

Respiratory Block

OSP Revision

We worked on prof. *Ahmed Fathalla Ibrahim*, file based on what might come & we Keen to add the most important points and information theory, which we may Need

For Any comments Please don't hesitate to contact With us by:

anatomy433@live.com

Important notes before you begin

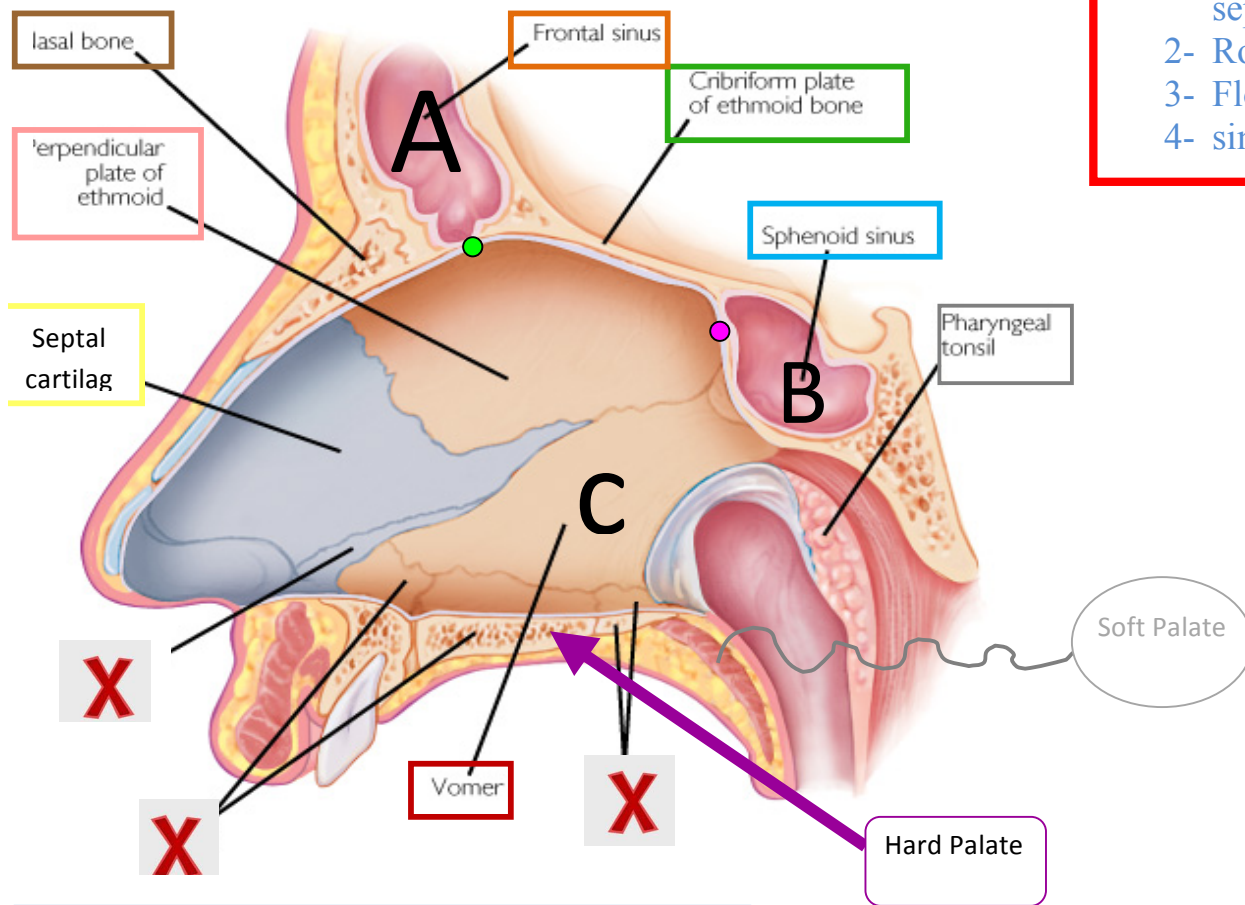
- ✓ Make sure you understand the difference between the terms (Identify the structure of the pointing arrow & Any Q related to That arrow linked) which have two completely different answers..
- ✓ make sure your spelling is correct or relatively similar to ensure your grade in the given question.
- ✓ Most likely seven questions will come in the test.
- ✓ Be careful of answering a question and you're not sure 90% of the answer, because the wrong Answer Deducted from grades!

***تنويه:** لسنا مسؤولين عن أي سؤال يأتي خارج محتوى هذا العمل انما هو مجهود تطوعي بذلنا فيه ما استطعنا رغبة منا في تسهيل هذه المادة وتحبيبها .. وفقكم الله لما يحبه ويرضاه

Tabel Of Contant

- ❖ NASAL CAVITY, LARYNX, PHARYNX, TRACHEA.....3-7
- ❖ LUNGs & PLEURA.....
- ❖ MEDIASTINUM Contents.....
- ❖ MUSCLES INVOLVED IN RESPIRATION.....
- ❖ RADIOLOGY.....

NASAL CAVITY



Sagittal section of head showing:

- 1- Medial Wall.(nasal septum)
- 2- Roof
- 3- Floor
- 4- sinuses

• The roof is made out of :

- 1) **Body of sphenoid .**
- 2) **Cribriform plate of ethmoid bone .**
- 3) **Frontal bone .**
- 4) **Nasal (nasal) bone & cartilage**

• **Floor :**

_ Separates nasal cavity from the oral

_ Formed by : **hard (bony) palate .**

Medial Wall (Nasal Septum) :

_ Osteocartilaginous partition.

_ Formed by:

- 1) **Perpendicular plate of ethmoid bone.**
- 2) **Vomer.**
- 3) **Septal cartilage**

• **Sinuses (Here) :**

- 1) **Frontal Sinus**
- 2) **Sphenoidal sinus**

In this photo, there may be asked a question like :

1- IDENTIFY the labeled STRUCTURE:

A-..... (frontal air sinus).

B-.....(Vomer)

2- IDENTIFY the Site of drainage of:

A-..... (Middle meatus)

c-..... (Sphenoethmoidal recess)(**The small space above the superior concha**)

Q

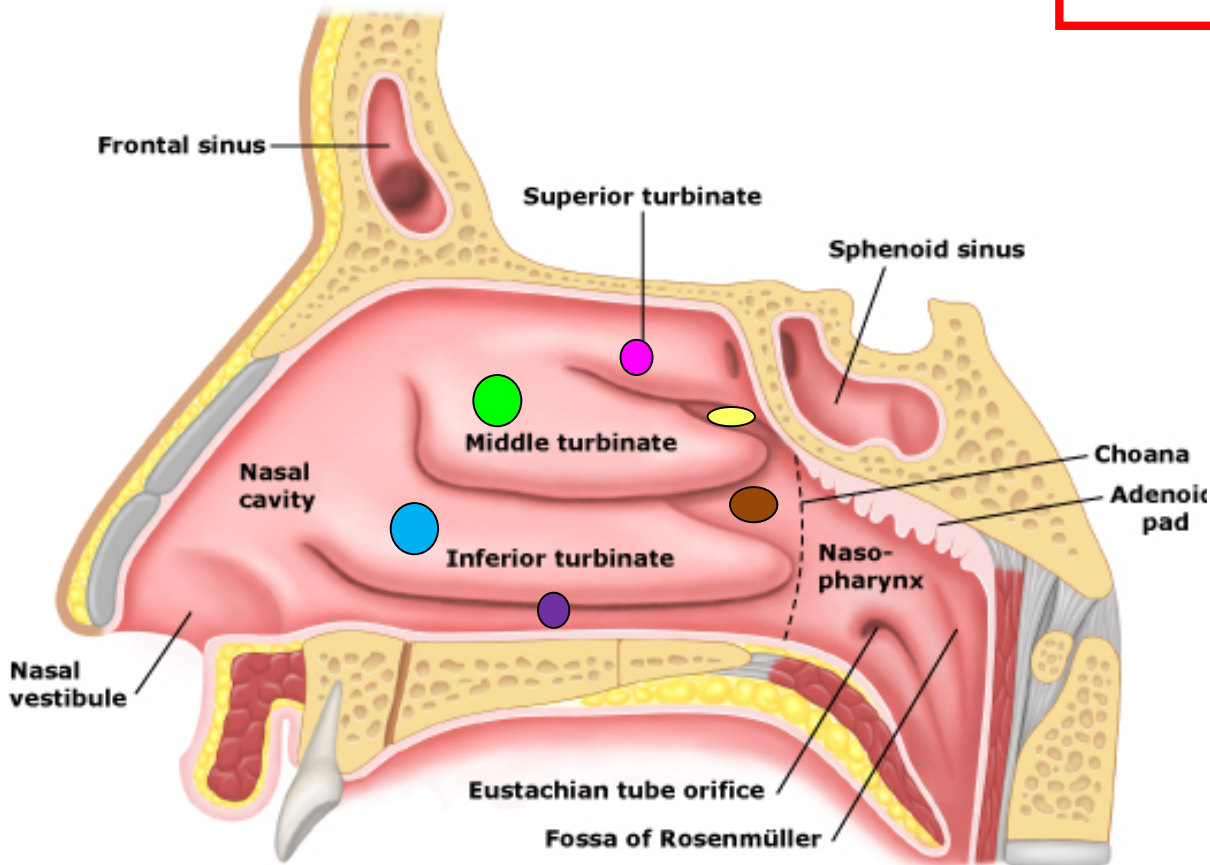
We Are not sure if they will ask about the Nerve Supply, Venous & Lymph Drainage, of the nasal cavity or not !

NASAL CAVITY

Sagittal sectionog head showing:

1-Lateral Wall.

2- Nasopharynx.



Lateral Wall:

- **superior, middle & inferior** conchae (turbinate).

The cavity below each concha is called a meatus and are named **as superior, middle & inferior** corresponding to the conchae, (The small space above the superior concha).

- The conchae increase the surface area of the nasal cavity.
- The recess & meati receive the openings of the:
 - Paranasal sinuses.
 - Nasolacrimal duct.

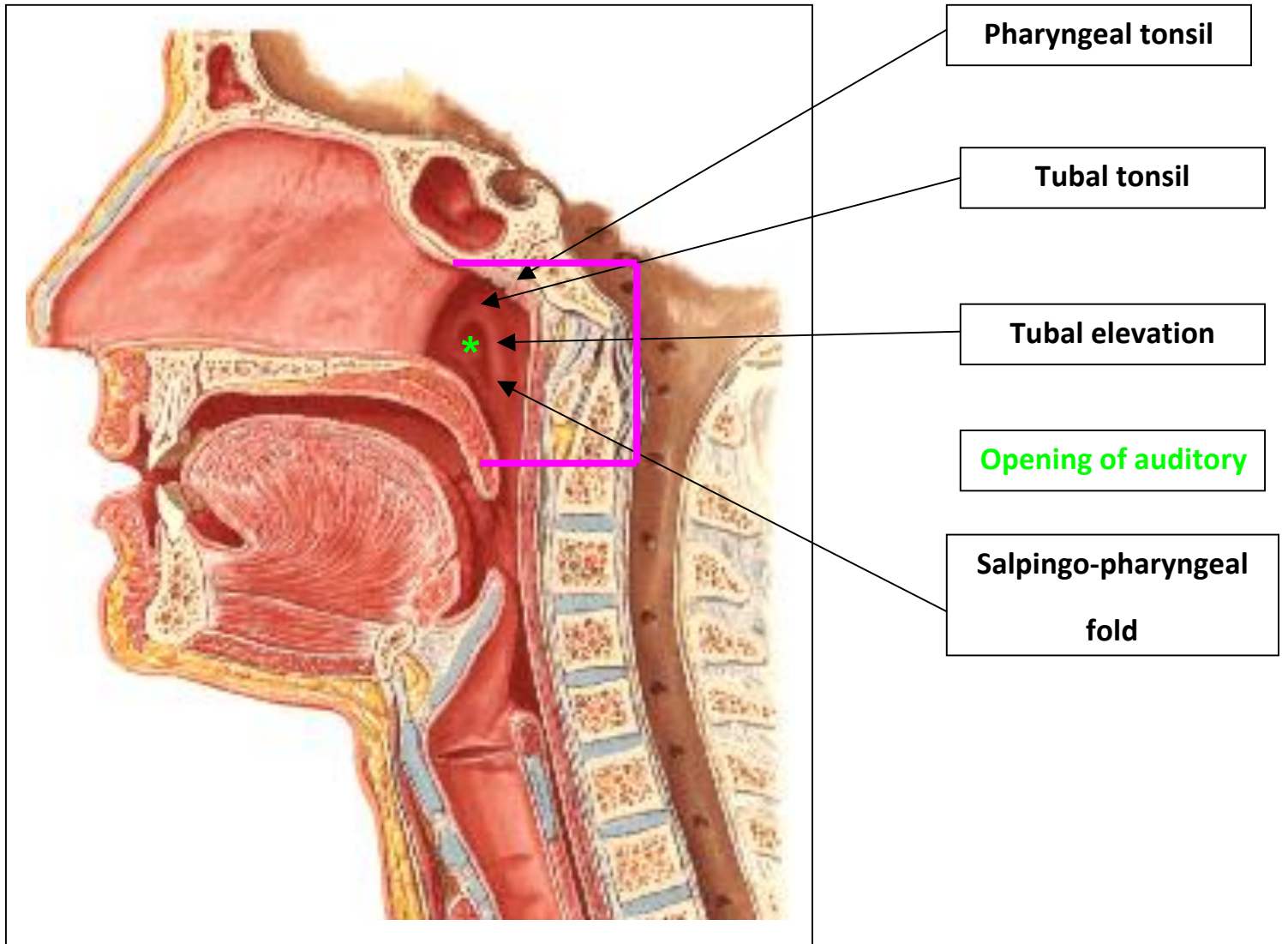
most important meatus is the middle one

Q

They may ask you any thing on these information

| | |
|------------------------|---|
| Sphenoethmoidal recess | sphenoidal sinus |
| Superior meatus | posterior ethmoidal sinus |
| Middle meatus | middle ethmoidal, maxillary, frontal & the anterior ethmoidal sinuses |
| Inferior meatus | nasolacrimal duct. |

Nasopharynx



Nasopharynx:

Extends from the base of skull to the soft palate.

