MED437
KING SAUD UNIVERSITY

ANATOMY
Team 437

OSPE

Anatomy

Respiratory Block

Please note that these figures are not necessarily
those present in the exam

THANK YOU

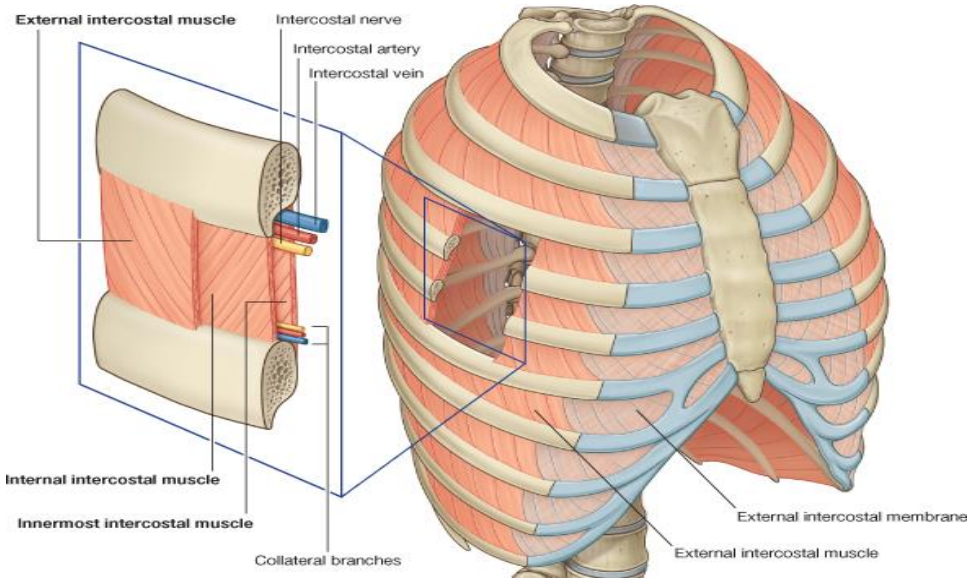
PROF. AHMED FATHALLA IBRAHIM

OSPE

- According to Prof. Ahmed the OSPE will only be identifying structures (theoretical questions are in the SAQ)

- SAQ content is at the end of this document

MUSCLES INVOLVED IN RESPIRATION: Action- Nerve supply



Intercostal Muscles

External Intercostal Muscle

Nerve supply: intercostal nerves

Action: rib elevators (inspiratory)

Internal Intercostal Muscle

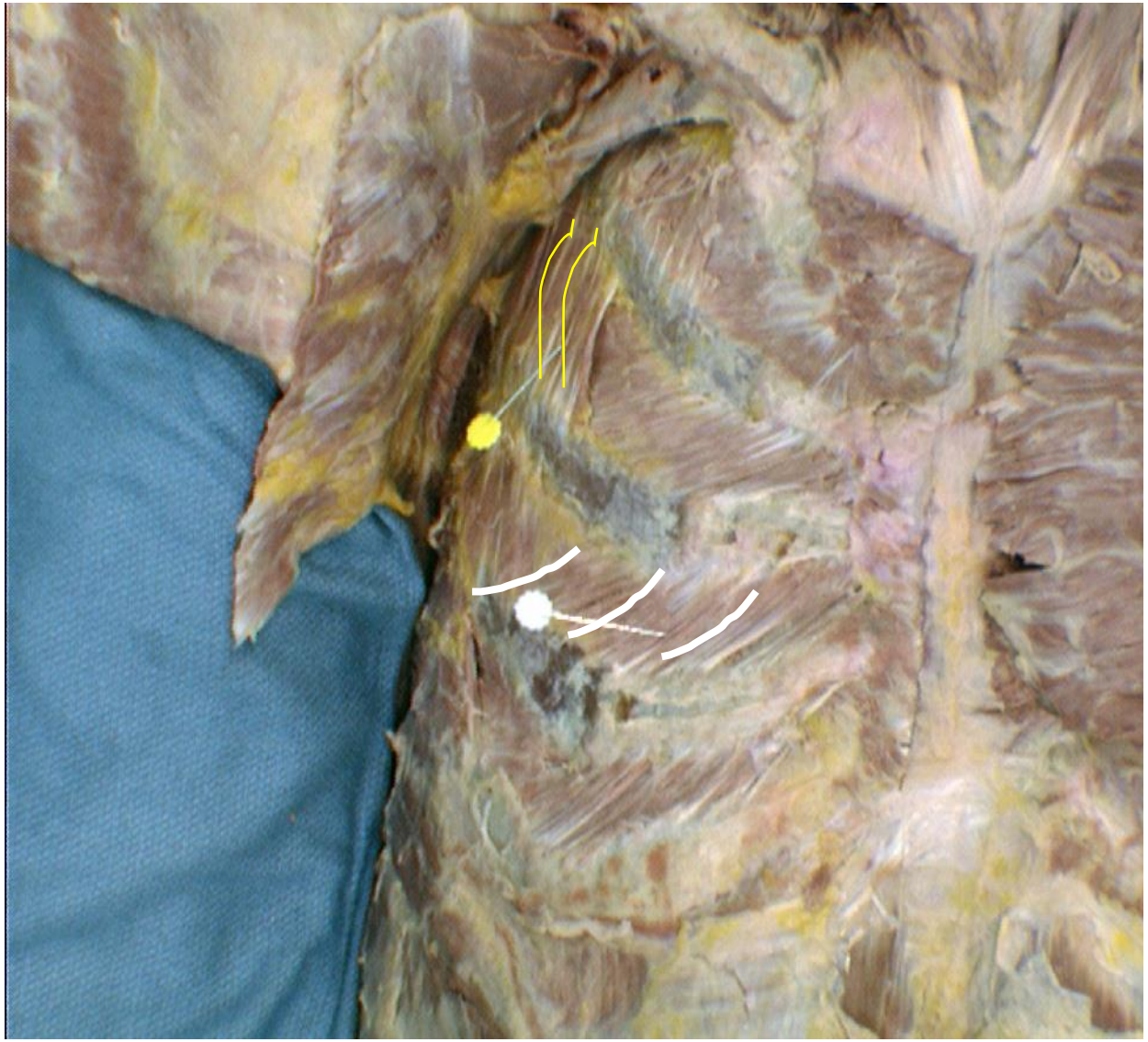
Nerve supply: intercostal nerves

Action: rib depressors

Innermost Intercostal Muscle

Nerve supply: intercostal nerves

Action: rib depressors



Yellow :external intercostal muscle
White : internal intercostal muscle
Note the directions of the fibers

MUSCLES INVOLVED IN RESPIRATION
Action- Nerve supply

Anterior Abdominal Wall Muscles

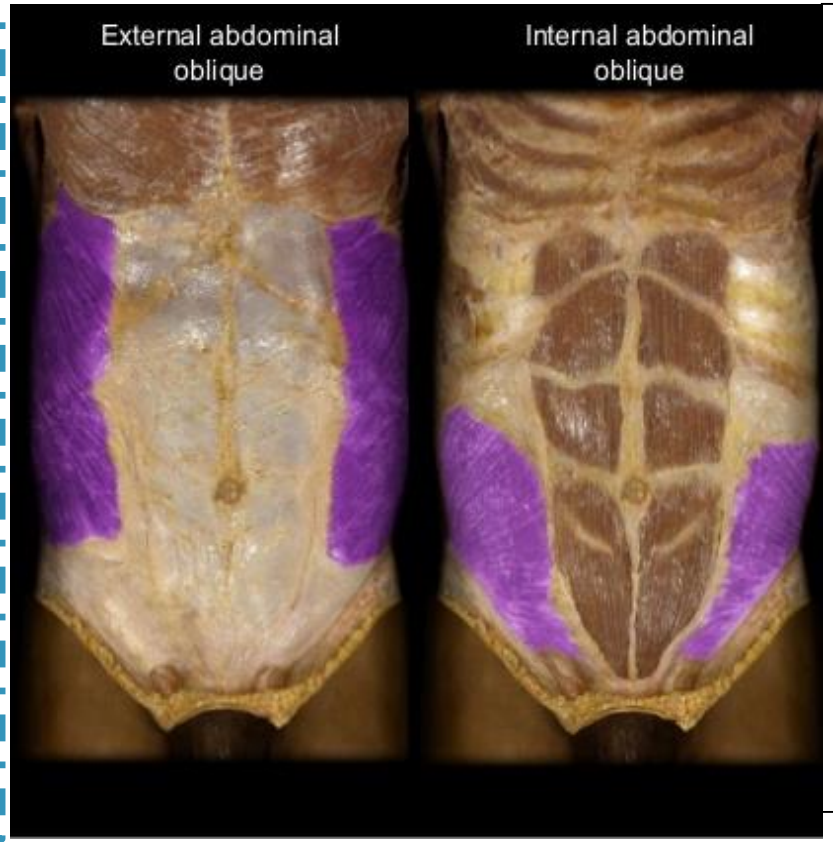
External Oblique Muscle & Internal Oblique Muscle

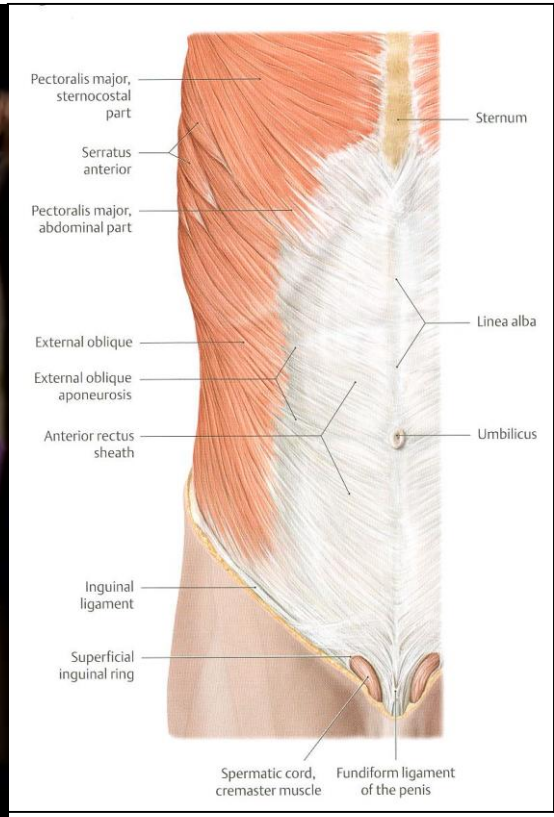
Nerve supply:

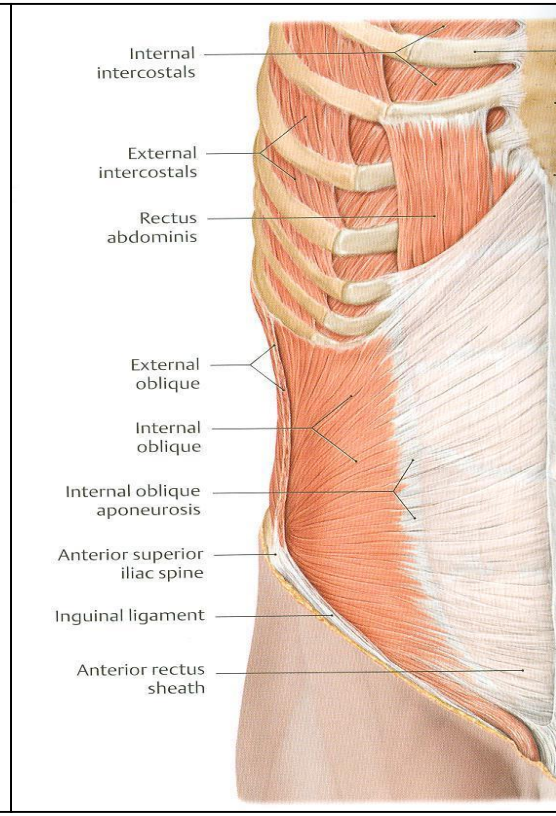
lower intercostal nerves (T7 – T11),
subcostal nerve (T12), and first lumbar nerve.

Action:

Compression of abdominal viscera to help in ascent of diaphragm (during forced expiration)







- You only need to be able to identify the muscles for the OSPE

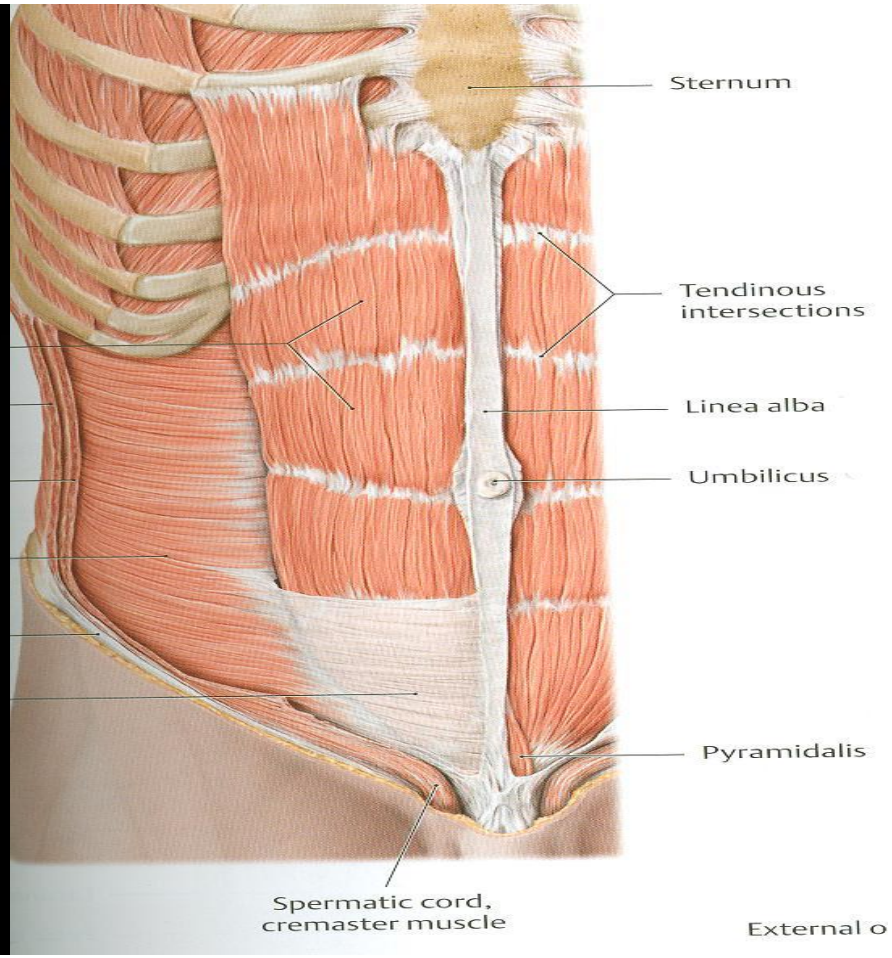
MUSCLES INVOLVED IN RESPIRATION
Action- Nerve supply

