

Trachea and Bronchi

By

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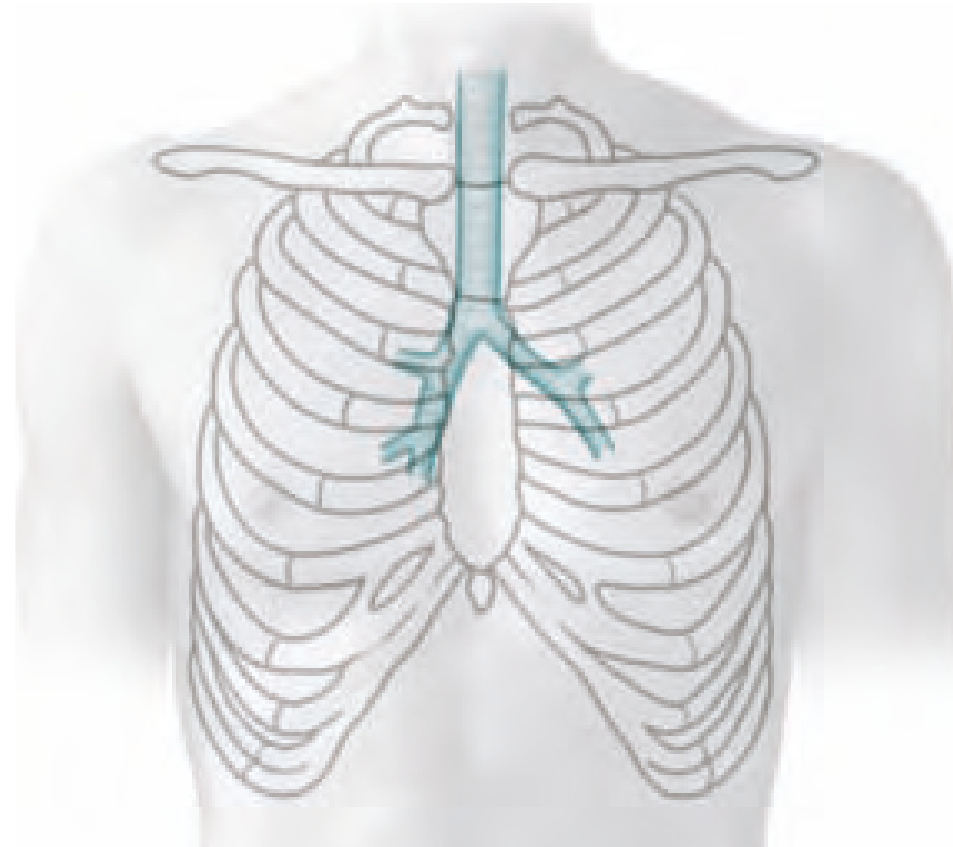
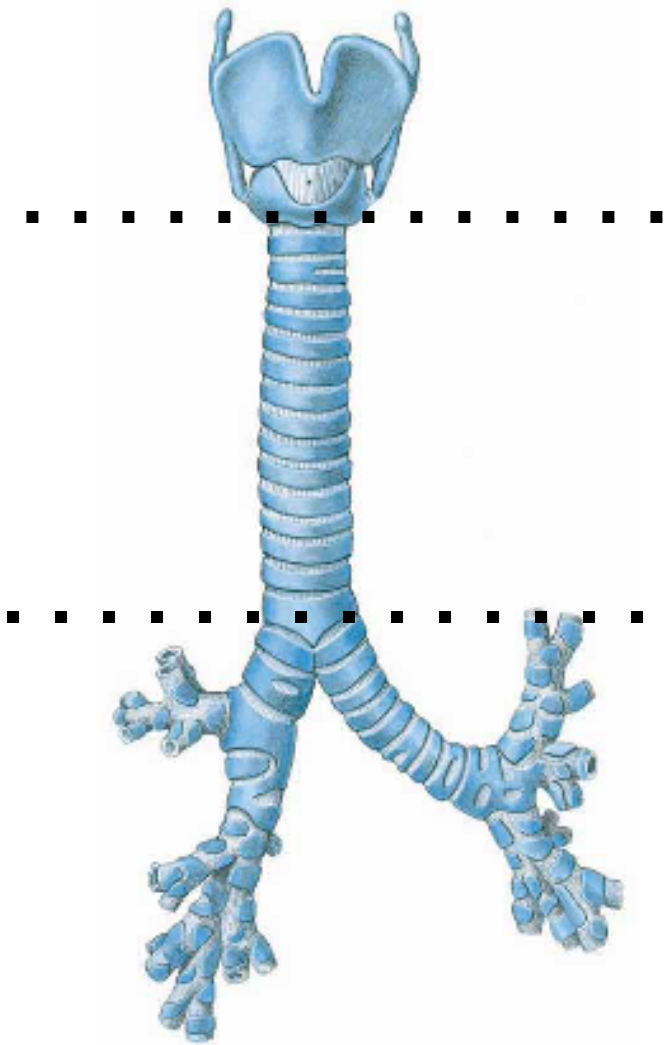
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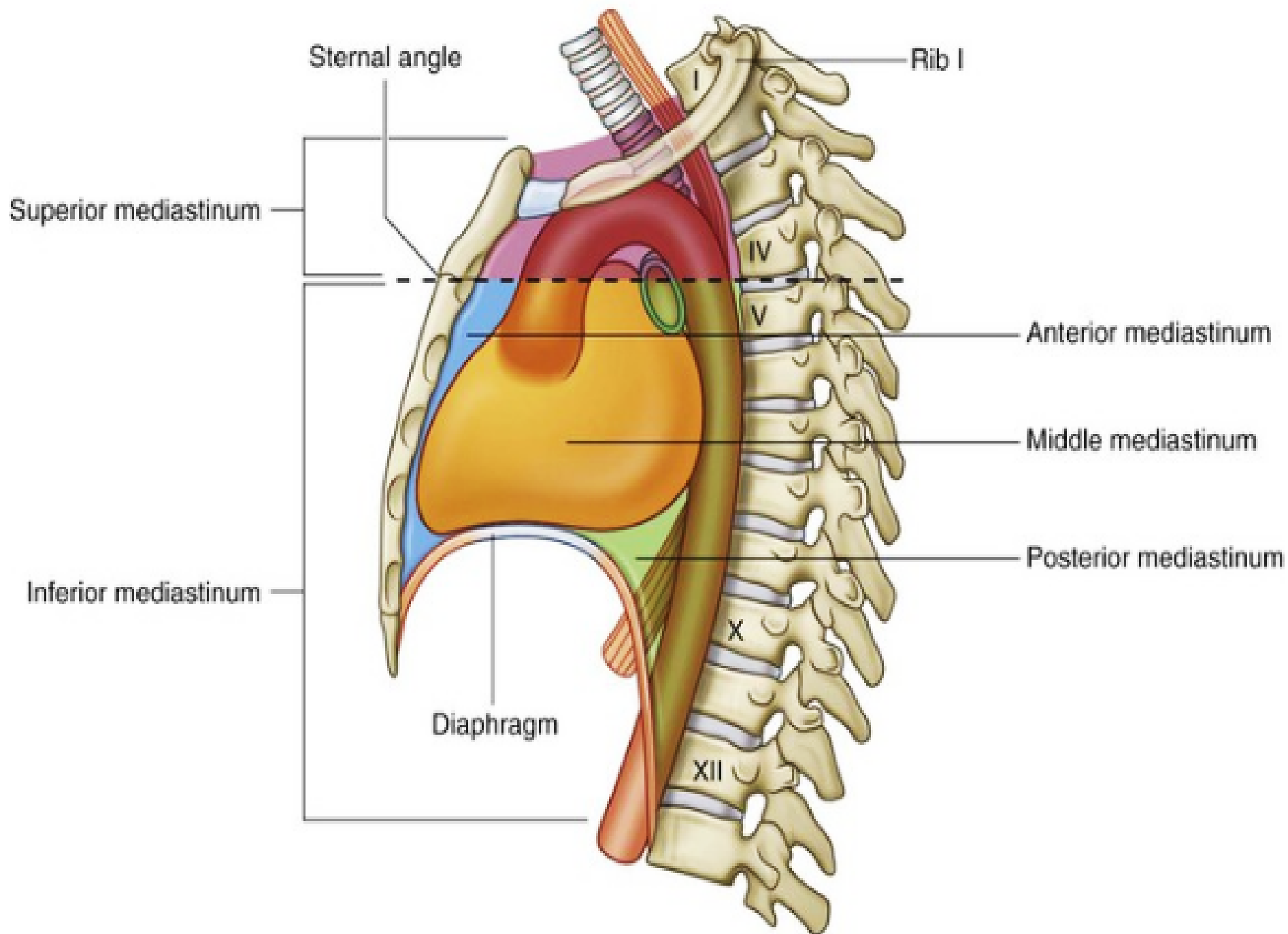
Trachea