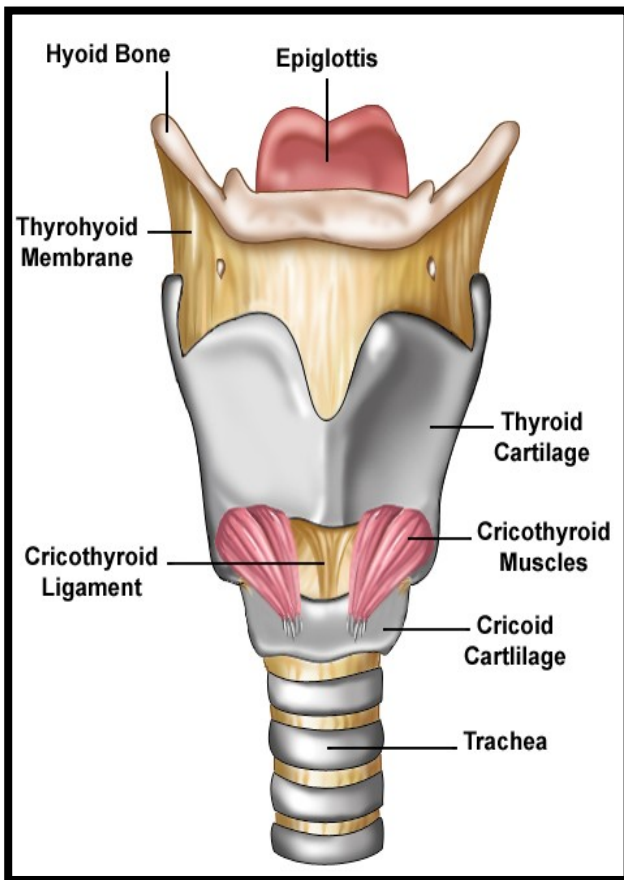
- Contains Pharyngeal tonsils (adenoides) in its roof.
- Lateral wall shows:
 - Opening of auditory tube.
 - Tubal elevation (produced by posterior margin of the auditory tube).
 - Tubal tonsil.
 - Salpingopharyngeal fold (raised by salpingo-pharyngeus muscle).

Q

They may ask you any thing on these information

You Must differentiate between the Opening & elevation o auditory tube

LARYNX, TRACHEA



Q
If You see a picture for larynx You must write the names of it's cartilage (do not write just larynx)

It's important to know the intrinsic muscles and their nerve supply and functions

(extrinsic not important)

All intrinsic muscles, are supplied by the recurrent laryngeal nerve except the **cricothyroid** which supply

by external laryngeal of superior laryngeal

The function of cricothyroid is increase the tension of vocal cord .

Sensory Above the vocal cords supply by Internal laryngeal nerve and below by recurrent laryngeal

Nerve.

You should to memorize all structure in the larynx above & below pictures :

We have to read the question very carefully, because you might be asked to **identify** or to **describe the function**.

***For example**, the function of epiglottis => during swallowing it prevents food from going into the air passage

Most important functions of larynx are breathing and phonation

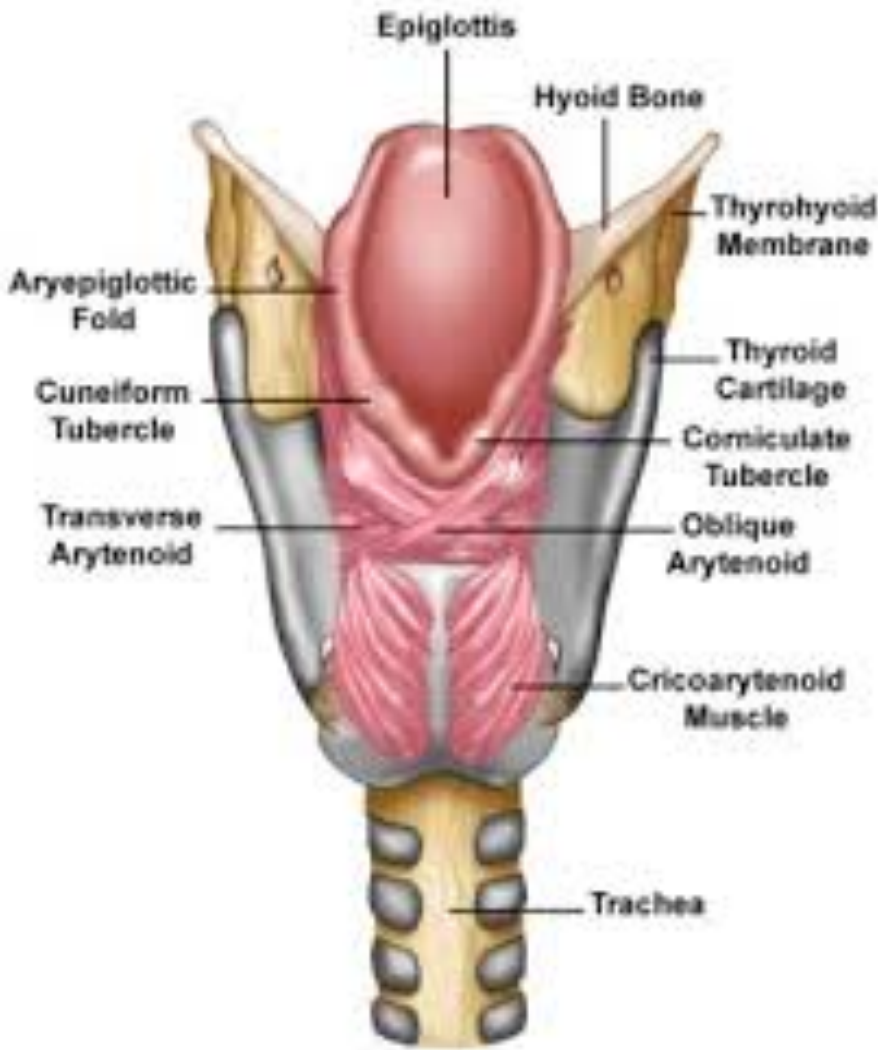
• **The cartilaginous skeleton is comprised of :**

1. Thyroid 2. Cricoid Single 3. Epiglottis (**Single**)

1. Arytenoid 2. Corniculate Paired 3. Cuneiform (**Paired**)

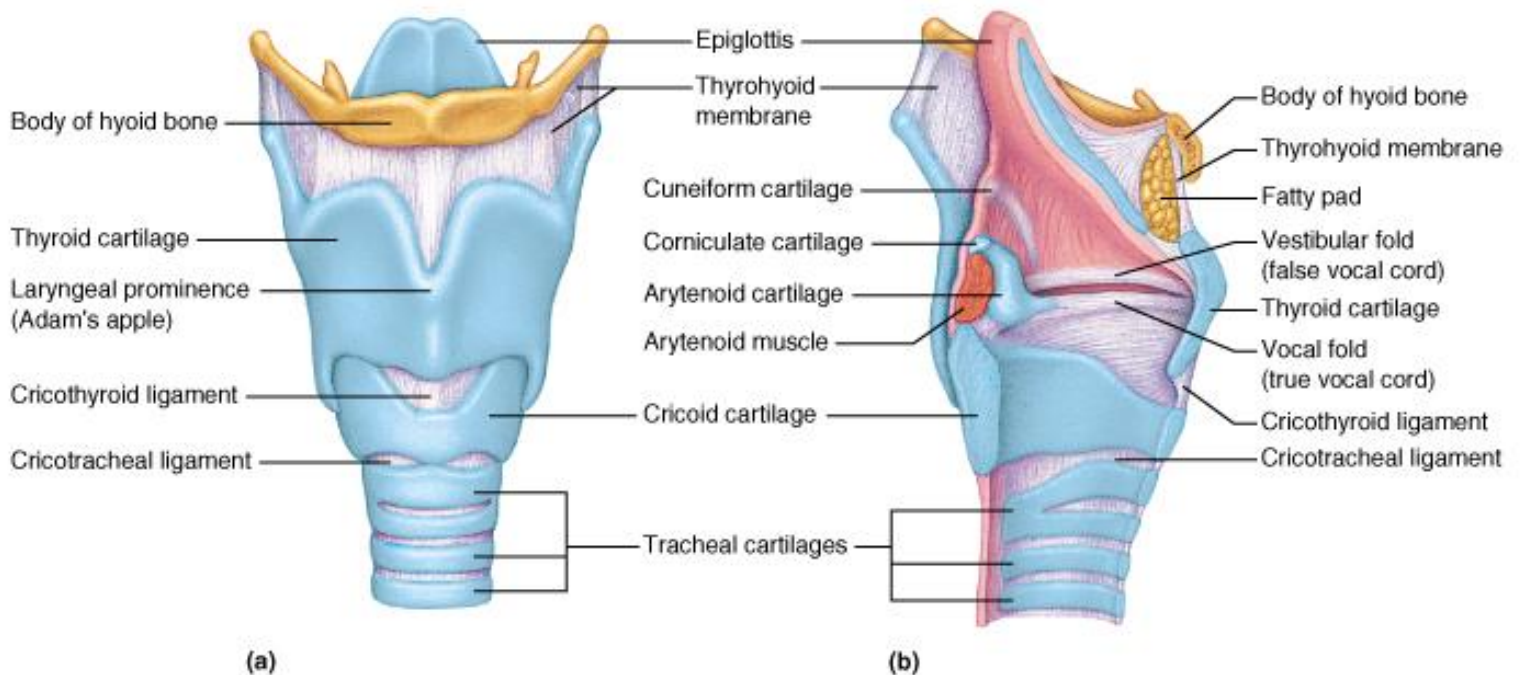
All the cartilages, except the epiglottis, are of hyaline type.

