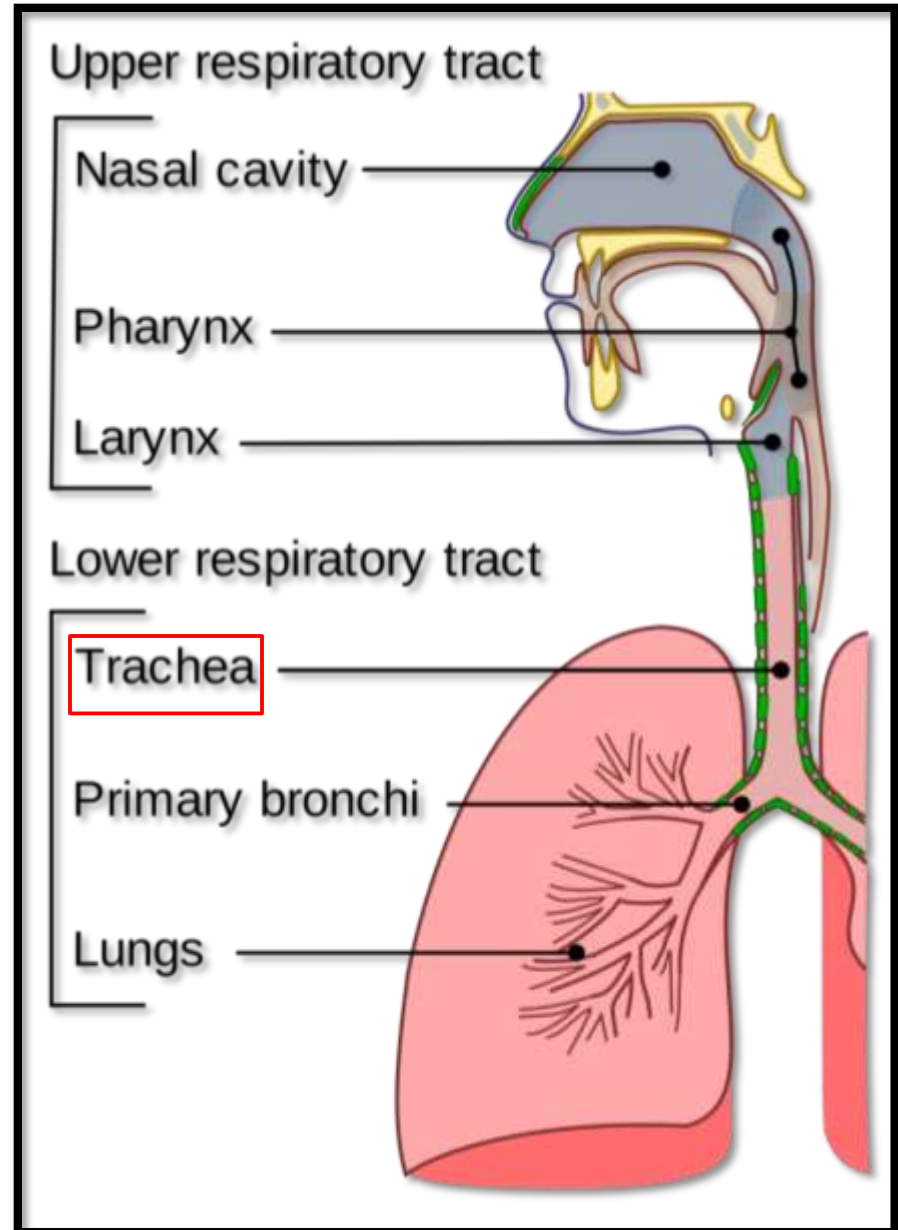


TRACHEA & OESOPHAGUS

**Presented by:-
Dr. Sushma Tomar
Associate Professor
Department of Anatomy**

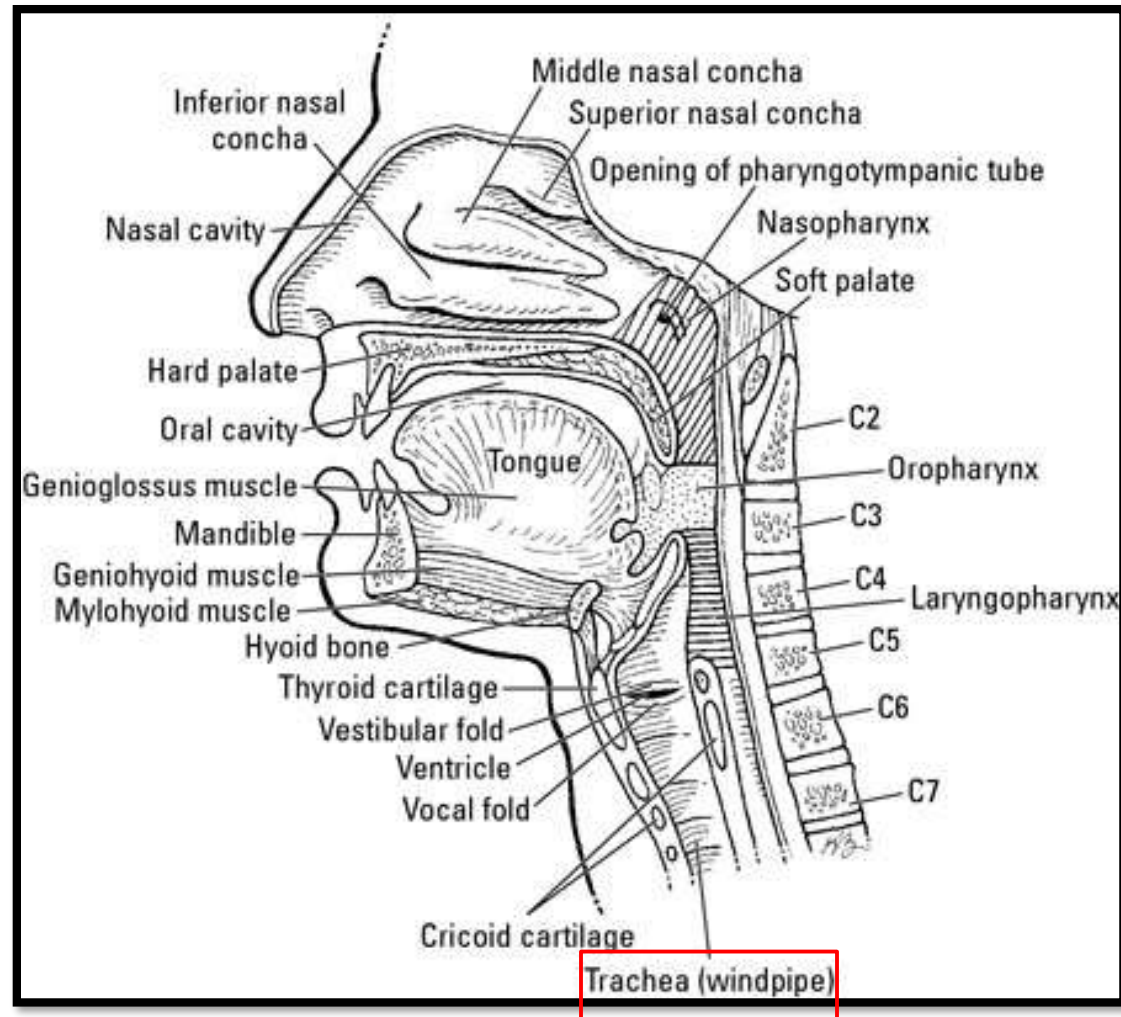
TRACHEA

- Also called wind pipe.
- A non-collapsible, membrano-cartilaginous mobile tube.
- Forms the beginning of lower respiratory passage.



TRACHEA contd...

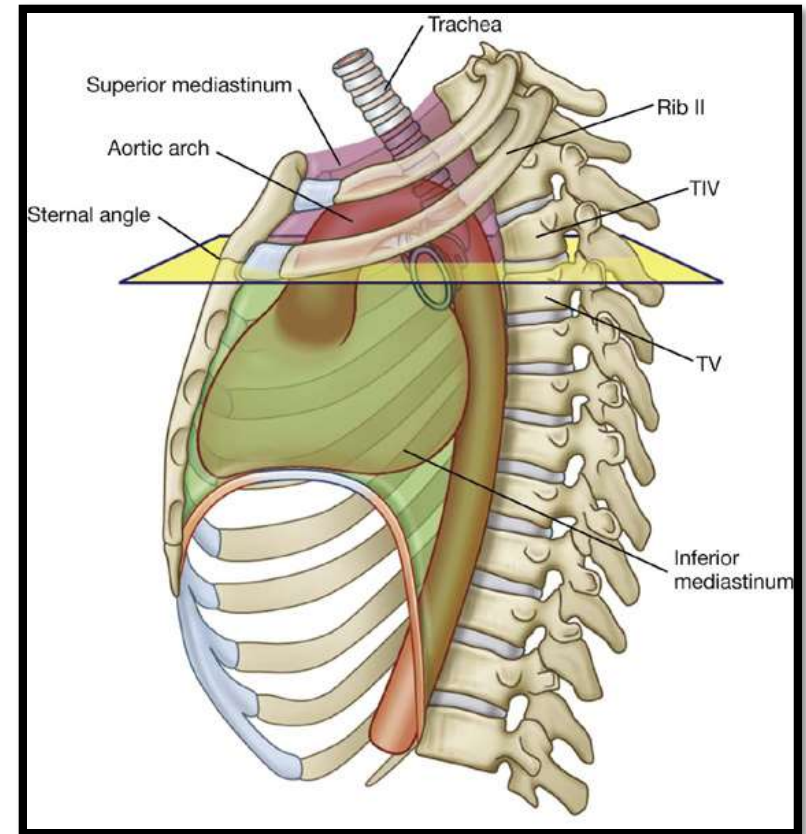
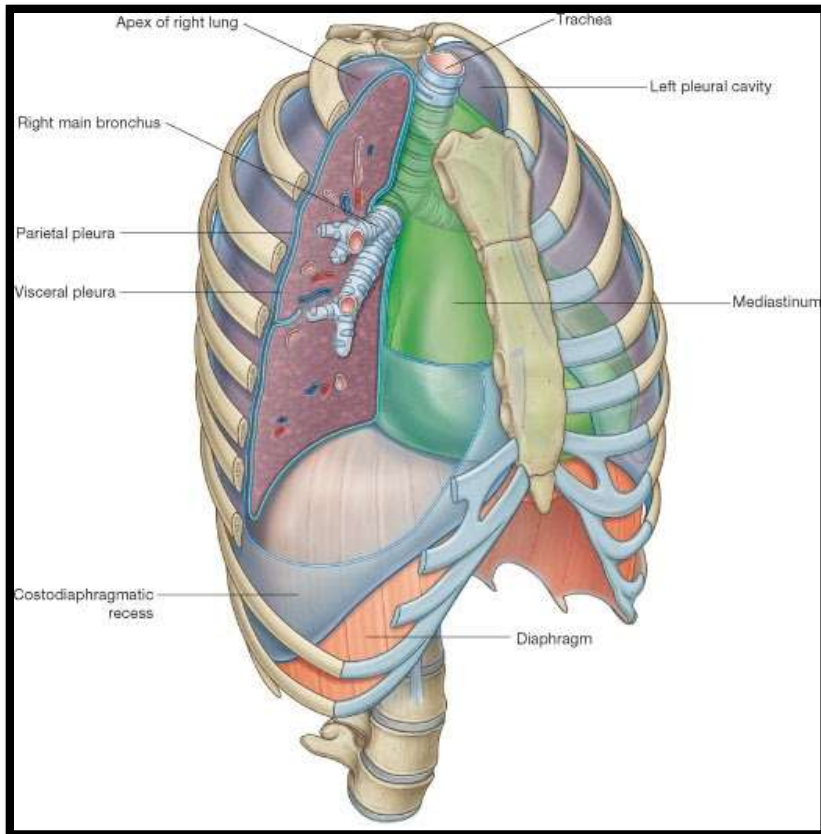
- Begins in the neck as a continuation of larynx **at the lower border of the cricoid cartilage** at the level of lower border of **sixth cervical vertebra**.

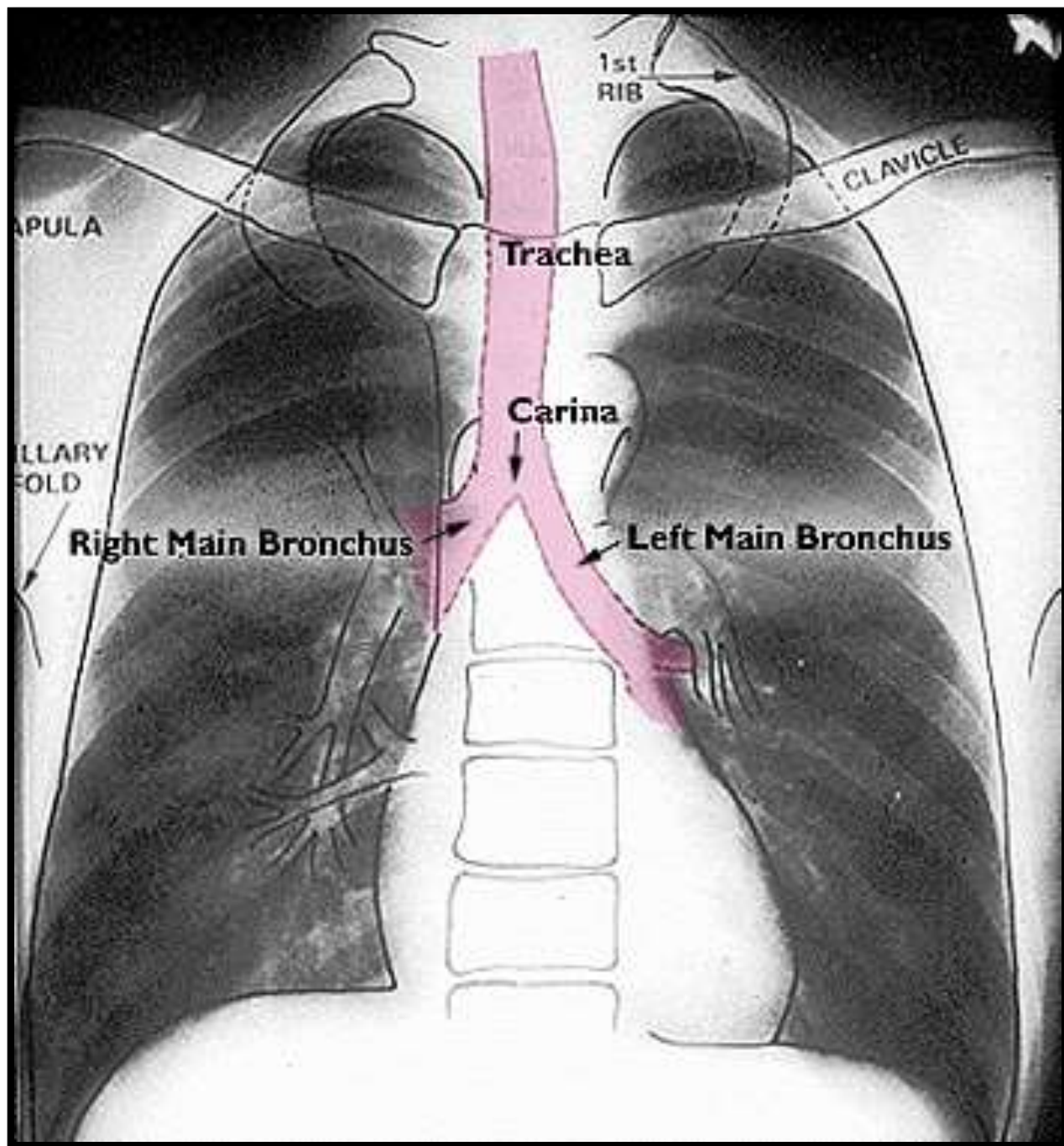


TRACHEA contd...