Anterior Abdominal Wall Muscles

Transversus Abdominis

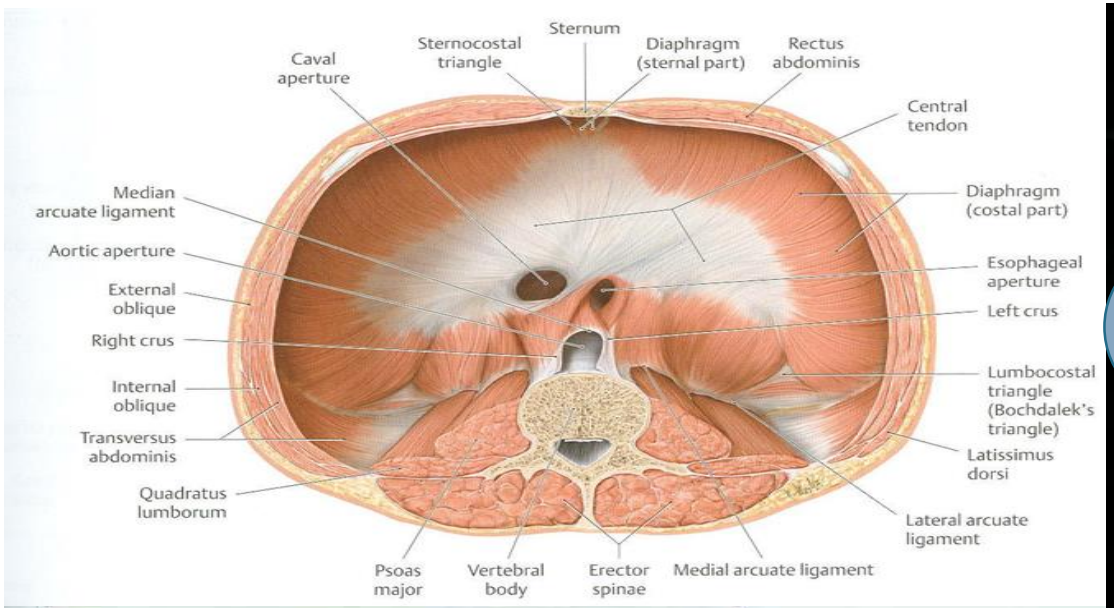
Nerve supply:
lower intercostal nerves (T7 – T11), subcostal nerve (T12), and first lumbar nerve.

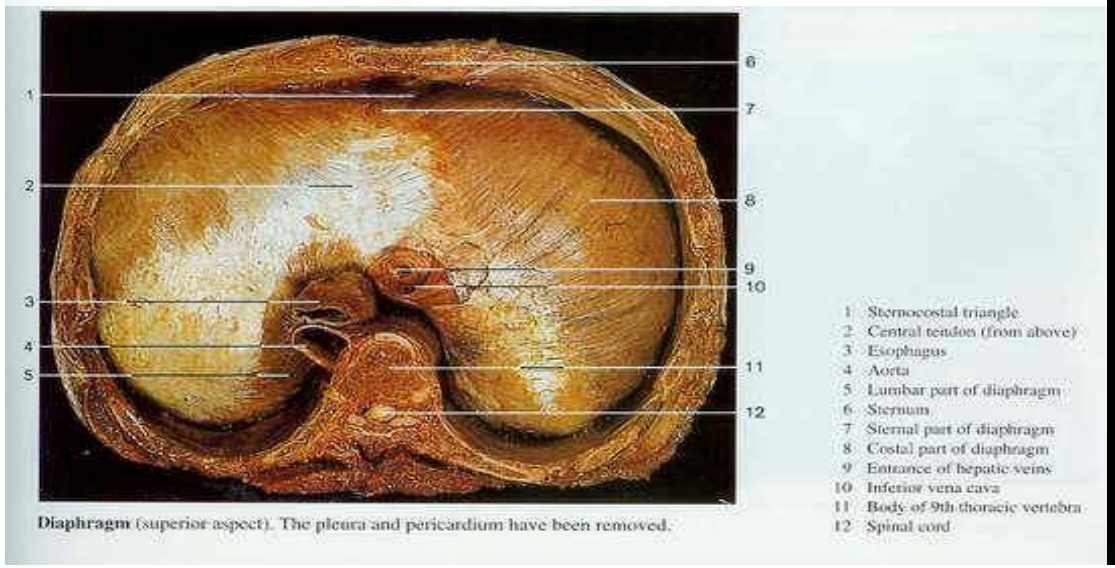
Action:
Compression of abdominal viscera to help in ascent of diaphragm (during forced expiration)



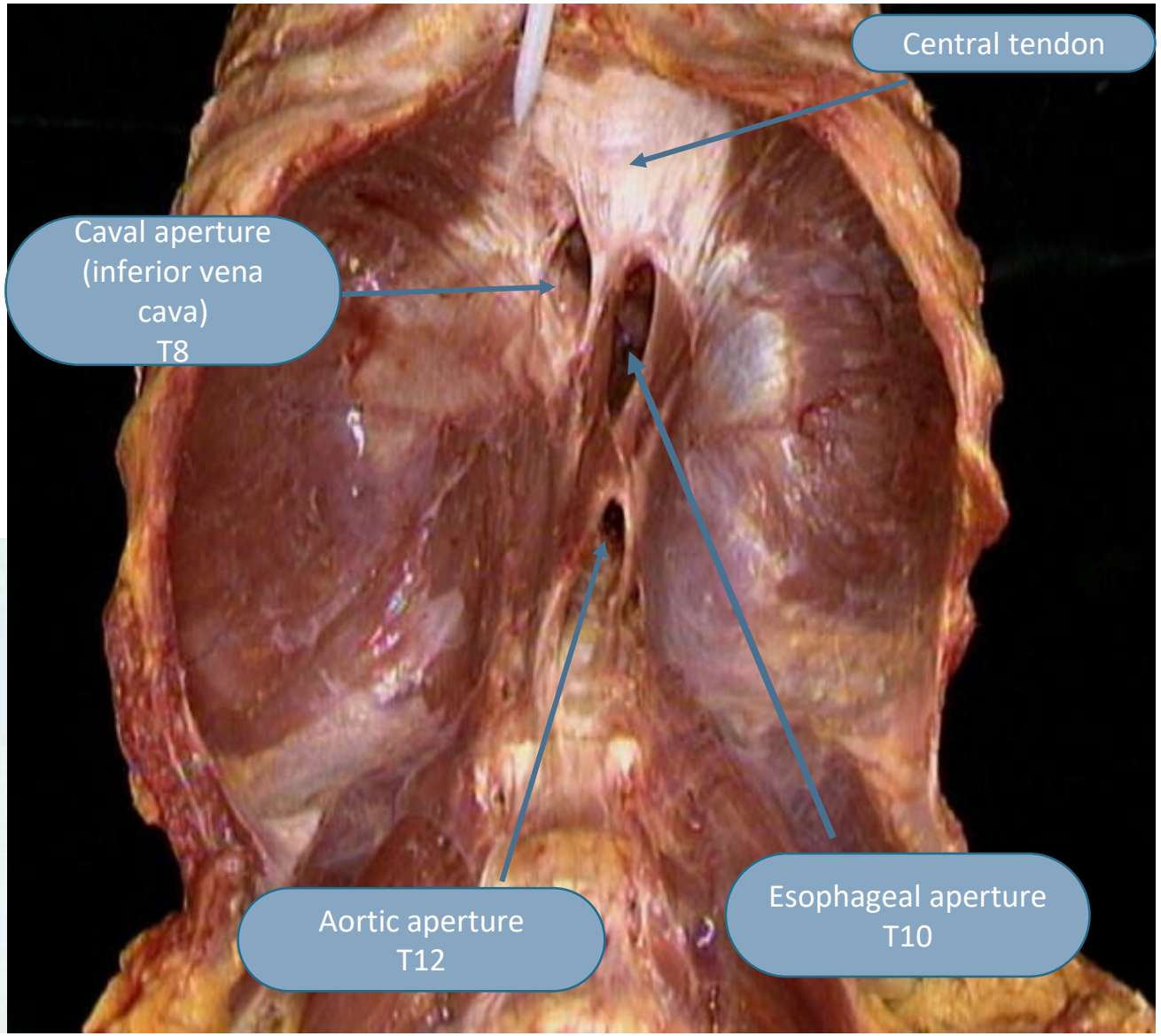
- You only need to be able to identify the muscles for the OSPE