Epiglottis is formed of elastic cartilage



Please Try to memorise most of these structures

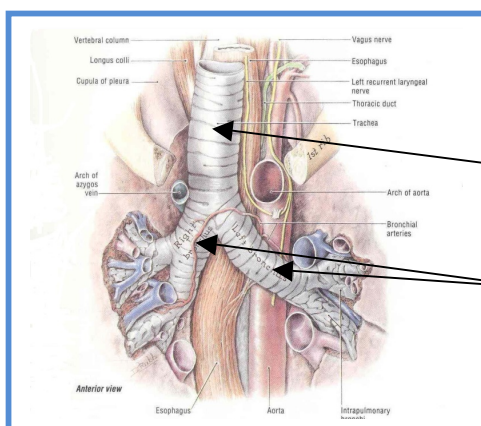
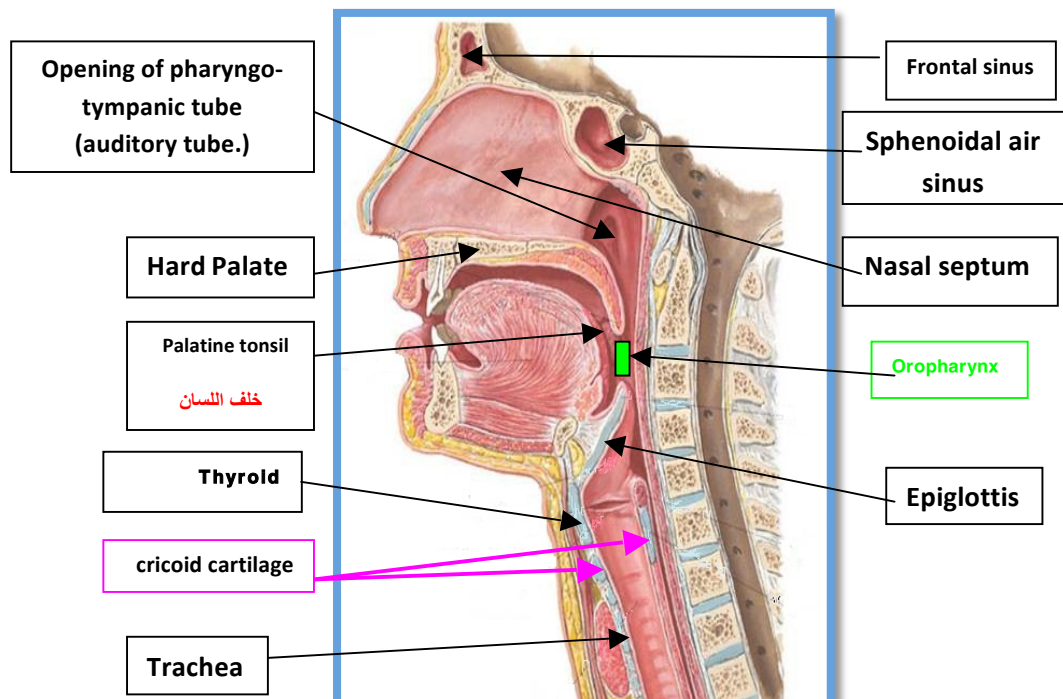
You Can Do it



Addational Notes of Larynx :

- ✓ Thyroid Cartilage (consist of twolamina fused together which form the thyroid angel), we can only find it in the anterior part of larynx. · Cricoid cartilage it is ring shaped and we can see it in the anterior and posterior part of thelarynx.
- ✓ Vestibular fold., **Vocal fold.** & Arytenoid Cartilage is above the cricoid cartilage, it is triangular in shape & It has three angels' anterior , lateral and upper (apex).
- ✓ **The vocal fold** is connected from anterior angel of arytenoid cartilage to the angel of thyroid.
 - ✓ **Whenever the angel of thyroid becomes narrower the vocal fold becomes longer.**
- ✓ In males the thyroid angel is narrower than in females.
- ✓ The corniculate cartilage is attached to the apex of arytenoid cartilage

NASAL CAVITY, LARYNX, PHARYNX, TRACHEA



Trachea

Right & left Bronchi

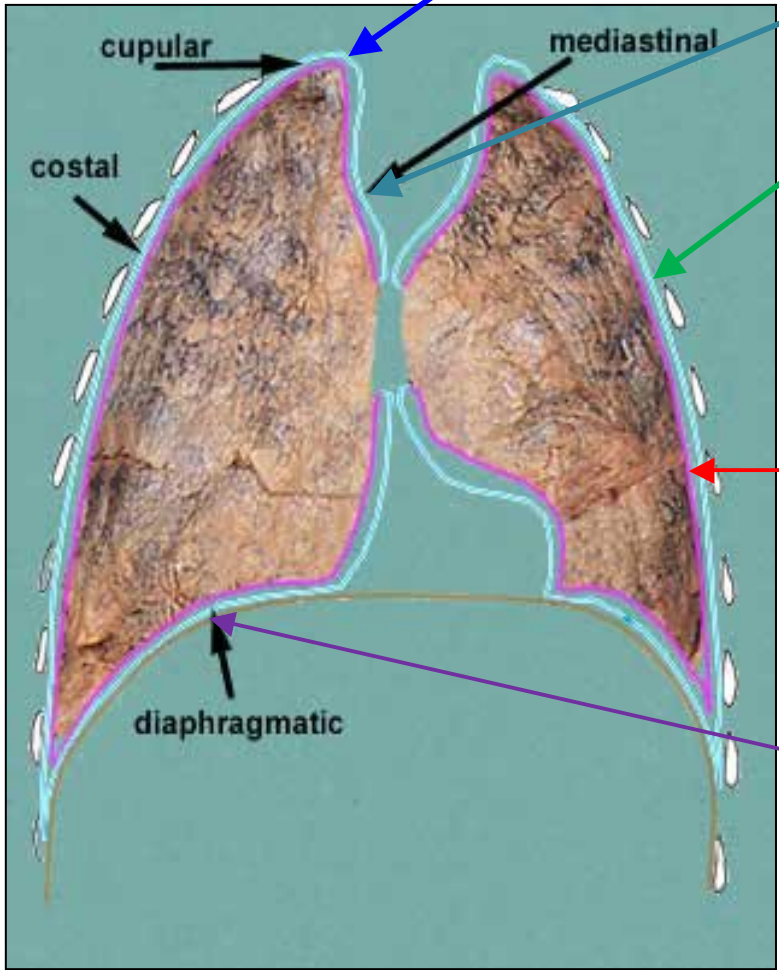
| Right Principal Bronchus | Left Principal Bronchus |
|---|--|
| Wider, shorter (one inch long) and more vertical than the left | Narrower, longer (two inches long) and more horizontal than the right |
| Gives superior lobar bronchus before entering the hilum of the right lung | Passes to the left below the arch of aorta and in front of esophagus |
| On entering the hilum it divides into middle and inferior lobar bronchi | On entering the hilum of the left lung it divides into superior and inferior lobar bronchi |

LUNG & PLEURA

The questions :
IDENTIFY?
STRUCTURES RELATED TO?
NERVE SUPPLY?

Cervical Parietal pleura, supplied by **1st intercostal nerve**
It lines the under surface of the **suprapleural membrane**

Mediastinal Parietal pleura, covers the mediastinum supplied by **phrenic nerves**.

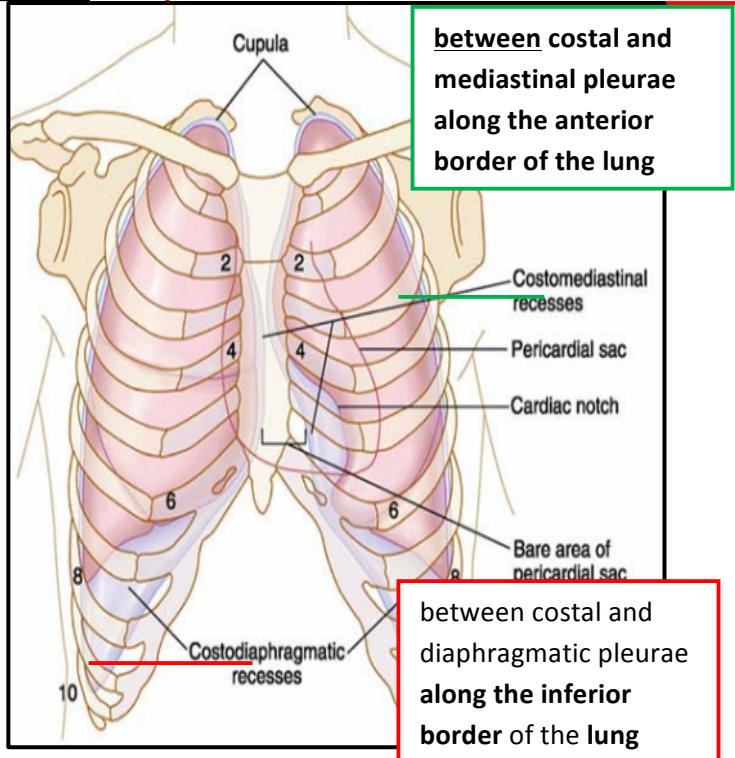
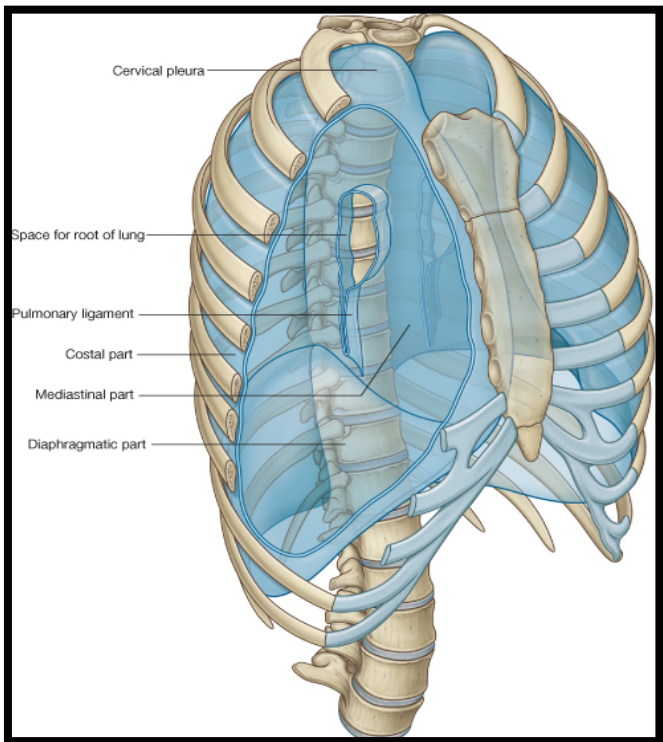


Costal Parietal pleura, lines, the back of the:
Sternum, Ribs & costal cartilages,
Intercostal spaces, Sides of vertebral bodies
supplied by the **intercostal nerves**

Visceral Pleura
1- Surround the lungs.
2- sensitive to *stretch*.
3- The nerve supply is **autonomic fibers**

Diaphragmatic Parietal pleura, covers the thoracic (upper) surface of the diaphragm.
supplied by : 1- **phrenic nerves over the domes**. 2- **lower 6 intercostal nerves around the periphery**

***Parietal pleura :**
sensitive to pain, pressure, temperature, and touch

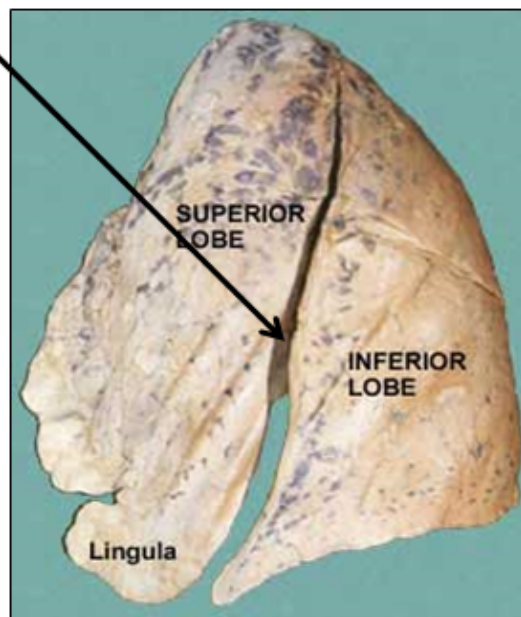
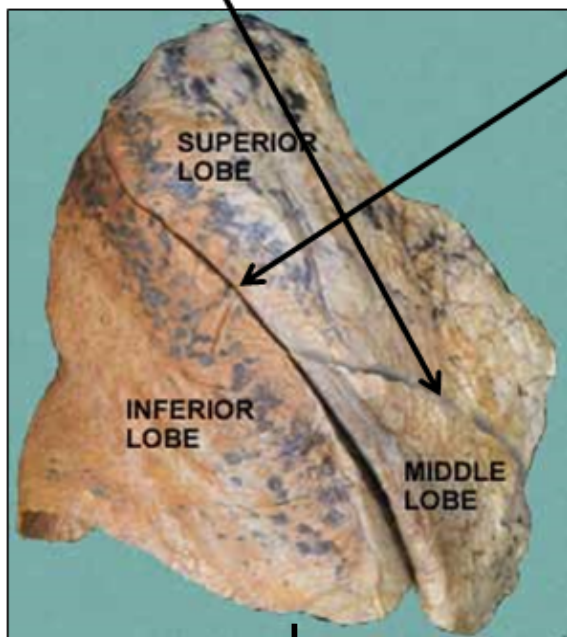