C6

T4

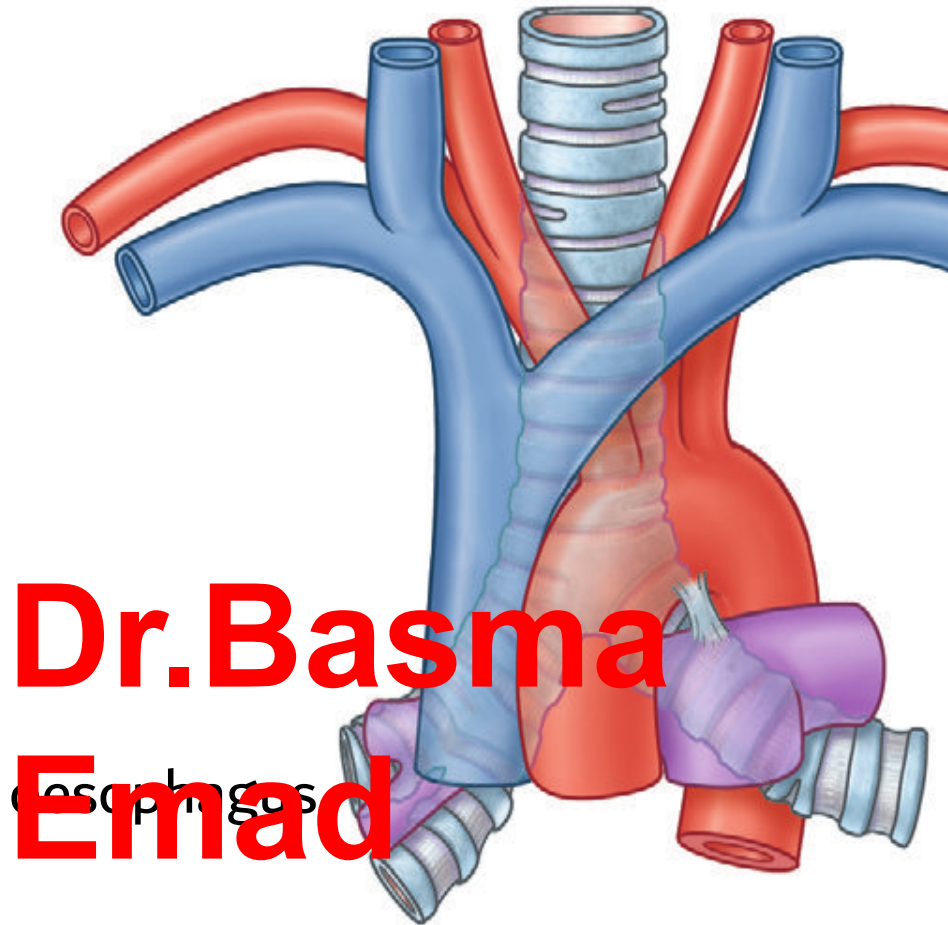


Beginning: in the neck, at the level of the lower border of C6, as a continuation of the larynx,
End: in the thorax, at the level of sternal angle (disc between T4/T5) by dividing into 2 principal bronchi.
Length: 4-5 inches (10-12 cm)
Diameter: 1/2-3/4 inch (1½-2 cm) (Diameter 3 mm at birth)
Upper 1/2 lies in neck (cervical part)- Lower 1/2 lies in thorax (thoracic part).
Thoracic part of trachea spans whole superior mediastinum from suprasternal notch to sternal angle.

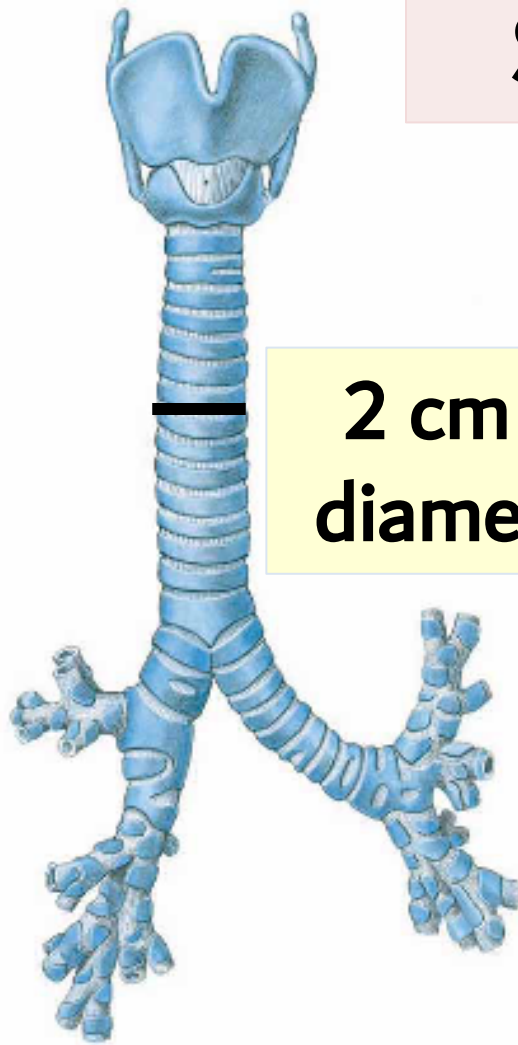


Events at level of sternal angle of Louis

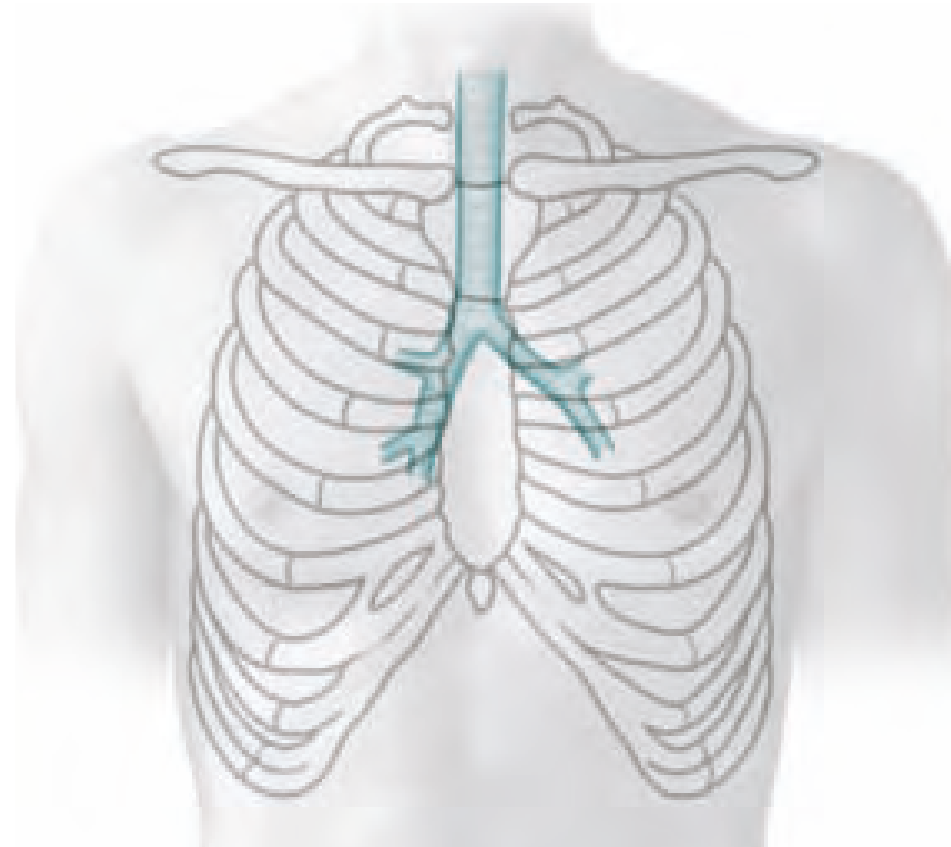
- end of ascending aorta
- Beginning and end of **aortic arch**
- Beginning of descending aorta
- Division of **pulmonary trunk**.
- **Azygos vein** joins SVC.
- **Thoracic duct** reaches left side of esophagus
- Bifurcation of trachea and **deep cardiac plexus** on it.
- The **ligamentum arteriosum** and **superficial cardiac plexus** on it.



Surface anatomy

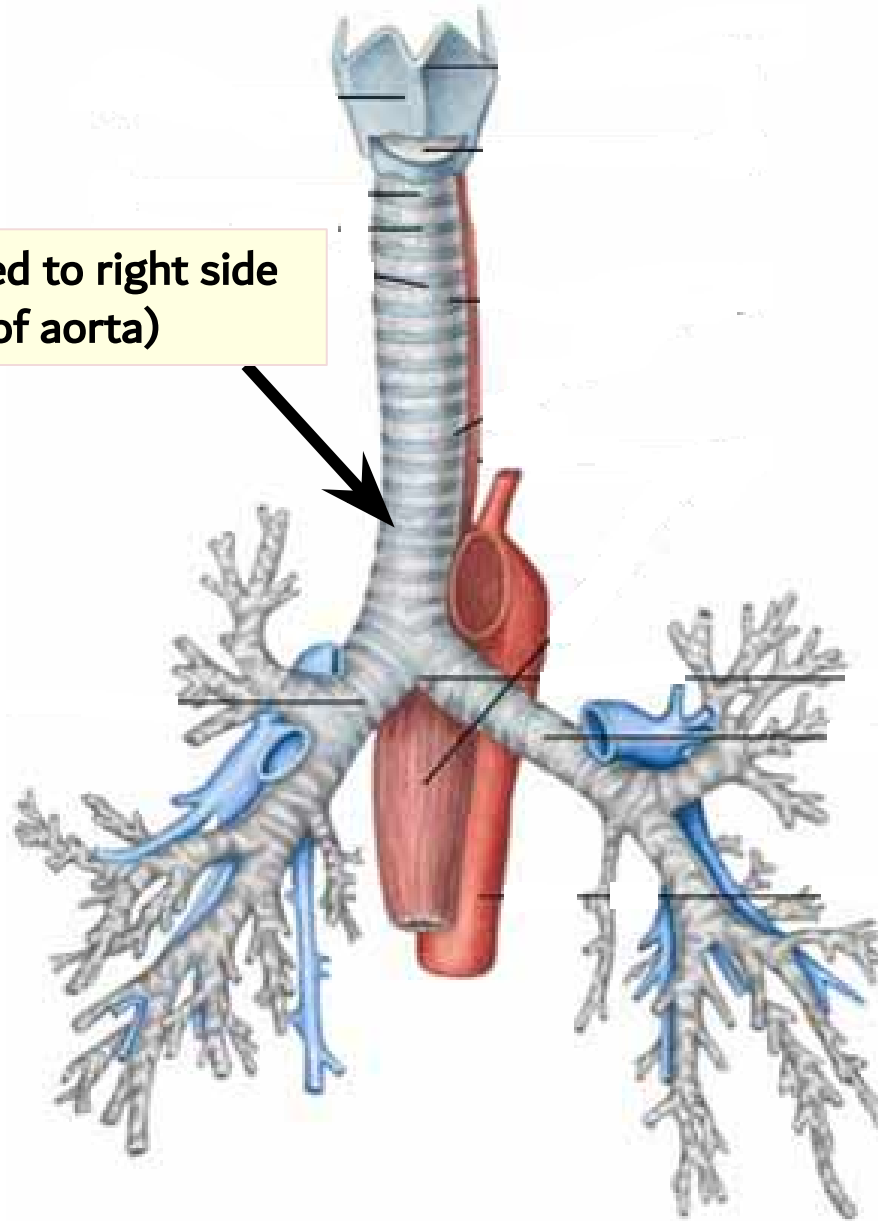


**2 cm in
diameter**



The surface anatomy of trachea can be represented by a band, 2 cm wide drawn in the middle line from the lower border of the larynx to the sternal angle just to the right of the median plane