DIAPHRAGM



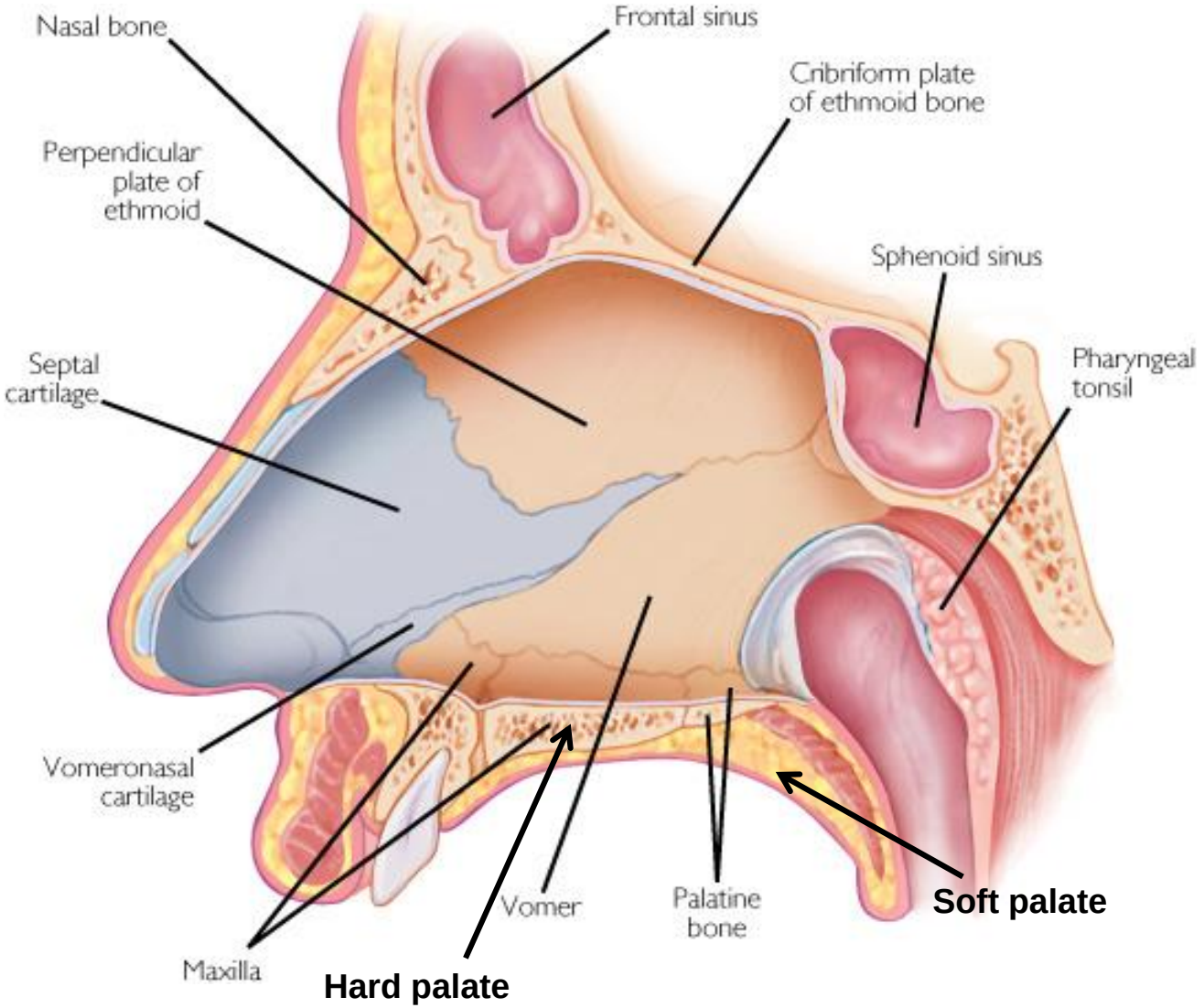


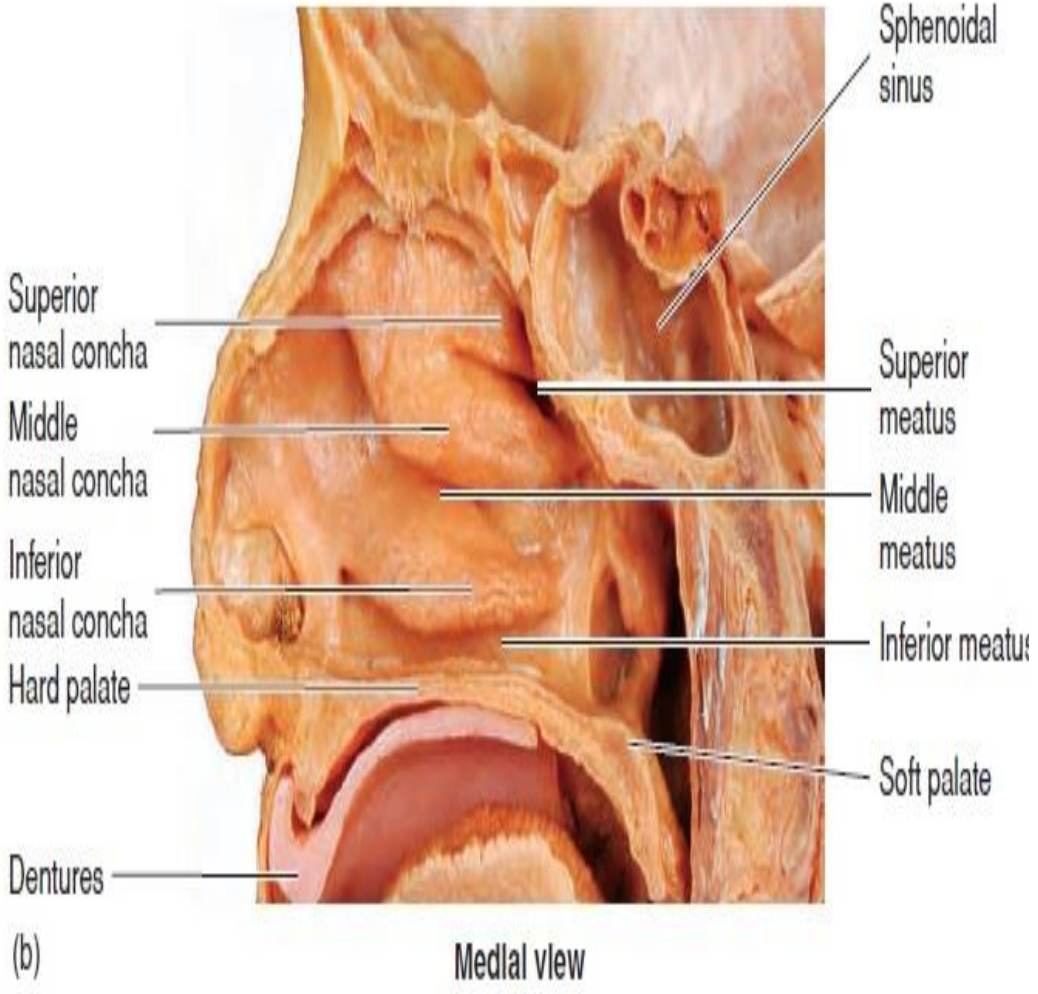
Diaphragm (superior aspect). The pleura and pericardium have been removed.



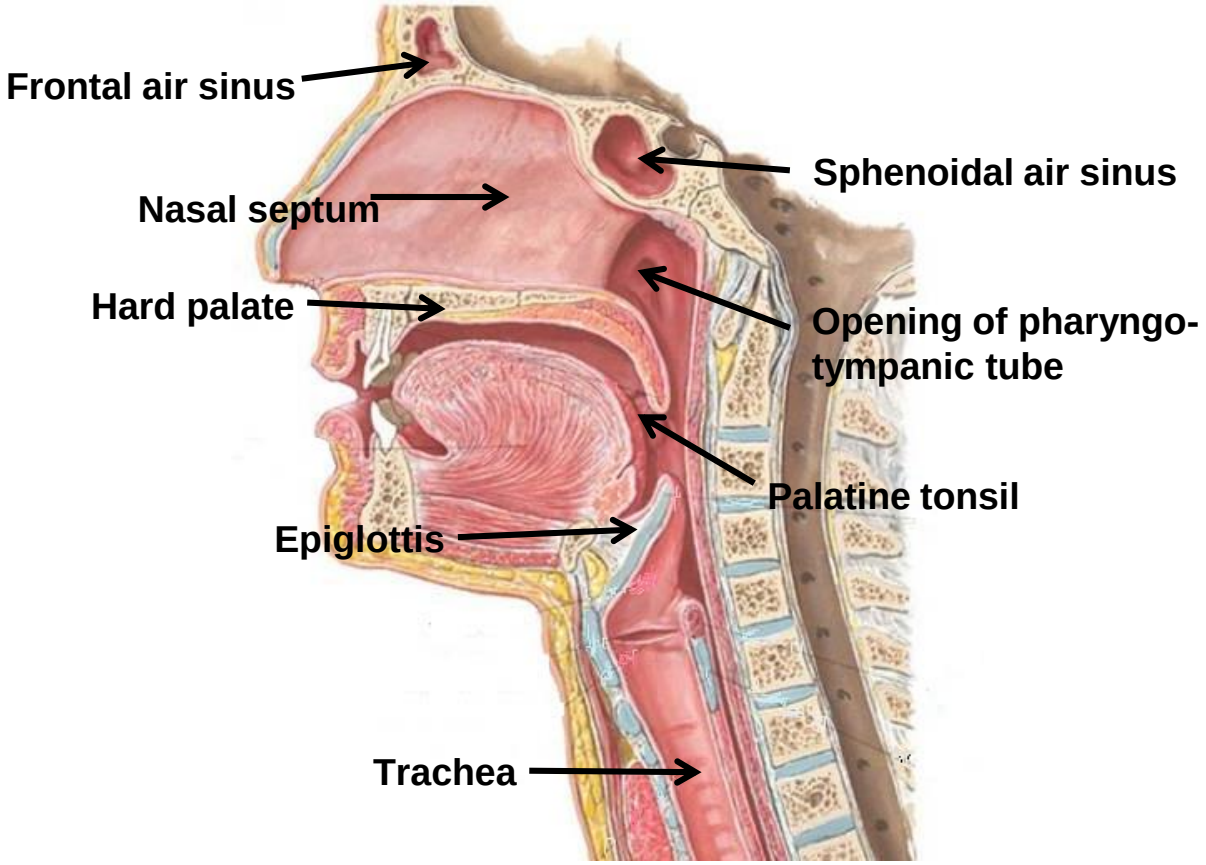
- We must know the structures passing through the diaphragm

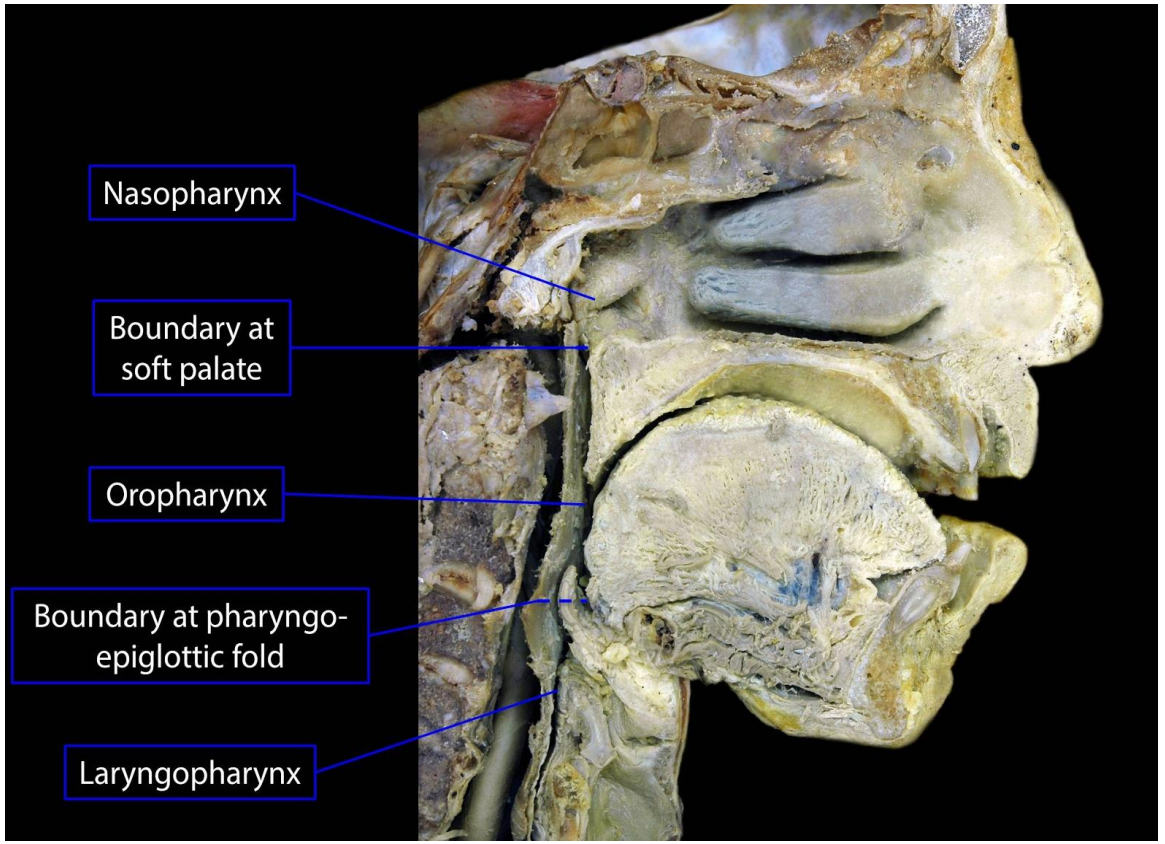
NASAL CAVITY





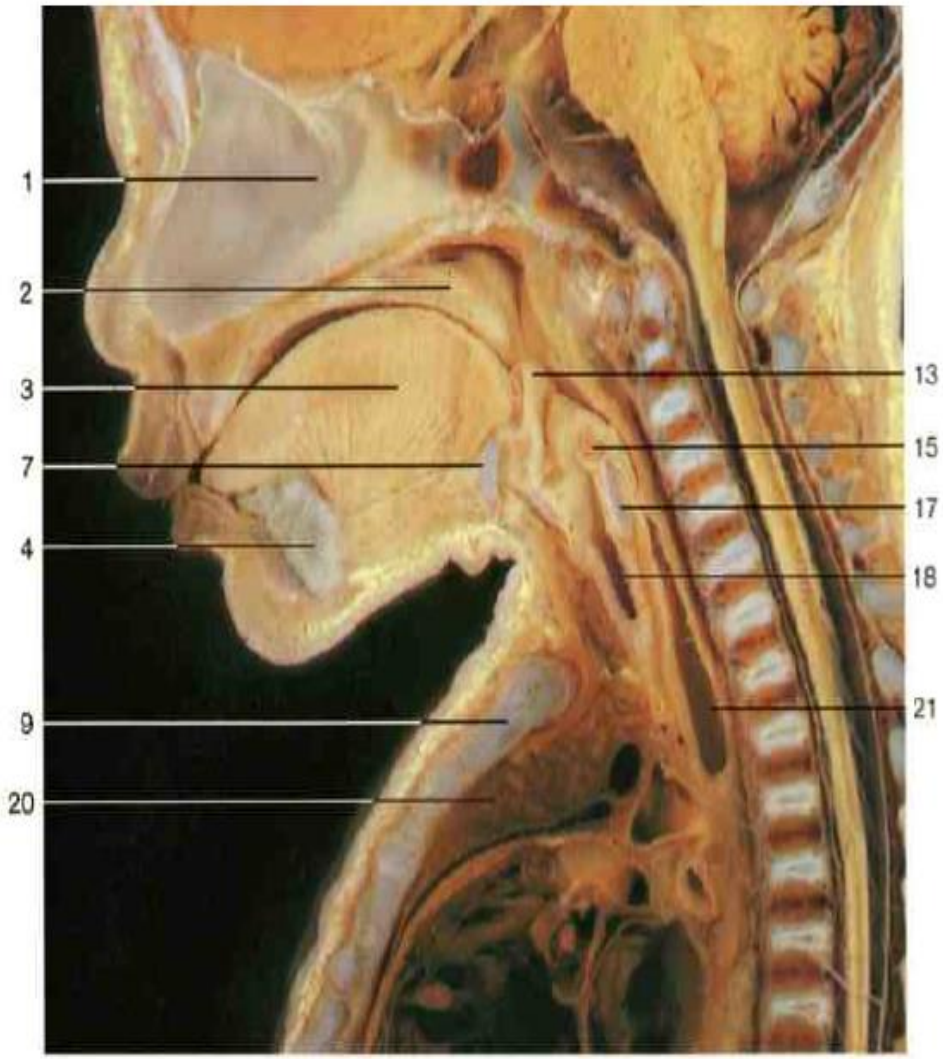
NASAL CAVITY, LARYNX, PHARYNX, TRACHEA



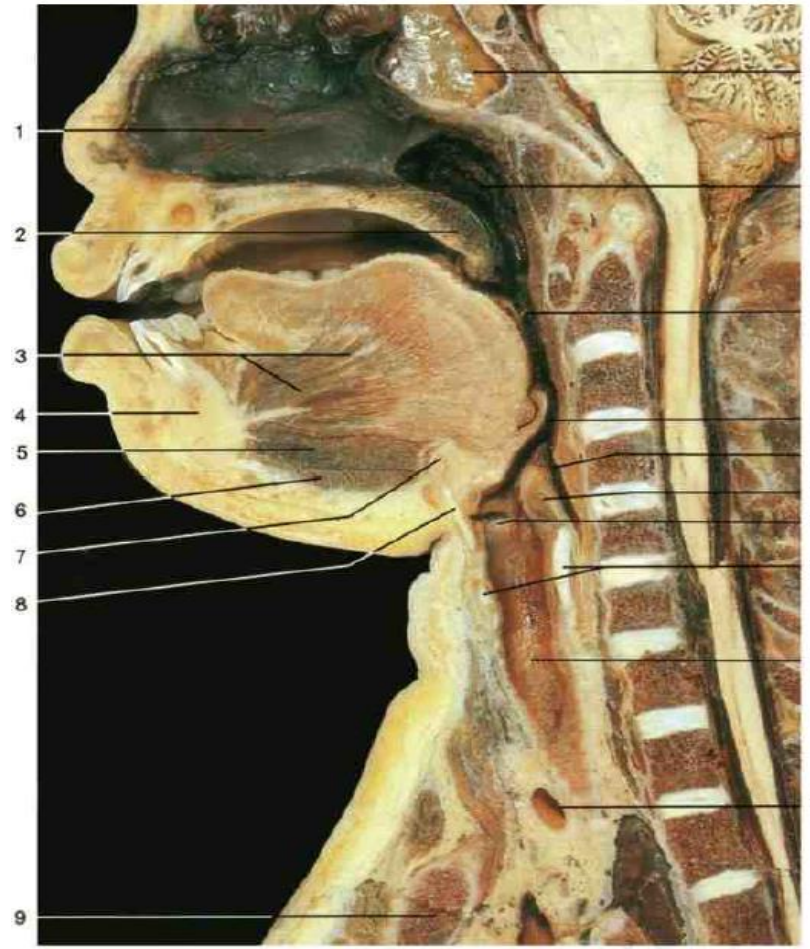


- N.B.: Site of drainage of the sinuses – important structures in the wall of pharynx- blood supply – lymphatic drainage