COURSE-

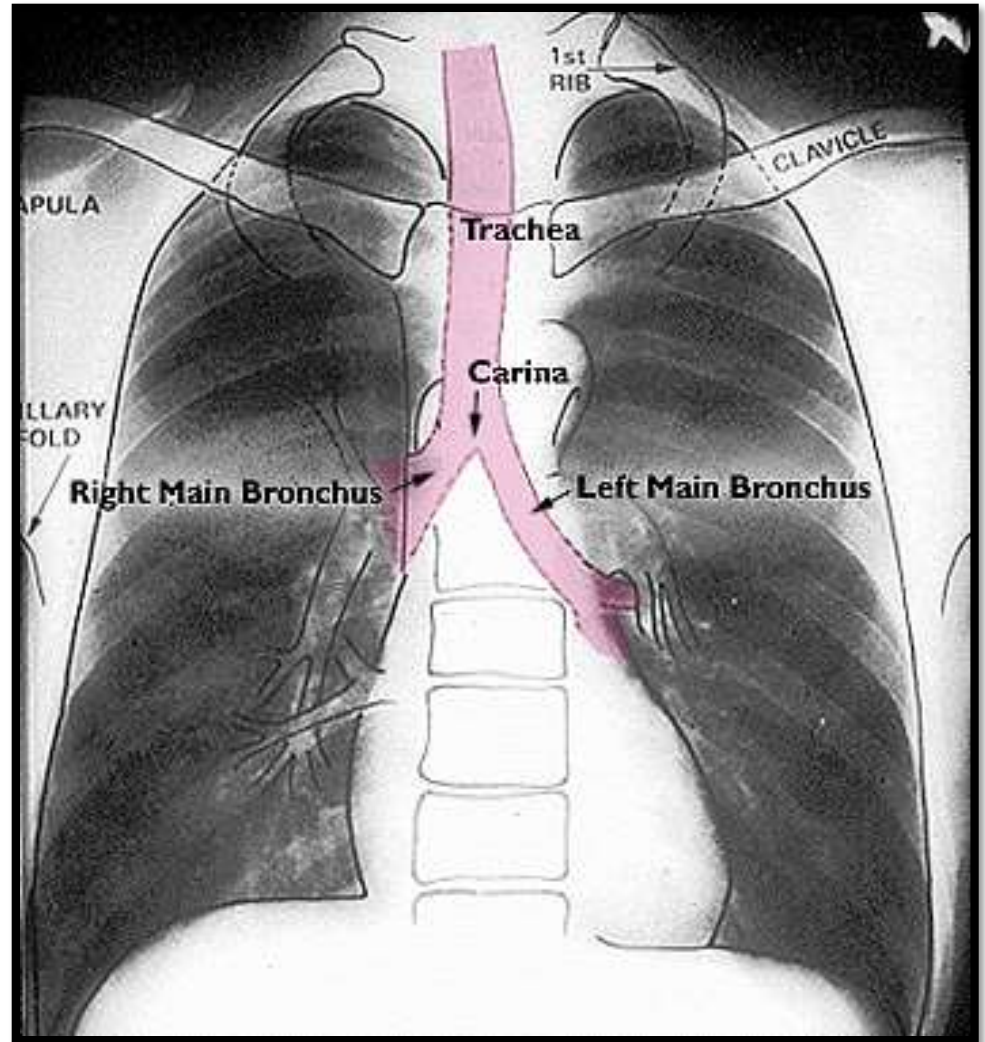
- Passes downwards through the neck and the superior mediastinum of thorax.
- Ends by dividing into right and left principal bronchi, **opposite the sternal angle** at the level of **lower border of T4 vertebra**.





TRACHEA CONTD...

- Trachea lies in median plane except at its termination.
- Near the bifurcation, trachea deviates slightly to the right due to the pressure of arch of aorta.
- Bifurcation of trachea corresponds with **lower border of T4 vertebra** in **cadaver** and in **supine position**.
- Bifurcation extends to **T6 vertebra** in the **living** and in **standing position**.
- In the **newborn**, trachea bifurcates at the level of **T3 vertebra**.



TRACHEA CONTD...

- During **expiration** the bifurcation **rises** by about one vertebral level.
- During **deep inspiration** may be **lowered** as far as the sixth thoracic vertebra.

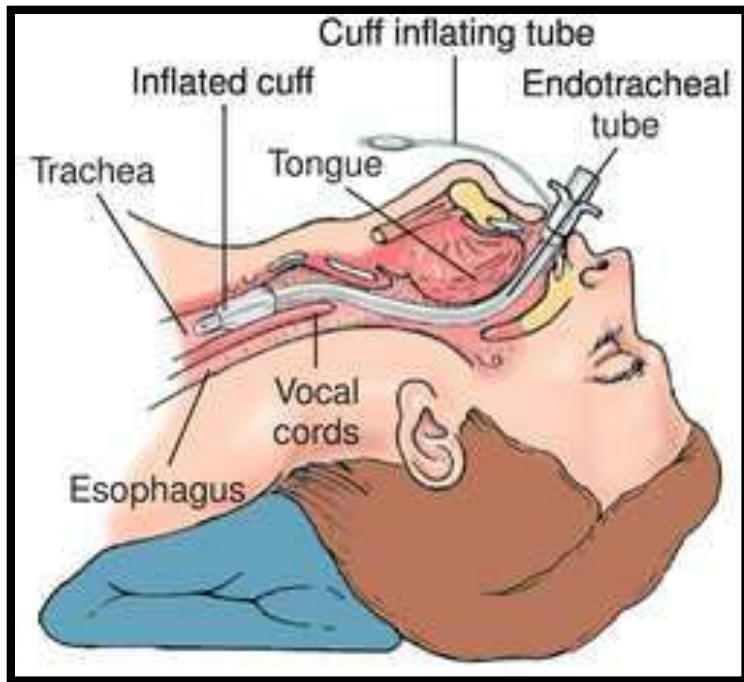
DIMENSIONS

LENGTH: 10-11cm (4-6 inch)

BREADTH: Outer Diameter: ~2cm (in adult males)

~1.5 cm (in adult females)

- ❖ Lumen is ~3mm in newborns and remain so up to the 3rd year of life.
- ❖ Lumen increases by 1mm each year up to 12 years.
- ❖ Lumen is smaller in living human being than in cadavers.

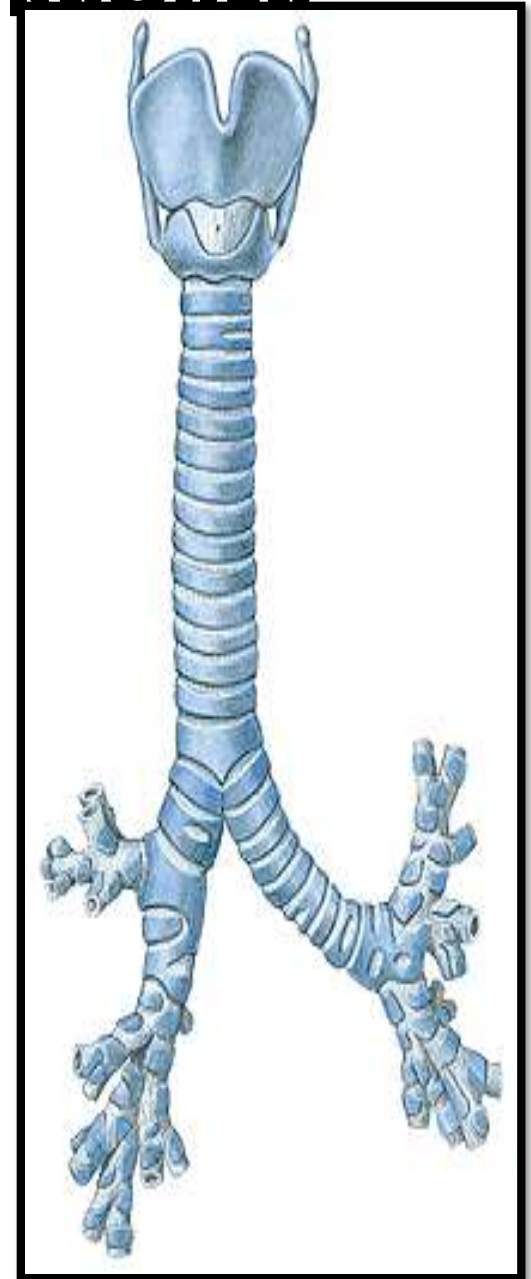
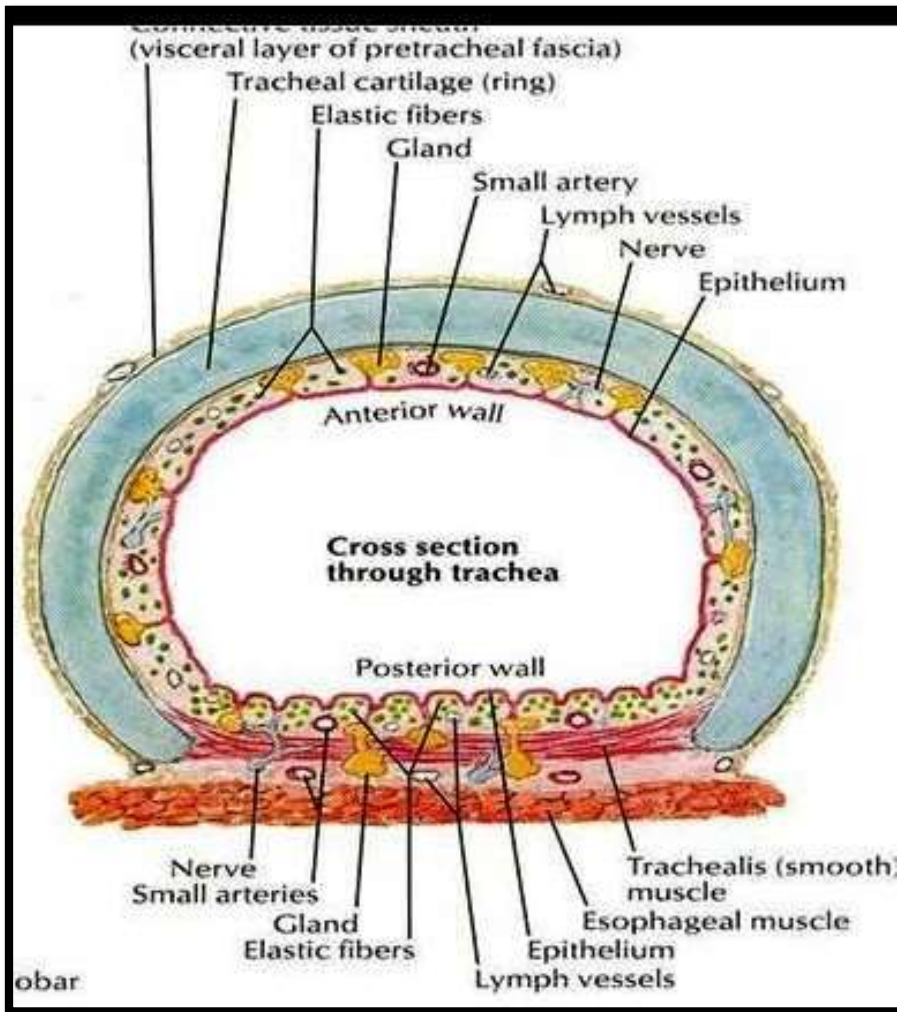


DIFFERENCES IN TRACHEA BETWEEN CHILDREN & ADULTS

S.NO.	FEATURES	IN CHILDREN	IN ADULTS
1	INTERNAL DIAMETER	$\geq 3\text{mm.}$	12 mm.
2	PLACEMENT	Deeply placed.	Superficially placed.
3	MOBILITY	More movable.	Less movable.
4	LOW TRACHEOSTOMY	Risky, because above the supra-sternal notch, crossed sometimes by left brachio-cephalic vein and summit of arch of aorta.	Less risky, because trachea is not usually crossed by these structures.

STRUCTURES FORMING THE TRACHEA

- Cartilaginous rings.
- Mucous membrane.