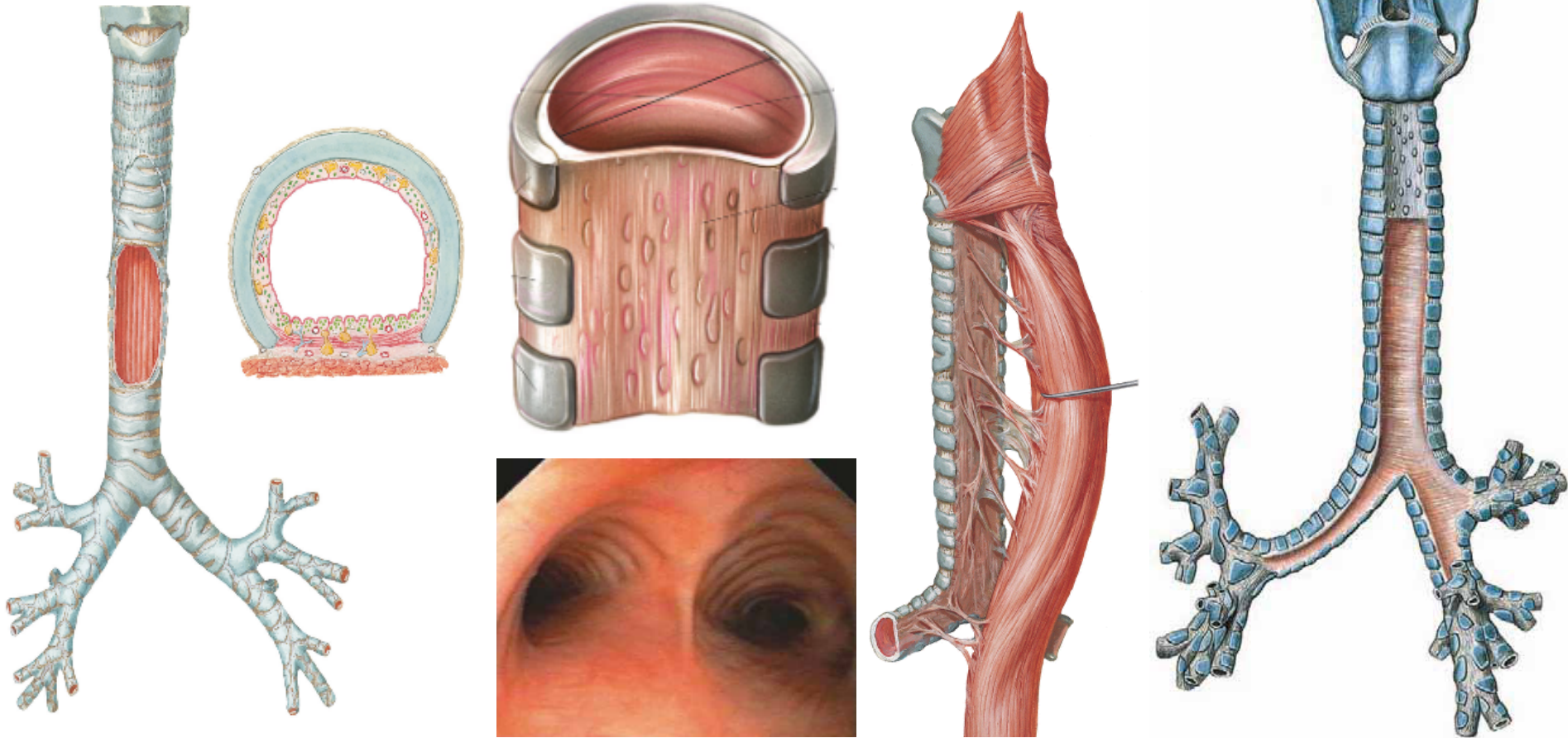
Trachea slightly deviated to right side
(pushed by arch of aorta)



Trachea lies exactly in **middle line** except at its lower end where it **deviates** slightly to right (pushed by the arch of the aorta).

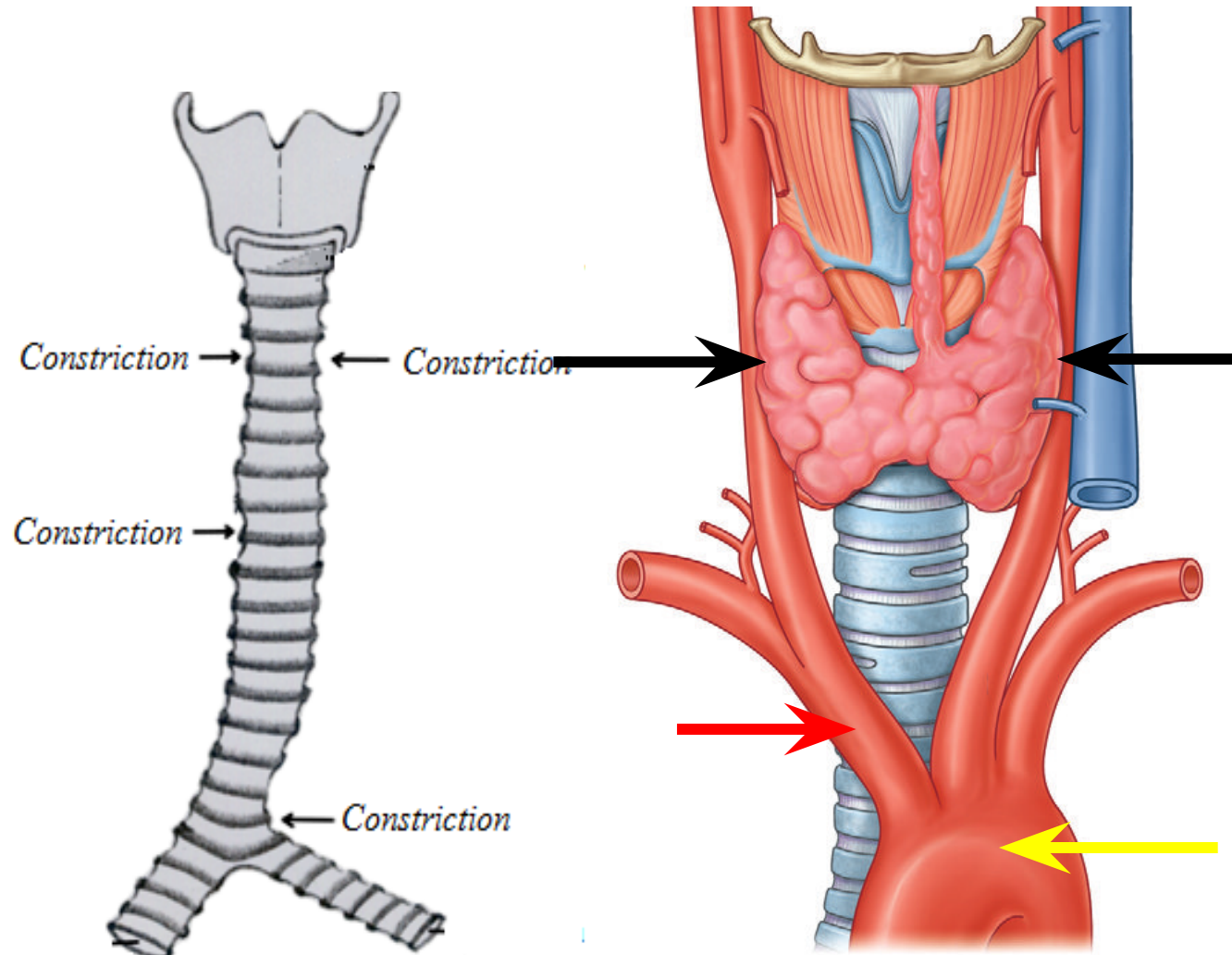
As it descends, it **recedes** from surface to follow curvature of vertebral column.