1 Nasal septum
2 Uvula
3 Genioglossus muscle
4 Mandible
5 Geniohyoid muscle
6 Mylohyoid muscle
7 Hyoid bone
8 Thyroid cartilage
9 Manubrium sterni
10 Sphenoidal sinus
11 Nasopharynx
12 Oropharynx
13 Epiglottis
14 Laryngopharynx
15 Arytenoid muscle
16 Vocal fold
17 Cricoid cartilage
18 Trachea
19 Left brachiocephalic vein
20 Thymus
21 Esophagus

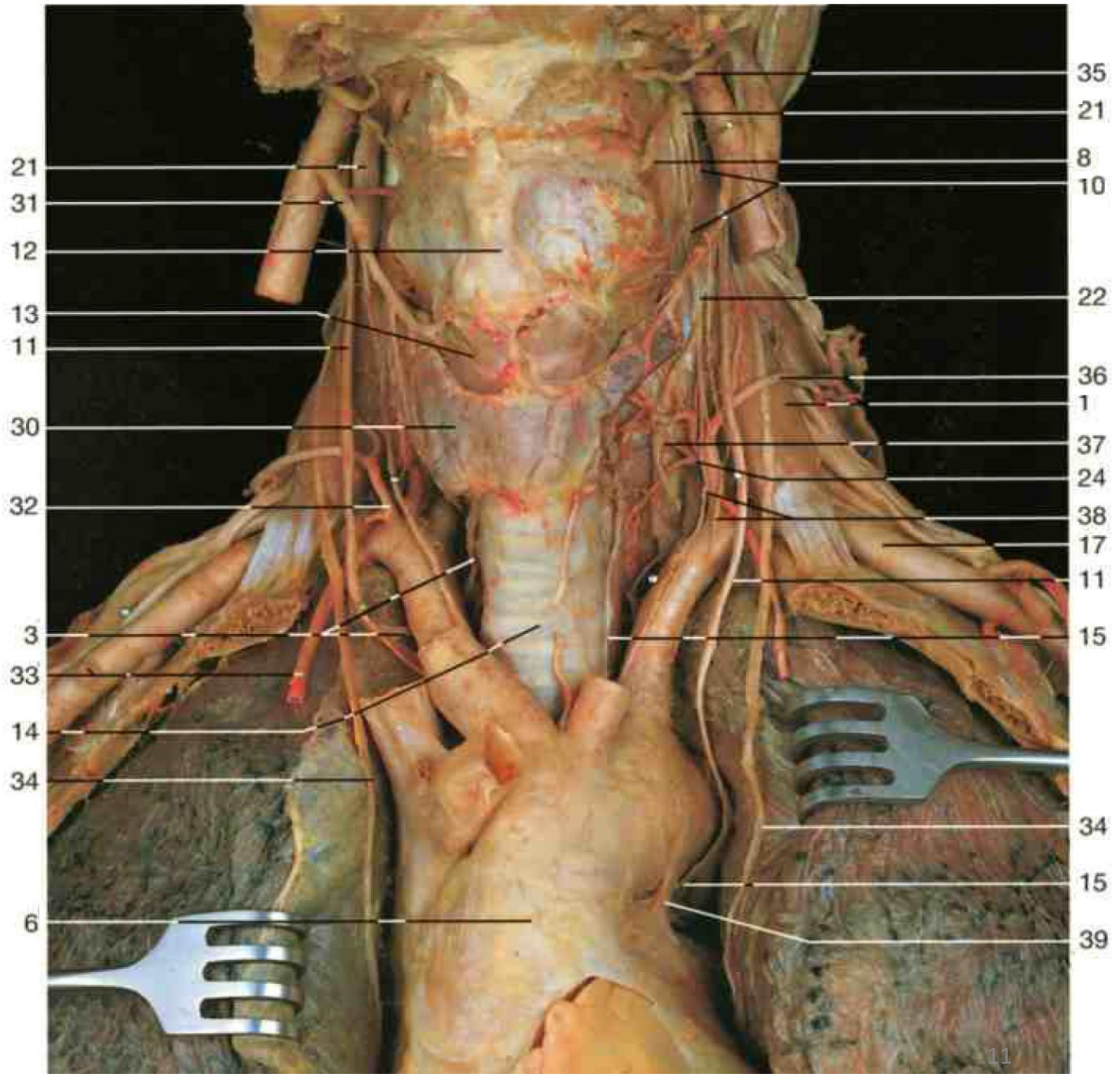


Median section through neonate head and neck. Note the high position of the larynx permitting the epiglottis to nearly reach the uvula (cf. with the figure above).



Median section through adult head and neck. Note the low position of the adult larynx when compared with that of the neonate (cf. with the figure below).

1 Scalenus anterior muscle
3. Right recurrent laryngeal nerve
6 Aortic arch
8 Internal branch of superior laryngeal nerve
10 External branch of superior laryngeal
nerve
11 Vagus nerve
12 Thyroid cartilage
13 Cricothyroid muscle
14 Trachea
15 Left recurrent laryngeal nerve
17 Left subclavian artery
22 Sympathetic trunk
24 Inferior thyroid artery
30 Thyroid gland
31 Superior thyroid artery
33 Internal thoracic artery
34 Phrenic nerve
35 Hypoglossal nerve
39 Ligamentum arteriosum



- Note the thyroid gland covering the cartilage

(he said he's going to use a picture without the gland)

LARYNX, TRACHEA

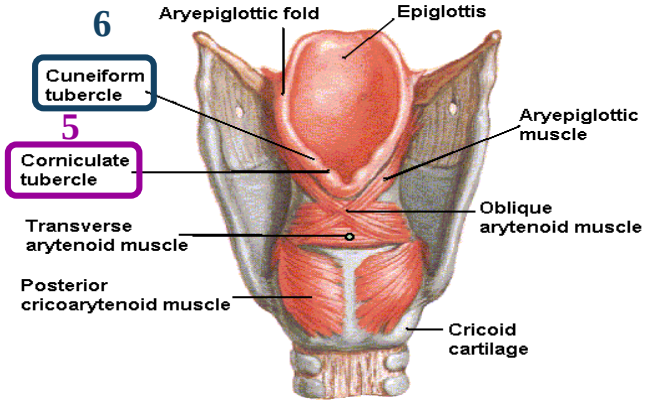
- The cartilaginous skeleton is composed of 9 cartilages:

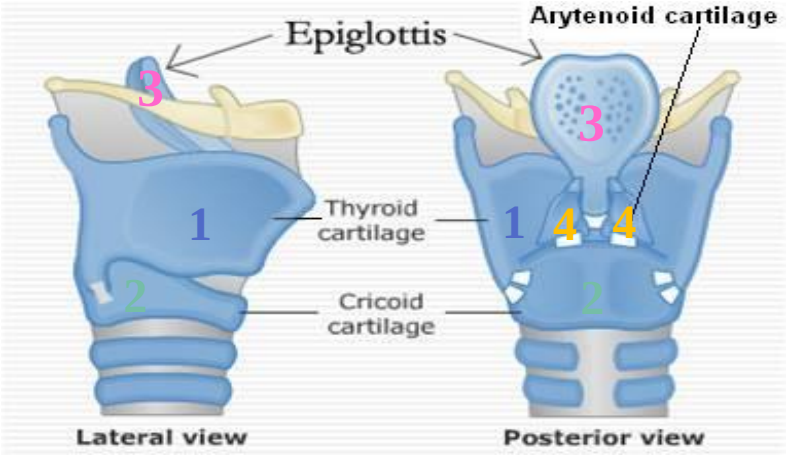
3 Single:

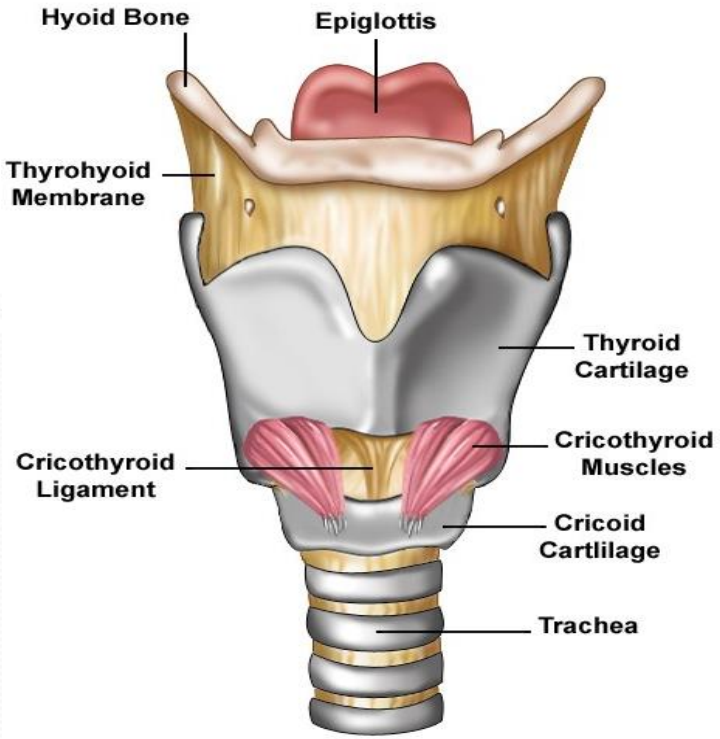
1. **Thyroid** 2. **Cricoid** 3. **Epiglottis**

3 Paired:

4. **Arytenoid** 5. **Corniculate** 6. **Cuneiform**







Structure	Beginning	Termination
Pharynx	Base of skull	C6 vertebra
Larynx	Laryngeal inlet	Lower border of cricoid (C6)
Trachea	Lower border of cricoid (C6)	Sternal Angle (T4)

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

- Identify the following labelled structures :

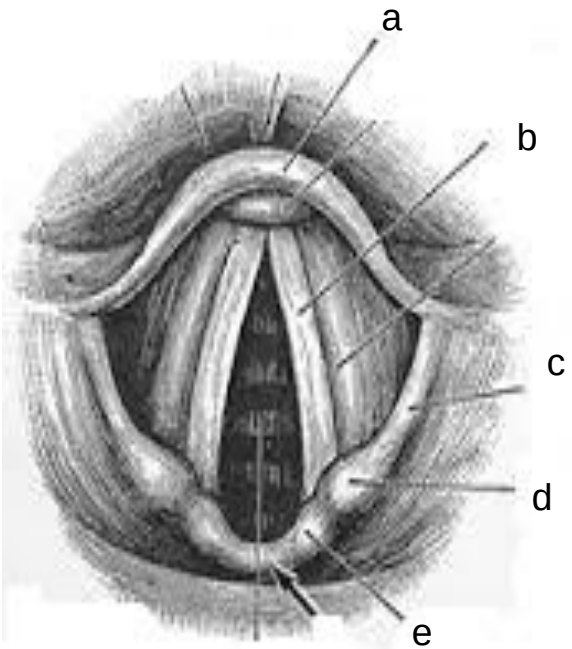
a ……

b……

c……

d……

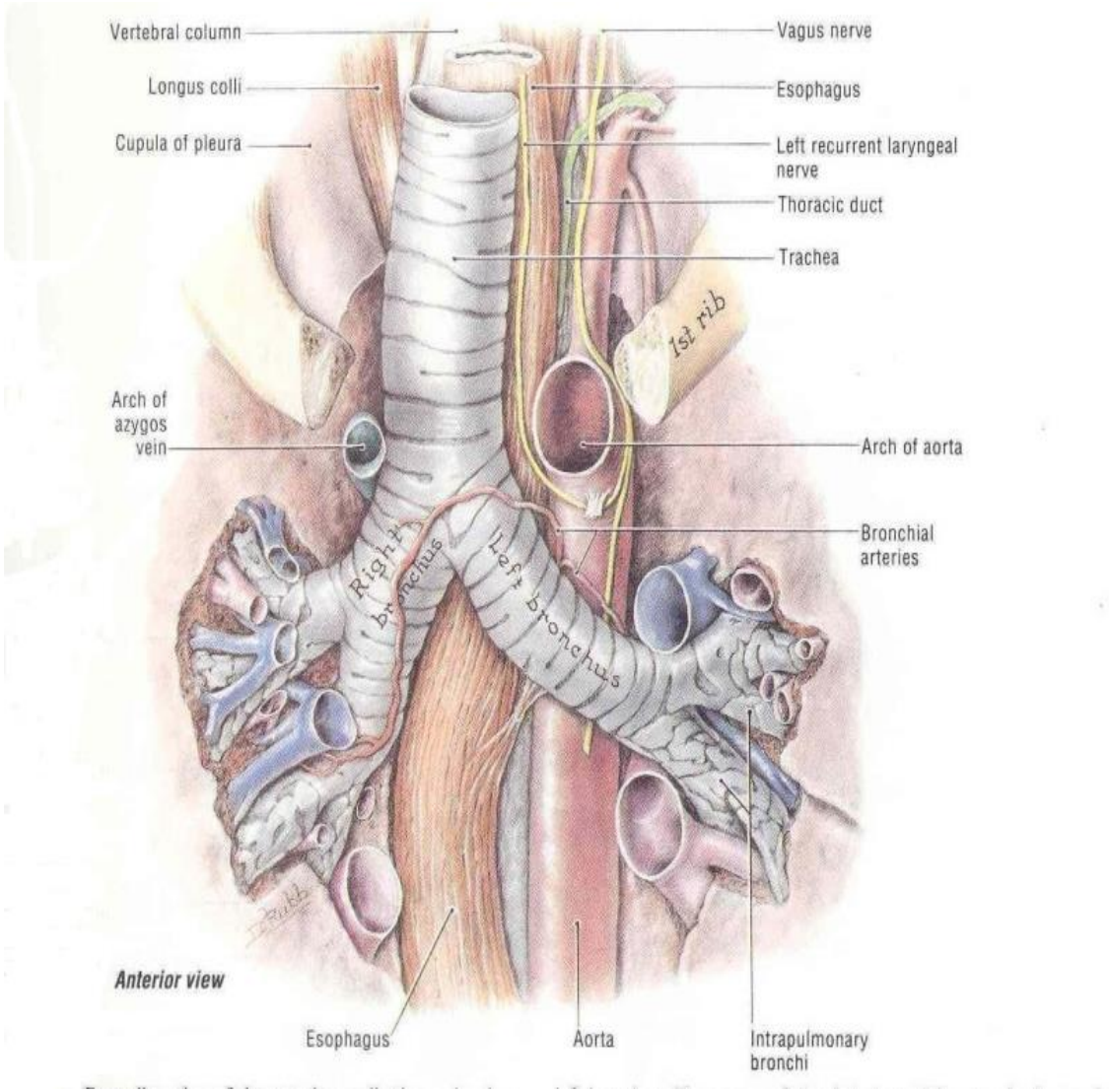
e……



- Answers :

