

Lower Respiratory Tract -Handout (3) Lung Innervation & Mediastinum

★ Lung Innervation

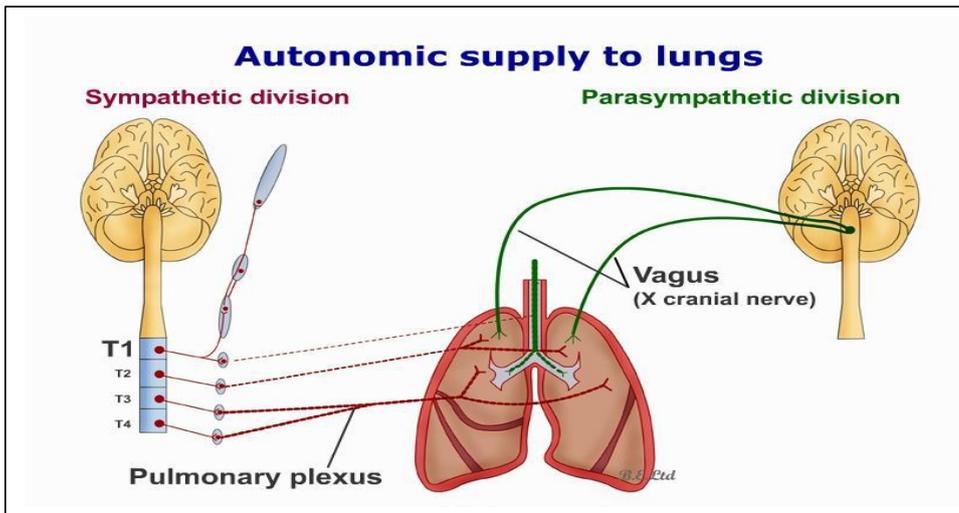
Nerves of the lung and visceral pleura are derived from the pulmonary plexuses anterior and (mainly) posterior to the roots of the lung .

These nerve networks contain = **Parasymp** fibers + **Symp** fibers + **Visceral afferent** fibers

Source	CN X -Presynaptic
Motor	Bronchoconstrictors
Secretory	secretomotor
Vessels	Vasodilator

Source	T1-T4
Motor	Bronchodilators
Vessels	Vasoconstrictors

-Can be reflexive or nociceptive (conducting pain impulses)
Nociceptive afferent fibers from the **visceral pleura and bronchi** accompany the **sympathetic** fibers through the symp trunk to the **sensory ganglia of upper thoracic spinal nerves**, whereas those **from the trachea** accompany the **parasymp** fibers to the **sensory ganglion of CN X**.