between costal and mediastinal pleurae along the anterior border of the lung

between costal and diaphragmatic pleurae along the inferior border of the lung

Transverse (horizontal) fissure

Oblique fissure



Right lung

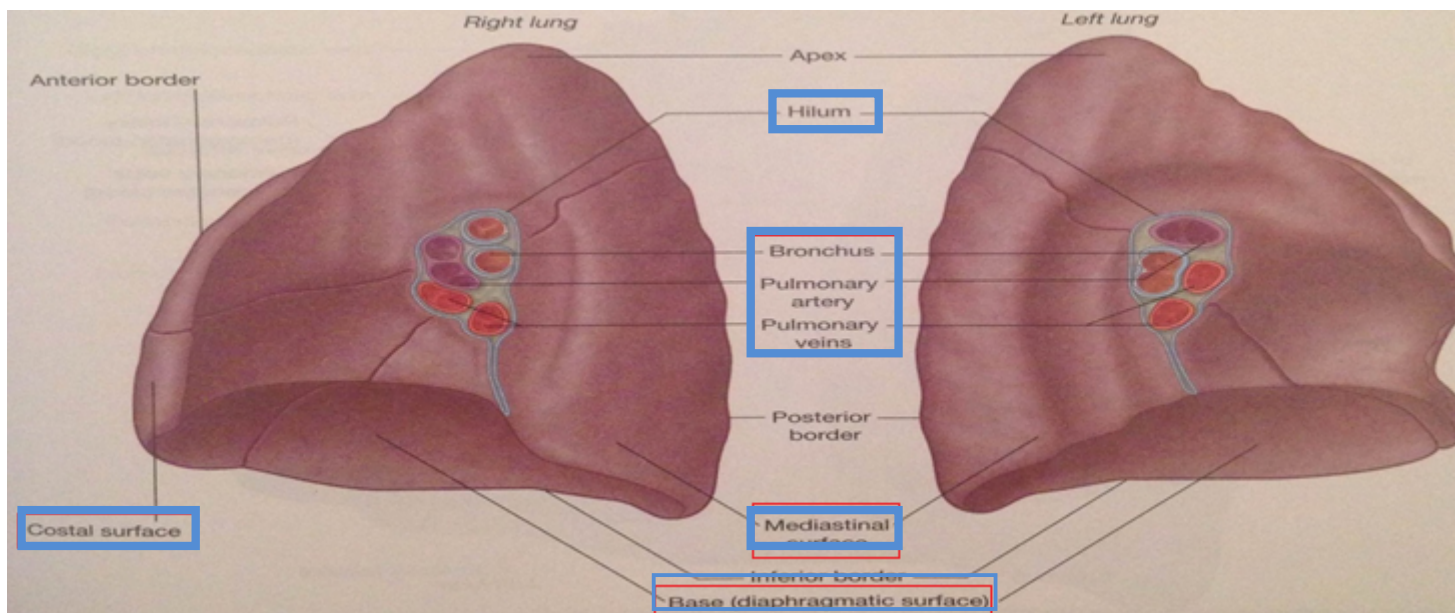
Left lung

Larger & shorter than left lung.
 Divided by
 A- **2 fissures (oblique & horizontal)**
 B- **3 lobes (superior, middle and**

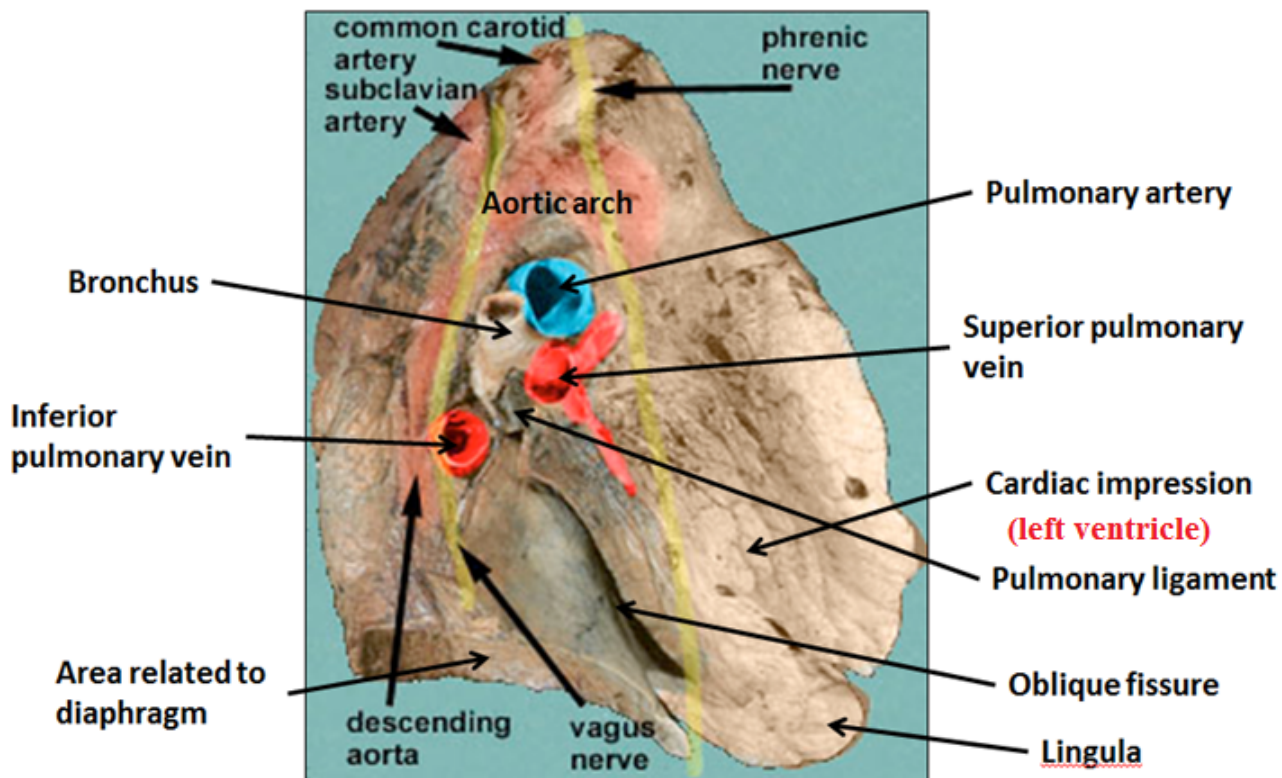
smaller & taller than right lung.
 Divided by
 A- **one oblique fissure.**
 B- **2 lobes, superior and inferior**
 lobes
 There is No horizontal fissure.

The **blood** supply of lungs: **Bronchial arteries.**
 The **nerve** supply of lungs: **Pulmonary plexus which formed of autonomic N.S**

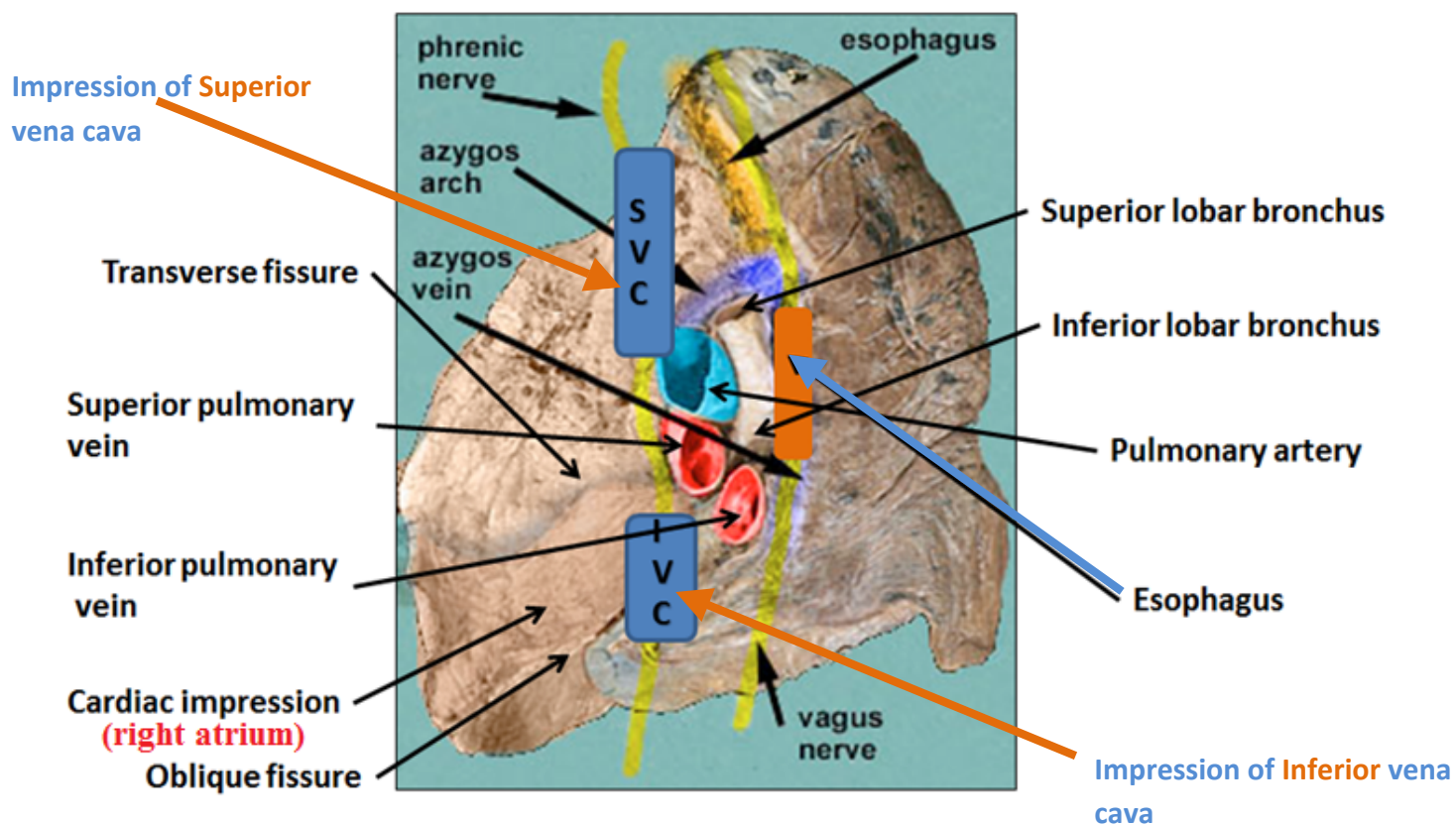
BRONCHI (posterior), **PULMONAR ARTERY** (superior), **PULMONARY VEINS** (inferior & anterior)