Structure of Trachea

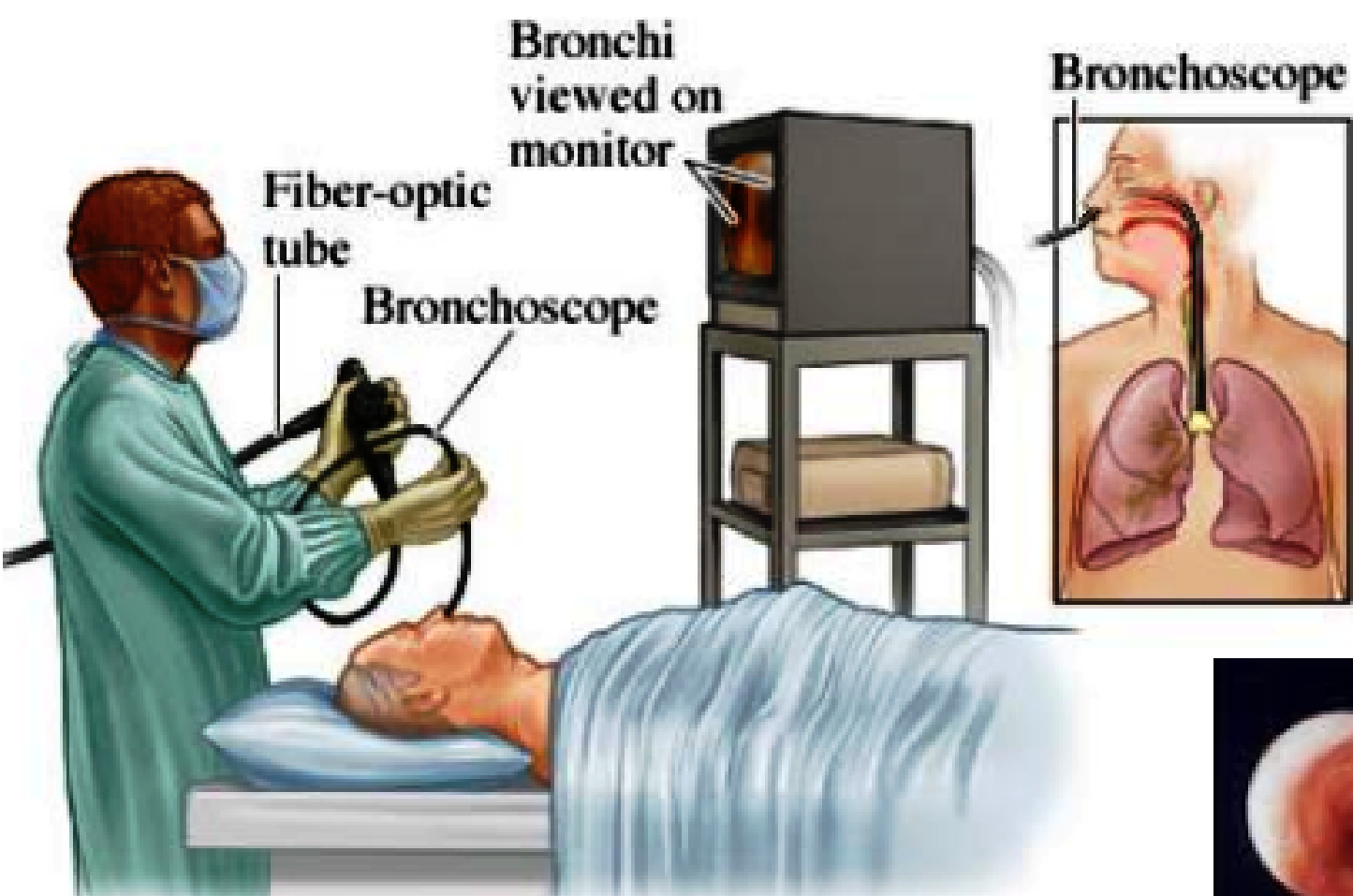


- Trachea is an elastic tube (**can be stretched**)-
- Kept patent by 16-20 C-shaped (incomplete) cartilagenous rings.
- Opening of C is directed backwards to allow distension of the oesophagus during swallowing.
- 2 ends of each cartilagenous ring are connected by smooth muscle fibres (**trachealis ms**).
- Lower border of last cartilagenous ring projects upwards inside cavity of trachea, forming ridge between 2 bronchi called the **carina**.

Constrictions of Trachea



- ☐ at upper end, by **thyroid gland**.
- ☐ at middle, by **brachiocephalic artery**, on its **right side**.
- ☐ at lower end, by **arch of aorta**, on its **left side**.

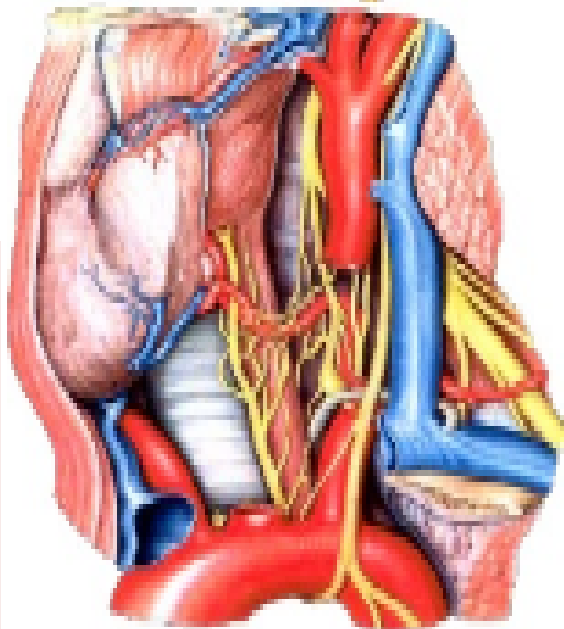
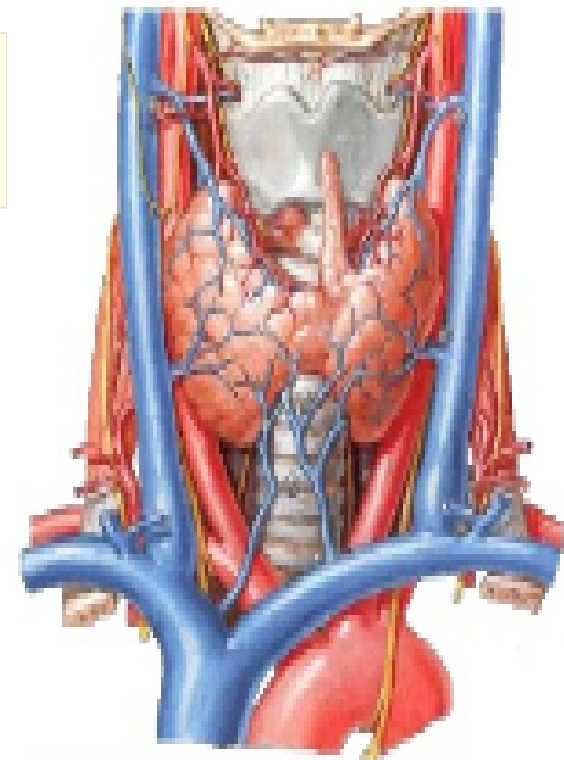


Relations of Trachea

**Tube in midline
????**

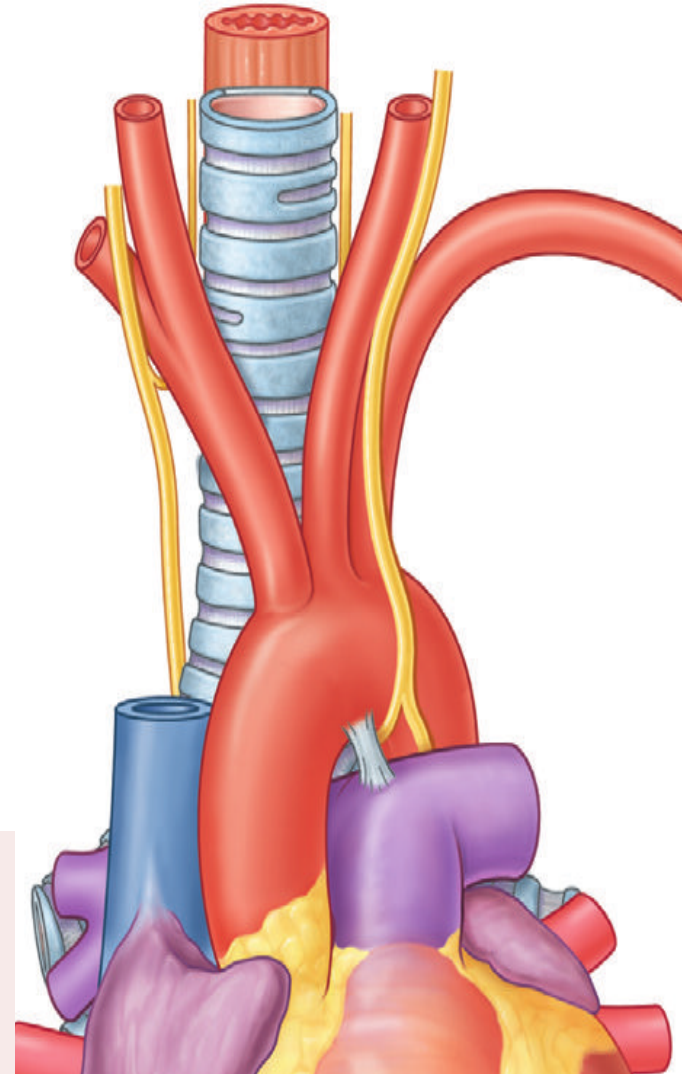
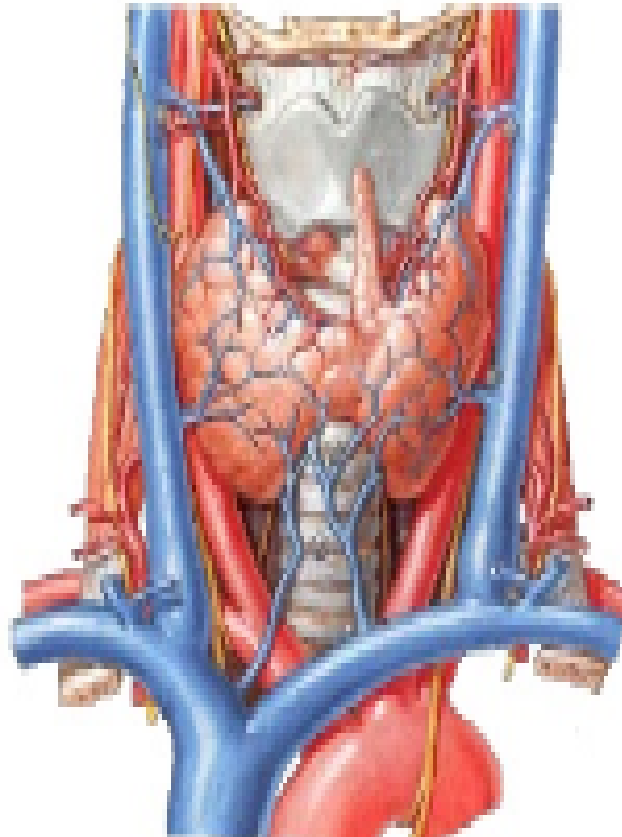
- **Anterior**
- **Posterior**
- **Right**
- **Left**

Anterior Relations of cervical part of Trachea



- 1- Skin and fascia.
- 2- Muscles: Sternohyoid and sternothyroid.
- 3- Isthmus of thyroid gland covers 2nd, 3rd and 4th rings.
- 4- Blood vessels: thyroidea ima artery, inferior thyroid veins, jugular arch & anastomosis between both superior thyroid a.
- 5- Lymph nodes: pretracheal.