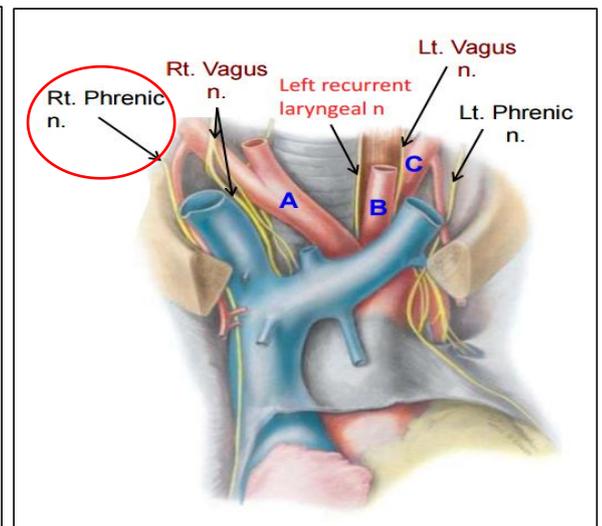
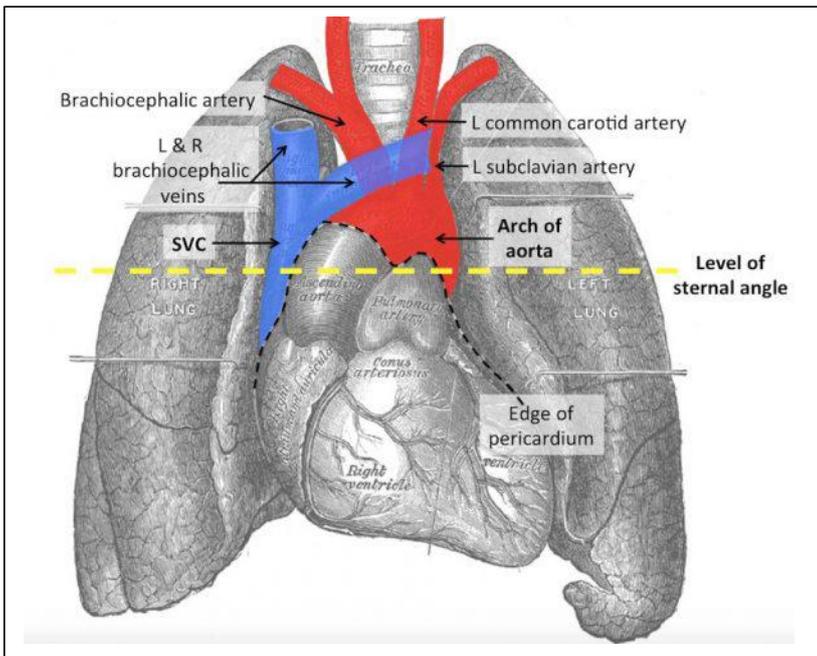
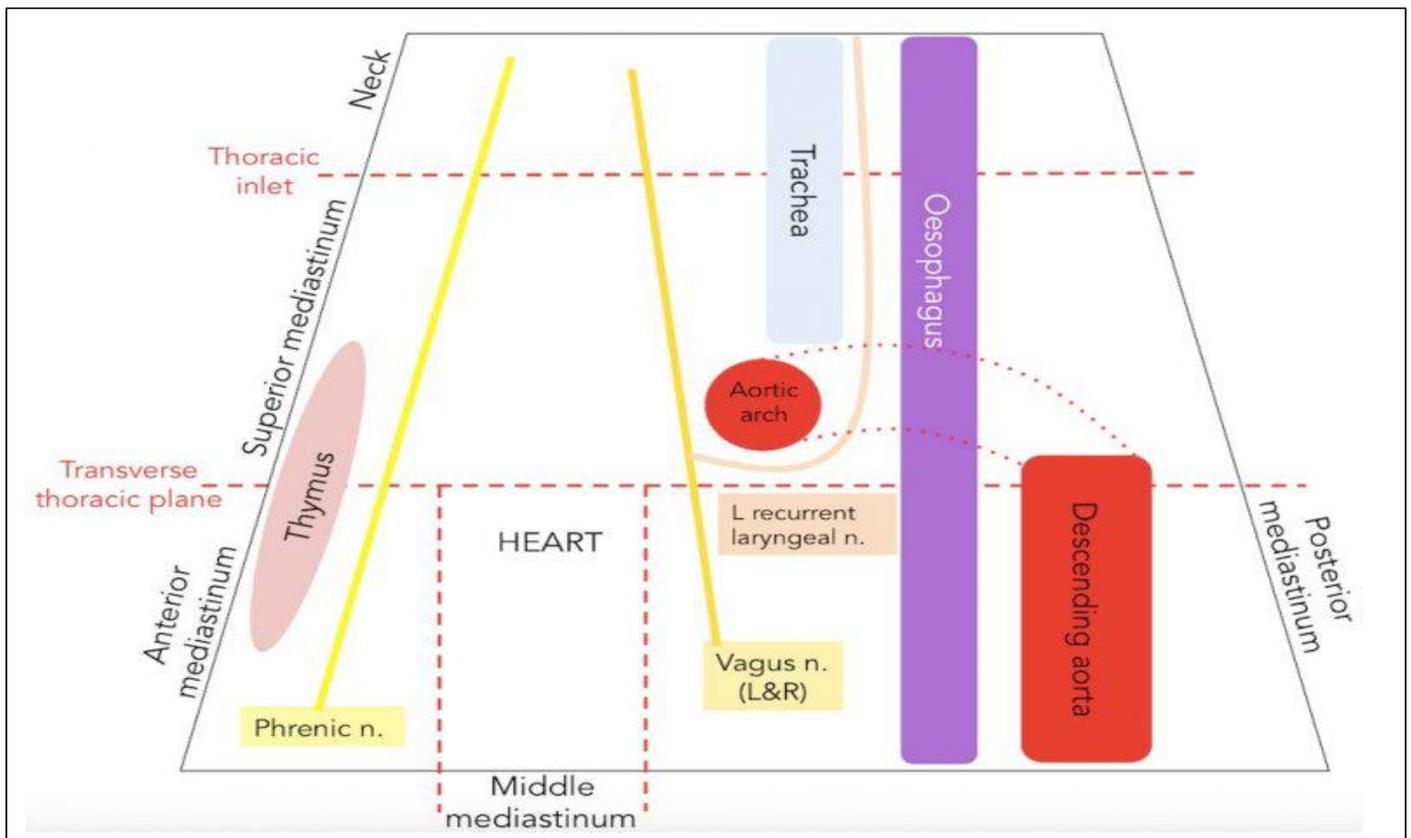
Mediastinum