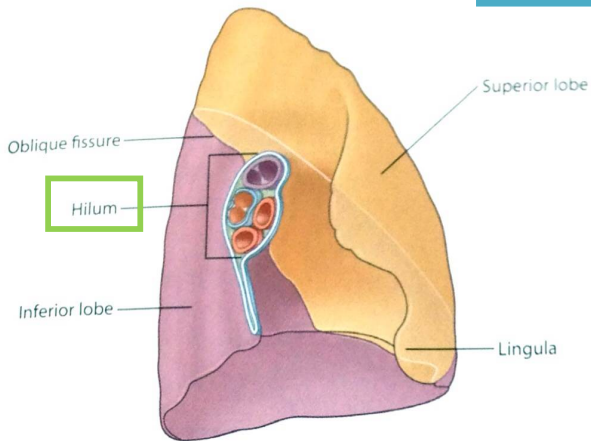
LEFT LUNG



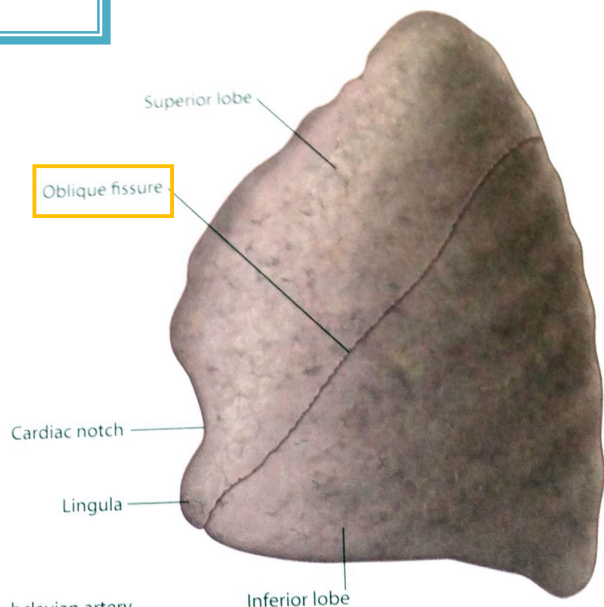
RIGHT LUNG



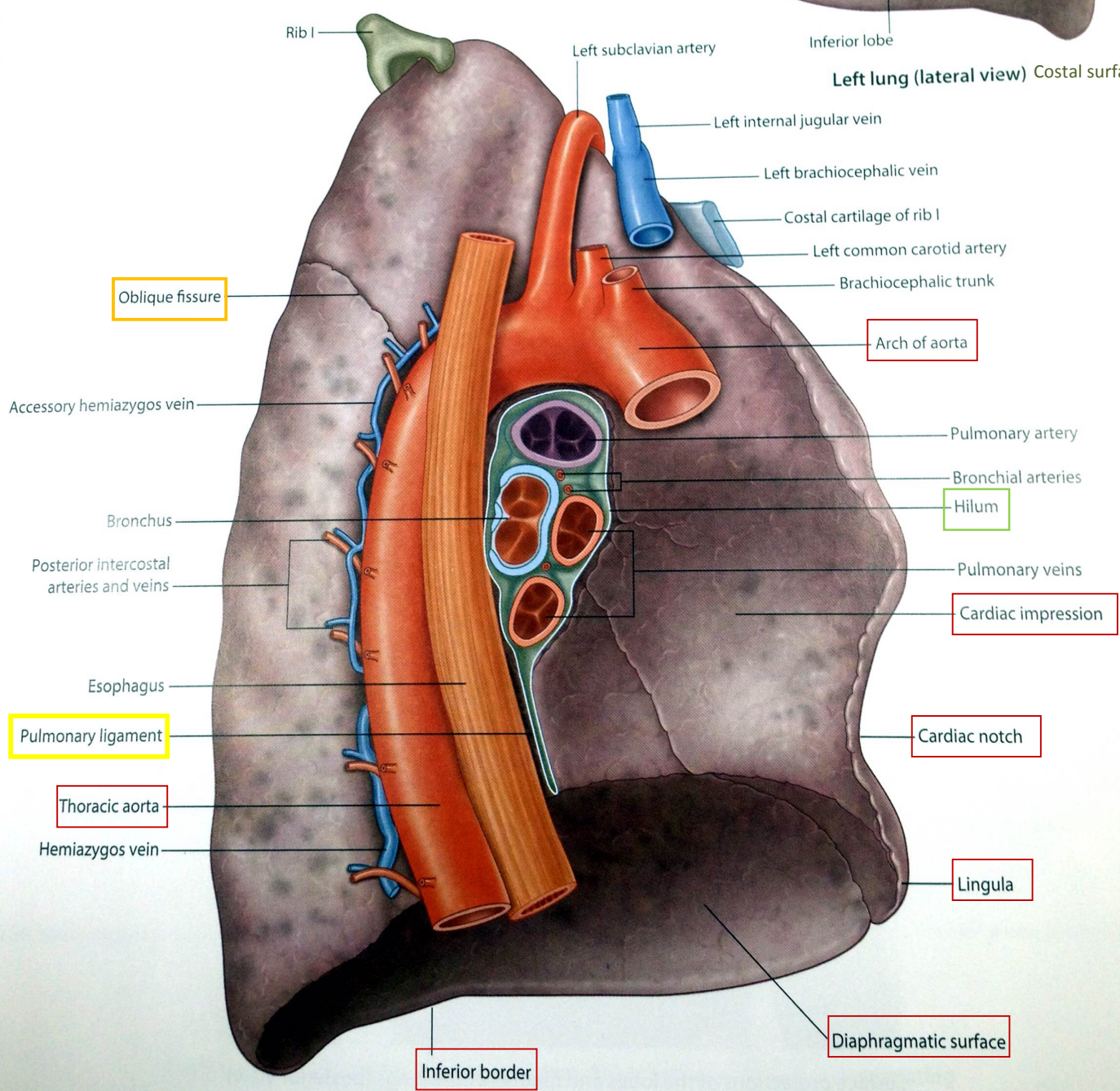
Left Lung



Lobes of the left lung (anteromedial view)

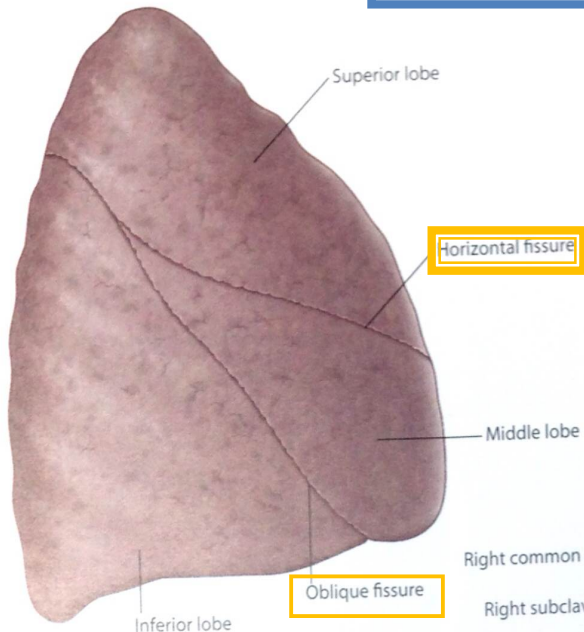


Left lung (lateral view) Costal surface

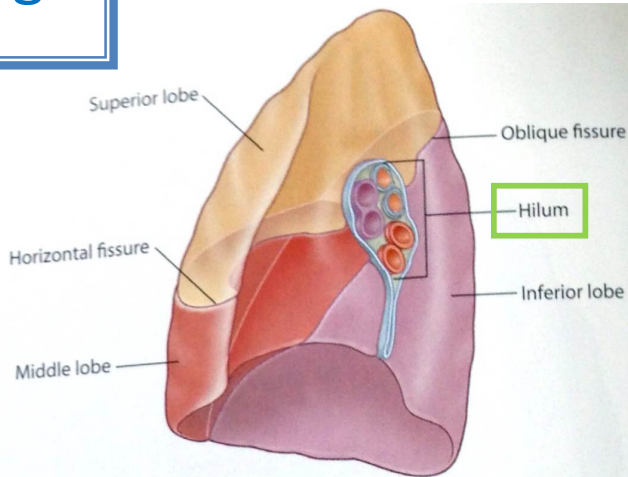


Left lung and related structures (medial view)

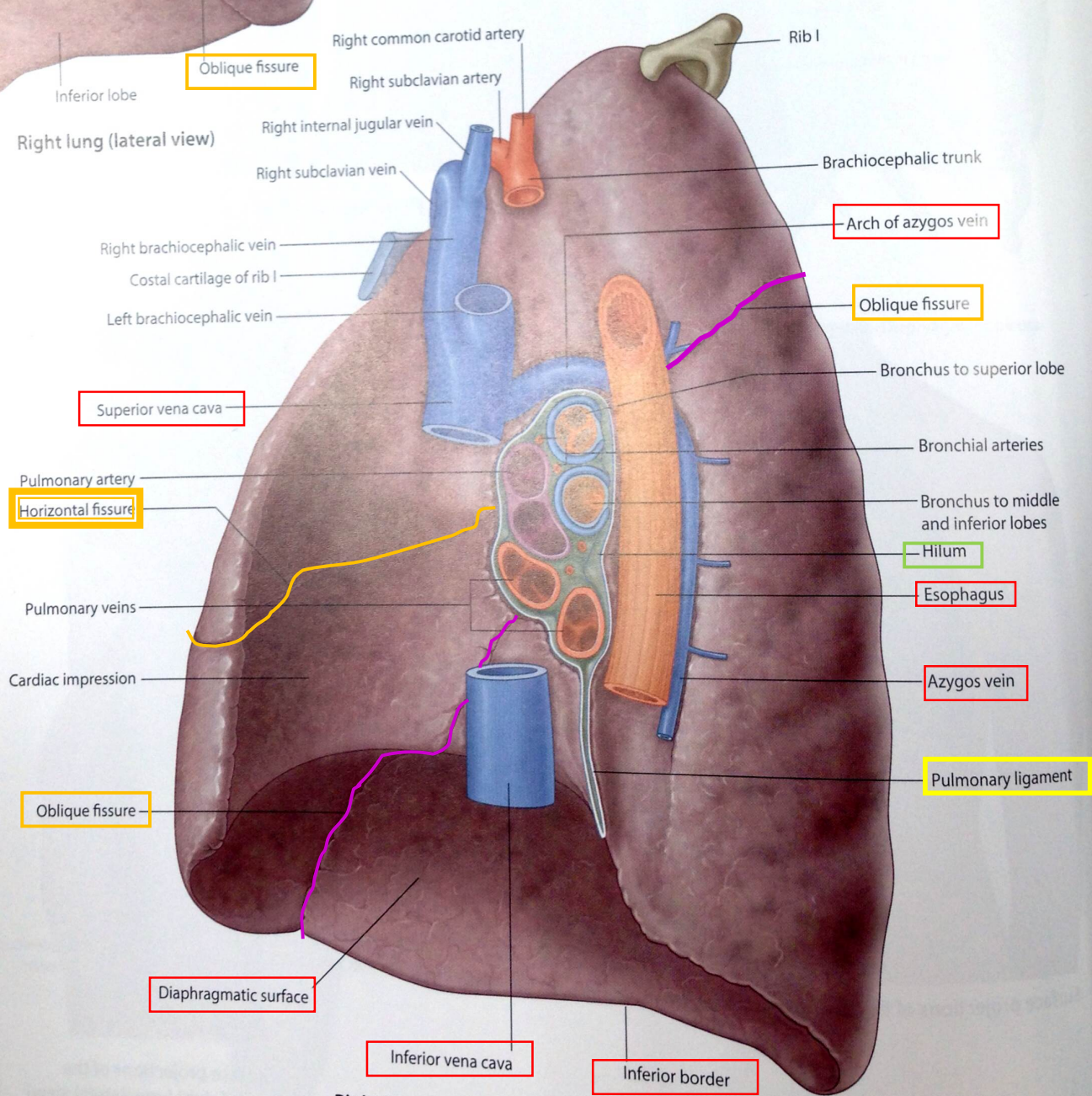
Right Lung



Right lung (lateral view)



Lobes of the right lung (anteromedial view)

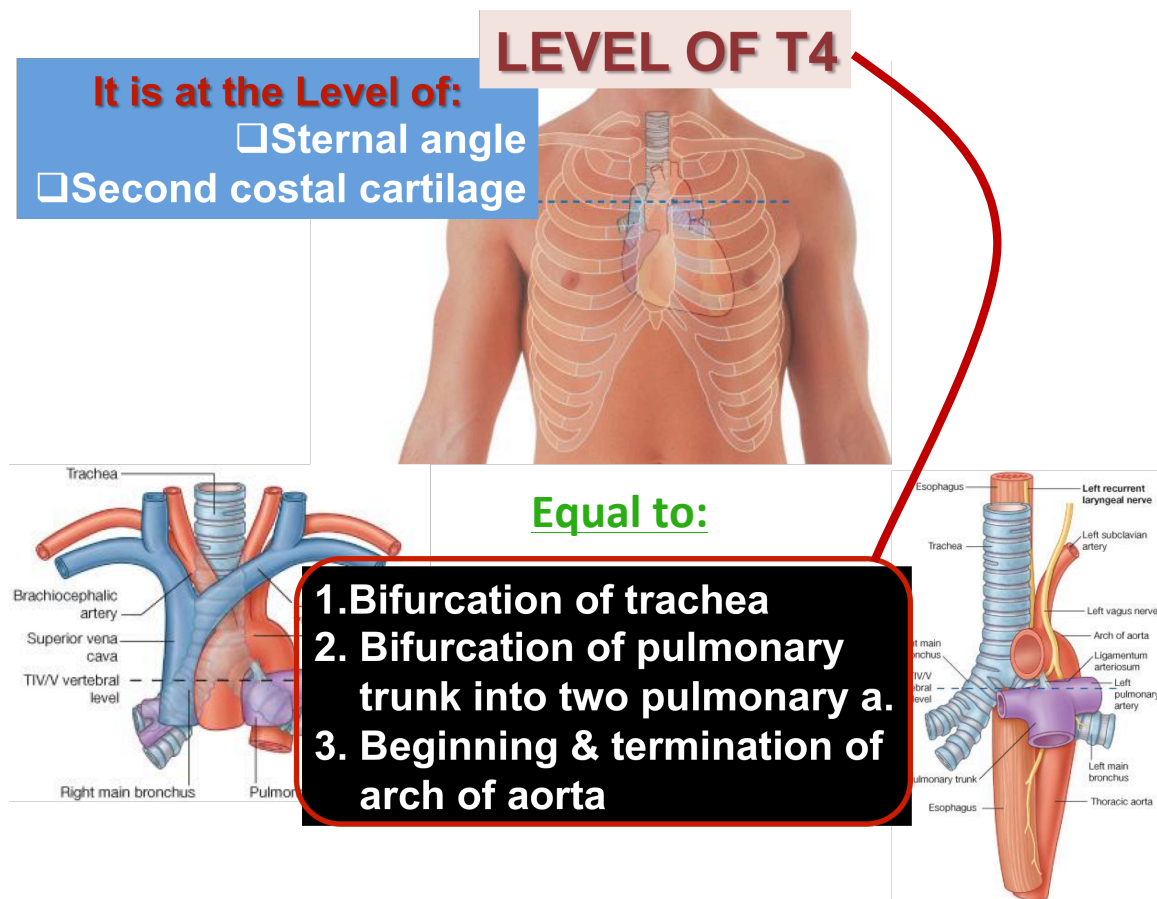


Right lung and related structures (medial view)

MEDIASTINUM

What we have to know:

- Level of T4
- Content of each mediastinum
- Structures present in more than mediastinum.



