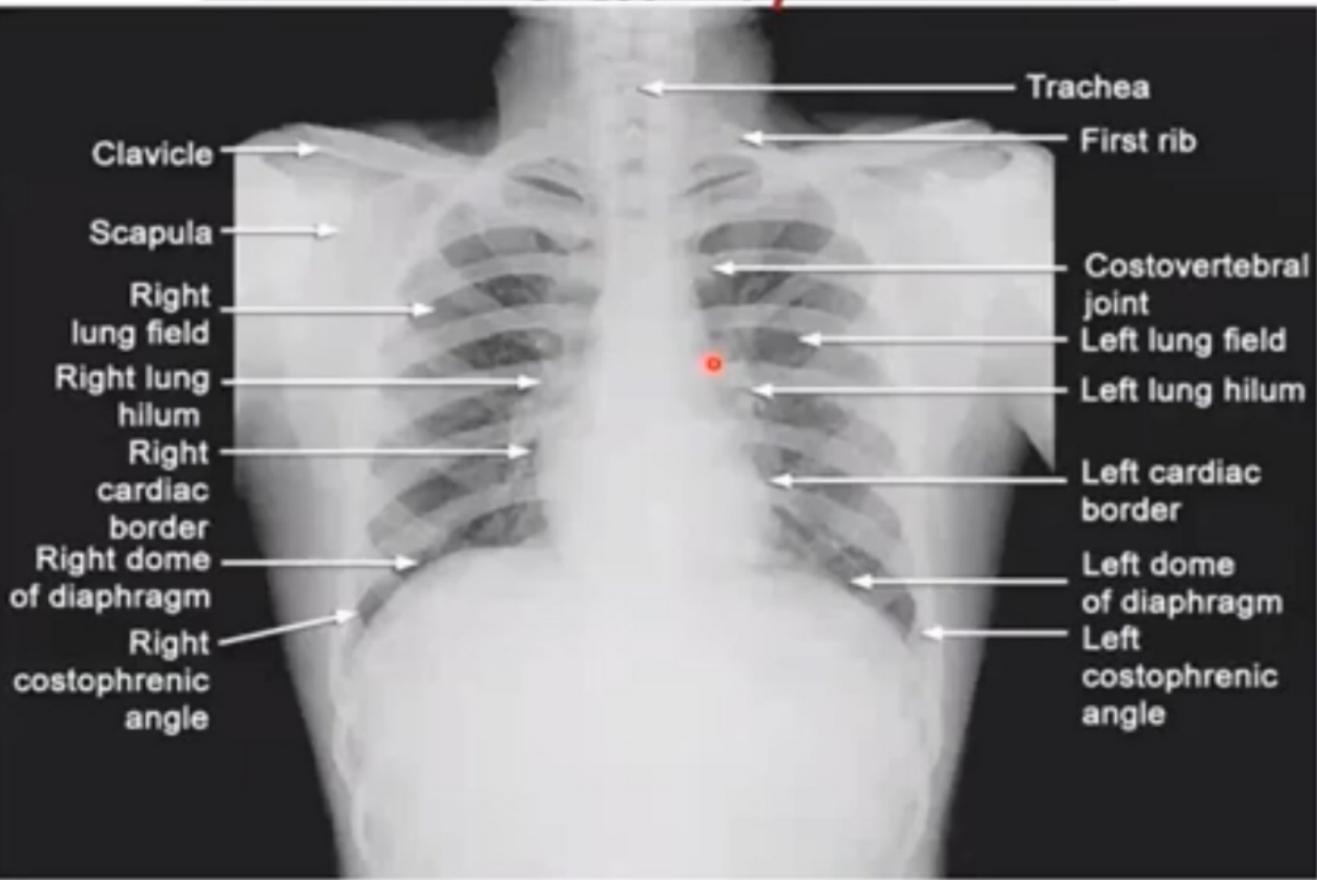




# Lymphatic

# 5-Bronchomediastinal trunk





Trachea

First rib

Clavicle

Scapula

Costovertebral joint

Left lung field

Right lung field

Right lung hilum

Left lung hilum

Right cardiac border

Left cardiac border

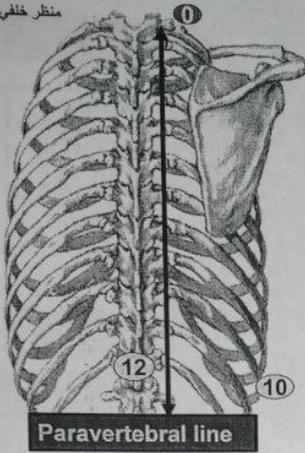
Right dome of diaphragm

Left dome of diaphragm

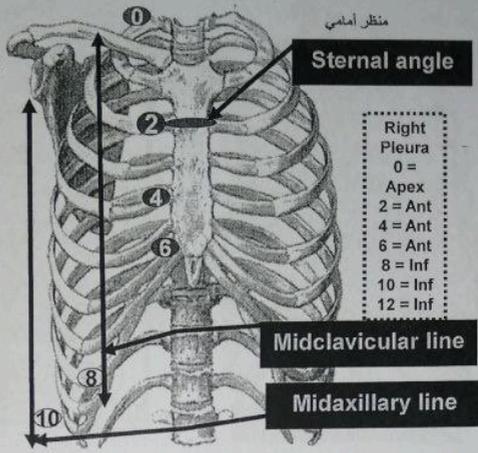