Location	B/w the 2 pul cavity , considered to be the central compart. of the thoracic cavity . Covered on each side by mediastinal pleura
Boundaries	Ant » Post :Sternum and Costal cartilages & Bodies of thoracic vertebrae Sup » Inf : Sup thoracic aperture & Diaphragm
Subdivisions	Superior Mediastinum extends inferiorly from the superior thoracic aperture to the horizontal plane that includes the sternal angle anteriorly and passes approximately through the junction (IV disc) of T4 and T5 vertebrae posteriorly Inferior Mediastinum » further subdivided into : Ant inf Mid inf » Where the heart resides Post inf

(1) Sup Mediastinum

Contents :

Arteries	★ Arch of the aorta ★ Major branches of aortic arch : Innominate a , Lt SCA , Lt common carotid a
Veins	Rt and Lt innominate vv & upper pt of SVC ,Azygos v
Tubes	Oesophagus , Trachea , thoracic duct
Nerves	The 2 vagi Phrenic nerves Lt recurrent laryngeal n (not the Rt) +Sympathetic Trunk Superficial & Deep Cardiac Plexus
Others	Thymus gland (r/t to both sup and ant media) & LNs



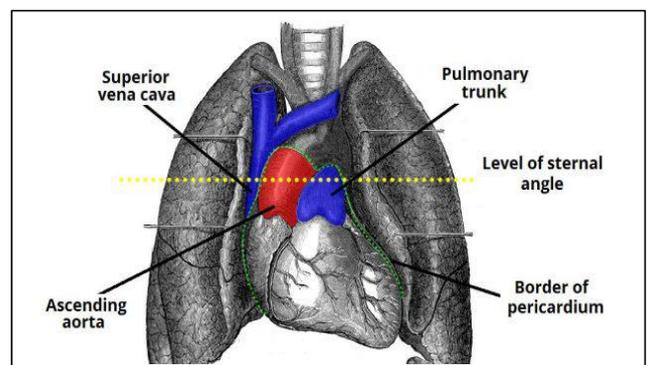
From the anterior surface of the anterior scalene muscle, the phrenic nerves (roots C3, C4 and C5) enter the superior mediastinum lateral to the great vessels. They then descend anteriorly into the middle mediastinum, passing anteriorly to the hilum of the lungs.