The mediastinum in the thoracic cavity divides into:

- 1- Superior
- 2- Inferior (Anterior, Middle and Posterior)

The line between superior and inferior at level of:

- 1- T4
- 2- Second costal cartilage
- 3- Bifurcation of trachea
- 4- Bifurcation of pulmonary trunk

Everything pass through thoracic outlet (Upper opening) must be included in superior mediastinum

Why esophageal plexus called Anterior-posterior not right-left?

Because in the beginning of fetus life the stomach had right-left **surface** and anterior-posterior **border**, later it rotates 90 degree So right vagus nerve called posterior esophageal and left vagus nerve called anterior esophageal

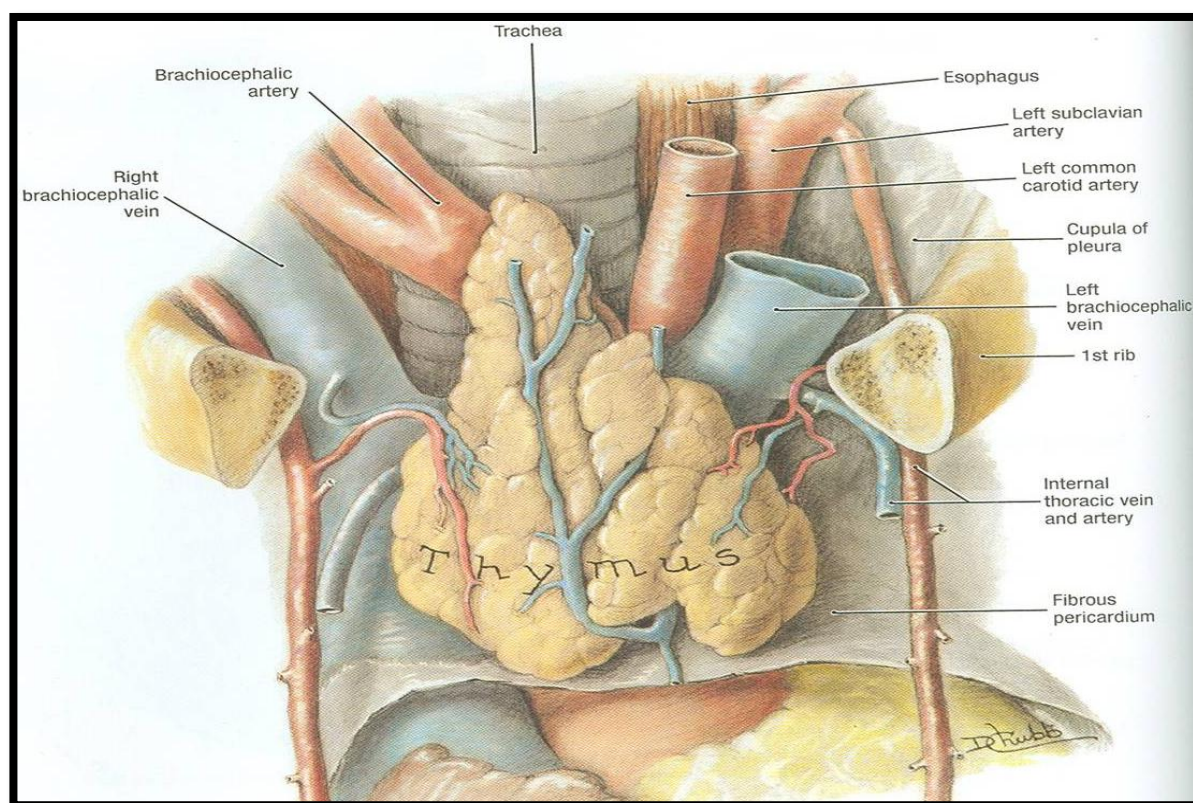
* ما قالها الدكتور لكنها موجودة في تيم وورك السنة اللي فاتت *

Six things found superiorly and inferiorly of mediastinum:

- Superior-Posterior (3) : Thoracic duct + esophagus + Vagus nerve (easier way to save it – Tom Eat Vegetables -)
- Superior-Middle (2) : Phrenic nerve + superior vena cava
- Superior-Anterior (1) : Thymus gland

MEDIASTINUM

Contents



-**Esophagus** in the **superior then posterior** Mediastina because it needs to reach the abdomen

-**Vagus Nerve**: descends through the **superior & posterior** mediastina “WHY POSTERIOR???”

Because it surrounded the esophagus and then form the esophageal plexus then continuo as Gastric nerve .

-(Stomach during Embryonic life has “right and left SURFACES” and “anterior and posterior BORDER” BUT now it has “right and left BORDER” and “anterior and posterior SURFACE” then rotation happened) That’s why the vagus nerves are called “RIGHT and LEFT not ANTERIOR and POSTERIOR” Right vagus=posterior esophageal , Left vagus=anterior esophageal .

-**Phrenic Nerve**: pass through the superior & middle mediastina

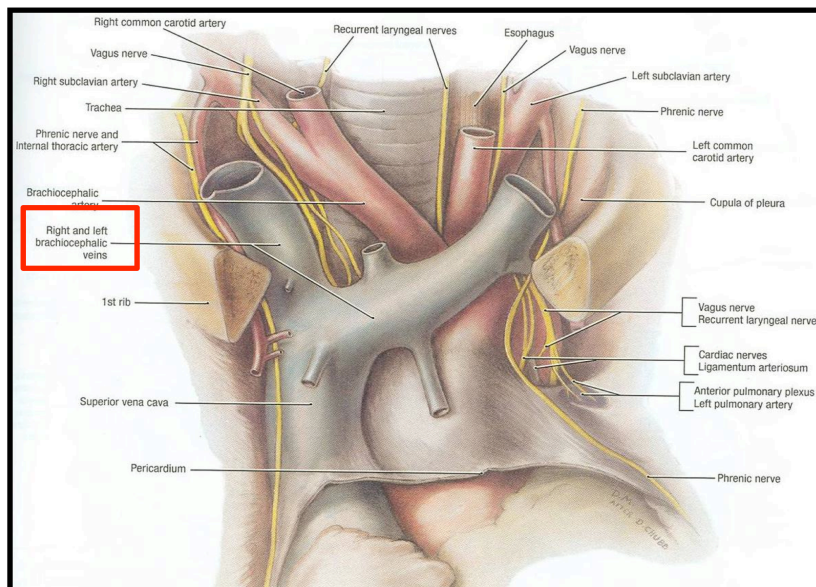
Thoracic Duct:

Superior mediastinum:: To the left side of Esophagus

Posterior mediastinum:: Behind Esophagus directly

MEDIASTINUM

Contents

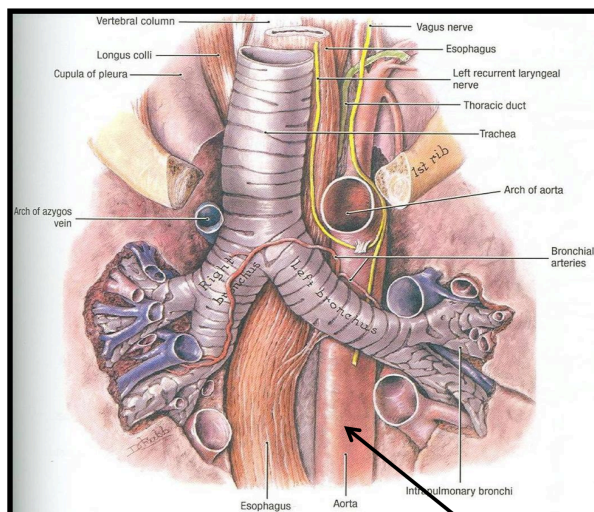


-Mention level of beginning and level of termination

-Locate: thoracic duct + L&R brachiocephalic veins + vagus nerve places (between which structures are they situated?)

MEDIASTINUM

Contents



Structures from superficial to deep: (superior mediastinum)

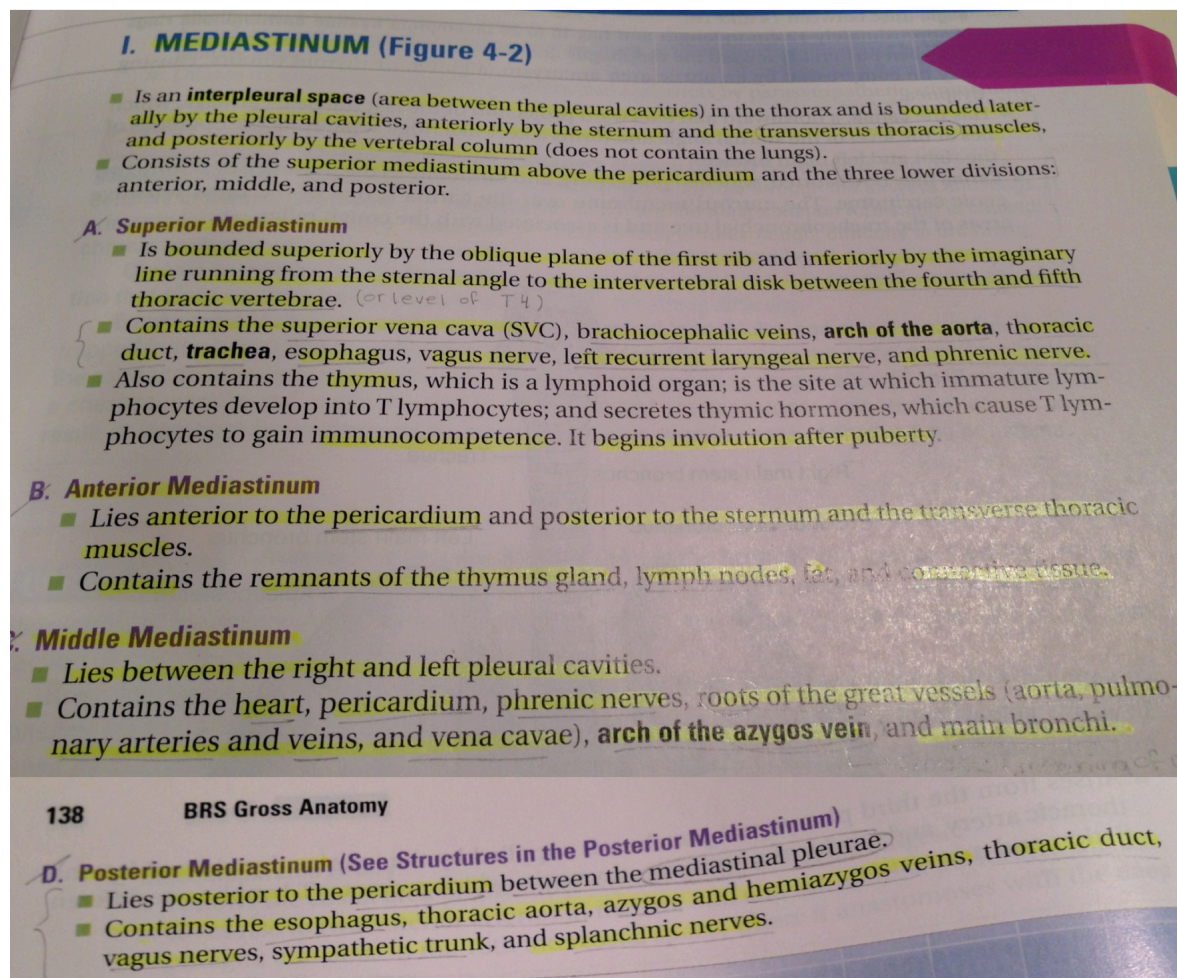
Manubrium → thymus → brachiocephalic veins and superior vena cava → arch of the aorta and its major branches → vagus and phrenic nerves → trachea → esophagus → thoracic duct