CARTILAGINOUS RINGS

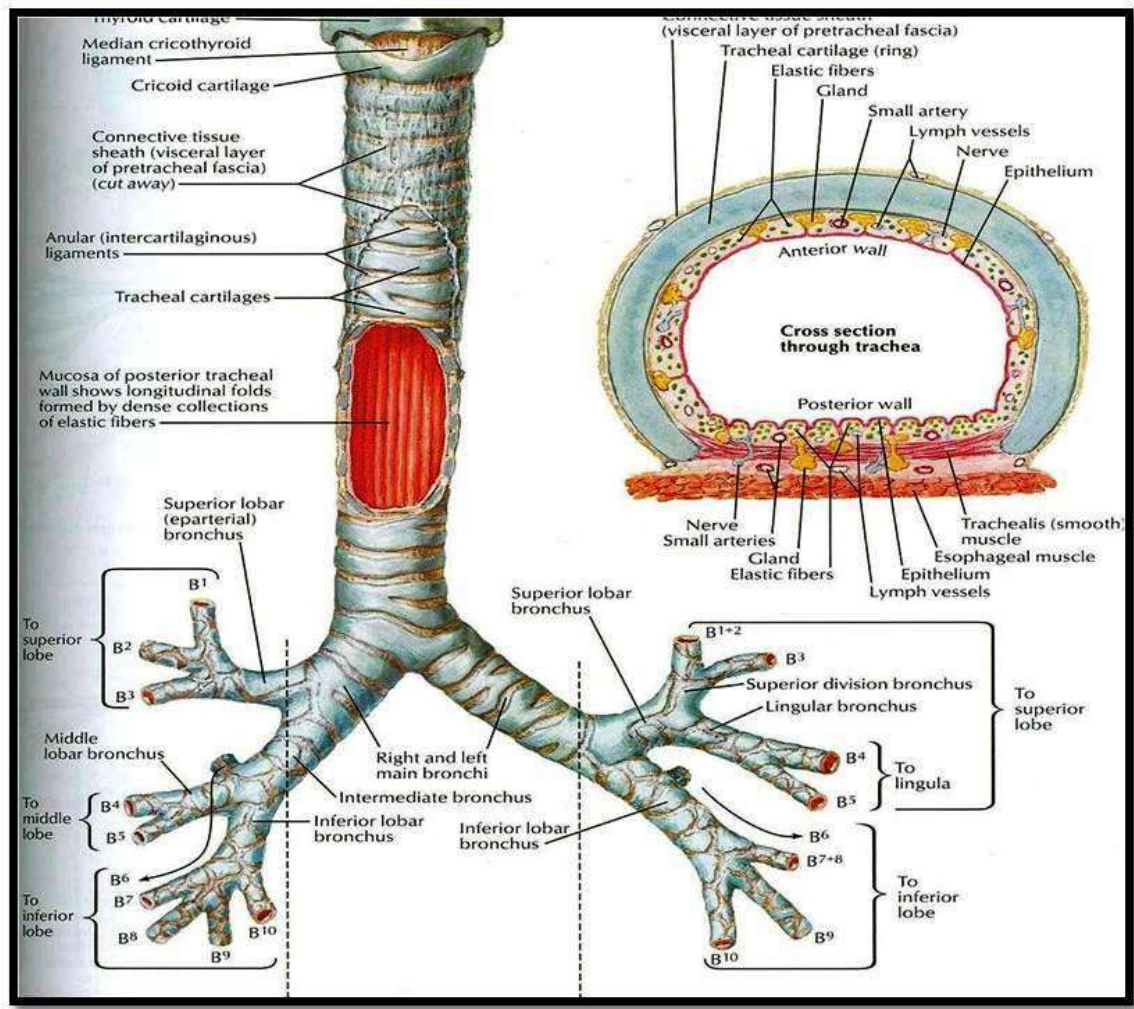
❖ C-shaped hyaline cartilaginous rings.

❖ ~16-20 in number.

❖ Deficient posteriorly in order to allow expansion of oesophagus during deglutition.

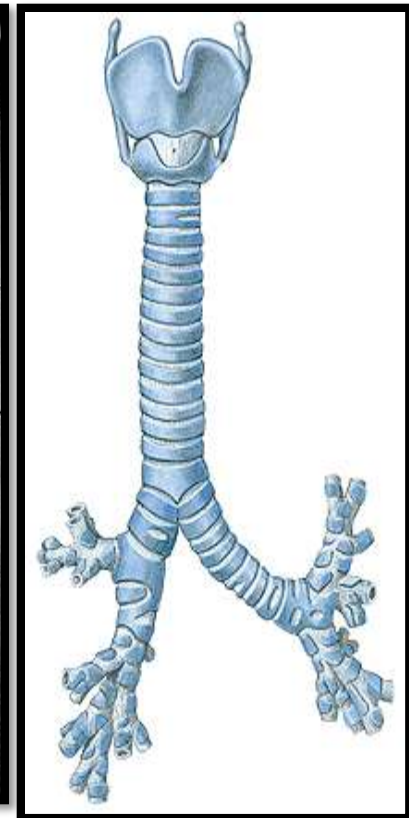
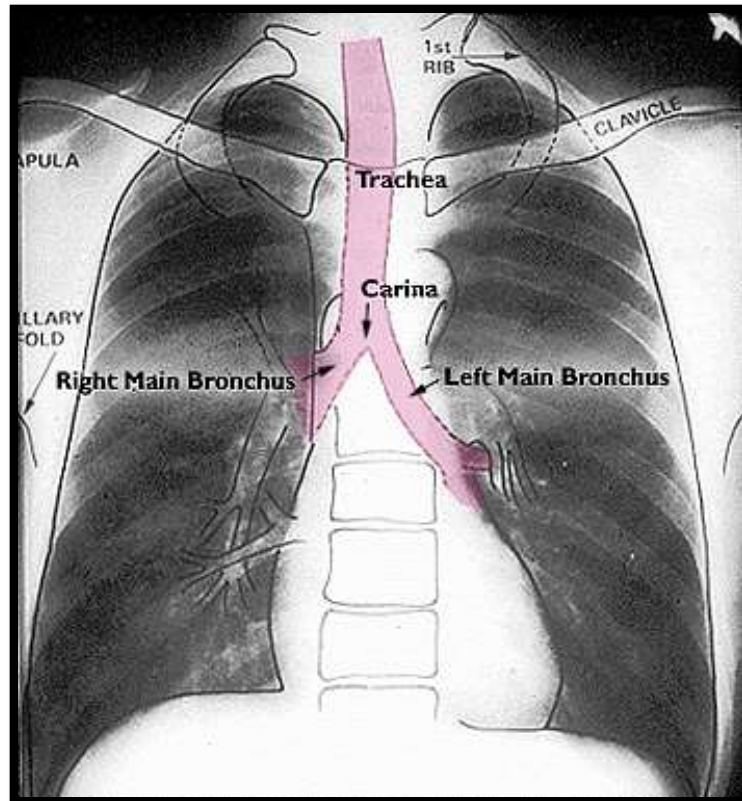
❖ The posterior free ends of the cartilage are connected by smooth muscle **trachealis**.

❖ First ring is the broadest.



CARTILAGINOUS RINGS contd...

- ❖ Last ring presents a triangular process known as the carina.
- ❖ Carina hooks upwards from the lower margin and surrounds the commencement of two bronchi.



CLINICAL IMPORTANCE of CARINA

- ❖ Carina presents a ridge in the interior of tracheal bifurcation..
- ❖ Acts as a guide for the surgeon during bronchoscopic or other examinations.
- ❖ Mucus membrane at the carina is one of the most sensitive areas and is associated with *cough reflex*.



The carina

Y this is Great



Courtesy Henri Colt MD,

Inverted Y Simulating Main Carina



Courtesy Henri Colt MD,

Note vertical RMB



From the head

Posterior

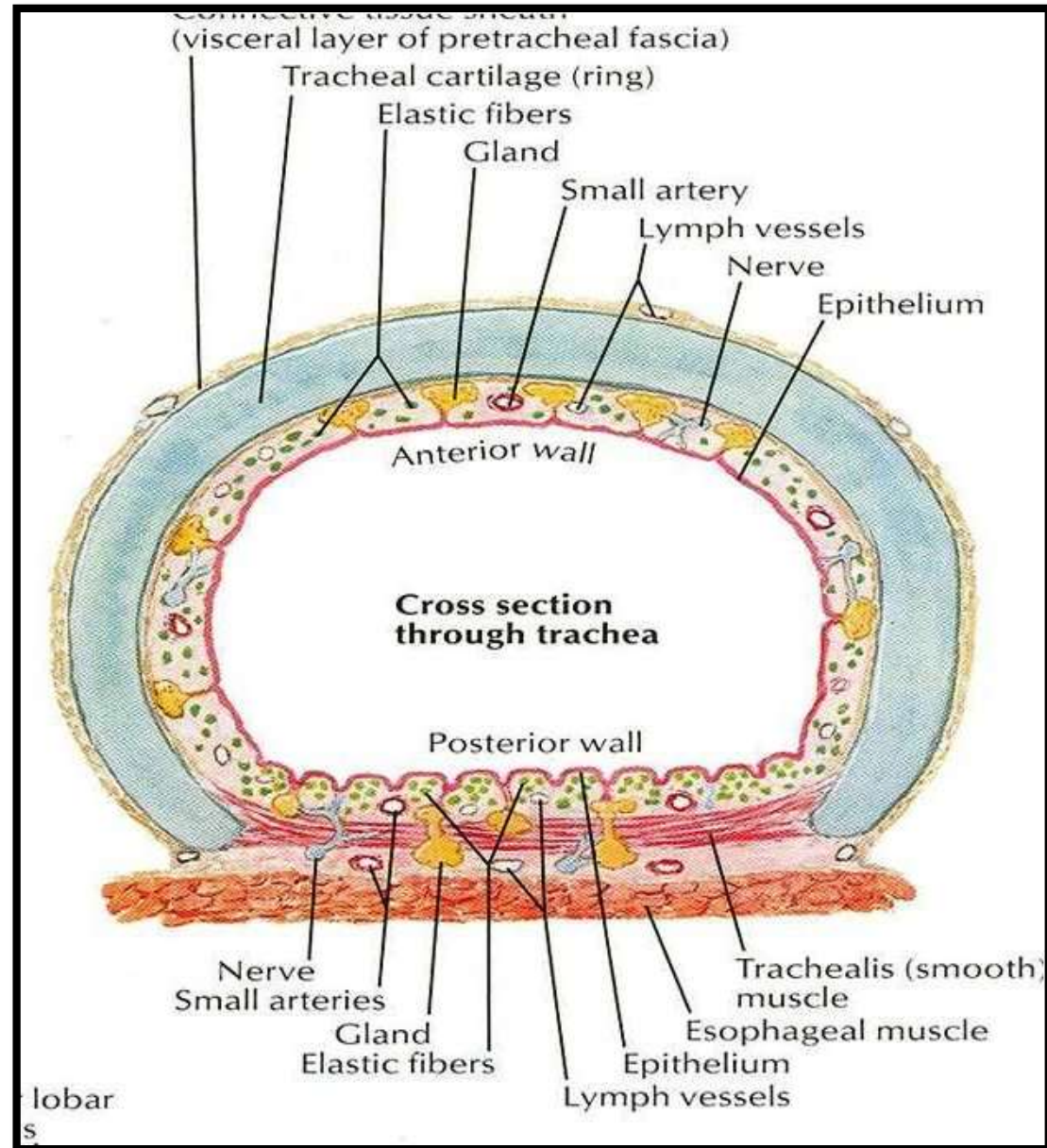


From the front

Posterior

MUCUS MEMBRANE

- Lined by ciliated pseudo-stratified columnar epithelium.
- Provided with numerous goblet cells.
- Taller cells have cilia.

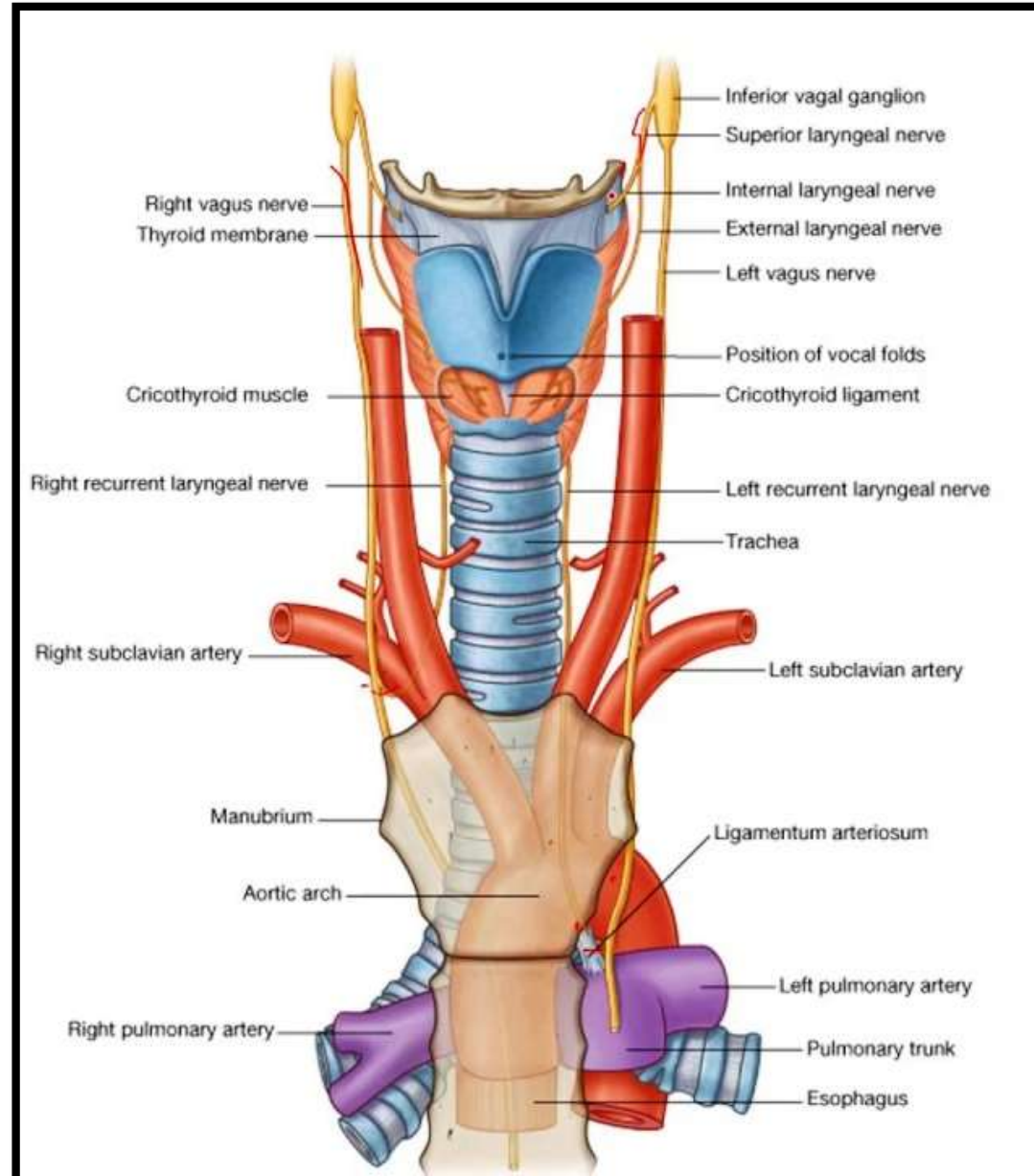


Cervical part of Trachea

- ~ 7 cm in length.