(2) Ant Mediastinum ▶

contains no major structures.
some lymphatic vessels, lymph nodes and branches of the internal thoracic vessels + **Thymus**

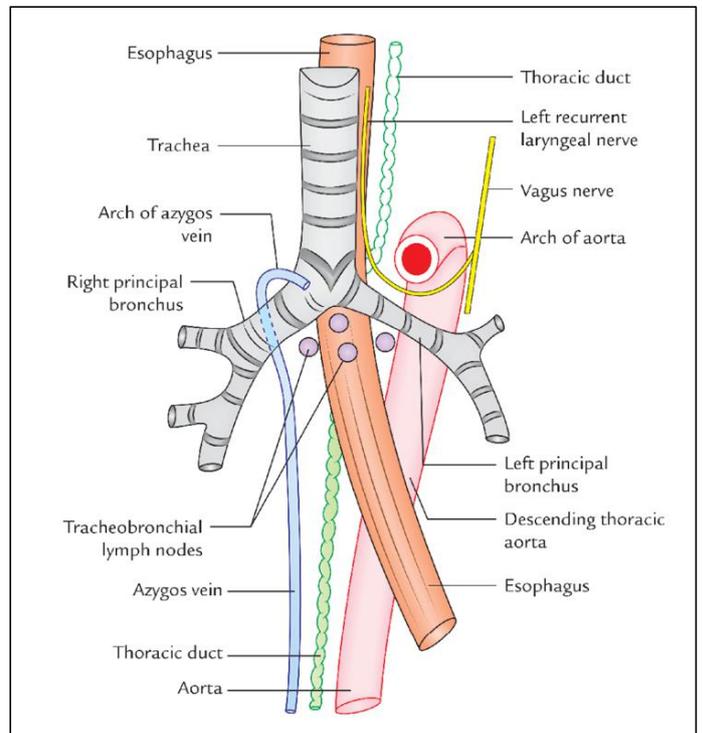
(3) Middle Mediastinum

- Heart
- Phrenic nerves
- Cardiac Plexus
- Lower pt of SVC
- Pt of ascending aorta
- Pt of pul trunk

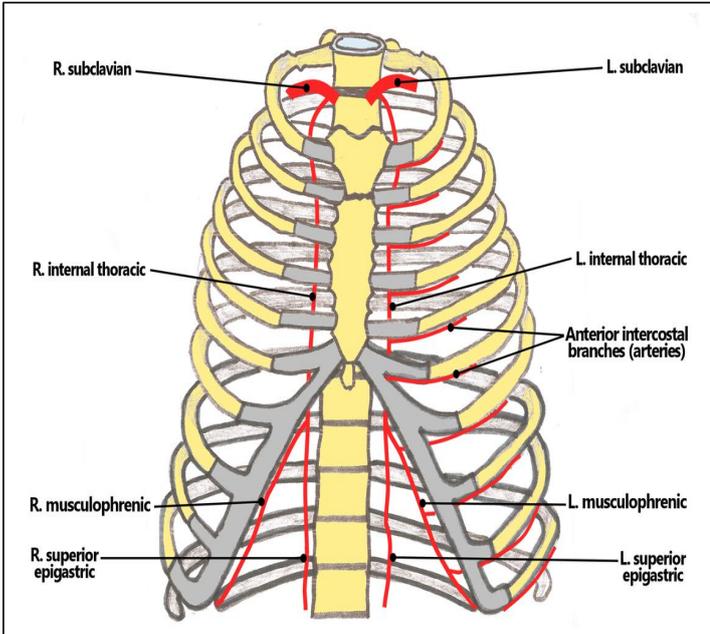


(4) Post Mediastinum

Arteries	Descending Aorta w/ its brs
Veins	Azygos sytem ▶ Azygos v , Hemiazygos v , accessory hemiazygos v Pul vv
Others	Oesophagus Thoracic duct
Nerves	Sympathetic trunk Splanchnic n Vagi