Relations of cervical part of Trachea

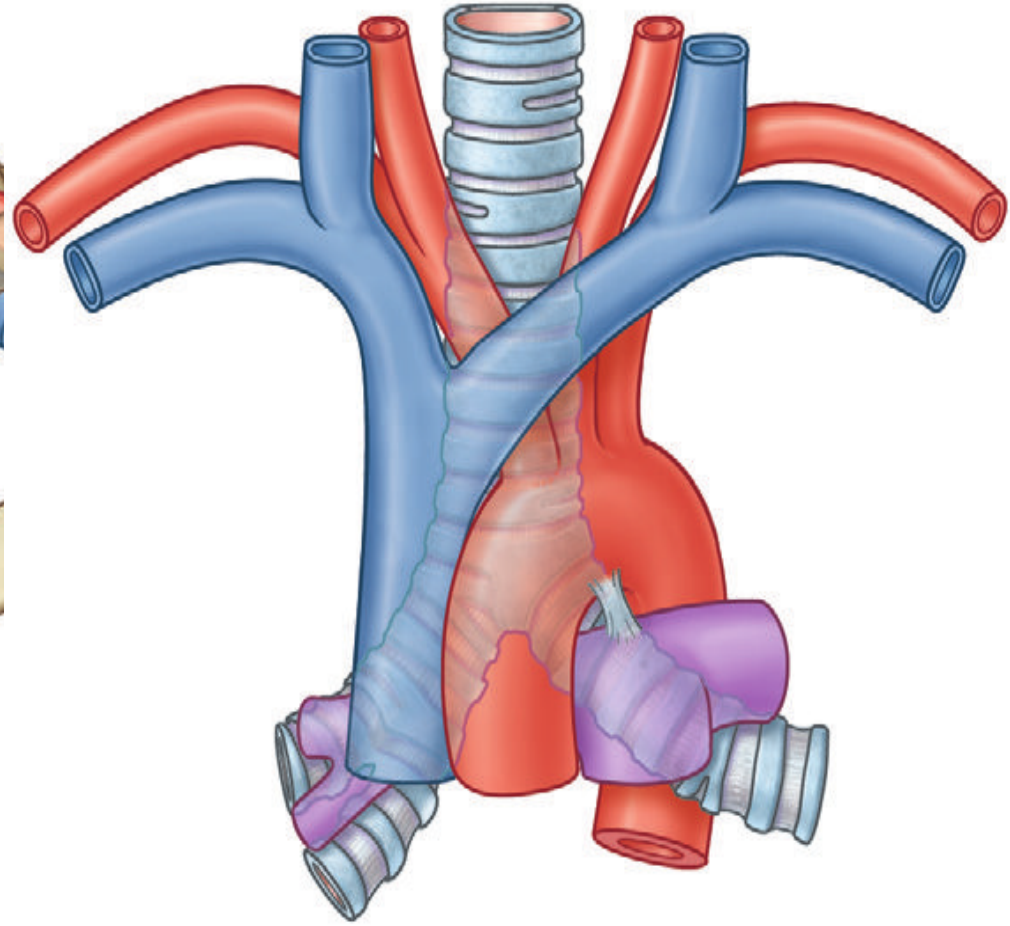
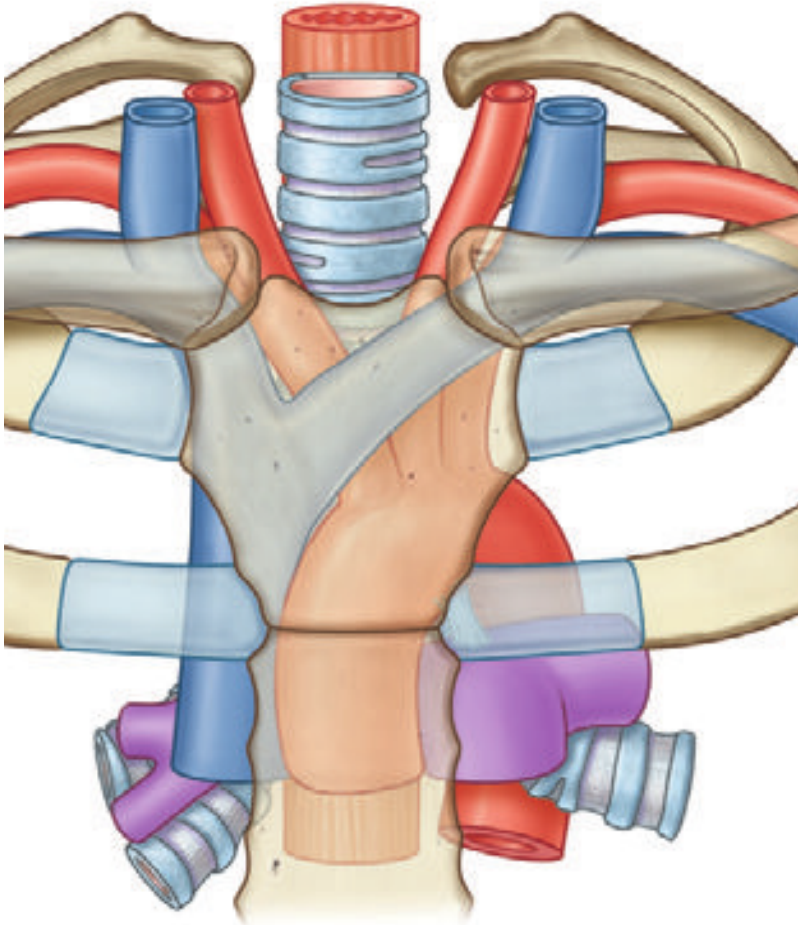


Posteriorly: Oesophagus and recurrent laryngeal nerves.

On each side:

- 1- Lobe of thyroid gland.
- 2- Common carotid artery.
- 3- Inferior thyroid artery.

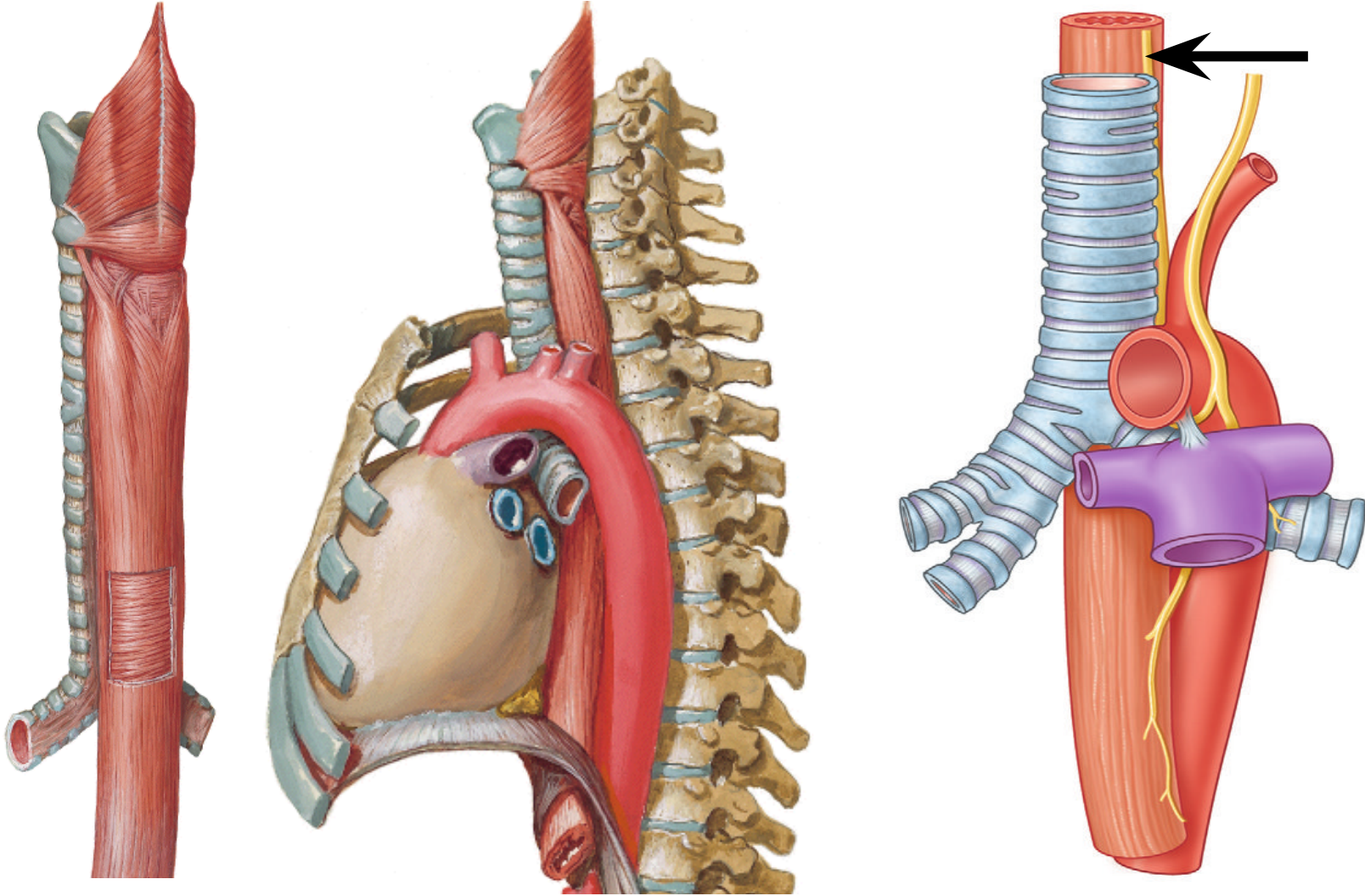
Anterior Relations of thoracic Trachea



Anteriorly; from before backwards:

- i) Manubrium sterni.
- ii) Left brachiocephalic vein running obliquely along upper aspect of arch of aorta
- iii) Arch of aorta and origins of brachiocephalic and LCC.