EXTENT-

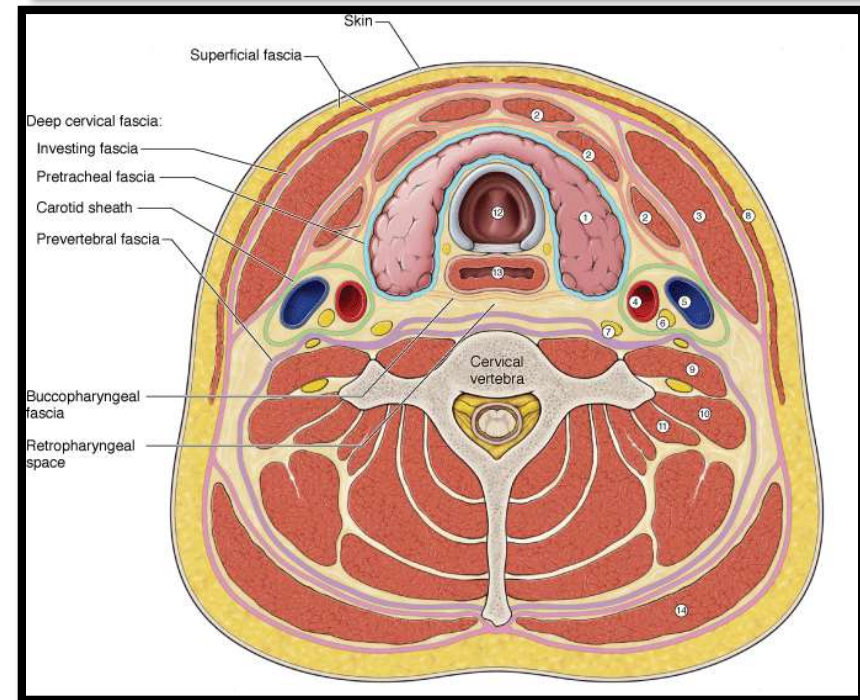
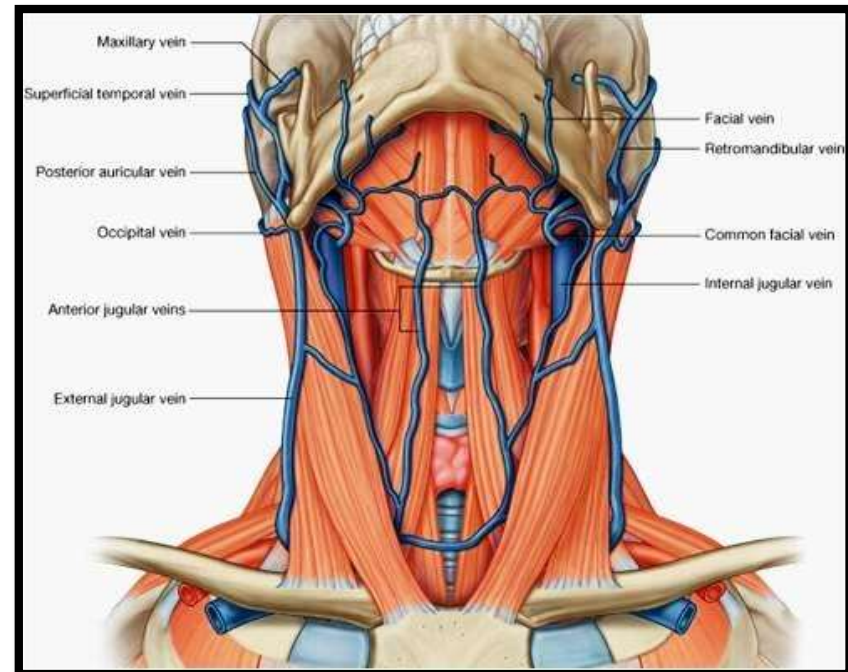
- From **lower border of Cricoid cartilage** to the **upper border of manubrium sterni**.

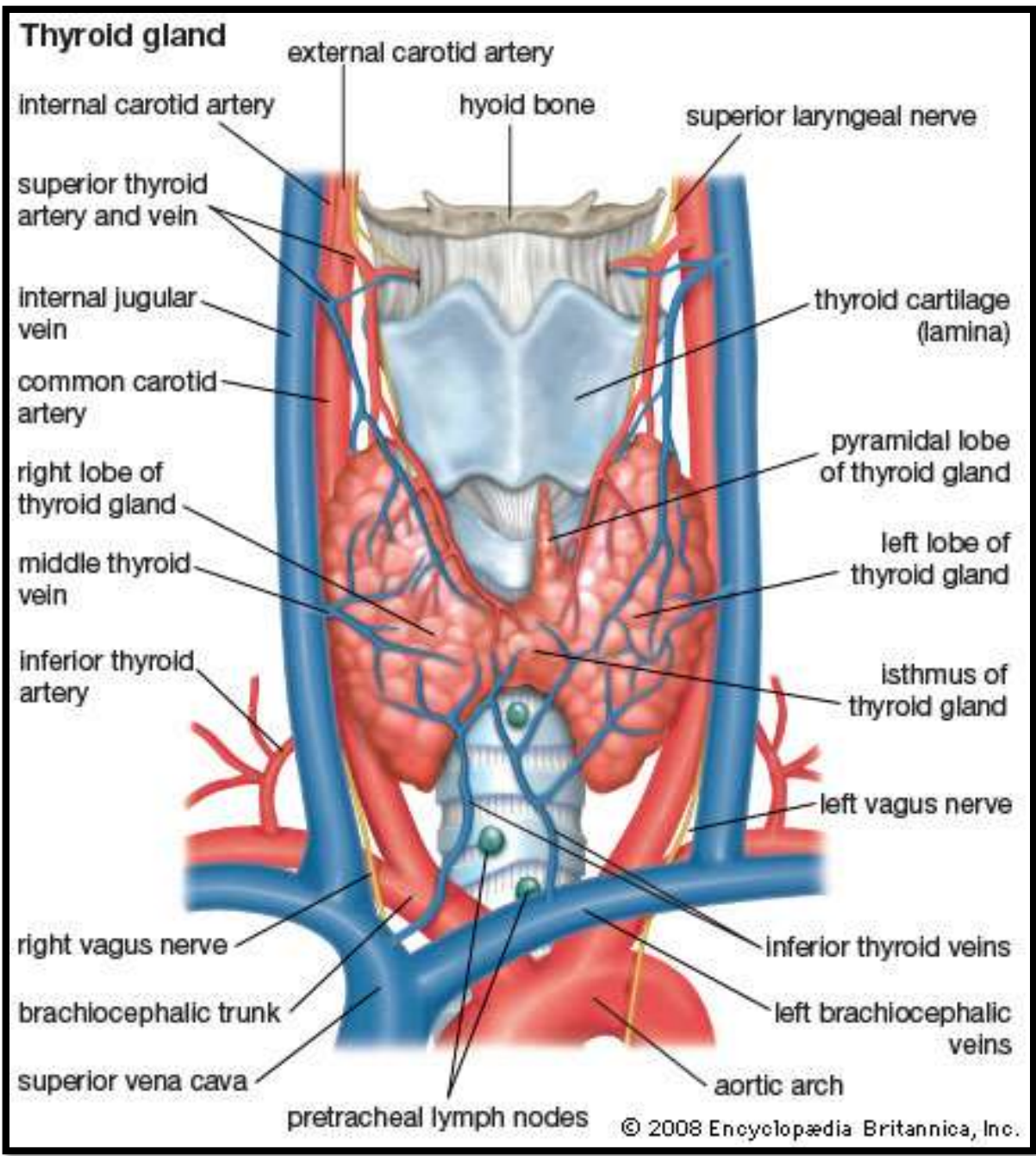


Relations

ANTERIOR-

- Skin.
- Superficial fascia containing anterior jugular veins and jugular venous arch.
- Investing layer of deep cervical fascia.
- Sternothyroid and Sternohyoid muscles.
- Isthmus of Thyroid gland.
- Inferior Thyroid veins and arteria thyroidea ima.
- Left brachiocephalic vein (in children)
- Thymus gland (in children).
- Brachiocephalic artery (in children).





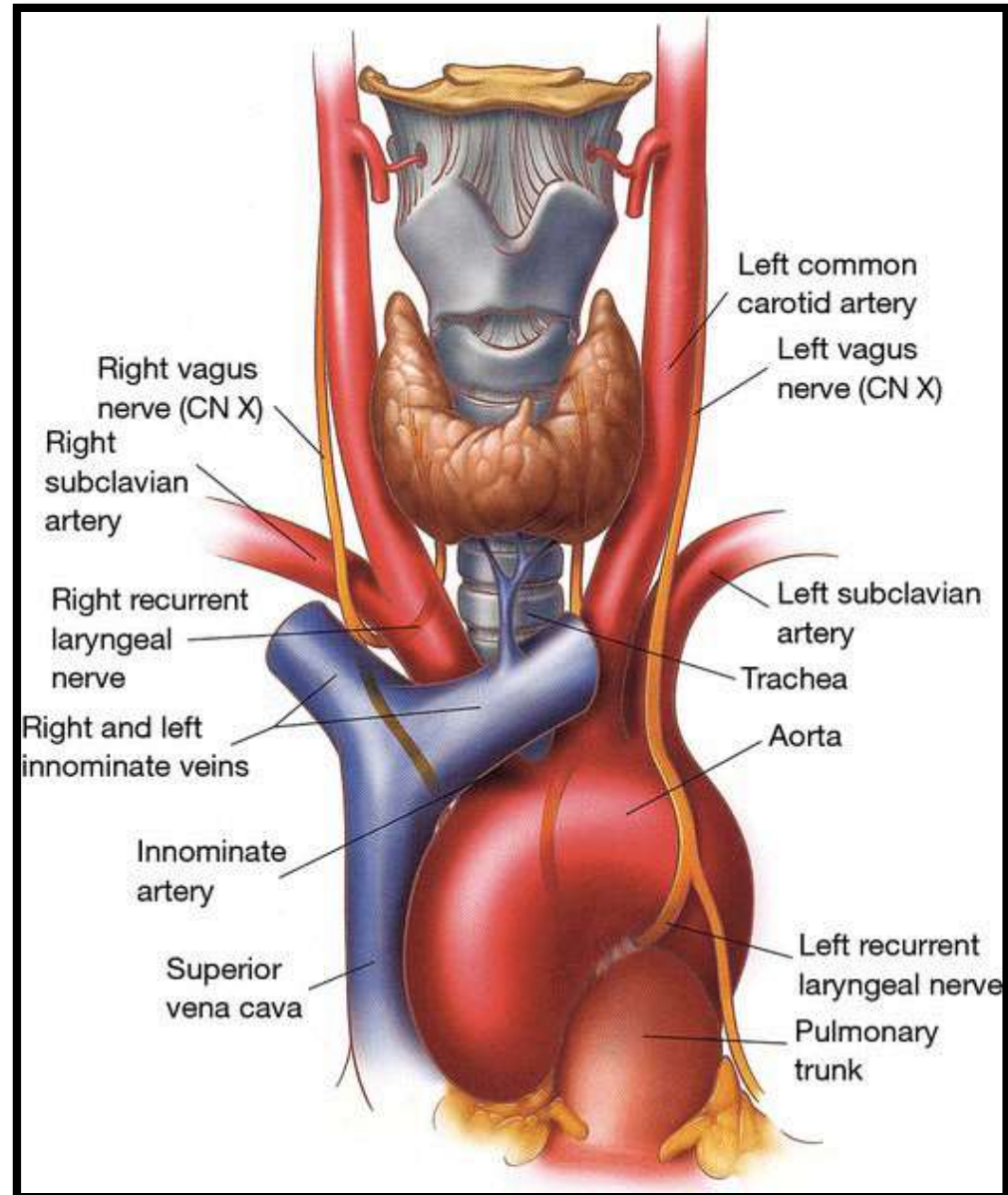
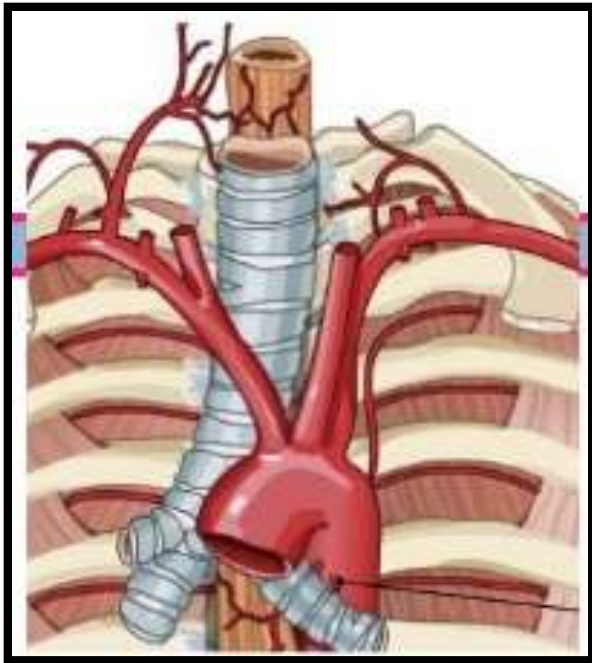
Relations contd...

POSTERIOR-

- Esophagus.
- Recurrent Laryngeal Nerves.