★ Internal Thoracic a



Arise from ? **1st part of SCA**

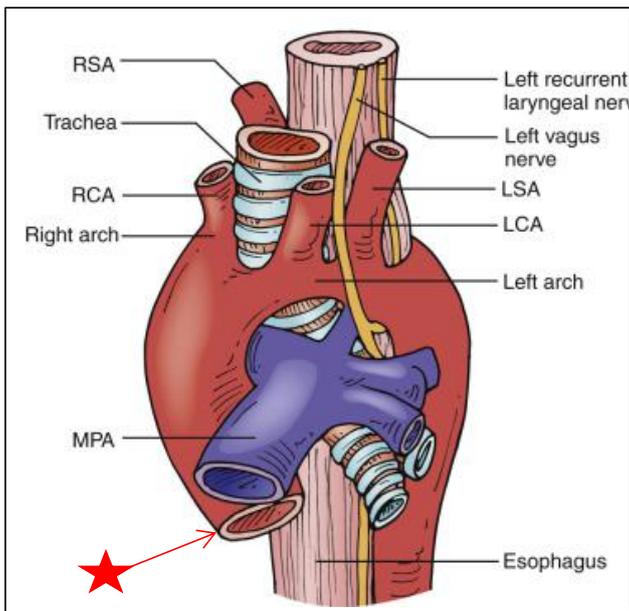
Course :

Lat to the sternum ▶ all the way down till its end (approx at the level of the **7th costal cart.**) ▶ during its descend it gives ant intercostal branches (**1-6th IC spaces**) ▶ continues to give **2 end branches**

A. Superior epigastric a

B. Musculophrenic a ▶ gives rise to ant intercostal aa supplying IC spaces (**7th -9th**)

Ascending Aorta



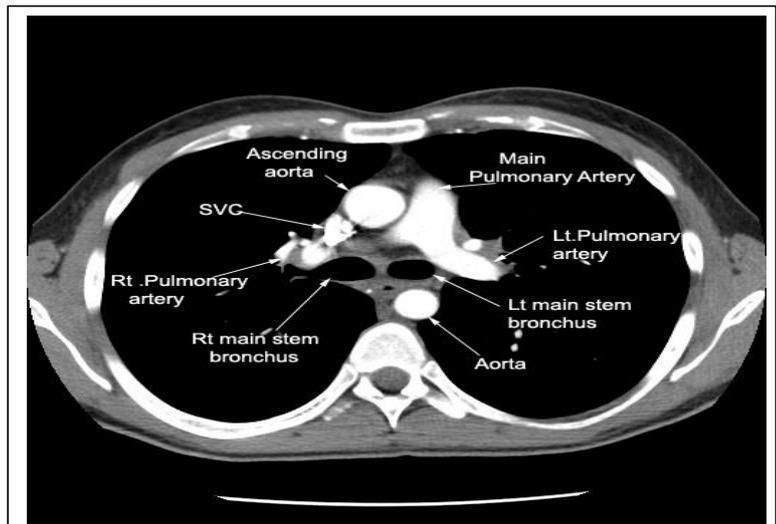
R/s w/ the **pulmonary trunk** :