Right costophrenic angle

Left costophrenic angle

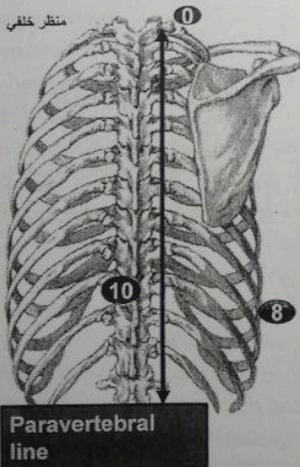
منظر خلفي



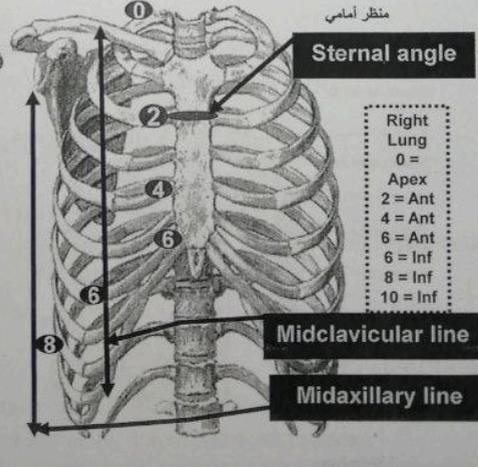
منظر أمامي

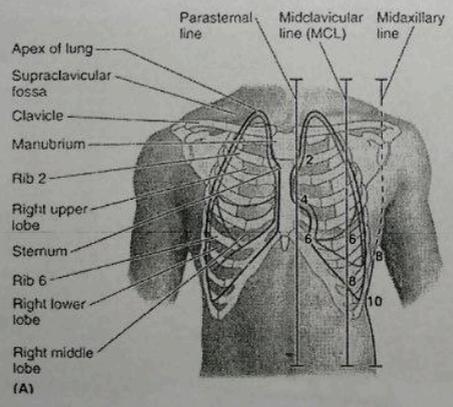
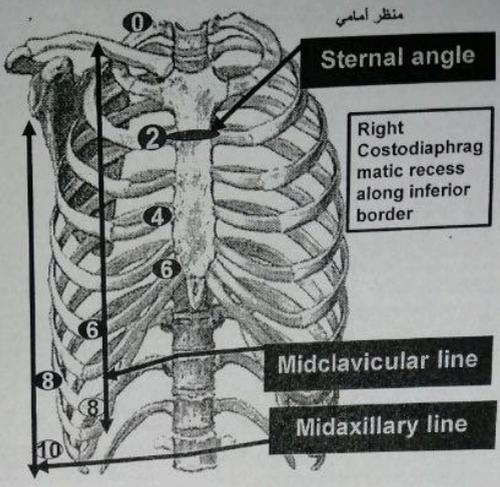
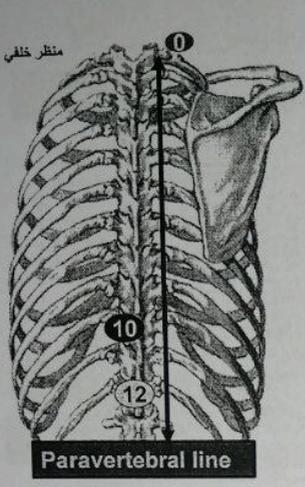


منظر خلفي



منظر أمامي





**Surface anatomy left & pleura lung**

Left Pleura= 0, 2, 4, 6, 8, 10, 12  
 Left Lung= 0, 2, 4, 6, 8, 10