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

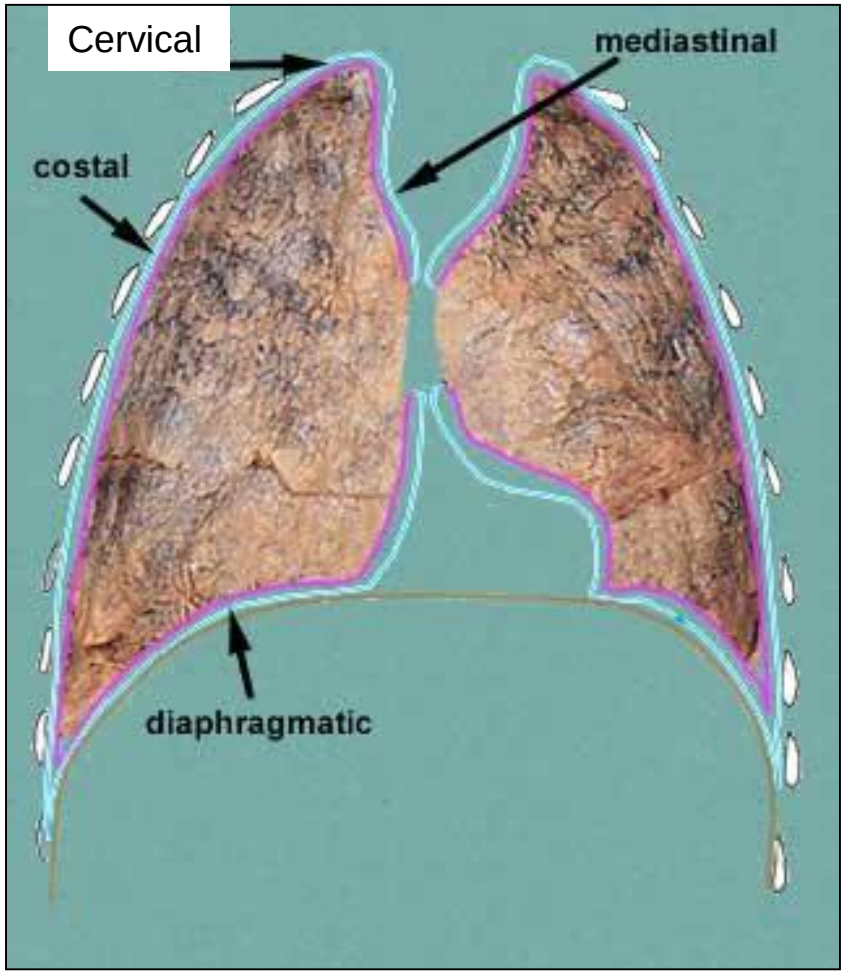
TRACHEA & BRONCHI



LUNG & PLEURA

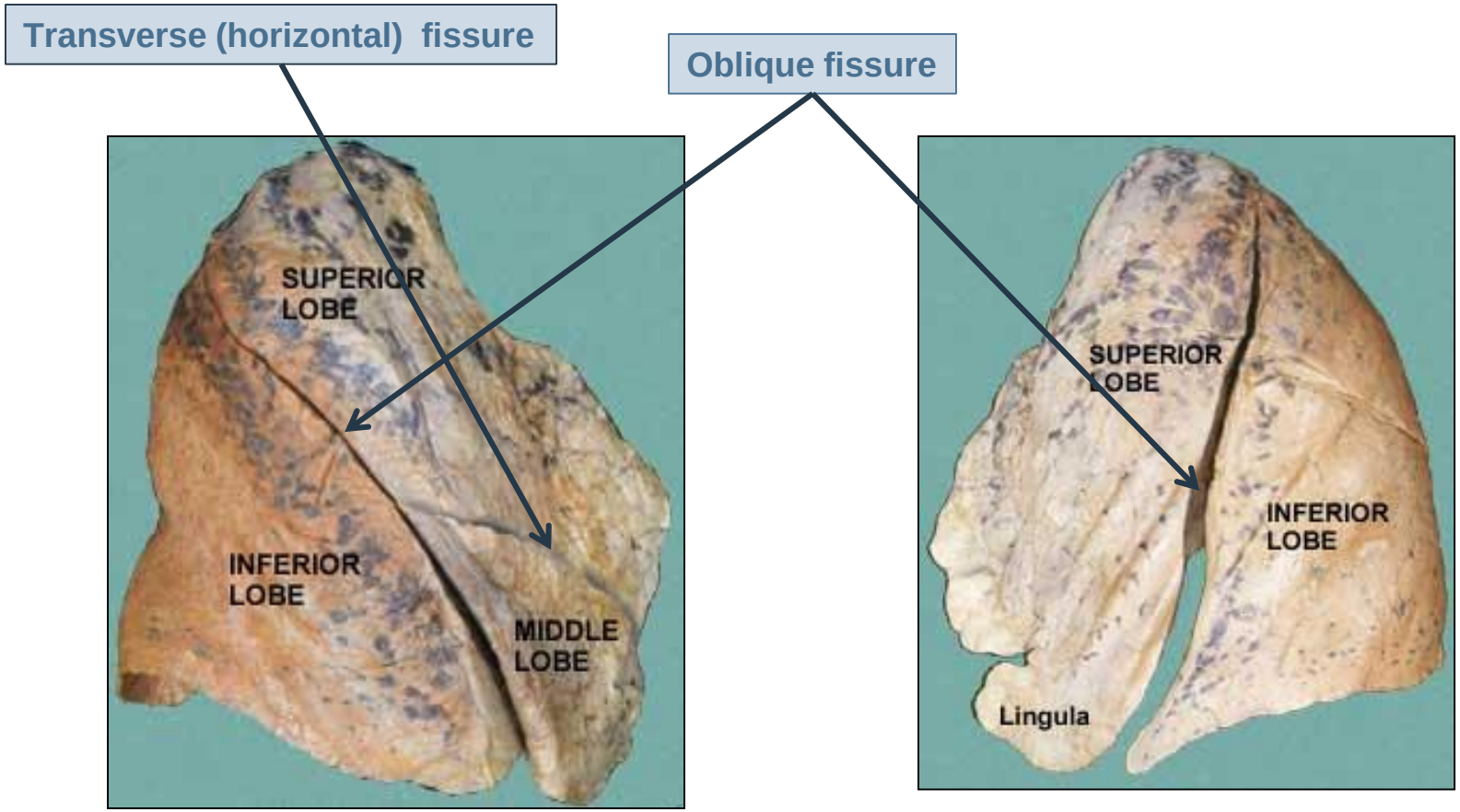
Nerve Supply			
Pleura	Visceral pleura		supplied by the **autonomic fibers** from the **pulmonary plexus.**
	Parietal pleura	Costal pleura	segmentally supplied by the **intercostal nerves.**
		Mediastinal pleura	**phrenic nerves**
		Diaphragmatic pleura	central part by **phrenic nerves**, around the periphery by **lowe**r **6 intercostal nerves**
Lungs			Pulmonary plexus at the root of lung….is formed of autonomic N.S. from sympathetic & parasympathetic fibers. 1- Sympathetic Fibers From: **sympathetic trunk** 2- Parasympathetic Fibers From: **Vagus nerve**