Emerges behind the pul trunk

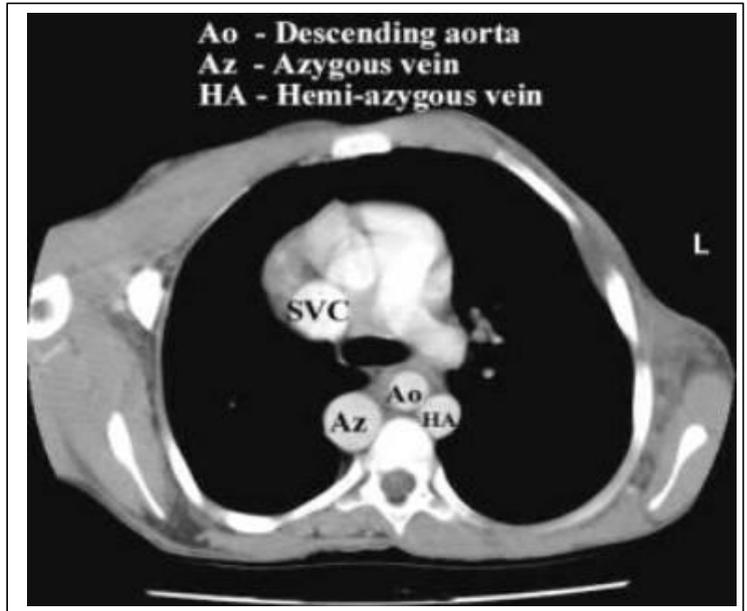
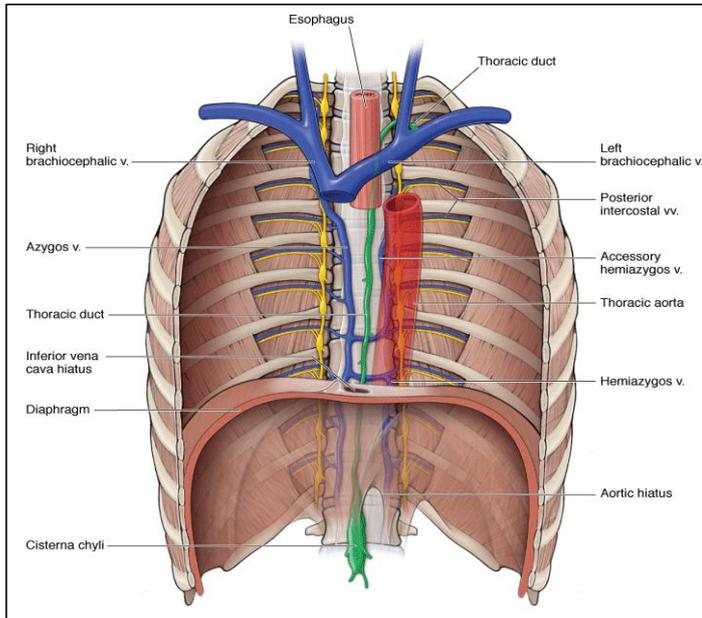
▶ **crossing it ant and to the rt** ▶ ends to the Lt where the aortic arch begins . (**ascending aorta ends ant & to the Rt pul trunk**)

R/s w/ **SVC** : **Anteriorly**

Surface Anatomy :
behind **Rt side of the sternum** below **sternal angle**



Descending Aorta



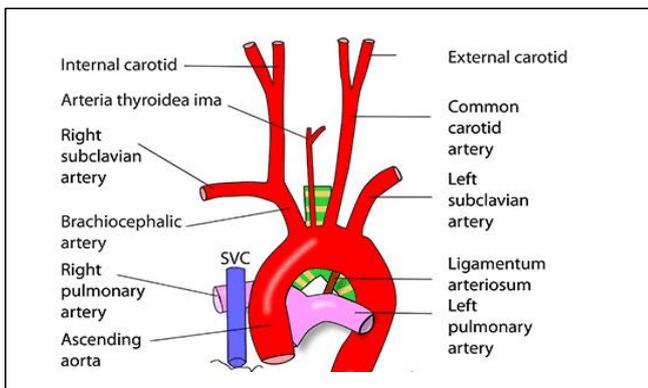
Thoracic duct is post to the Rt to Ao

Hemiazygos : Ao is ant to the Rt
Azygos is post and to the Rt to Ao
Ao is initially to the Lt to oesophagus then becomes post .