Posterior Relations of Trachea

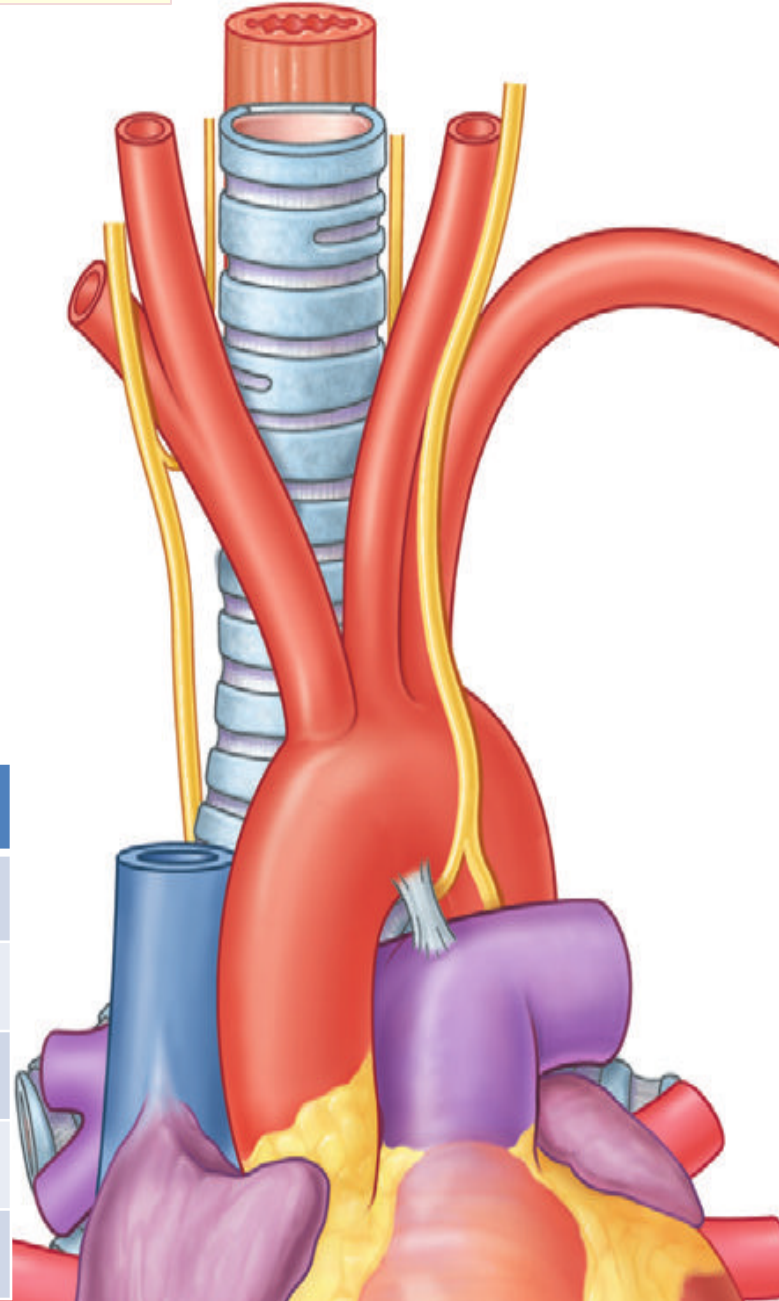


Posteriorly:

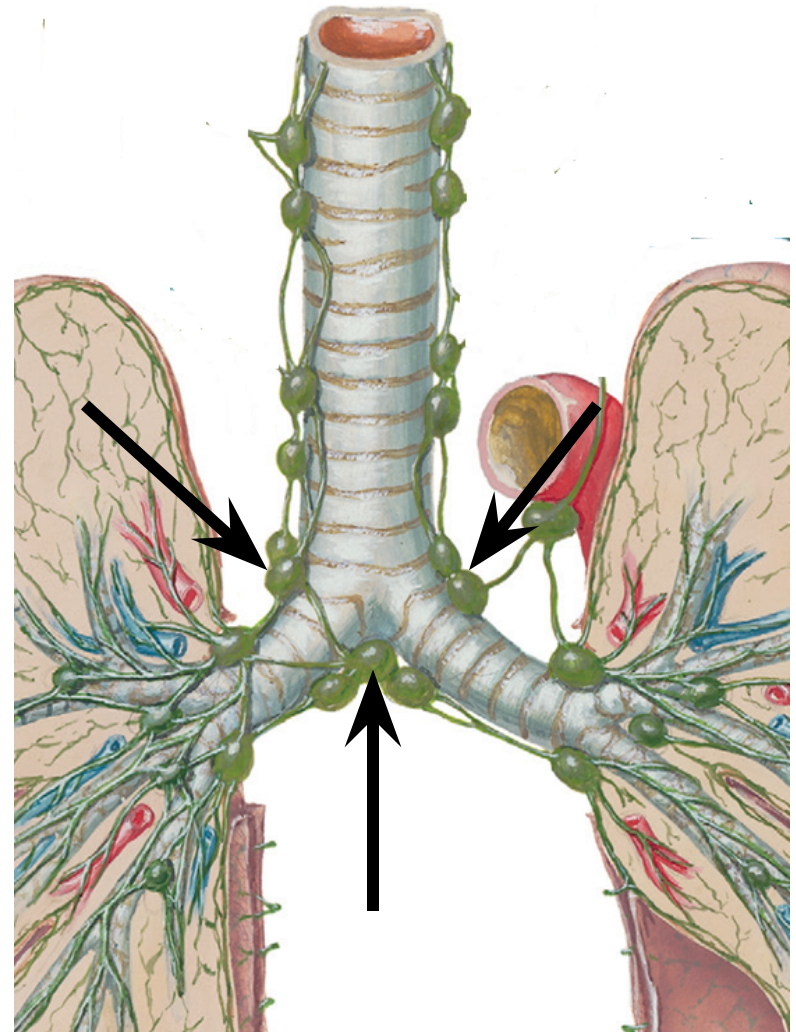
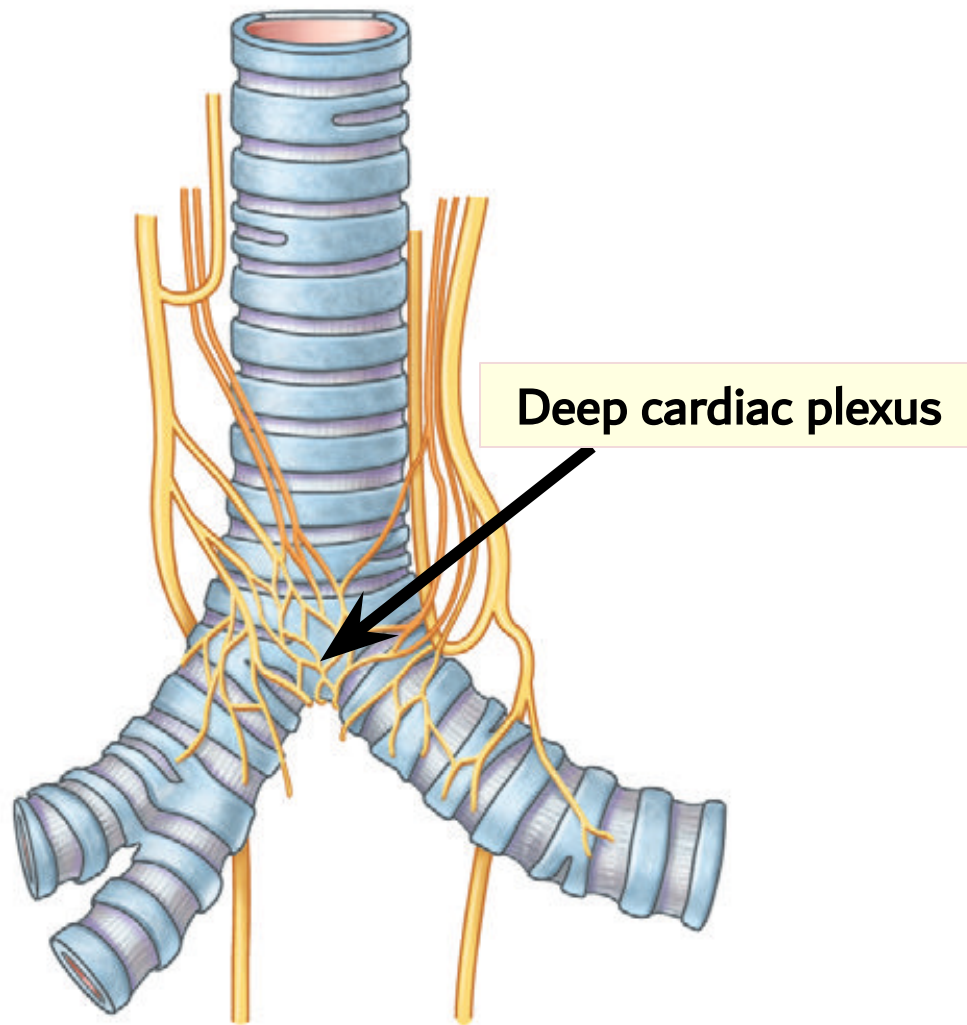
- i) The esophagus separates the trachea from the vertebral column.
- ii) The left recurrent laryngeal nerve lies between the trachea and esophagus.

Right and left relations

Right relations	Left relations
Right lung & pleura	Left lung & pleura
Arch of Azygos (+SVC)	Arch of aorta
Brachiocephalic artery	LCC & left subclavian
Paratracheal LNs	Paratracheal LNs
Right vagus	



Relations at bifurcation of trachea



- Deep cardiac plexus, on the front and sides of the bifurcation
- Three groups of tracheobronchial LNs, at 3 angles between trachea and 2 bronchi