ON EACH SIDE-

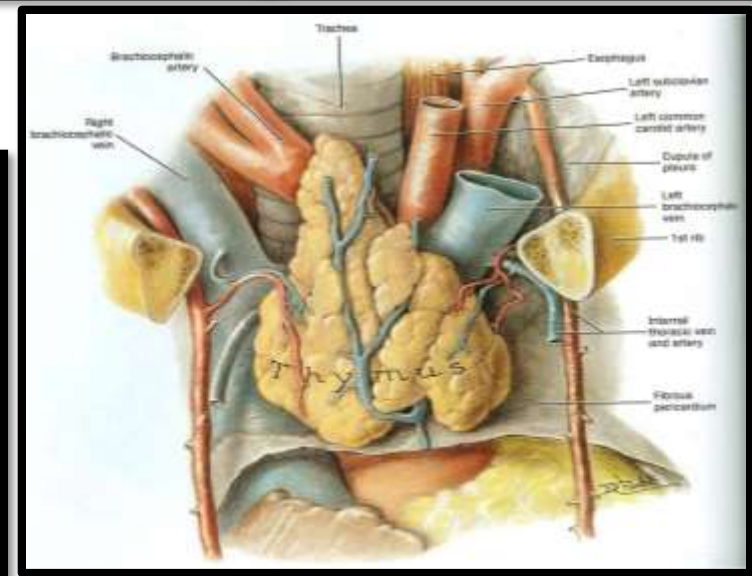
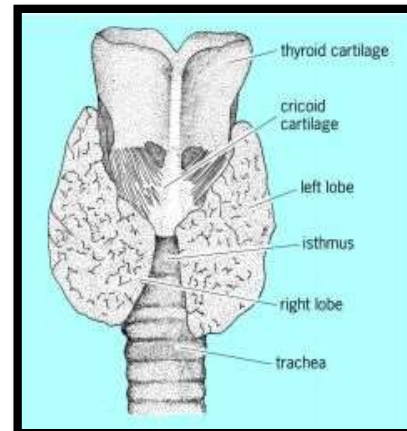
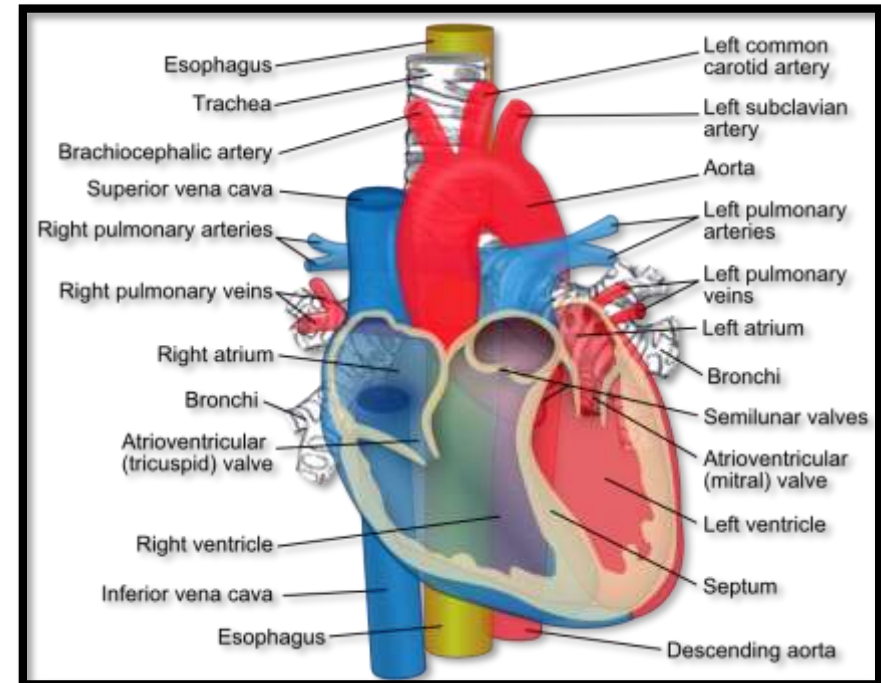
- Lobe of thyroid gland.
- Common carotid artery.
- Inferior thyroid artery.



RELATIONS (of thoracic part)

ANTERIORLY:

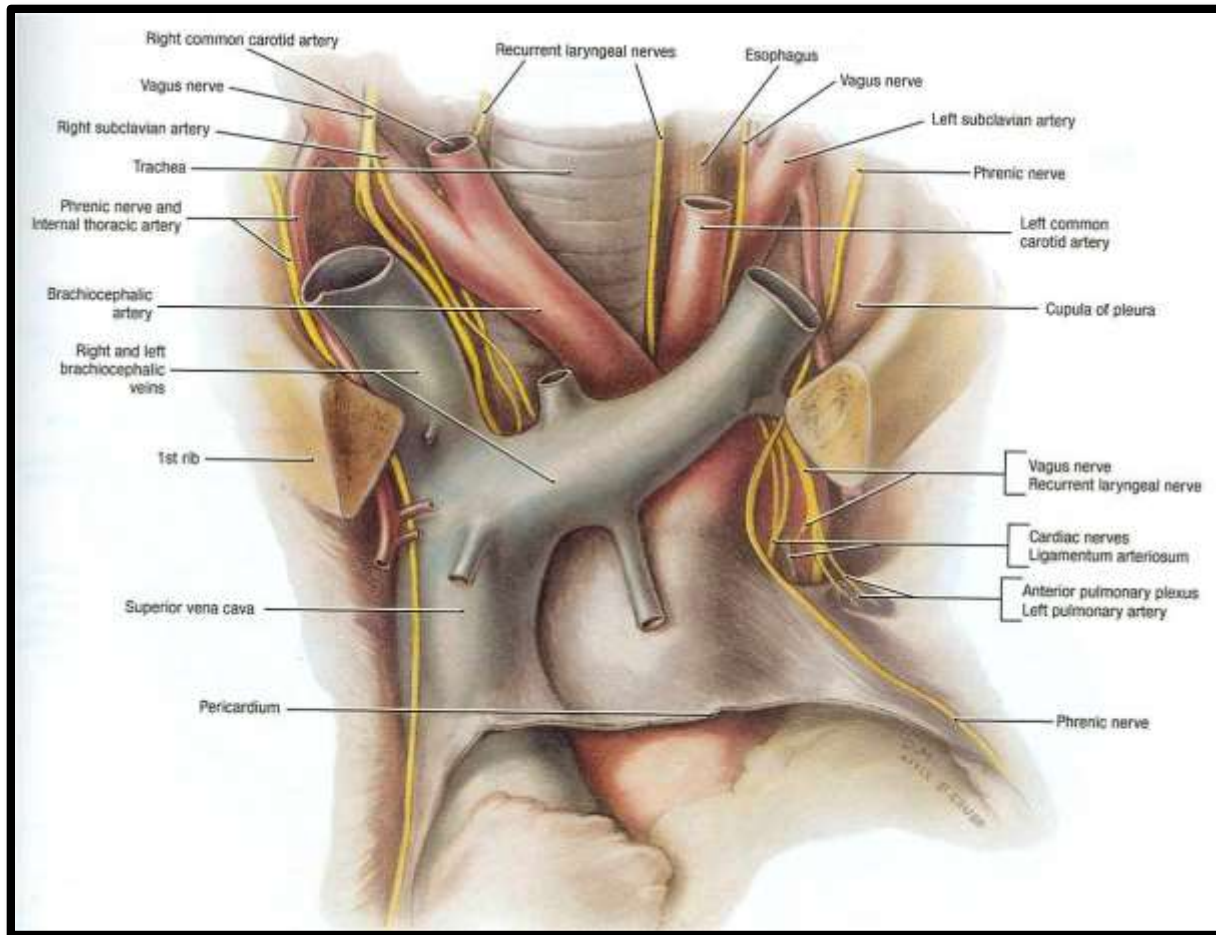
- Sternum.
- Thymus.
- Left brachiocephalic vein.
- Origins of the brachiocephalic and left common carotid arteries, and the arch of the aorta.



RELATIONS OF TRACHEA CONTD...

POSTERIORLY:

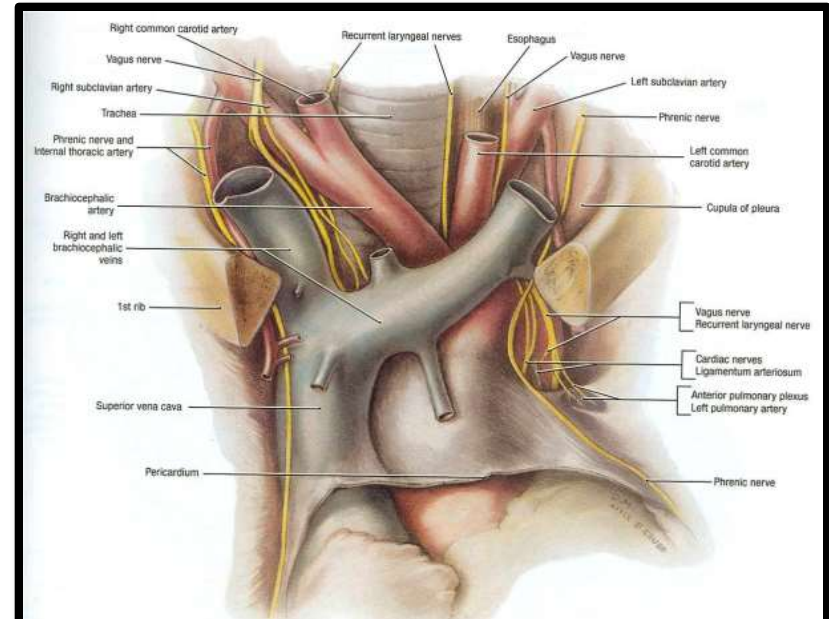
- Esophagus.
- Left recurrent laryngeal nerve.



RELATIONS OF TRACHEA CONTD...

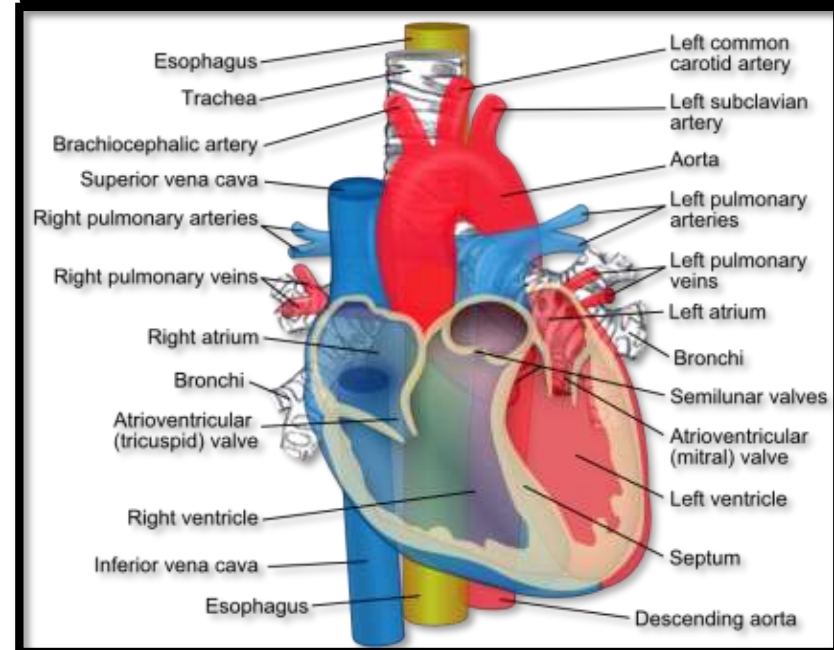
RIGHT SIDE:

- Azygos vein.
- Right vagus nerve.
- Pleura.



LEFT SIDE:

- Arch of the aorta.
- Left common carotid and left subclavian arteries.
- Left vagus.
- Left phrenic nerves, and the pleura



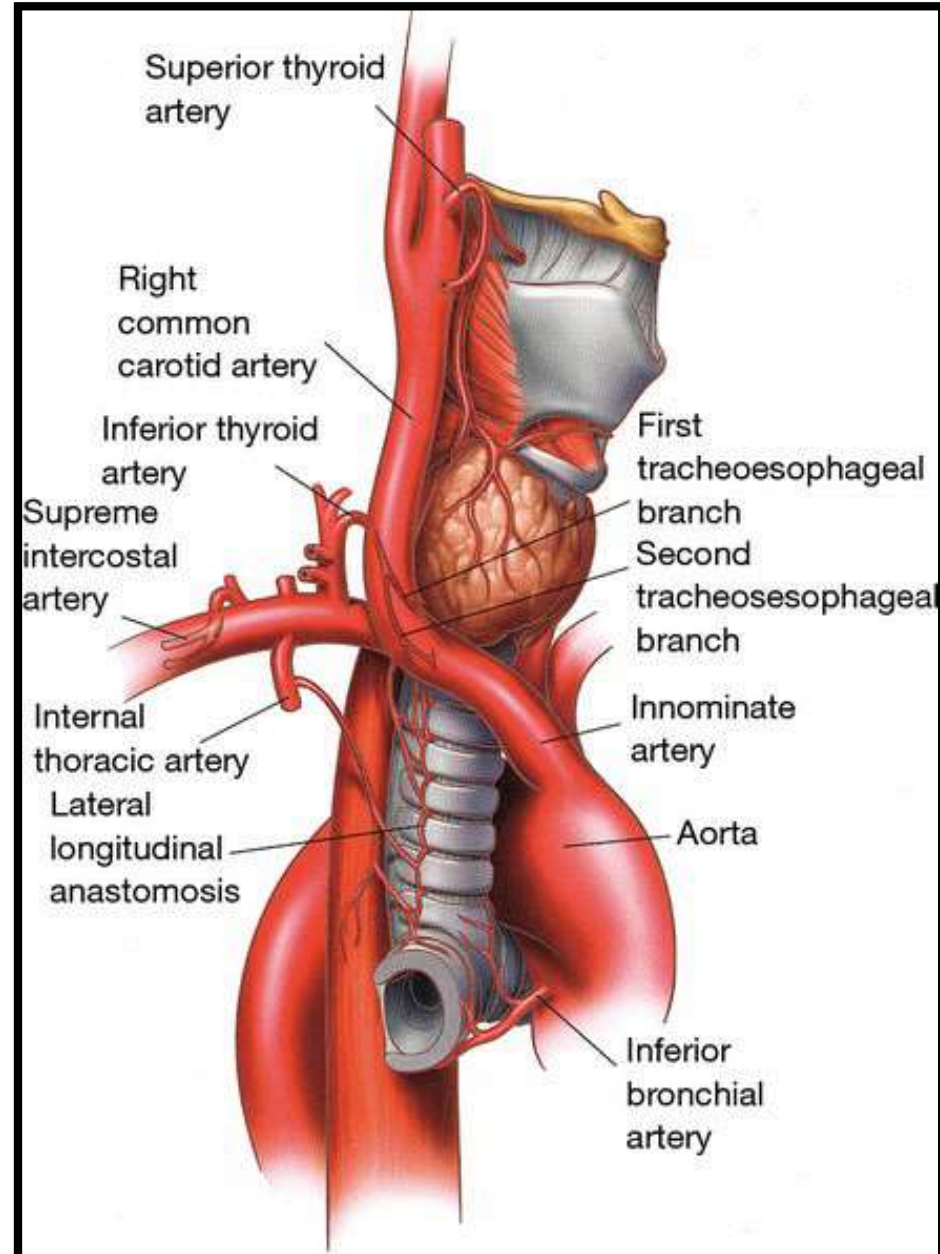
BLOOD SUPPLY

ARTERIAL SUPPLY

- Inferior thyroid arteries.