Surface Anatomy :
begins behind the Lt side of the sternal angle

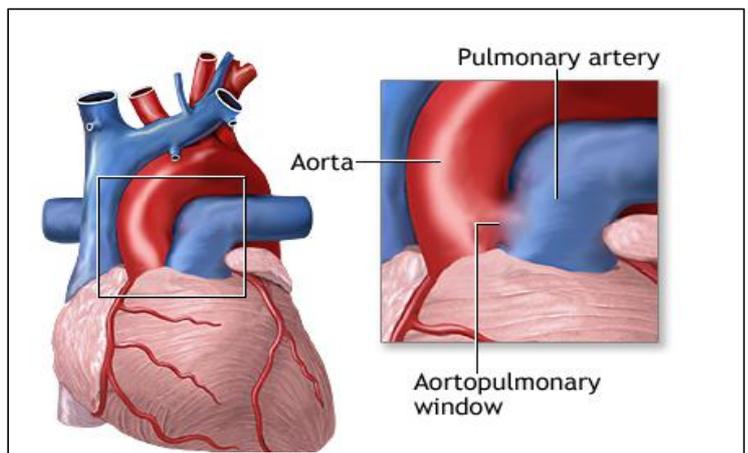
Arch of the aorta

Orientation	From Prox to Dist : <u>post and to the Lt</u>
Major Brs	-Brachiocephalic T (being post to the SVC) >Rt SCA , Rt Common Carotid a -Lt Common Carotid a -Lt SCA -Post to Lt BCV -Lt to the trachea
Major relations	R/t Trachea : ant to the Lt <u>Inf : Bifurcation of pulmonary trunk</u>
Surface Anatomy	post to the manubrium



Note :

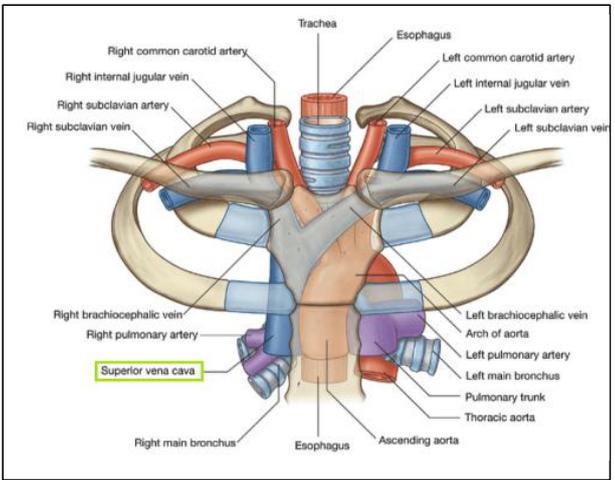
Lt pul a is ant to descending aorta , Rt pul a is post to ascending aorta .



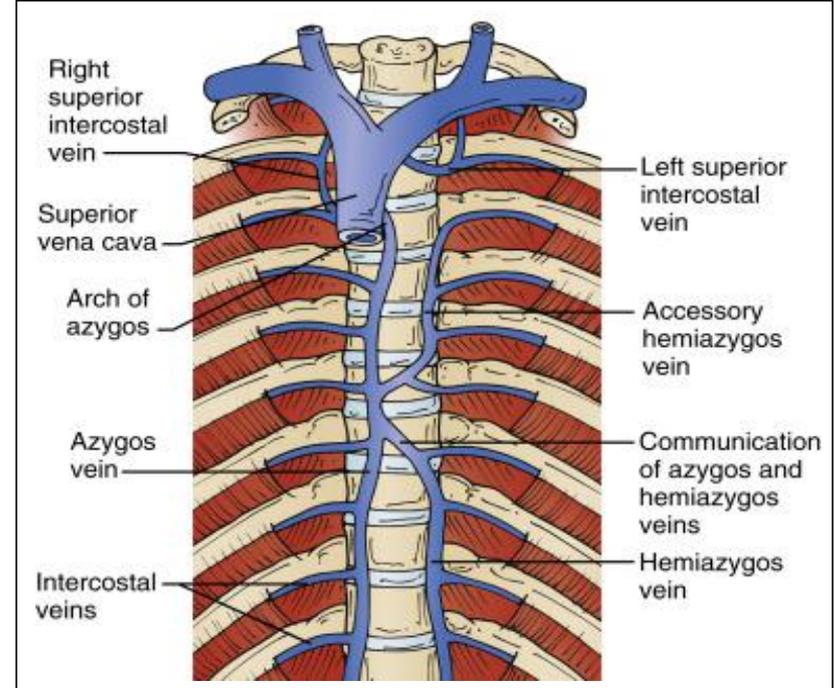
Recap :
Pul trunk bifurcates behind and to the Lt of the sternal angle