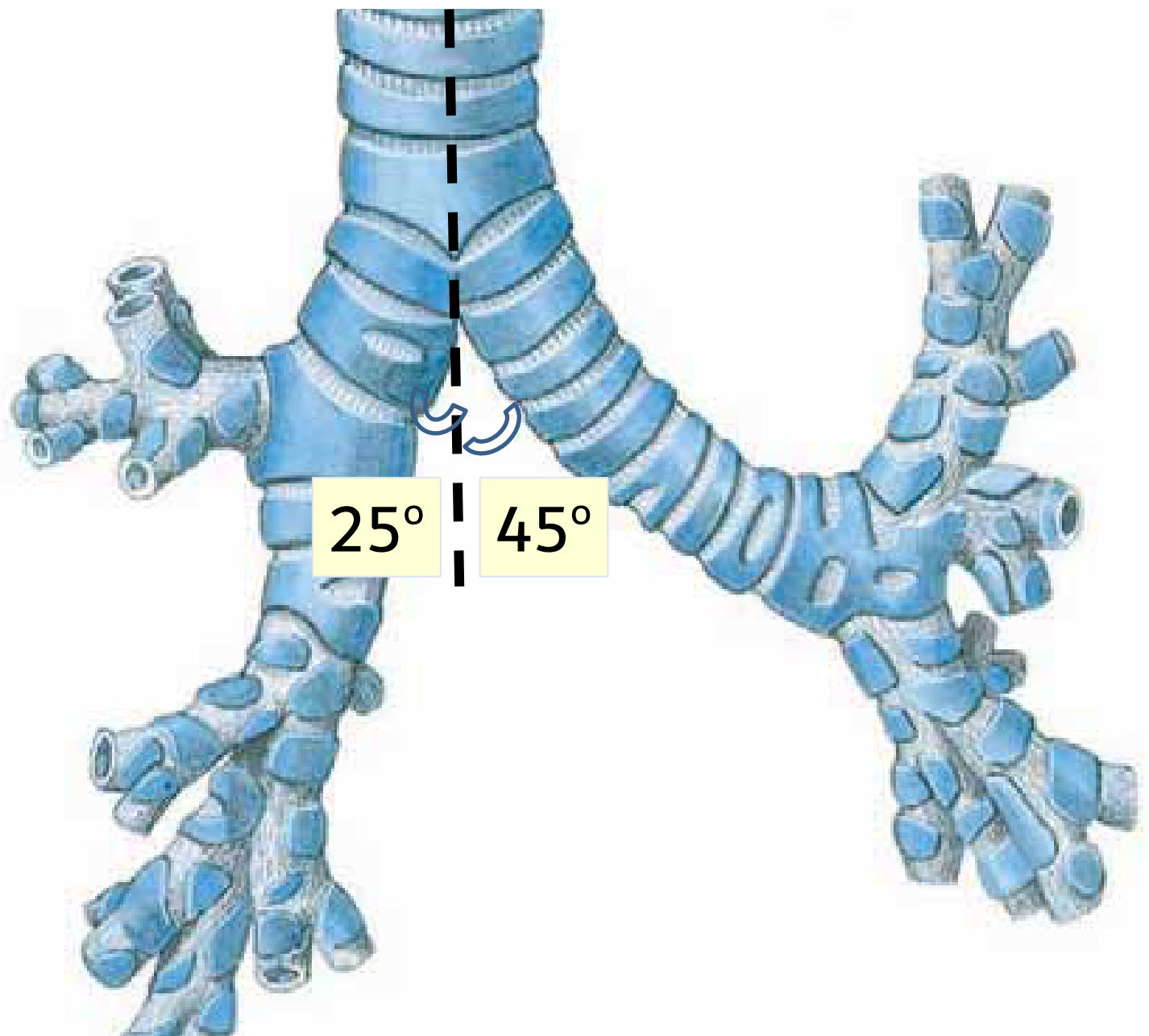
Supply of trachea

Arterial supply: from bronchial arteries.

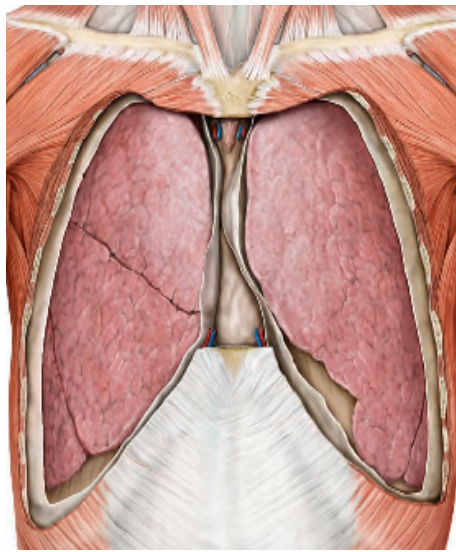
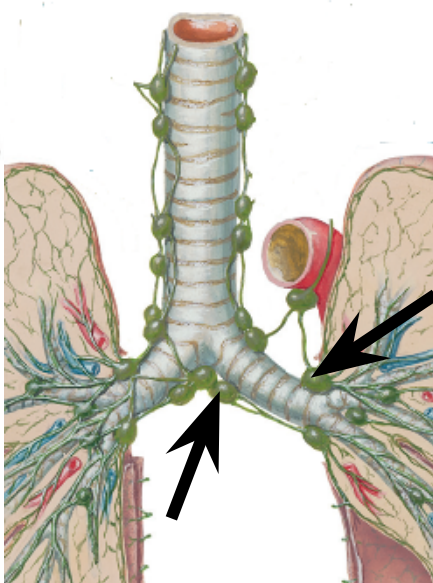
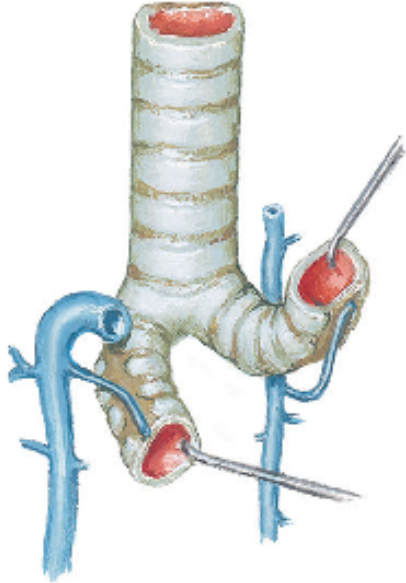
Venous drainage: via bronchial veins to azygos system of veins.

Lymphatics drain to tracheobronchial and paratracheal lymph nodes.

Nerve supply: autonomic fibres from 2 vagi & their recurrent laryngeal branches and from sympathetic chains.



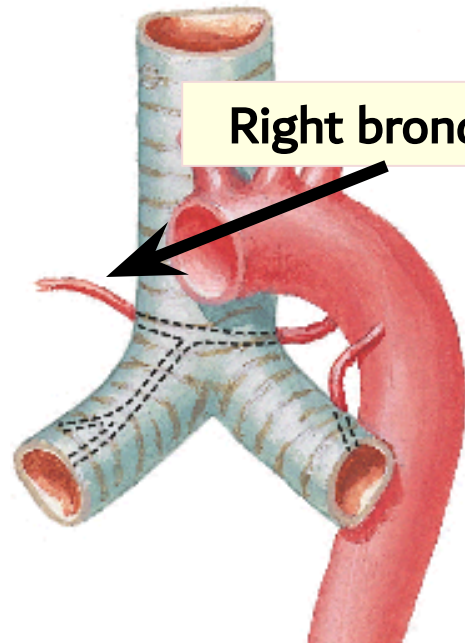
They **arise** from lower end of the trachea at the level of the sternal angle (disc between T4/T5). There, the trachea bifurcates into 2 principal (main) bronchi (right and left), one for each lung.



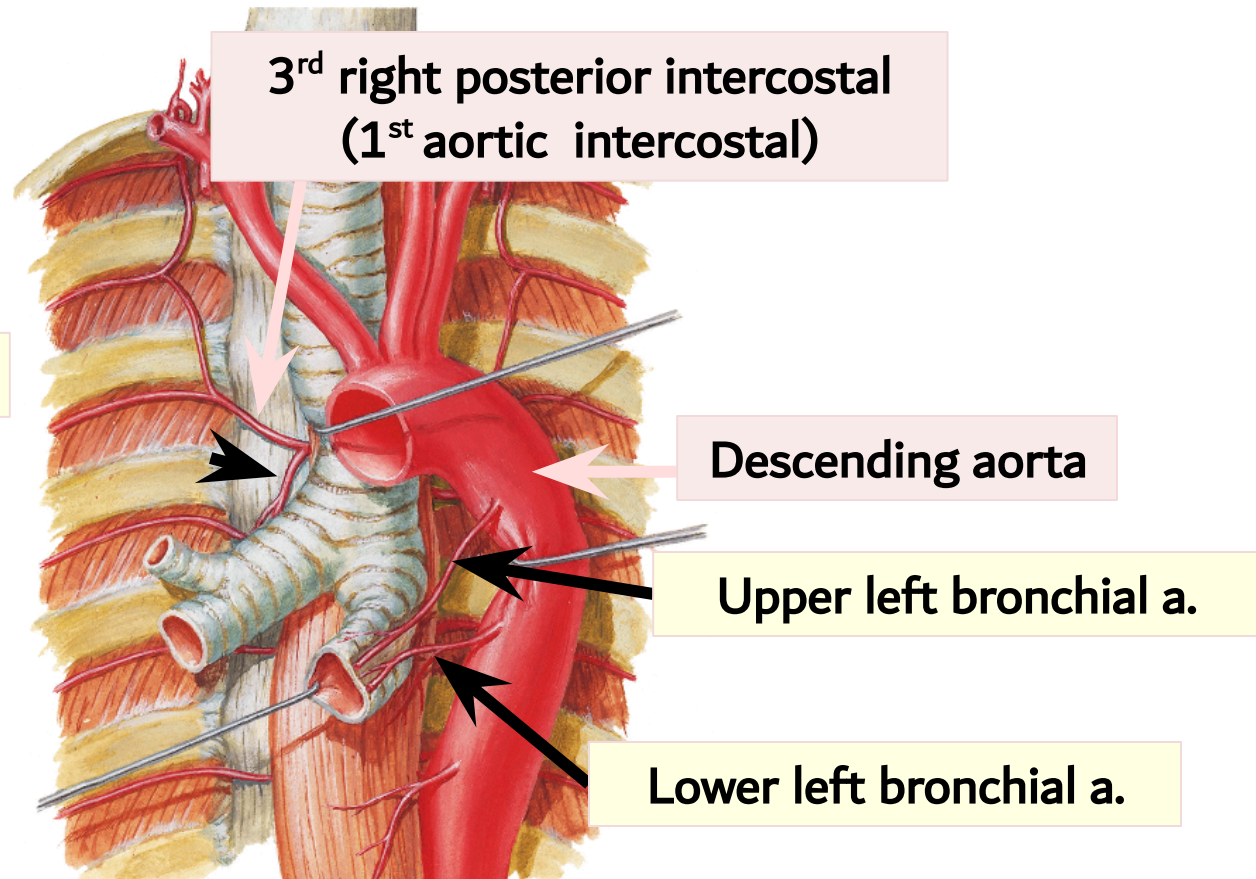
Right bronchus

Left Bronchus

Shorter (1 inch) (Trachea inclined to right)	Longer (2 inches)
Wider (Right lung larger)	Narrower
More vertical (angle 25°)	More oblique (angle 45°)
Divides into 3 lobar bronchi (superior, middle and inferior)	Divides into 2 lobar bronchi (superior and inferior)
Receives 1 (right) bronchial artery.	Receives 2 (left) bronchial arteries
Venous drainage ends into azygos vein	Superior and inferior hemiazygos veins.
Same lymphatic drainage (Tracheo-bronchial and Broncho-pulmonary LNs)	
Same nerve supply (Parasymp: Vagus and Sympathetic: anterior and post. Pulmonary plexus)	



Right bronchial a.