Nerve supply- Surface Anatomy

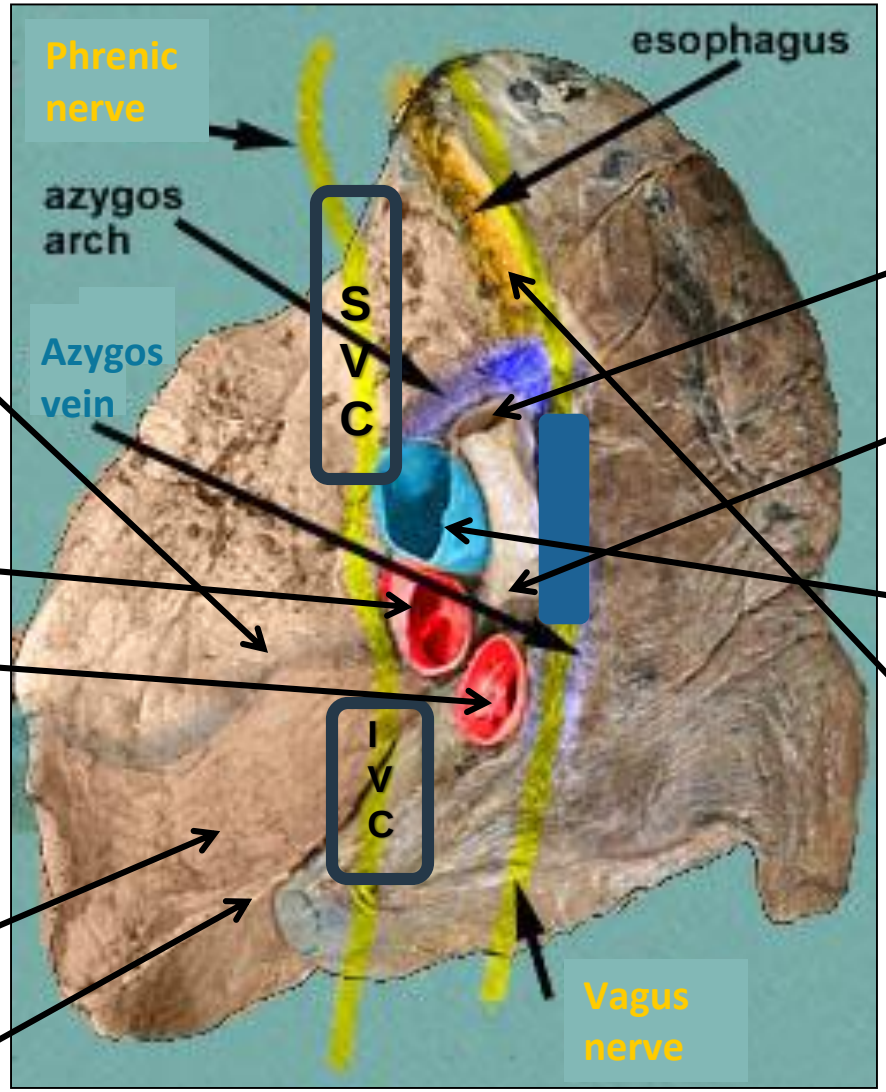


LUNG & PLEURA

Surface anatomy of fissures and cardiac notch



RIGHT LUNG



SVC = Superior Vena Cava
IVC = Inferior Vena Cava

Transverse fissure

Superior pulmonary vein

Inferior pulmonary vein

Cardiac impression

Oblique fissure

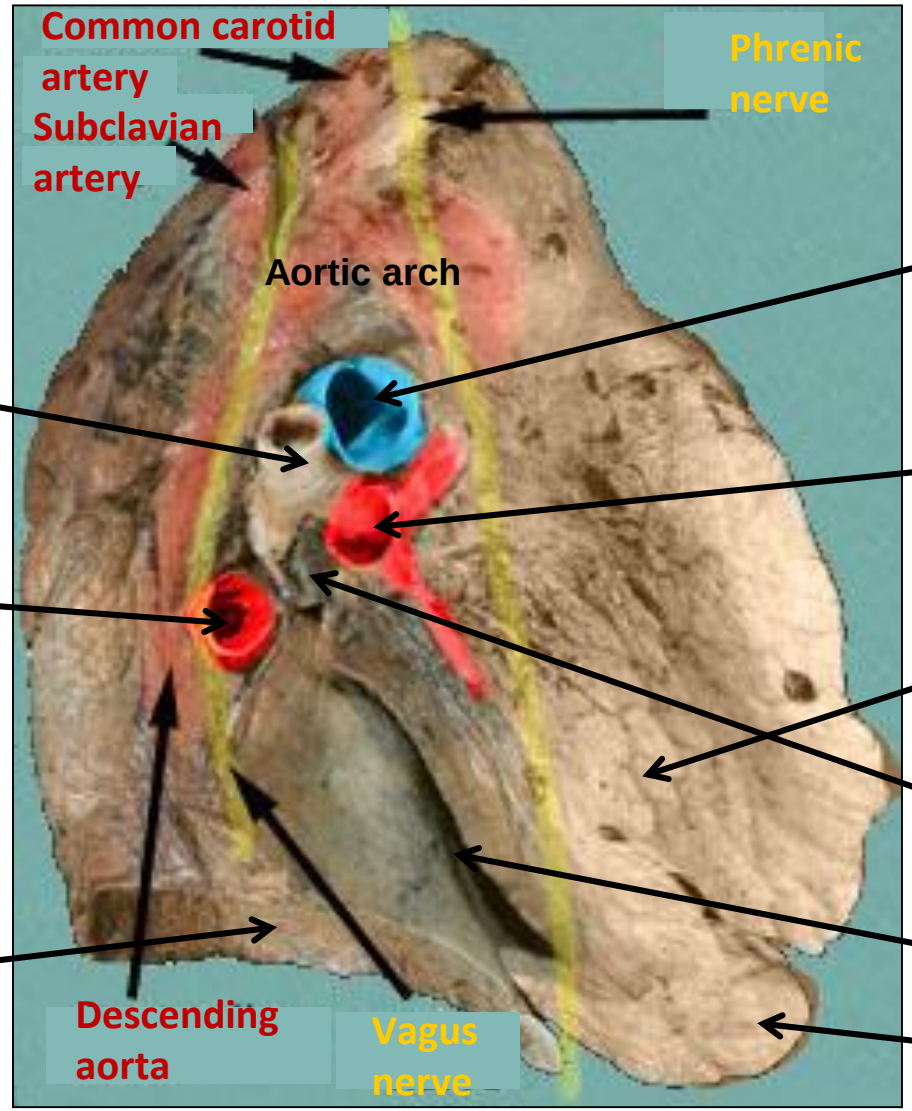
Superior lobar bronchus

Inferior lobar bronchus

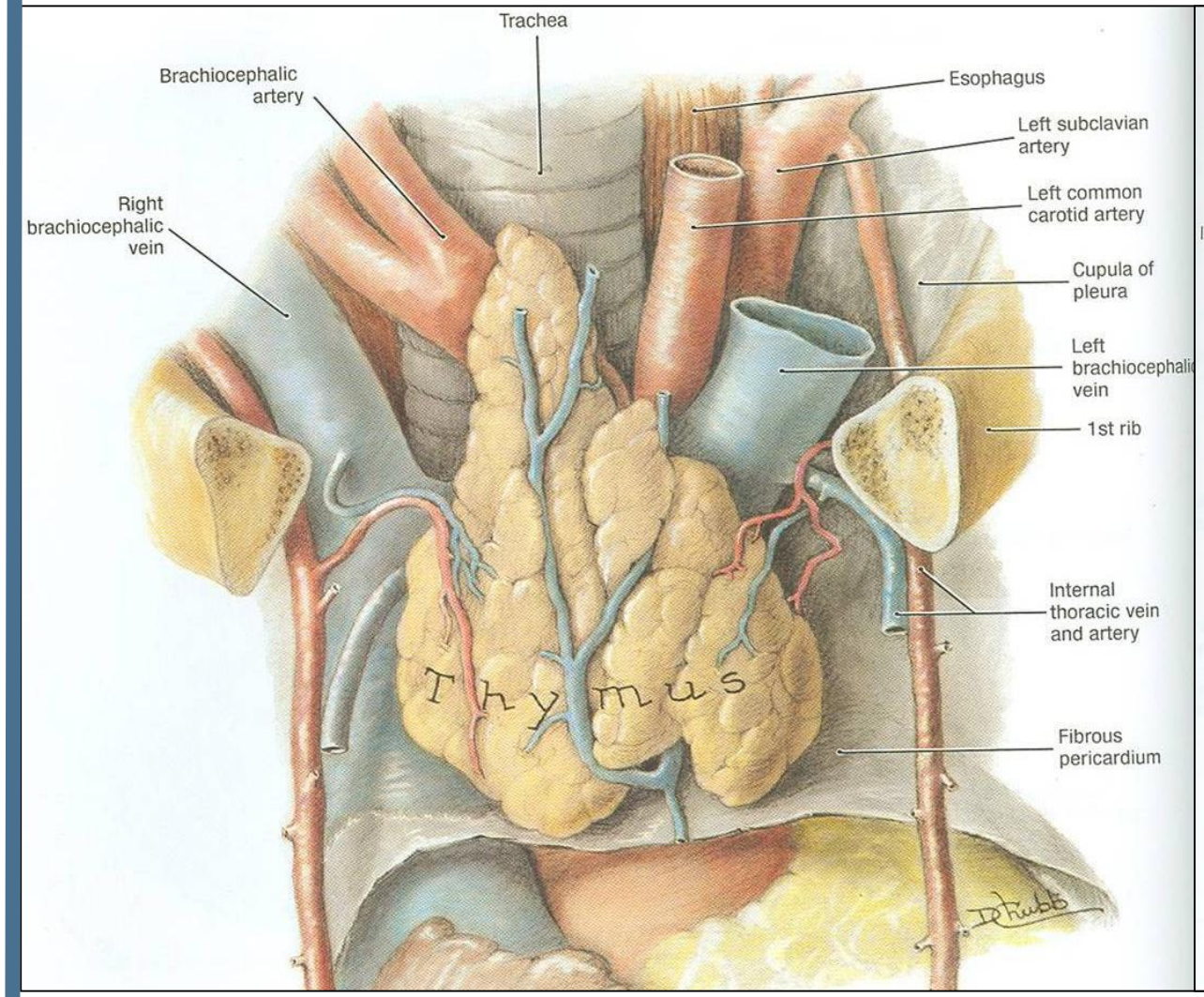
Pulmonary artery

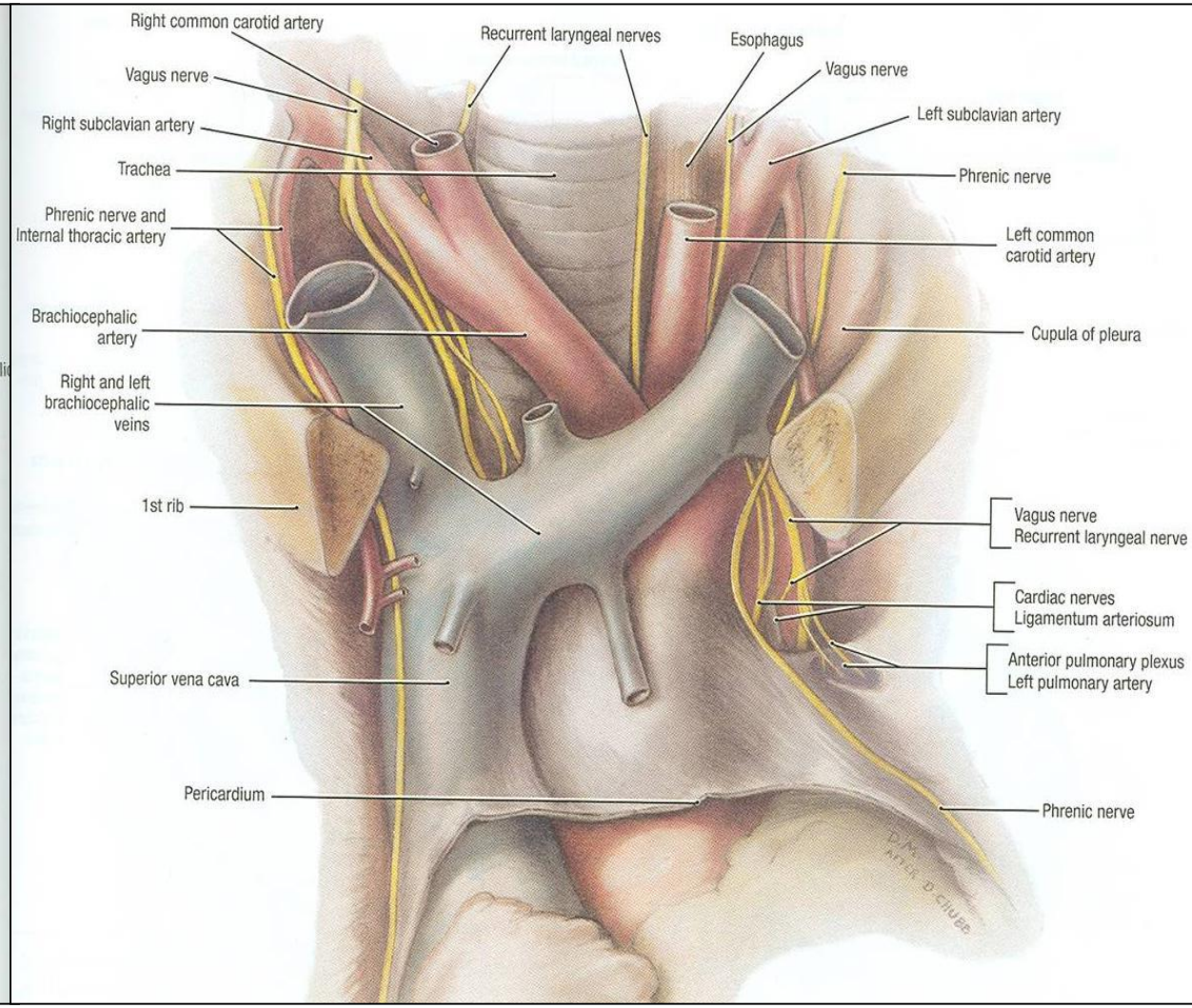
Esophagus

LEFT LUNG


Common carotid artery
Subclavian artery
Phrenic nerve
Aortic arch
Pulmonary artery
Bronchus
Superior pulmonary vein
Inferior pulmonary vein
Cardiac impression
Pulmonary ligament
Area related to diaphragm
Oblique fissure
Descending aorta
Vagus nerve
Lingula

MEDIASTINUM
Contents

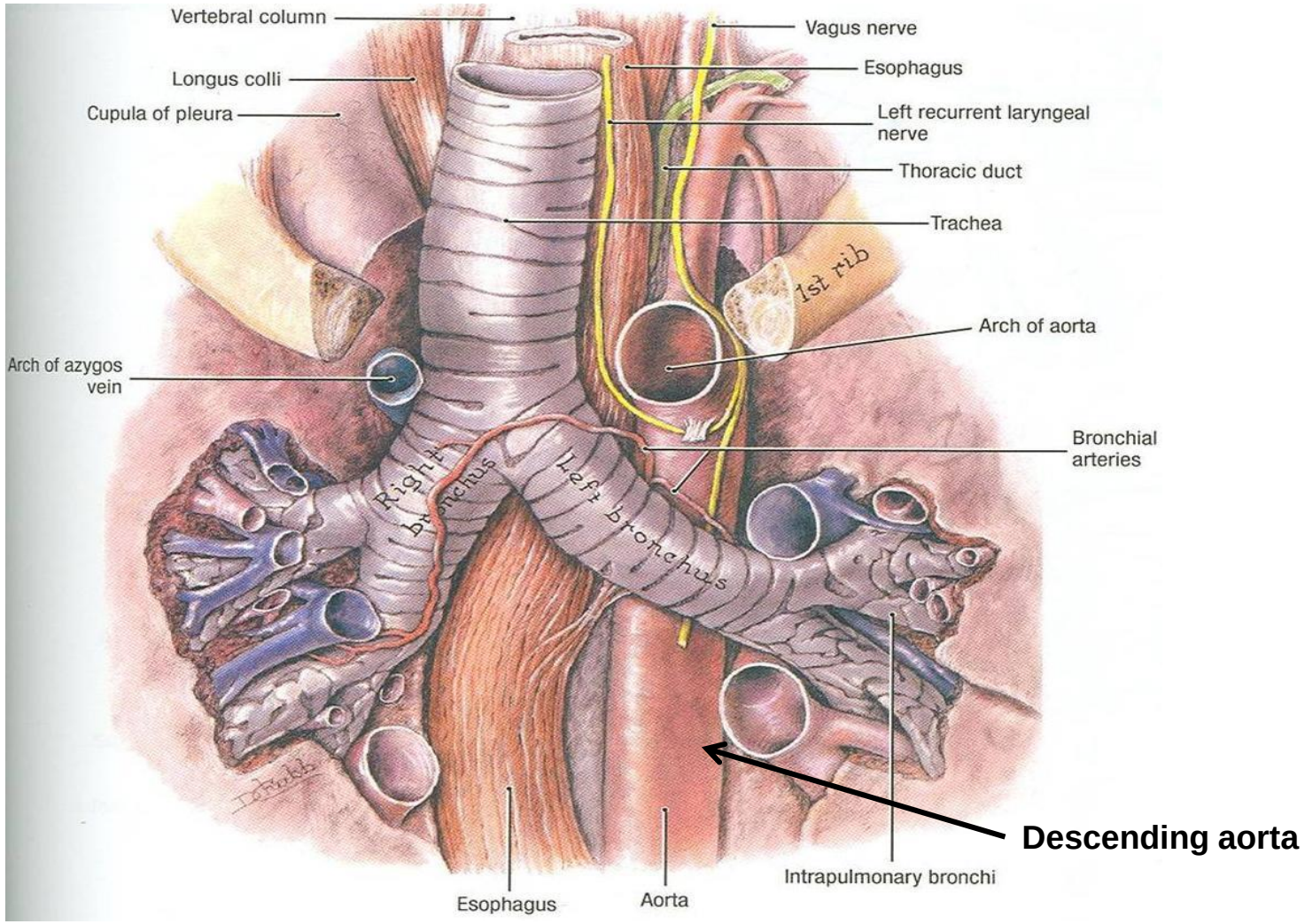




MEDIASTINUM
Contents

T4 is the level of:
Sternal angle
Second costal cartilage

1.Bifurcation of trachea
2. Bifurcation of pulmonary trunk
3. Beginning & termination of arch of aorta