SVC

Surface anatomy	Post to the Rt of the sternum
Relations	<ul style="list-style-type: none"> -Trachea : Ant to Rt -BCA : ant -Ascending aorta : post -Internal thoracic a : post
Tributaries	Formed by union of Rt and Lt BCV behind the Rt SC joint approx



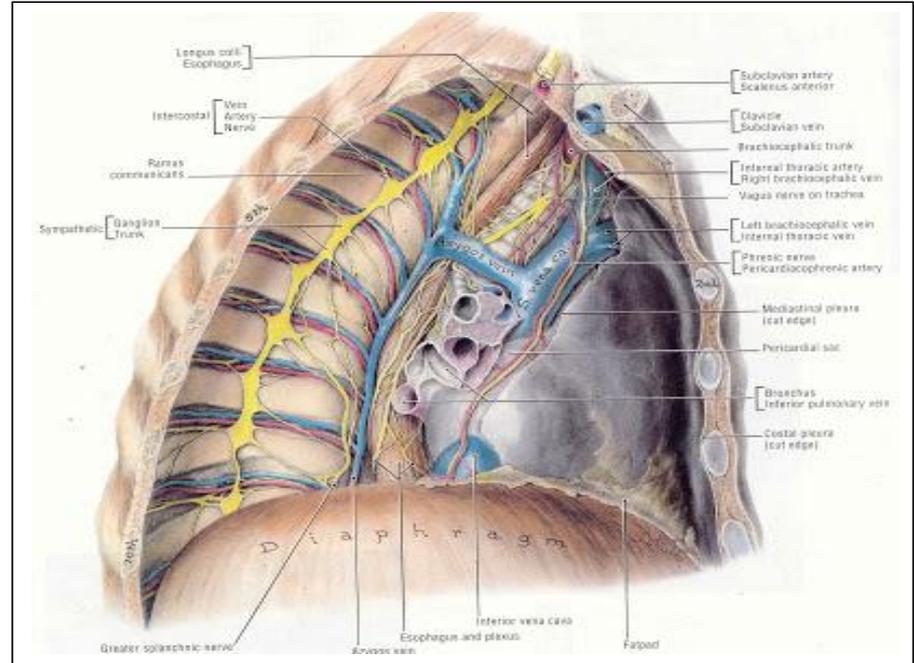
Azygos System



Forms an imp collateral channel connecting SVC & IVC .

Major rs :

- 'Rt and Post to descending aorta
- 'Rt to the thoracic duct
- 'Ant to Lt to sympathetic trunk
- 'Arch of Azygos crosses the Rt main bronchus sup



Recap :

- ★ **Azygos vein serves to drain most of post intercostal veins on the Rt side of the body**
- ★ **Hemizygos and accessory azygos drain most of the post intercostal veins on the Lt side of the body**

Surface Anatomy

<p>The cervical pleurae and apices of the lungs</p>	<p>pass through the sup thoracic aperture into the supraclavicular fossae (which are located post and sup to the clavicles)</p>
<p>Ant borders of the lung</p>	<p>adjacent to the ant line of reflection of the parietal pleura b/w the 2nd and 4th costal cartilages. (Both pleural reflections and anterior lung borders pass laterally at the 6th costal cartilages) Cardiac Notch (4th -6th IC space)-Lt Lung</p>
<p>Lower border</p>	<p>Lung MCL ▶ 6th rib MAL ▶ 8th rib SL ▶ 10th rib Pleura MCL ▶ 8th rib MAL ▶ 10th rib SL ▶ 12th rib</p>
<p>Fissures</p>	<p>Horizontal :along w/ course of the 4th rib ant Oblique :ant w/ the 3rd rib →post w/ 3rd spinous process (T3)</p>
<p>Costodiaphragmatic recess</p>	<p>From the 8th to 10th rib along the MAL</p>