N.B.:
LEVEL OF T4

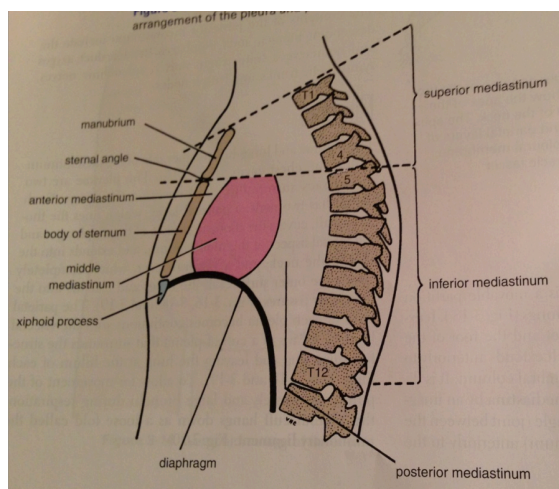
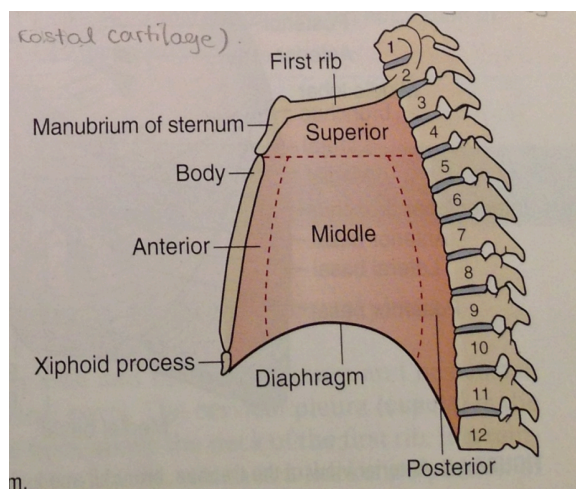
Descending aorta

* We write here superior mediastinum only, the rest of Mediastinum we done fantastic work on it in the teamwork of lecture so, you have to go there and study the rest of parts and content from it. 😊

Quick Summary (Taken from BRS Gross Anatomy):

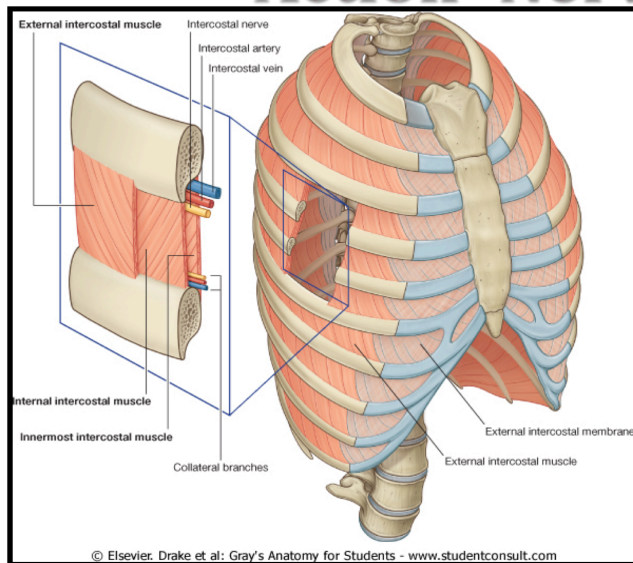


Schematic Diagrams of the Mediastinum



MUSCLES INVOLVED IN RESPIRATION

Action- Nerve supply

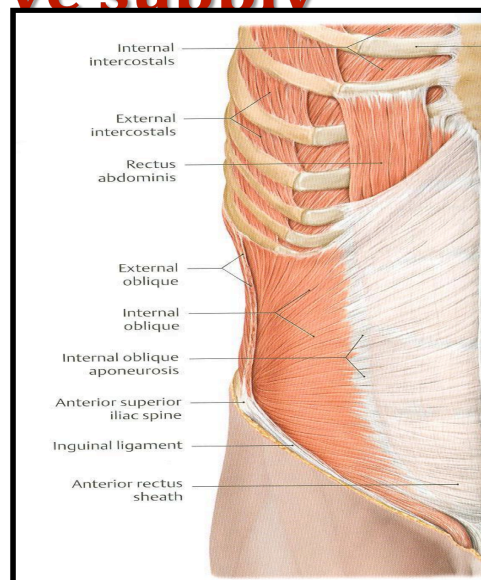
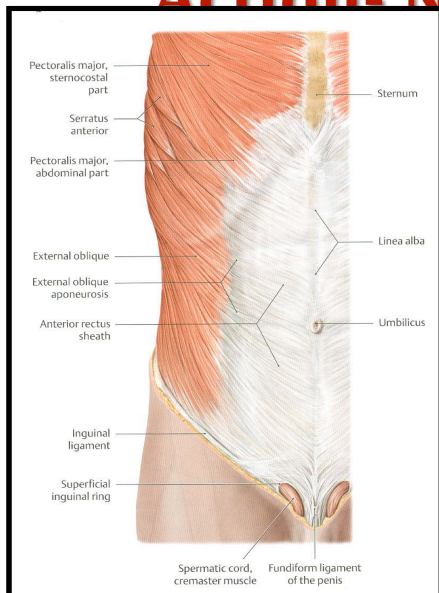


Rib elevators:

- 1- diaphragm: supplied by phrenic nerve - it increases the vertical diameter (it's the prime inspiratory muscle)
- 2- external intercostals: supplied by the intercostal nerve – they serve as rib elevators in normal and forceful breathing
- 3- sternocleidomastoid: USED ONLY IN FORCED BREATHING – supplied by the spinal accessory muscle – raises the thorax
- 4- scalenes: supplied by the lower cervical nerves –1st and 2nd rib elevators
- 5- pectoralis major: lateral and medial pectoral nerves – elevates costal cartilages
- 6- pectoralis minor: mainly medial pectoral nerve – elevates ribs

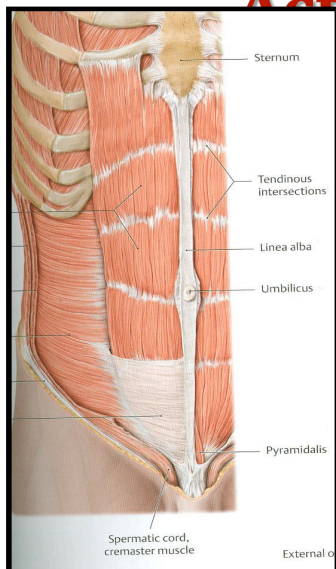
MUSCLES INVOLVED IN RESPIRATION

Action- Nerve supply



MUSCLES INVOLVED IN RESPIRATION

Action- Nerve supply



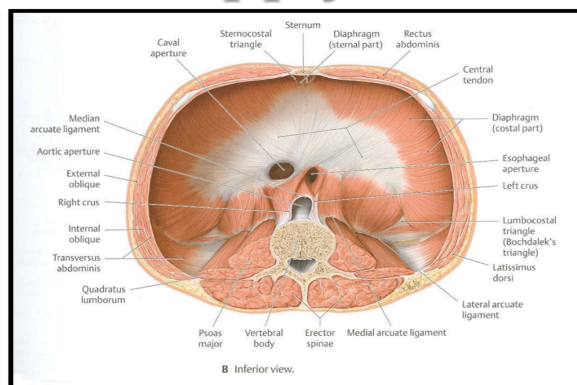
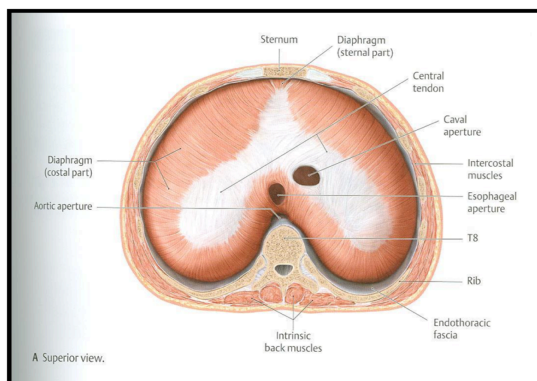
- Abdominal muscles (from superficial to deep): external oblique, internal oblique, transverse abdominis – rectus abdominis
- Abdominal muscles: 4 muscles arranged in 3 layers!
- Nerve supply for all: lower 5 intercostal – subcostal
- L1
- The different fiber arrangements is the prevent herniation (this is why in surgery, it's better to cut with the direction of the fibers to reduce scarring, also try to find a vascular area for faster healing!)
- Linea alba: white line (provides strength for the anterior abdominal wall)

Rib depressors: (ONLY USED IN FORCES BREATHING)

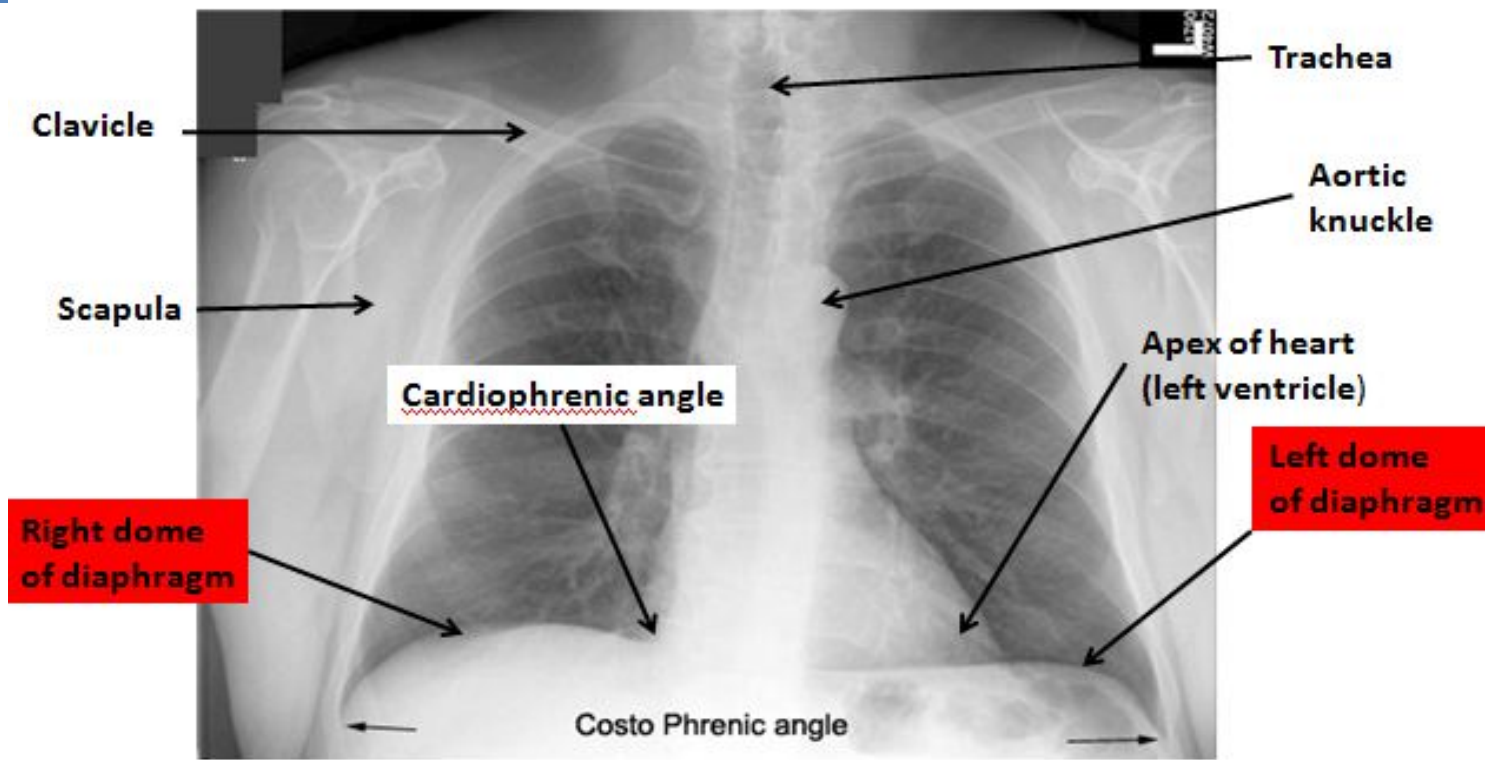
- 1- internal and innermost intercostals: supplied by the intercostal nerve – they depress the ribs
- 2- subcostalis muscles: supplied by intercostal nerve
- 3- transversus thoracis: supplied by the intercostal nerve – depresses ribs

DIAPHRAGM

Action- Nerve supply



- Locate the right crus – central tendon – left crus – median and lateral arcuate ligaments ??