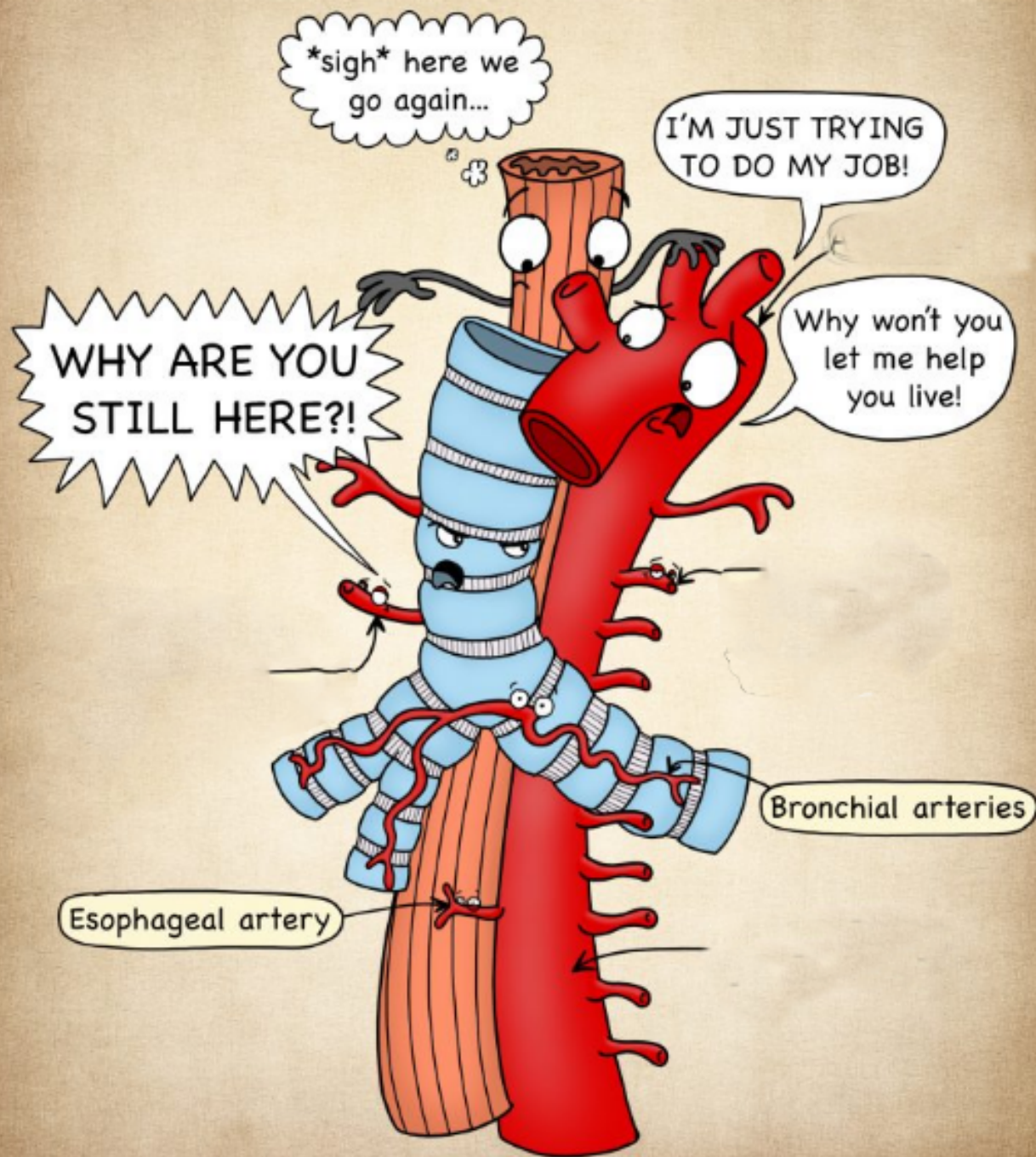
3rd right posterior intercostal
(1st aortic intercostal)

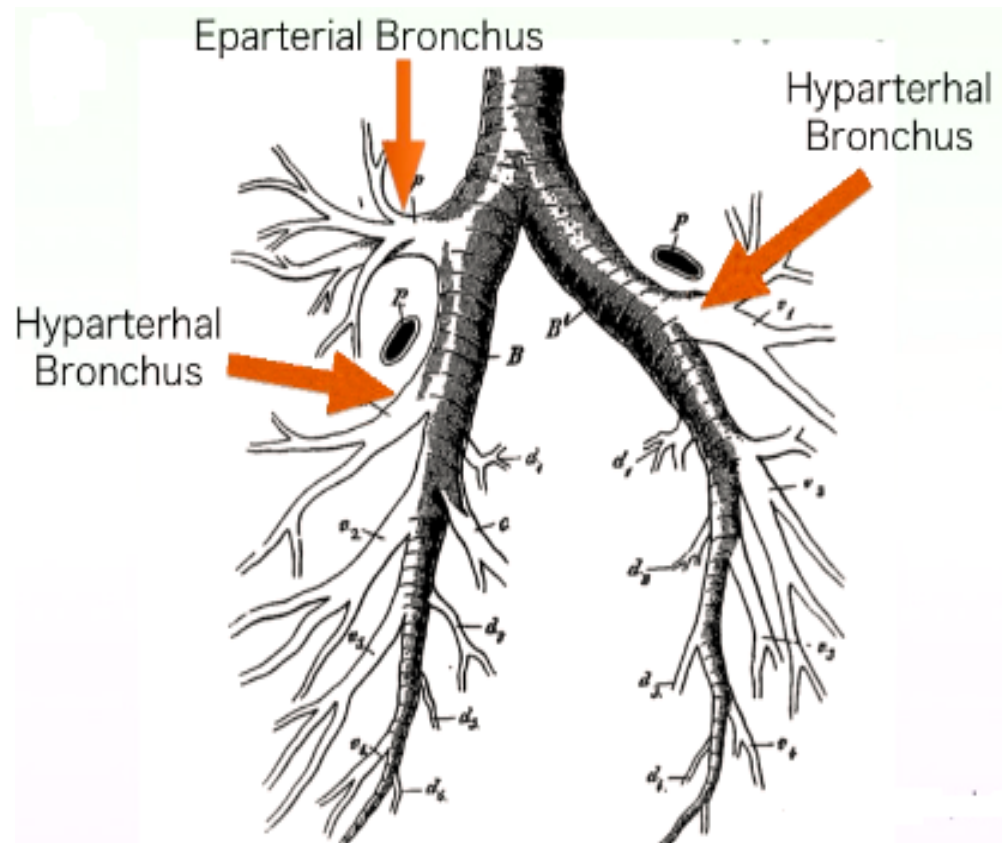
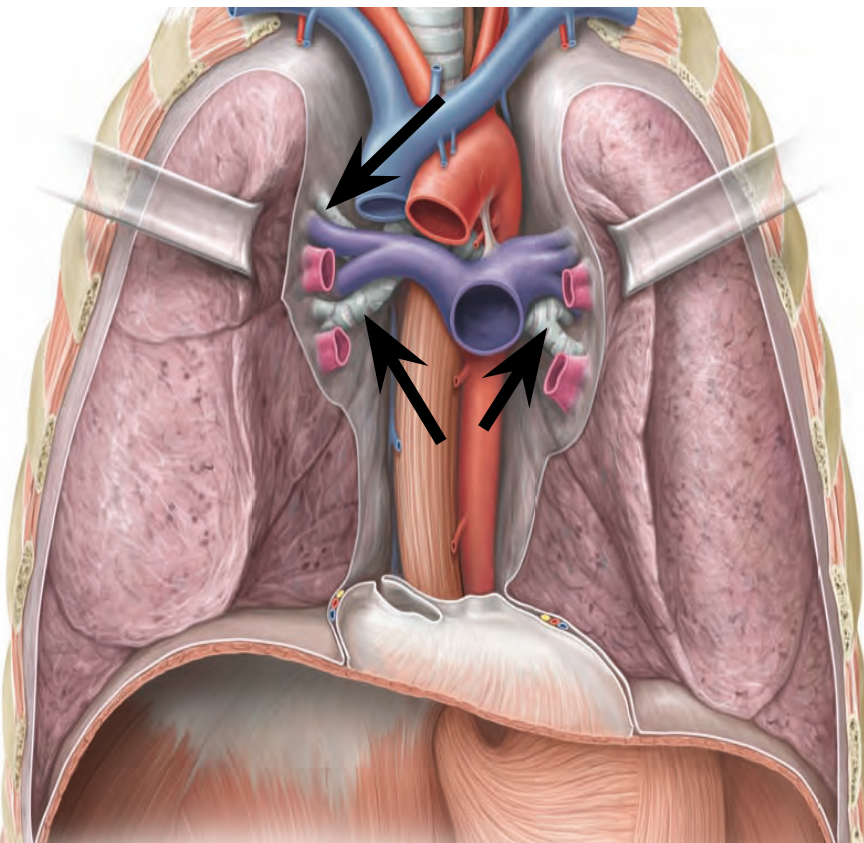
Descending aorta

Upper left bronchial a.

Lower left bronchial a.

Right bronchus	Left Bronchus
1 (right) bronchial artery.	2 (left) bronchial arteries
arises from:	arise form:
3 rd right posterior intercostal or Upper left bronchial artery.	descending thoracic aorta.





Right bronchus

The superior lobar (eparterial) bronchus arises outside the hilum.

Left Bronchus

Divides into 2 lobar bronchi (superior and inferior) to 2 lobes of lung, as it enters the hilum

Applied Anatomy

- 1-** The **trachea** may be compressed or displaced by enlargement of lymph nodes or arch of aorta.
- 2-** The **carina** may become wider or distorted (seen by a bronchoscope) if the inferior tracheobronchial lymph nodes are involved in cancer.
- 3-** A **foreign body** which may enter trachea will pass more commonly to **right** bronchus because it is wider and more in line with the trachea.

وَقُلِ الْحَمْدُ لِلَّهِ