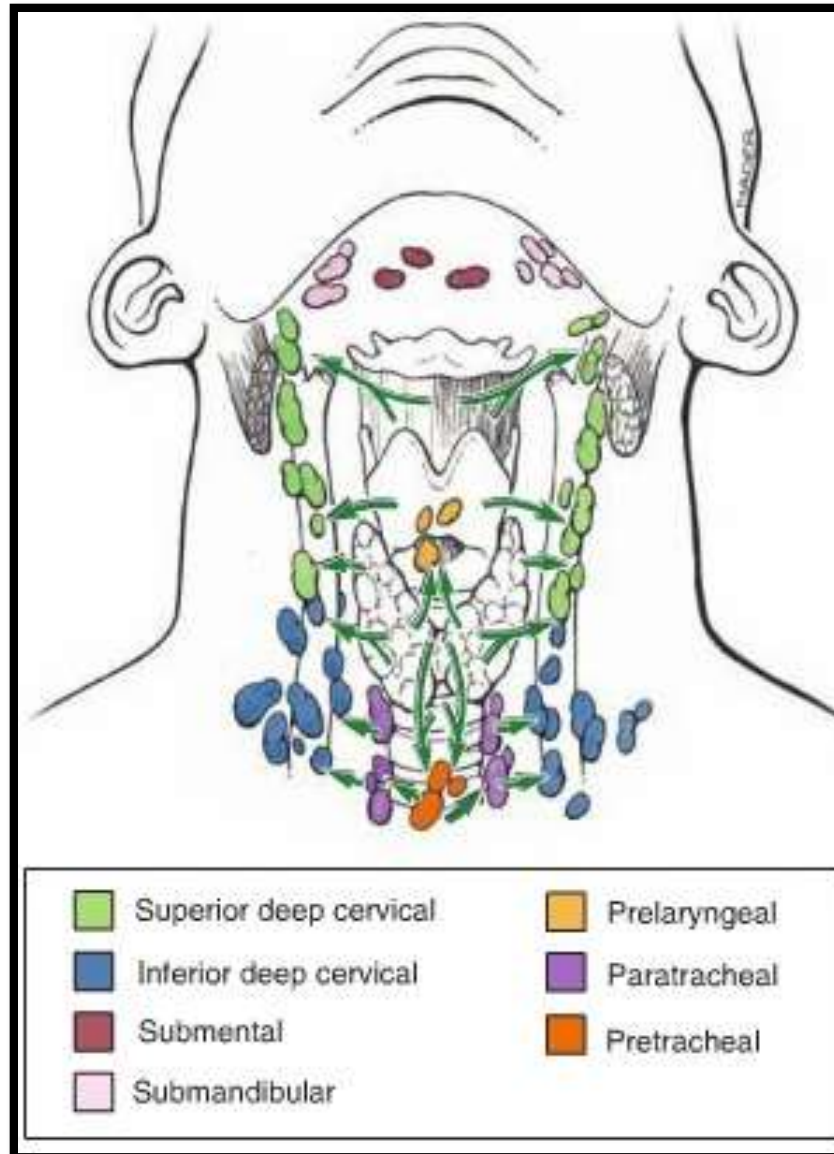
VENOUS DRAINAGE-

- Left brachiocephalic vein.



LYMPHATIC DRAINAGE

- The lymph drains into the **pretracheal** and **paratracheal** lymph nodes.



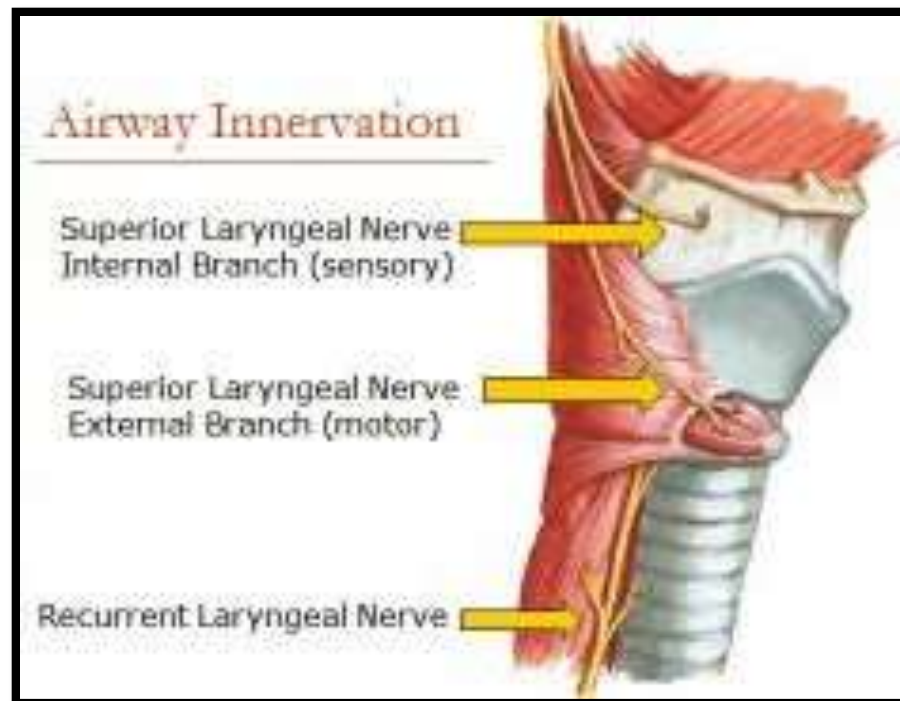
NERVE SUPPLY

PARASYMPATHETIC- Recurrent laryngeal nerves.

- ❖ Motor to trachealis muscles.
- ❖ Secretomotor to glands.
- ❖ Sensory to mucus membrane.

SYMPATHETIC-

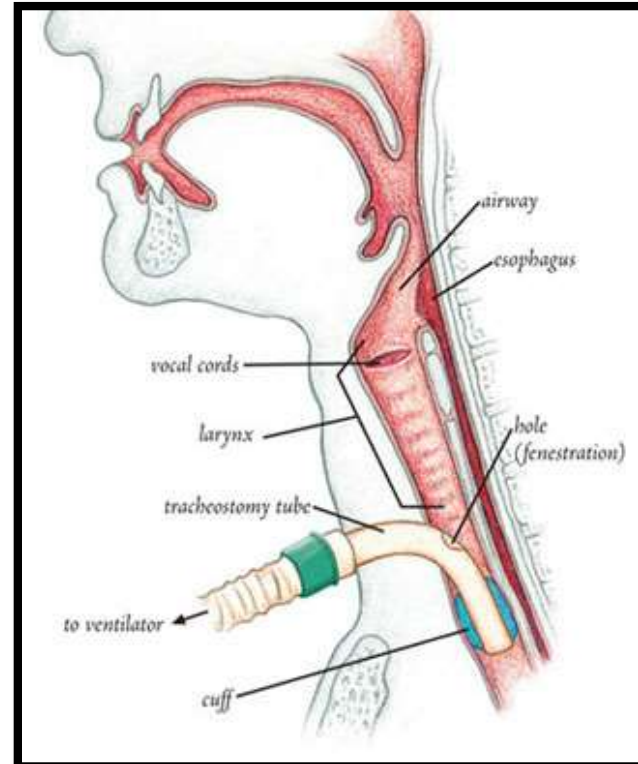
- ❖ Derived from upper 4 or 5 thoracic segments of spinal cord.
- ❖ Post-ganglionic neurons are located in middle cervical sympathetic ganglion.
- ❖ Vasomotor.



APPLIED ANATOMY

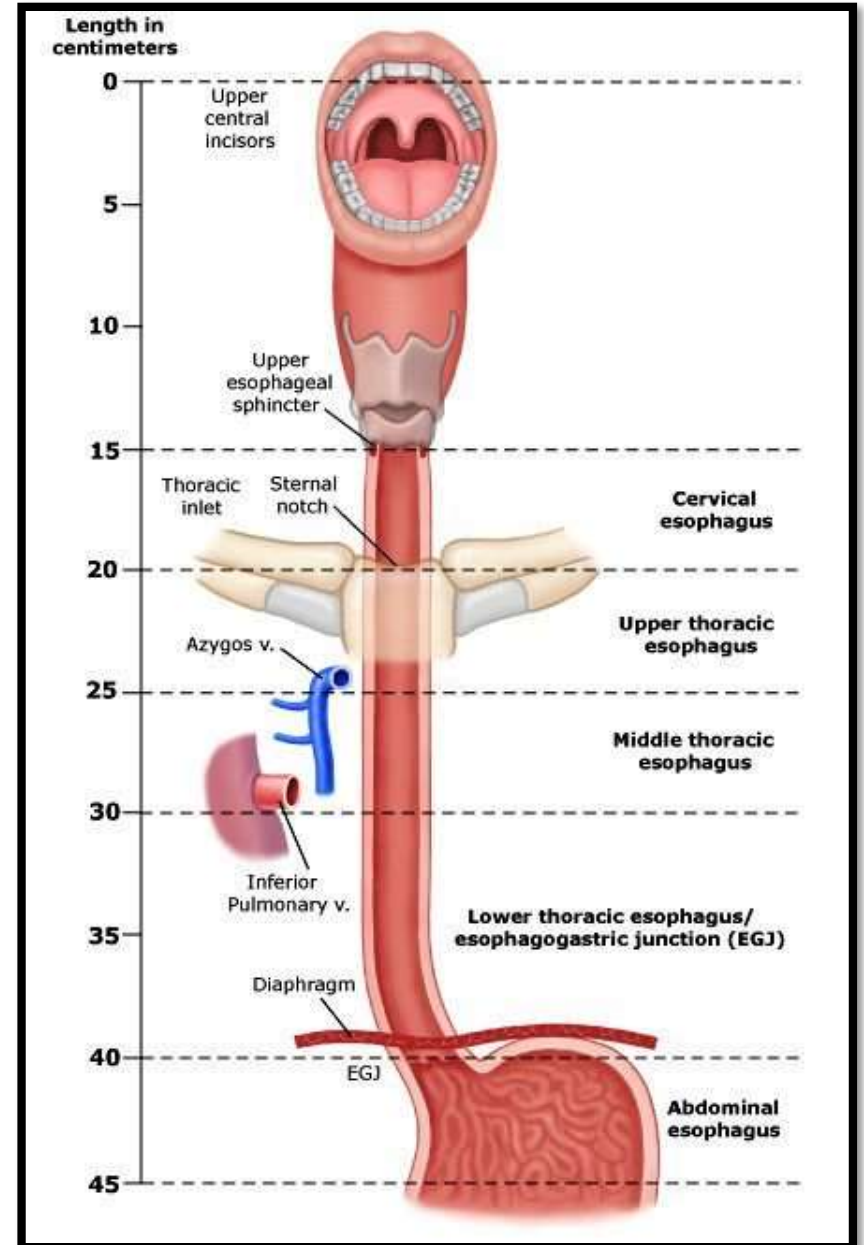
TRACHEOSTOMY-

- Life saving surgical procedure.
- Done in cases of laryngeal obstruction.
- Commonly done in retrothyroid region.
- Trachea is opened by a vertical incision.



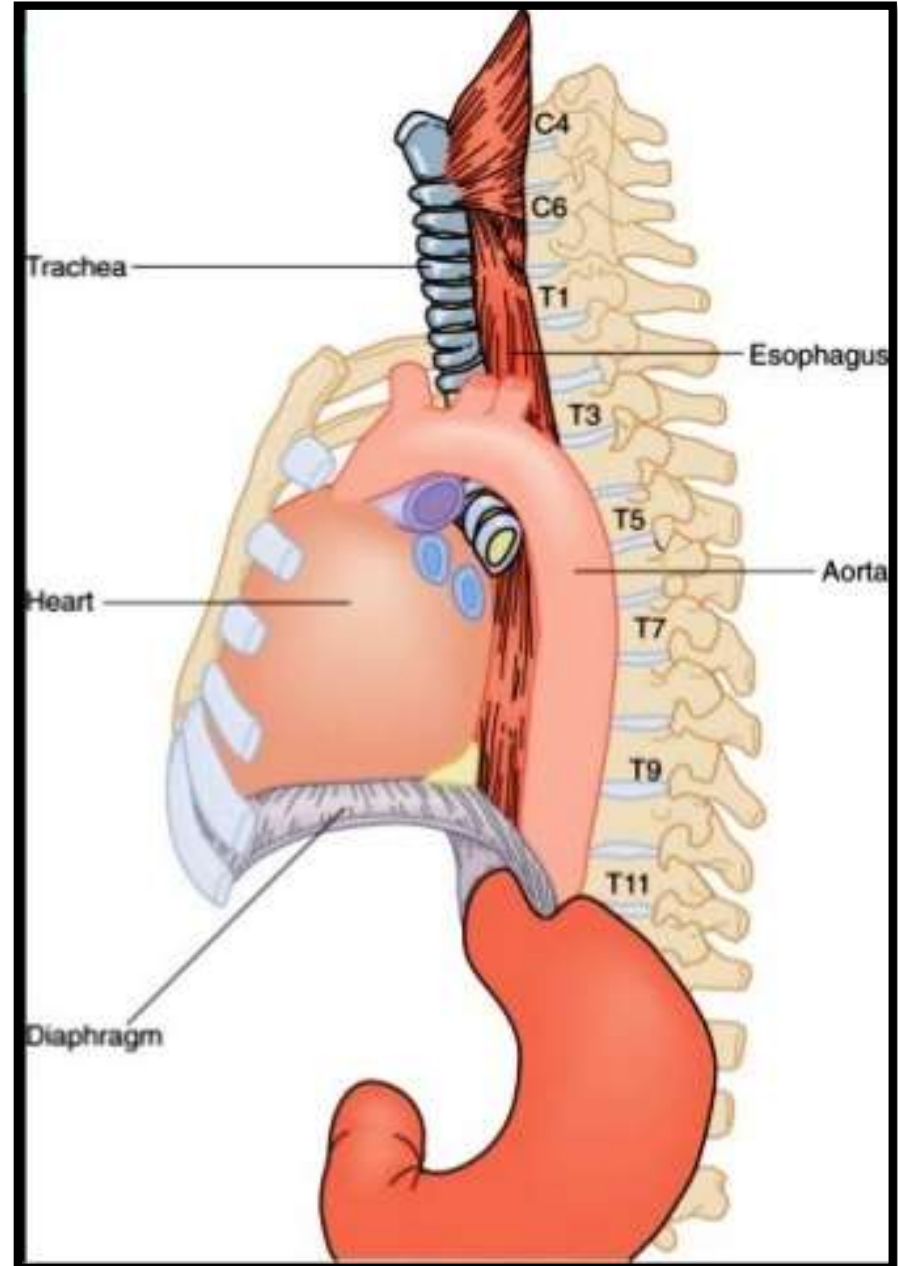
OESOPHAGUS

- Muscular tube of 25cm length.
- Connects the pharynx to the stomach.
- Flattened anteroposteriorly.