- **N.B:. LEVEL OF T4**

Superior-Posterior Mediastinum

1 .Right vagus nerve

2. Thyroid gland & Trachea

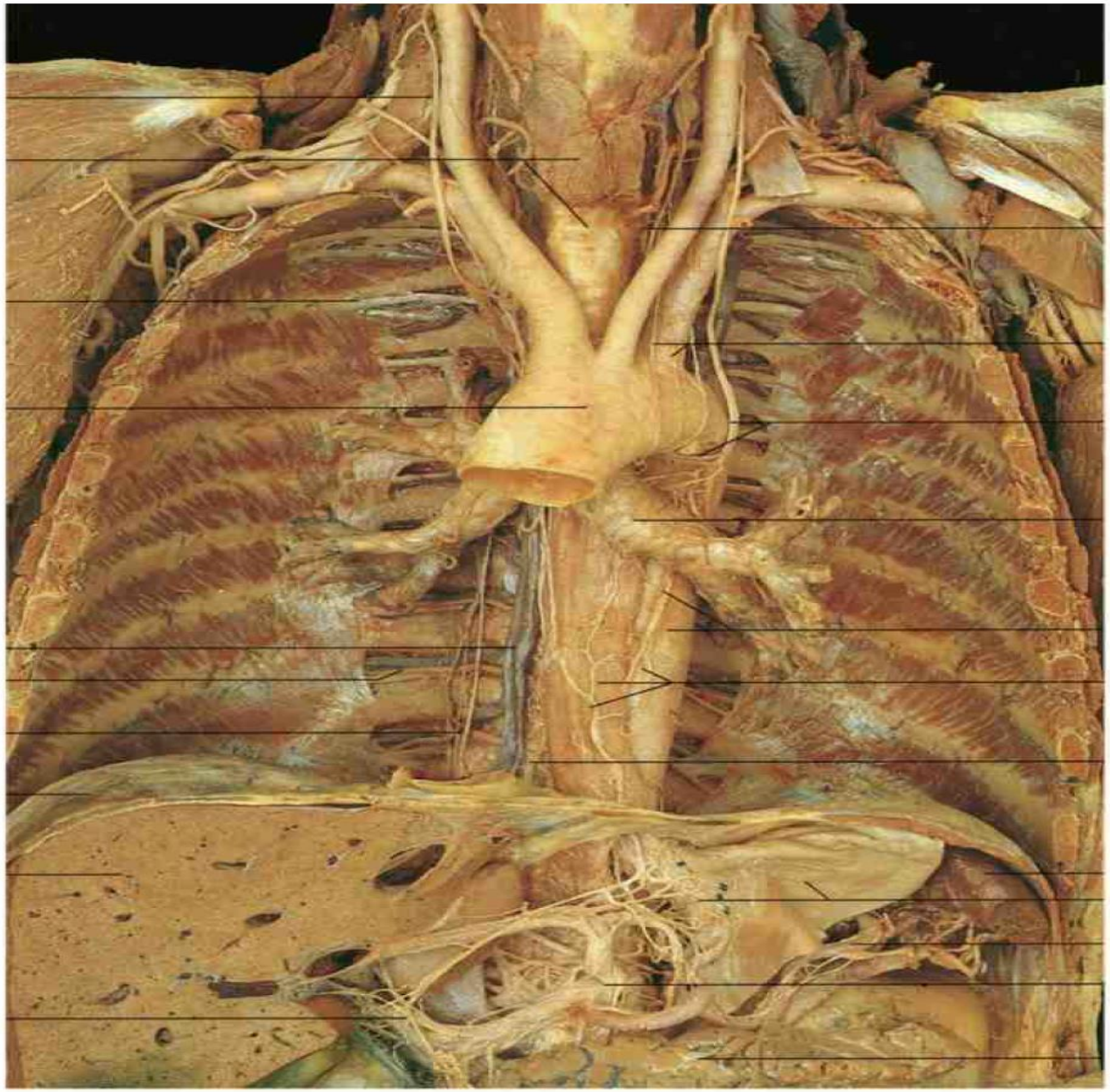
3. Intercostal nerve

4. Aortic arch

5.Azygos vein

8. Diaphragm

9. Liver



11. Left recurrent laryngeal nerve

13. Left vagus & left recurrent laryngeal nerve

14. Left primary bronchus

15. Thoracic aorta

16. Esophagus & esophageal plexuses

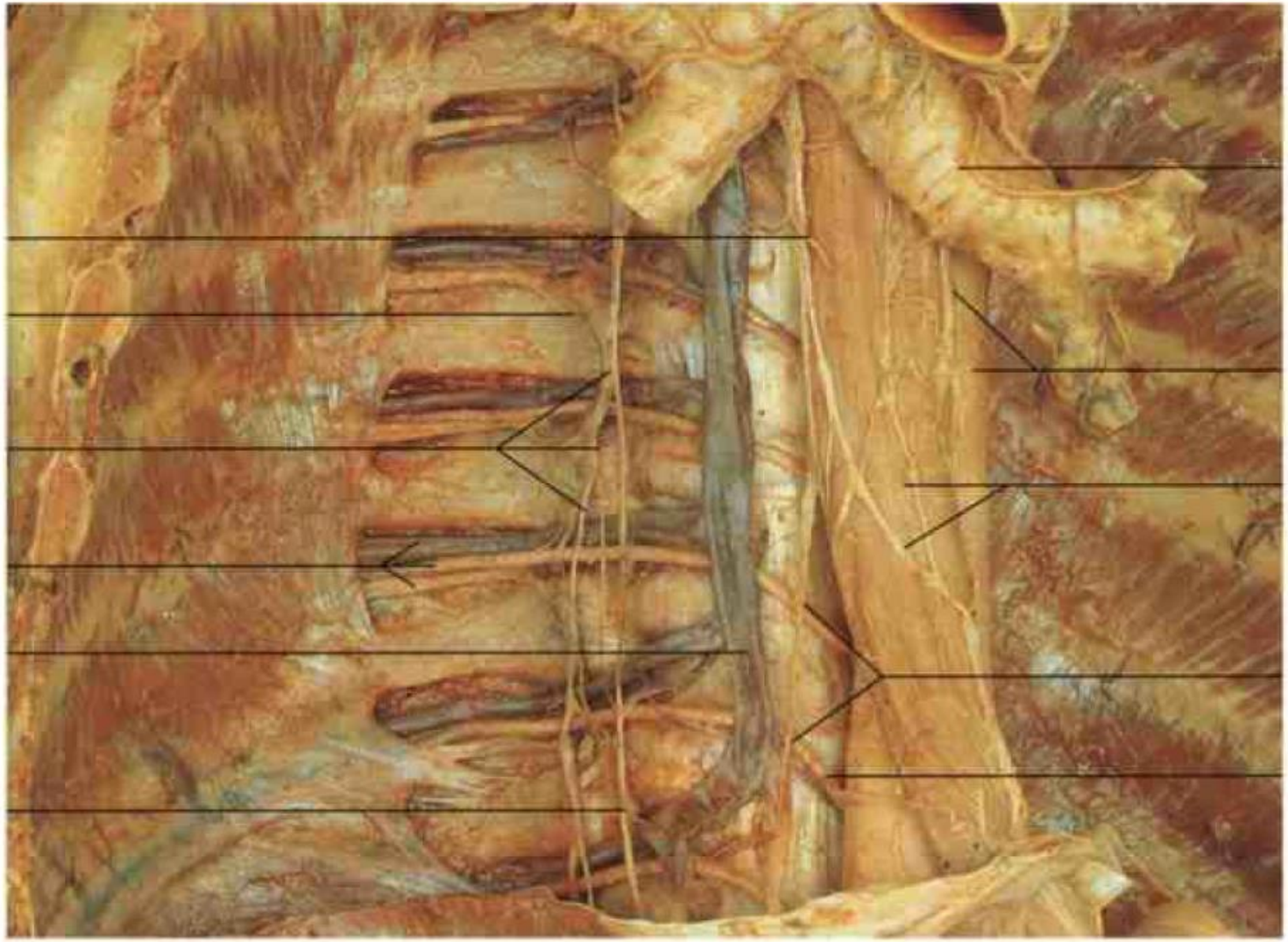
17. Thoracic duct

18. Spleen

19. Anterior gastric plexus of stomach

Organs of posterior mediastinum (anterior aspect).

Inferior-Posterior Mediastinum



1 .Right vagus nerve

23. Ramus communicans

24. Sympathetic trunk & ganglia

25. Posterior intercostal artery

25. Posterior intercostal vein

5.Azygos vein

14. Left primary bronchus

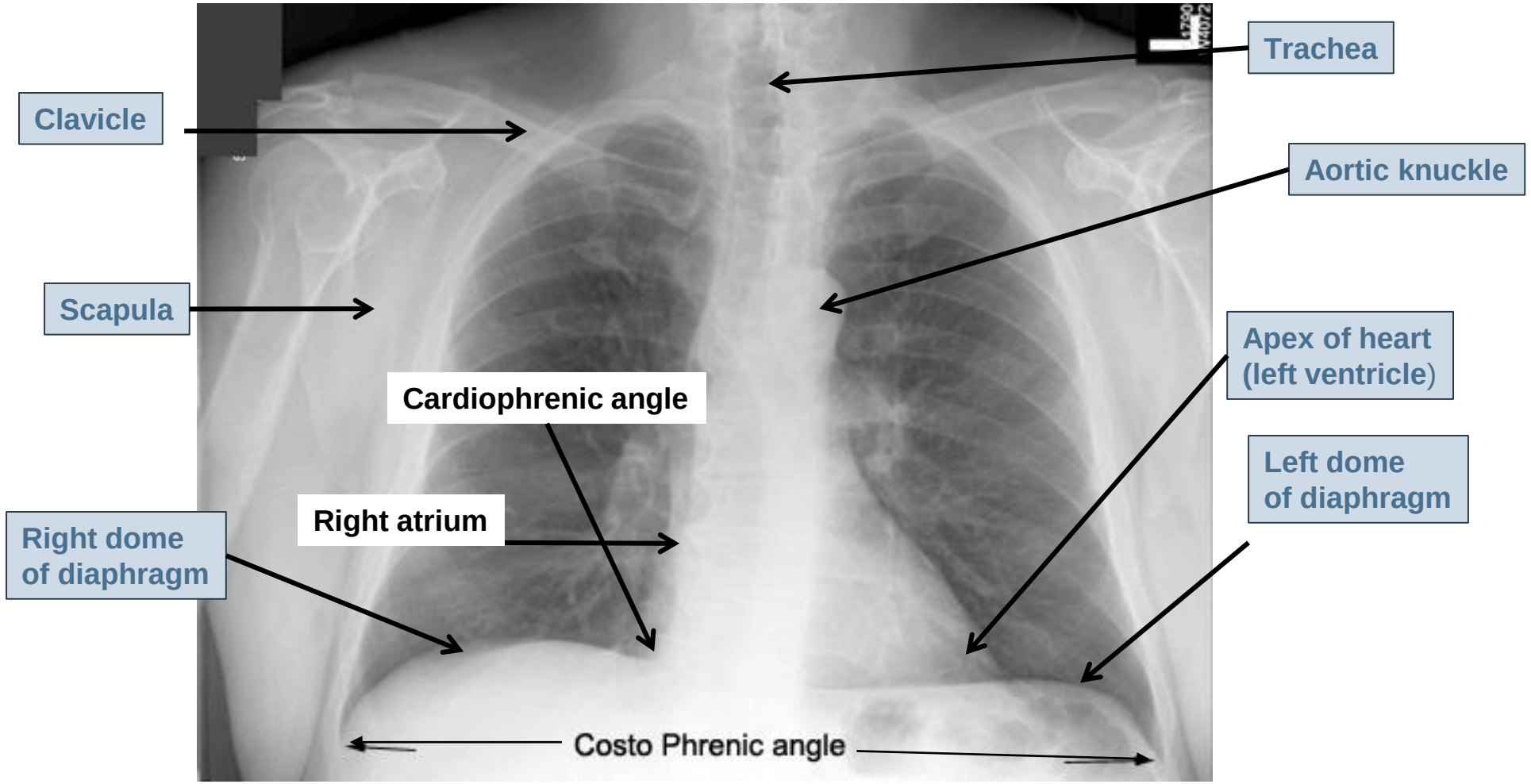
15. Left vagus nerve

15. Thoracic aorta

16. Esophagus & esophageal plexuses

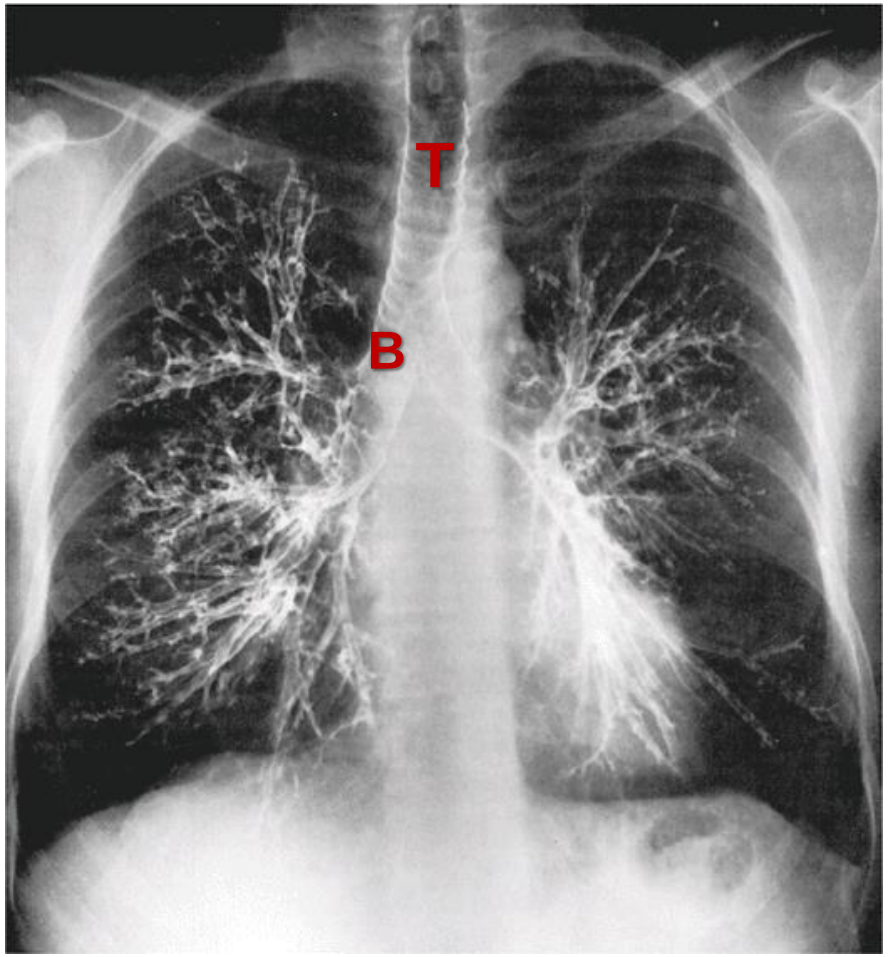
Inferior segment of posterior mediastinum (anterior aspect).

RADIOLOGY


Trachea
Clavicle
Aortic knuckle
Scapula
Apex of heart
(left ventricle)
Cardiophrenic angle
Left dome
of diaphragm
Right atrium
Right dome
of diaphragm
Costo Phrenic angle

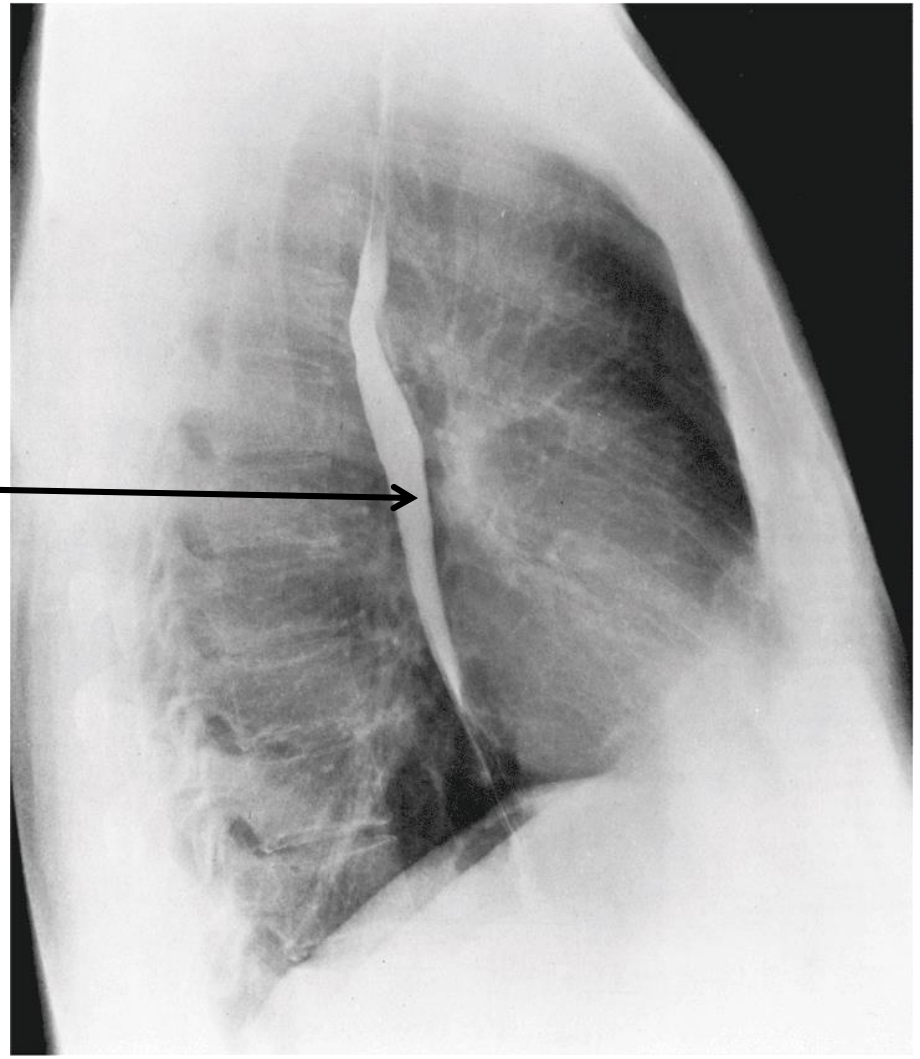
RADIOLOGY

T: Trachea
B: Bronchus (primary)



RADIOLOGY

Barium swallow



SAQ

Intercostals & Abdominal Muscles

Intercostal Muscles

External Intercostal Muscle
Nerve supply: intercostal nerves
Action: rib elevators (inspiratory)

Internal Intercostal Muscle
Nerve supply: intercostal nerves
Action: rib depressors

Innermost Intercostal Muscle
Nerve supply: intercostal nerves
Action: rib depressors

Anterior Abdominal Wall Muscles

Transversus Abdominis
External oblique muscle
Internal oblique muscle

Nerve supply:
lower intercostal nerves (T7 – T11), subcostal nerve (T12), and first lumbar nerve.

Action:
Compression of abdominal viscera to help in ascent of diaphragm (during forced expiration)

Diaphragm

Nerve supply:

Phrenic nerve (C3,4,5),

Action:

contraction (descent) of diaphragm increase vertical diameter of thoracic cavity essential for normal breathing.

Origin:

1) Costal: lower 6 costal cartilages
2) Vertebral: upper 3 lumbar vertebrae
 (right & left crus + arcuate ligaments)
3) Sternal: xiphoid process of sternum

Insertion:

Central Tendon (lies at the level of xiphisternal joint , at 9th thoracic vertebra)

Major openings of diaphragm

The thoracic spinal levels at which the three major structures pass through the diaphragm can be remembered by the number of letters contained in each structure:

- Vena Cava (8 letters) – Passes through the diaphragm at T8.
- Esophagus (10 letters) – Passes through the diaphragm at T10.
- Aortic Hiatus (12 letters) – "Passes" through the diaphragm at T12

Mnemonic of major openings of diaphragm: **I ate (8) 10 Eggs At 12.**
(I 8= inferior vena cava pierce at T8,
10 Eggs= Esophagus pierces at T10 ,
At 12 = Aorta pierces at T12)

NASAL CAVITY, LARYNX, PHARYNX, TRACHEA

Pharynx	*Arterial supply*	from branches of the following arteries: 1- Ascending pharyngeal 2- Ascending palatine 3- Facial 4- Maxillary 5- Lingual
	Veins	drain into pharyngeal venous plexus, which drains into the internal jugular vein
	Lymphatics	drain into the deep cervical lymph nodes either directly, or indirectly via the retropharyngeal or paratracheal lymph nodes

Larynx: Nerve Supply		
Sensory	*Above the vocal cords:*	- **Internal laryngeal nerve** - branch of the **superior laryngeal** of the **vagus nerve**.
	Below the vocal cords:	**Recurrent laryngeal nerve** of the **vagus nerve**
Motor	All intrinsic muscles supplied by the **recurrent laryngeal nerve** except the cricothyroid The cricothyroid is supplied by the **external laryngeal nerve** of **superior laryngeal of vagus.**	

NASAL CAVITY, LARYNX, PHARYNX, TRACHEA

Pharynx	Structures in the lateral wall
Nasopharynx	Opening of auditory tube Tubal elevation Pharyngeal recess Salpingopharyngeal fold Pharyngeal Tonsil Tubal Tonsil
Oropharynx	Palatopharyngeal fold Palatoglossal fold Palatine Tonsil
Laryngopharynx	Piriform Fossa

Site of Drainage	Sinus
Spheno-ethmoidal recess	sphenoidal sinus
Superior meatus	posterior ethmoidal sinus
Middle meatus	middle ethmoidal, anterior ethmoidal , maxillary, and frontal sinuses
Inferior meatus	nasolacrimal duct.

LARYNX, TRACHEA

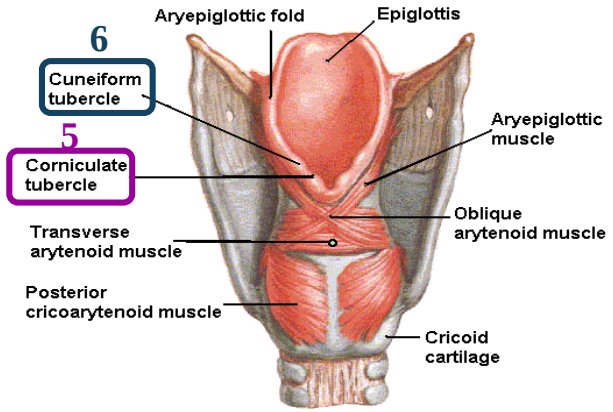
○ The cartilaginous skeleton is composed of 9 cartilages:

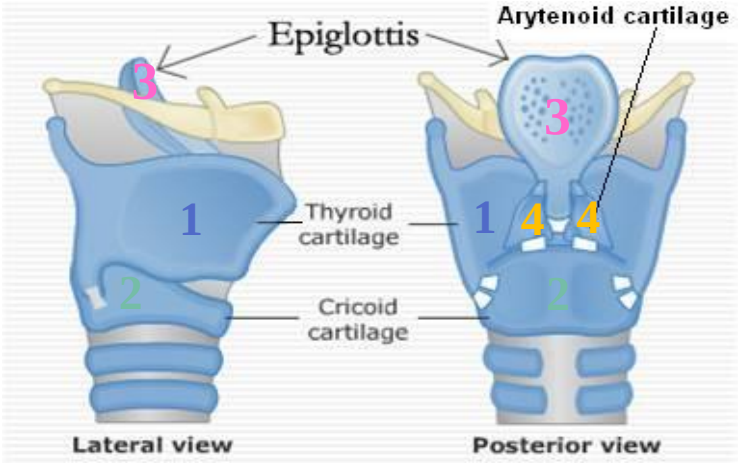
3 Single:

1. **Thyroid** 2. **Cricoid** 3. **Epiglottis**

3 Paired:

4. **Arytenoid** 5. **Corniculate** 6. **Cuneiform**





Structure	Beginning	Termination
Pharynx	Base of skull	C6 vertebra
Larynx	Laryngeal inlet	Lower border of cricoid (C6)
Trachea	Lower border of cricoid (C6)	Sternal Angle (T4)

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

LUNG & PLEURA

Nerve Supply			
Pleura	Visceral pleura		supplied by the **autonomic fibers** from the **pulmonary plexus.**
	Parietal pleura	Costal pleura	segmentally supplied by the **intercostal nerves.**
		Mediastinal pleura	**phrenic nerves**
		Diaphragmatic pleura	central part by **phrenic nerves**, around the periphery by **lower 6 intercostal nerves**
Lungs			Pulmonary plexus at the root of lung….is formed of autonomic N.S. from sympathetic & parasympathetic fibers. 1- Sympathetic Fibers From: **sympathetic trunk** 2- Parasympathetic Fibers From: **Vagus nerve**

Surface Anatomy

٤٣٥ SAQ

Describe the SUFACE ANATOMY OF PLEURA??

- **Apex:** lies one inch above the medial 1/3 of the clavicle.
- **Right pleura: The anterior margin** extends vertically from **sterno-clavicular joint** to **6th costal cartilage.**
- **Left pleura: The anterior margin** extends from **sternoclavicular joint** to the **4th costal cartilage**, then deviates for about 1 inch to left at **6th costal cartilage** to form **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 (T12 spine).**
- **Posterior margin : along the vertebral column** from the **apex** to the **inferior margin (T12 spine).**

Describe the SUFACE ANATOMY OF lung fissures??

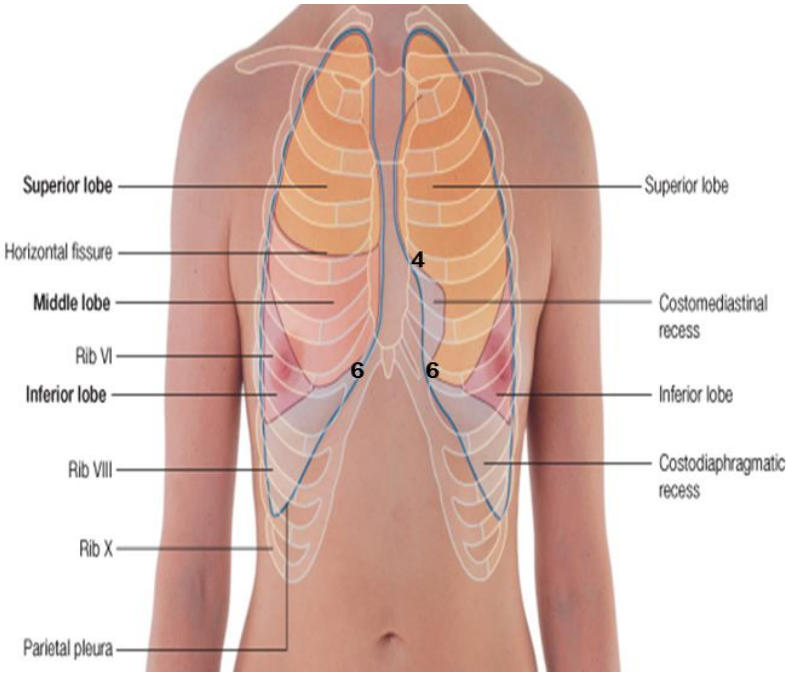
- **Oblique fissure:** Represented by a line extending from 3rd thoracic spine, obliquely ending at 6th costal cartilage.
- **Transverse fissure: Only in the right lung:** represented by a line extending from 4th right costal cartilage to meet the oblique fissure.

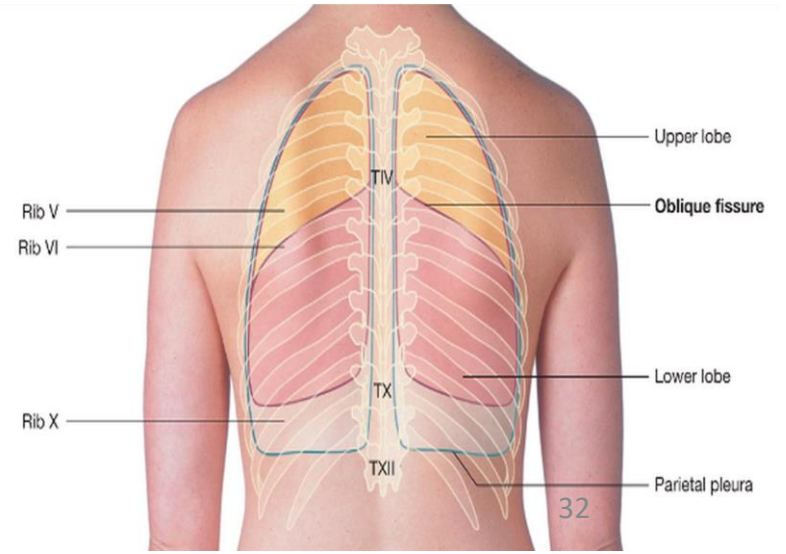
Describe the SUFACE ANATOMY OF cardiac notch??

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

Describe the SUFACE ANATOMY OF the lung??

- **Apex, anterior border and posterior border:** correspond nearly to the lines of pleura but are slightly away from the median plane.
- **Inferior margin :** as the pleura but more horizontally and finally reaching to the 10th thoracic spine.





MED437
KING SAUD UNIVERSITY

ANATOMY
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GOOD LUCK!

SPECIAL THANKS FOR TEAM 436.