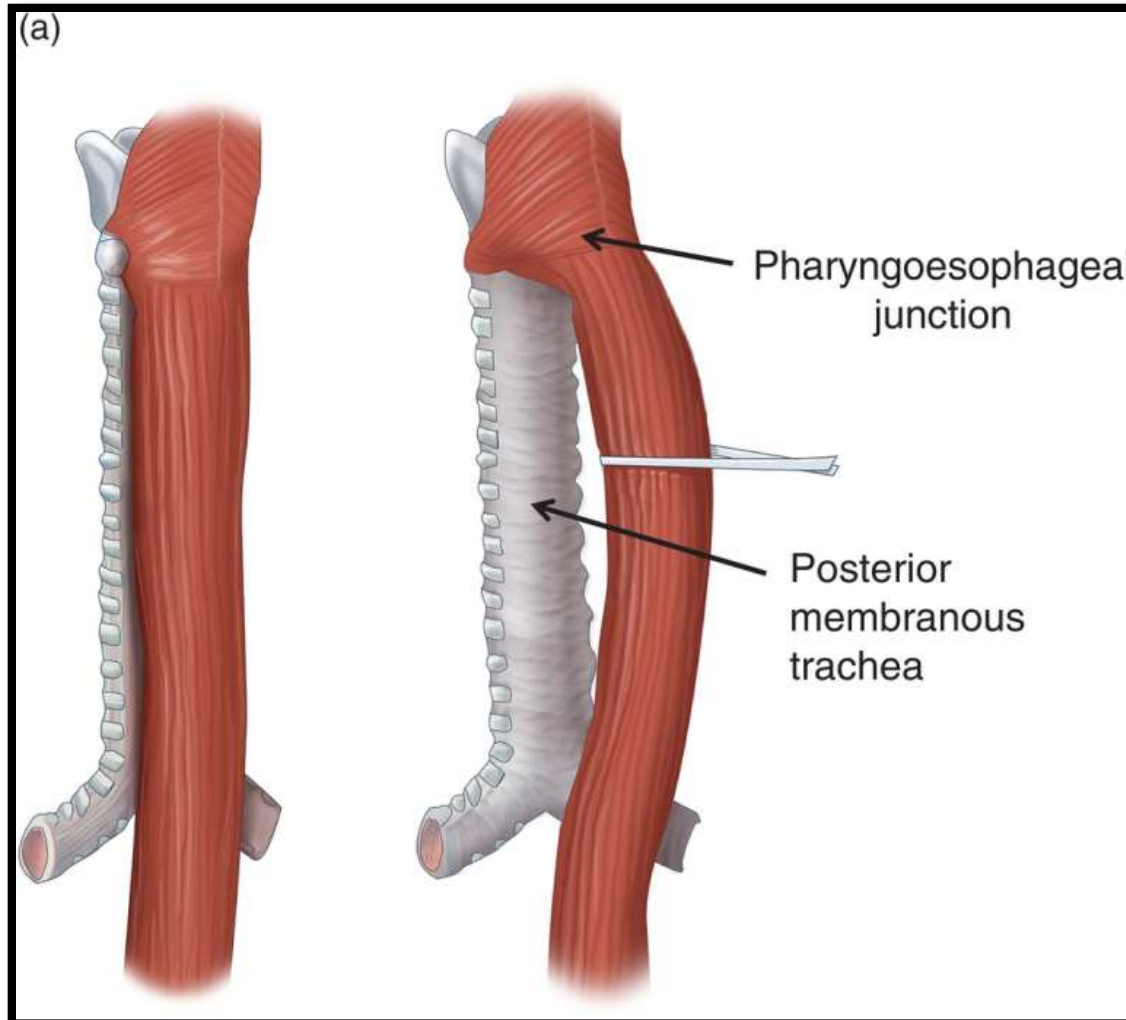
OESOPHAGUS contd...

- Begins in the neck at lower border of cricoid cartilage (at the lower border of C6 vertebra).
- Pierces the diaphragm at T10.
- Opens into the stomach at T11.



OESOPHAGUS contd...

- Pharyngo-esophageal junction is the **second narrowest** part of digestive tube.



OESOPHAGUS - DIVISIONS

CERVICAL PART –

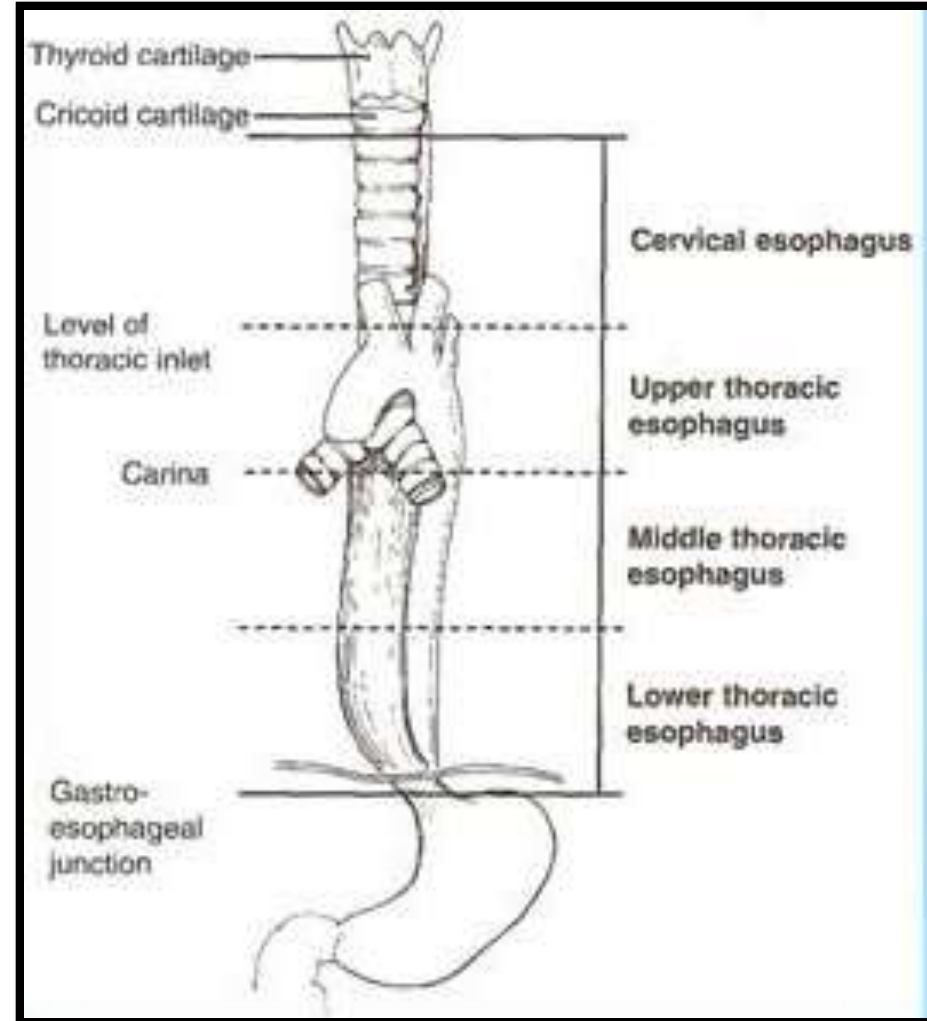
- Ends at the lower border of T1.

THORACIC PART –

- Ends at T10 where it pierces the diaphragm.

ABDOMINAL PART –

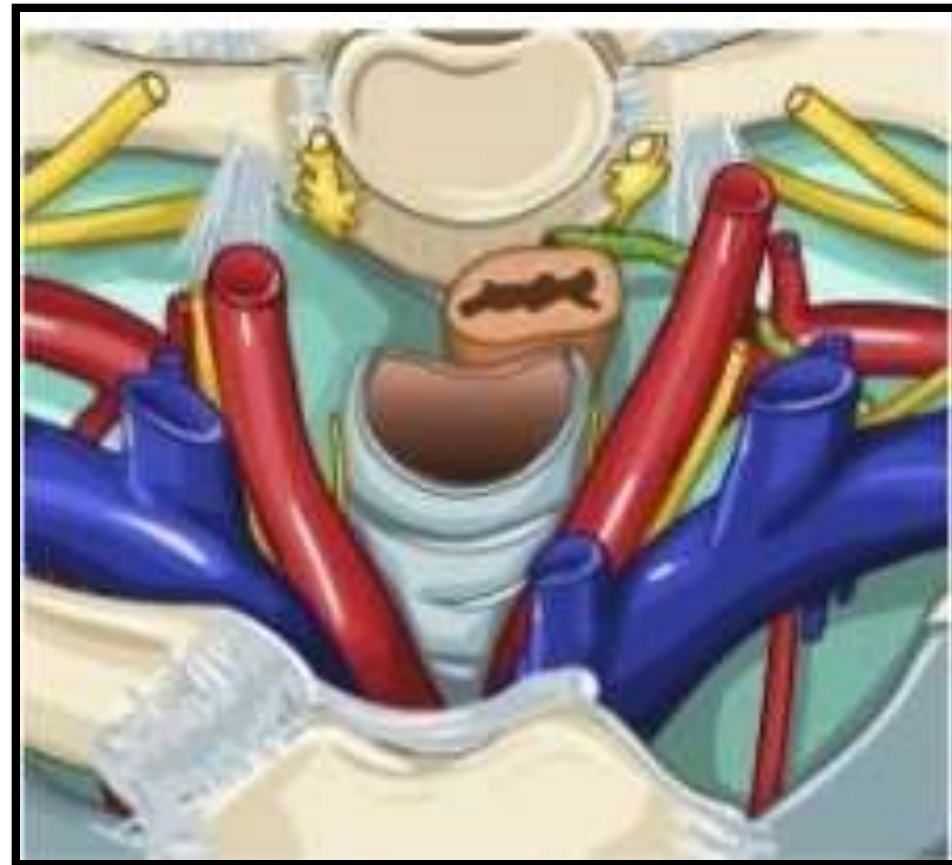
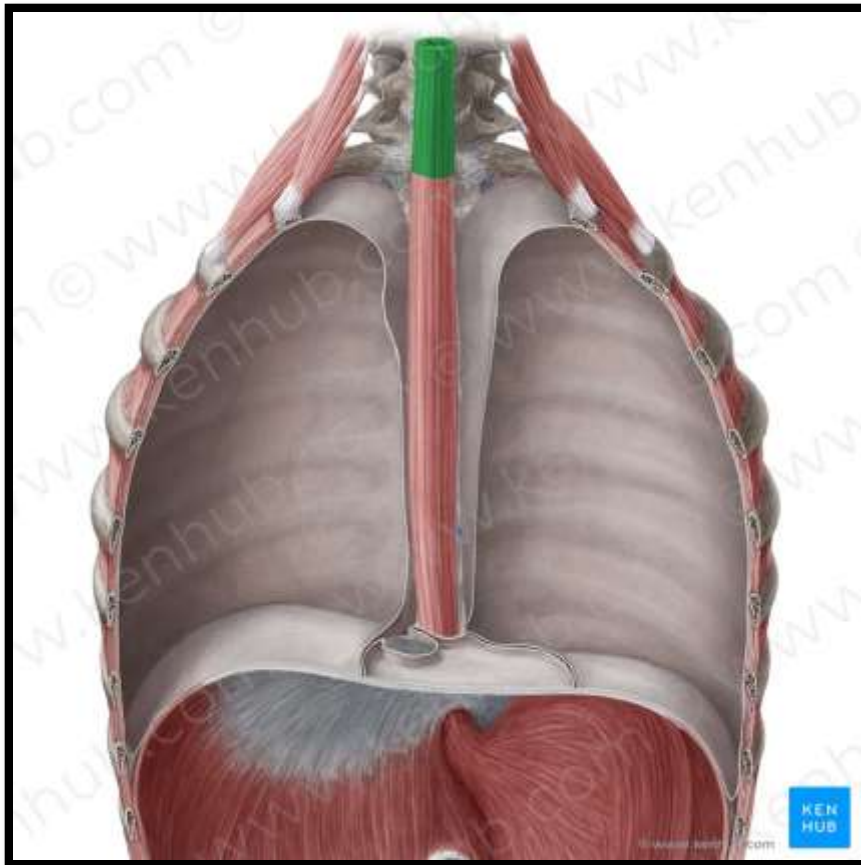
- Ends at the cardiac end of the stomach.



Cervical Part of Oesophagus

EXTENT-

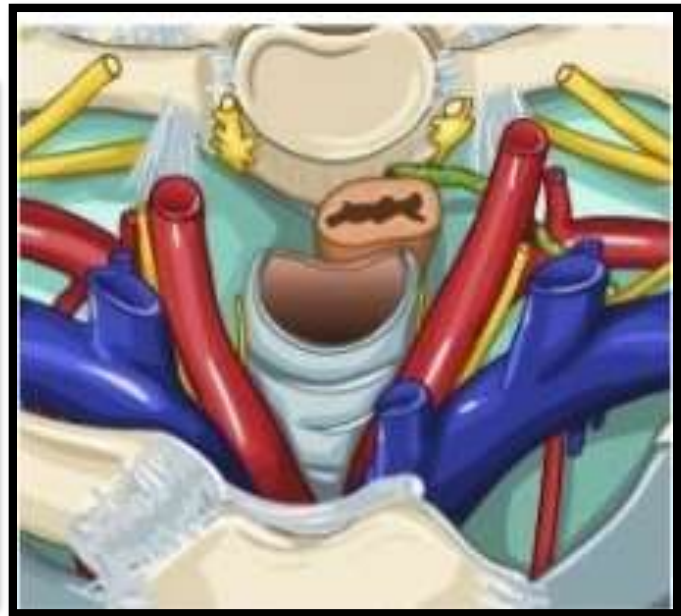
- From lower border of cricoid cartilage to the superior border of manubrium sterni.
- Begins in the midline but inclines slightly to the left as it descends.



Relations

Anterior-

- Trachea.
- Recurrent laryngeal nerves.

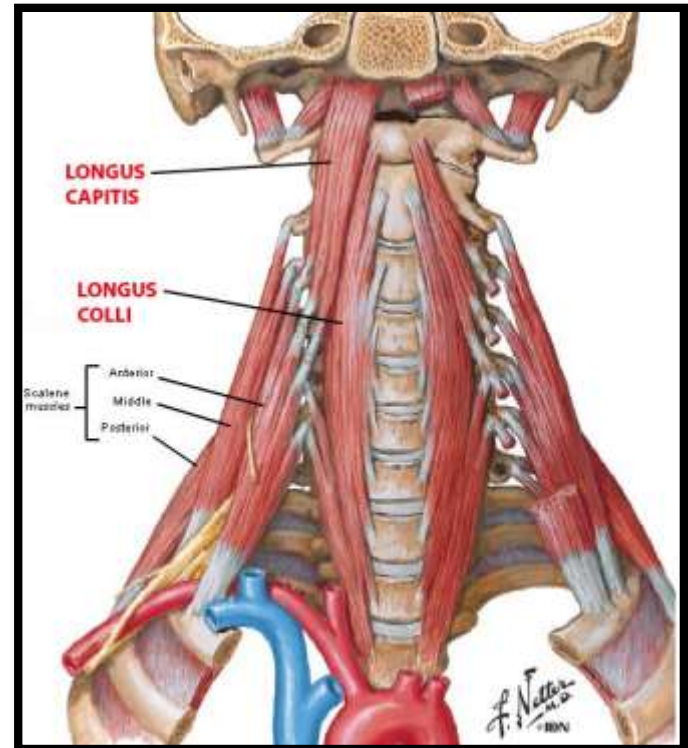


Posterior-

- Vertebral column.
- Prevertebral fascia.
- **Longus colli muscles.**

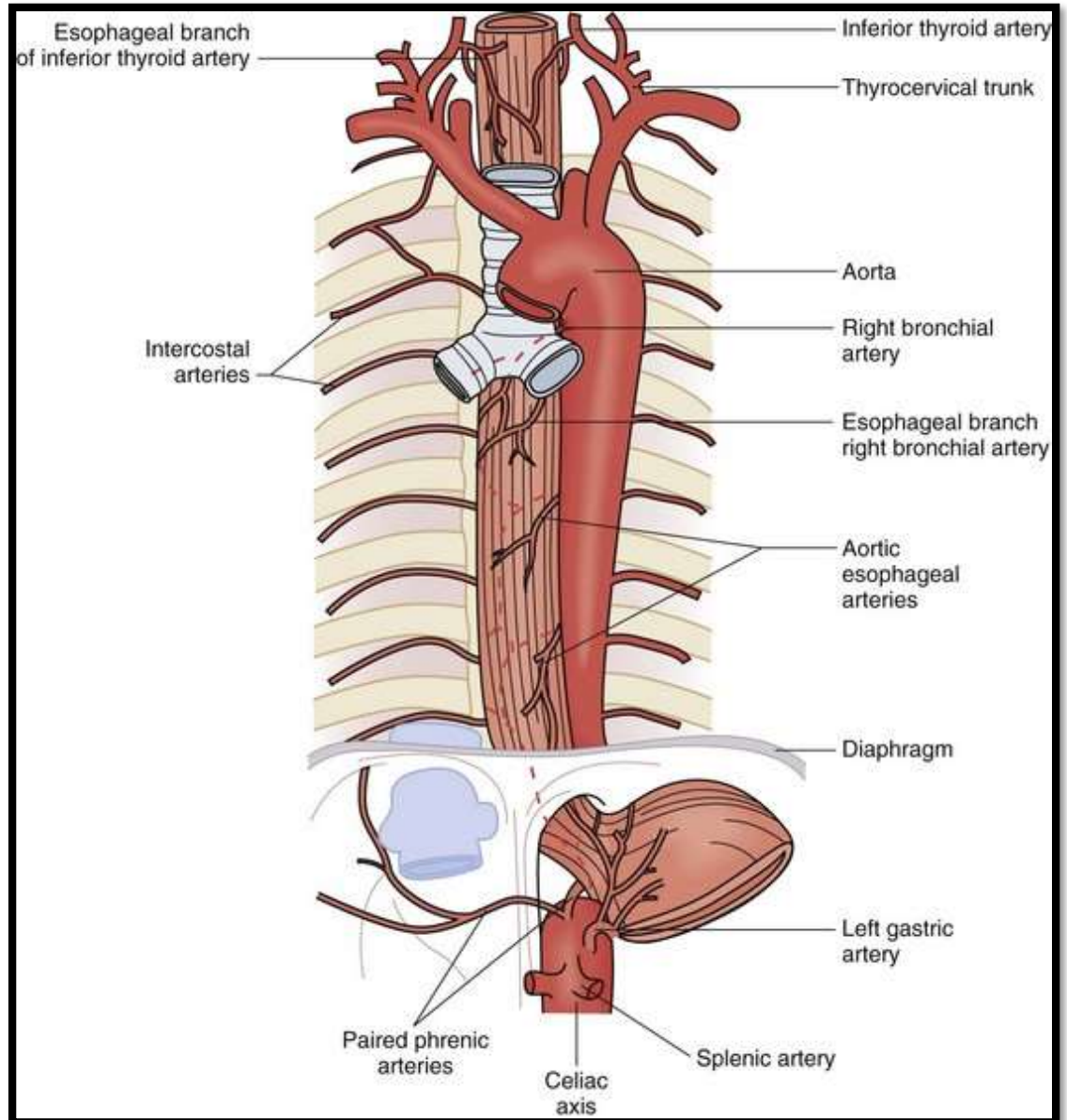
On each side-

- Lobe of thyroid gland.
- Common carotid artery.
- Thoracic duct on left side.



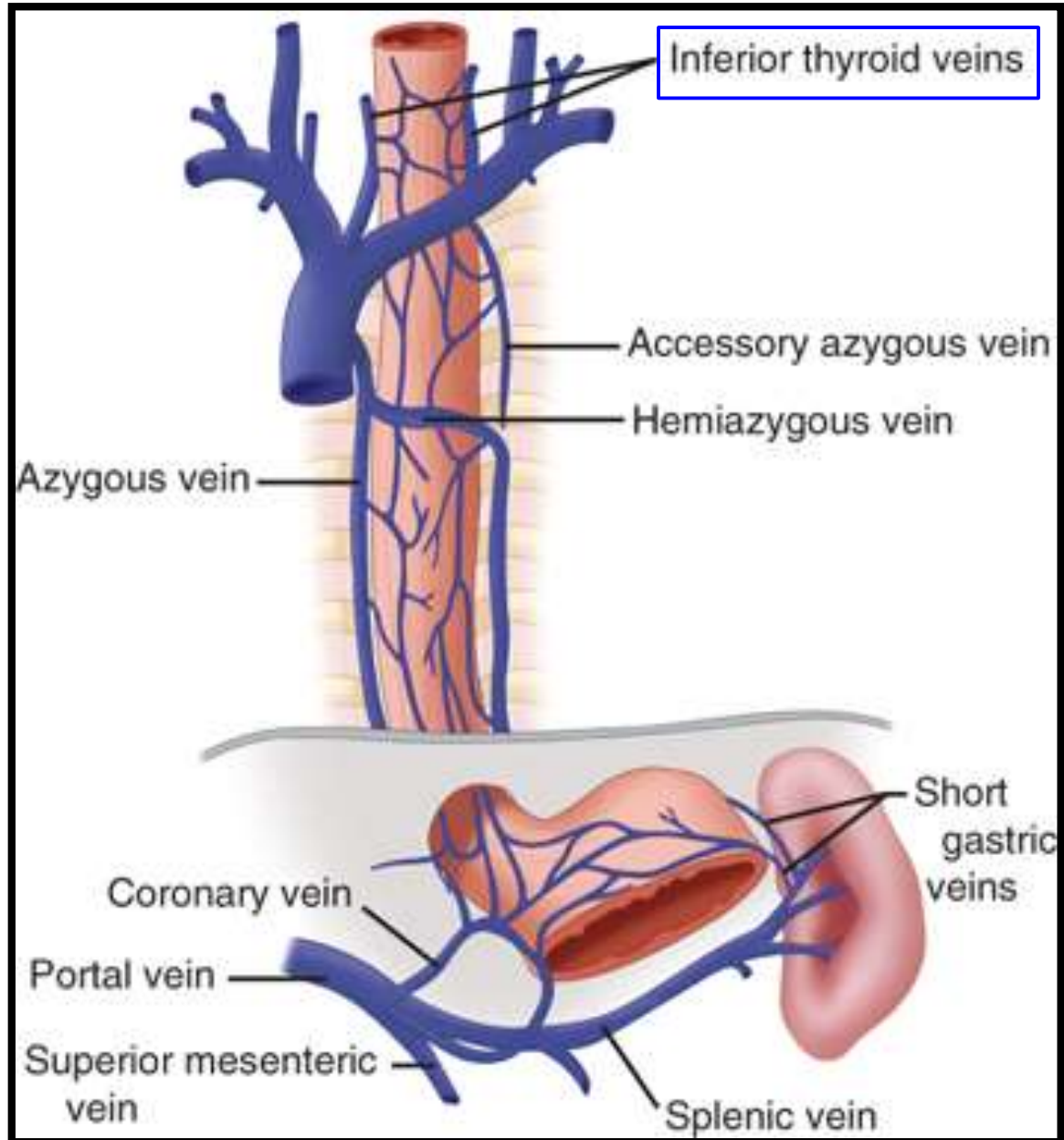
Arterial Supply

- Inferior thyroid arteries.



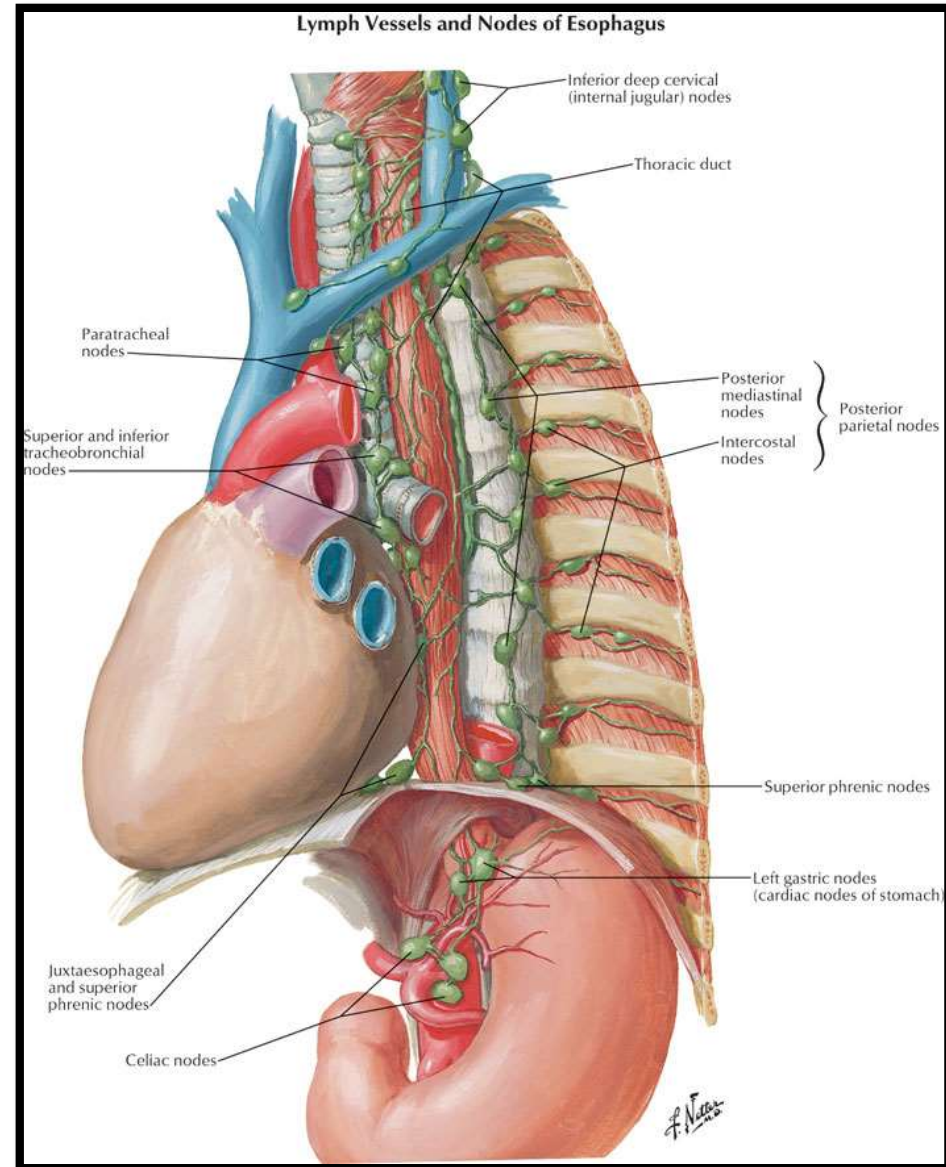
Venous Drainage

- Inferior thyroid veins.
- Left brachiocephalic vein.



Lymphatic Drainage

- Pretracheal lymph nodes.
- Deep cervical lymph nodes.



Thank
you