Notes: (should know all bones)

1-right dome is higher than left dome

- Beneath the right dome is the homogeneous, dense shadow of the *liver*.
- Beneath the *left dome* a gas bubble may be seen in the *fundus of the stomach*.

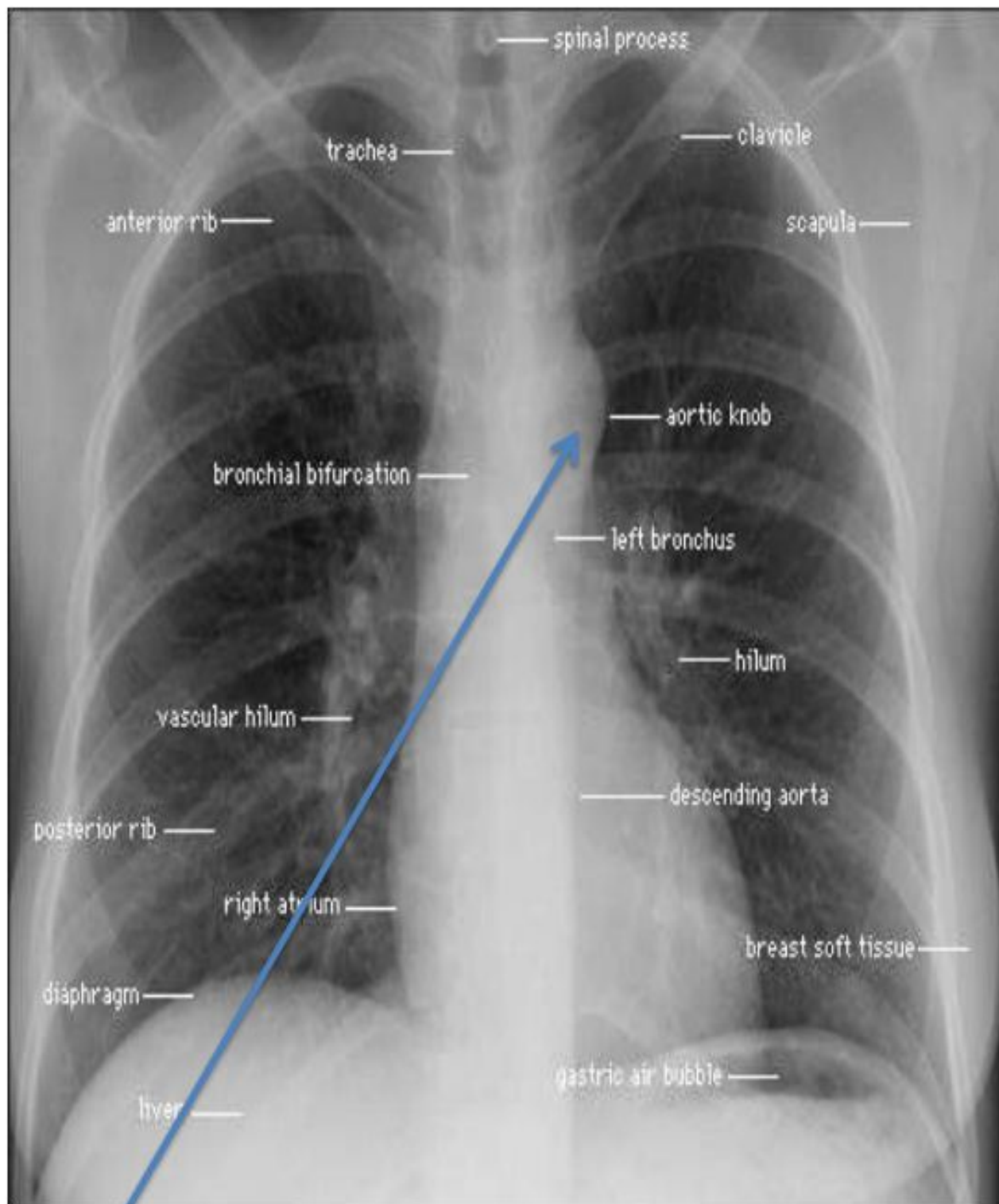
2- (What is the name of this film?)

Plain x-ray postero-anterior show.

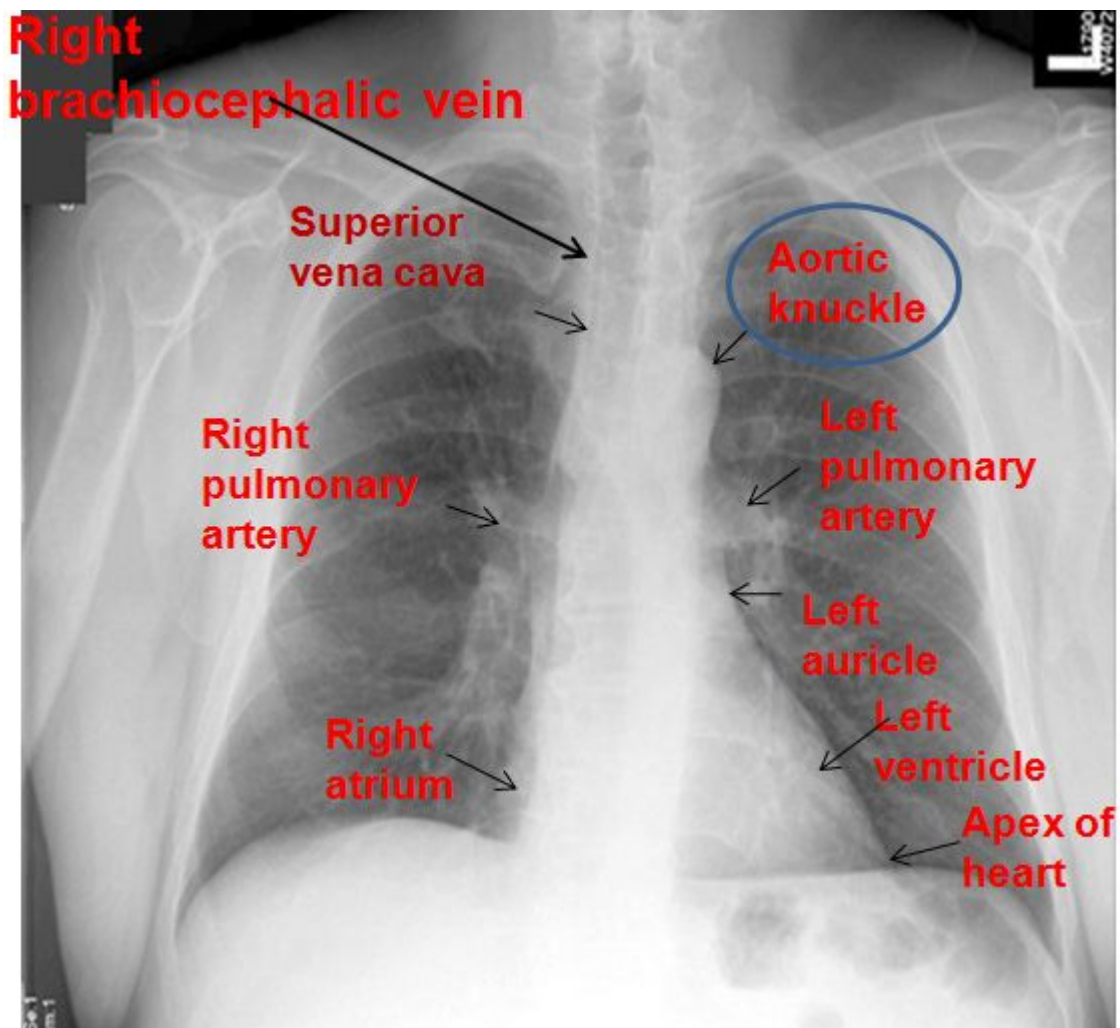
3- Right border: Right brachiocephalic vein, Superior vena cava, Right atrium and Inferior vena cava

Left border: Aortic knuckle or knob (aortic arch), pulmonary trunk, Left auricle and Left ventricle & Apex Of the heart

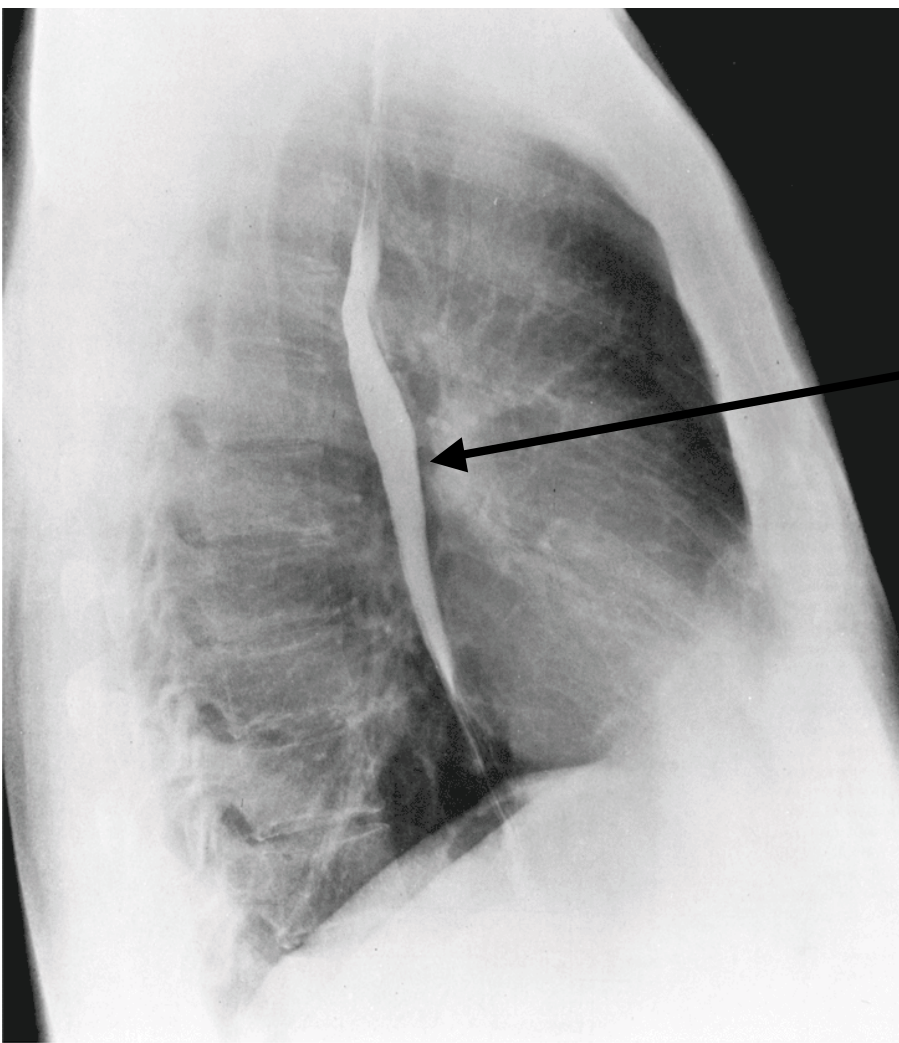
The most important part in left border is Aortic knuckle



What aortic knob (**knuckle**) represent? **Aortic arch**



| <u>Right Border</u> | <u>Left Border</u> | <u>inferior border</u> |
|---|--|---|
| <u>Right brachiocephalic vein, Superior vena cava, Right atrium, and sometimes the Inferior vena cava.</u> | A prominence, the <u>Aortic knuckle</u> , caused by the <u>aortic arch</u> ; Left margin of the <u>Pulmonary Trunk, the Left Auricle, and the Left Ventricle & apex of heart.</u> | (lower border of the heart) blends with the diaphragm and liver shadow. Note the cardiophrenic angles. |



Esophagus

Contrast Visualization of the Esophagus

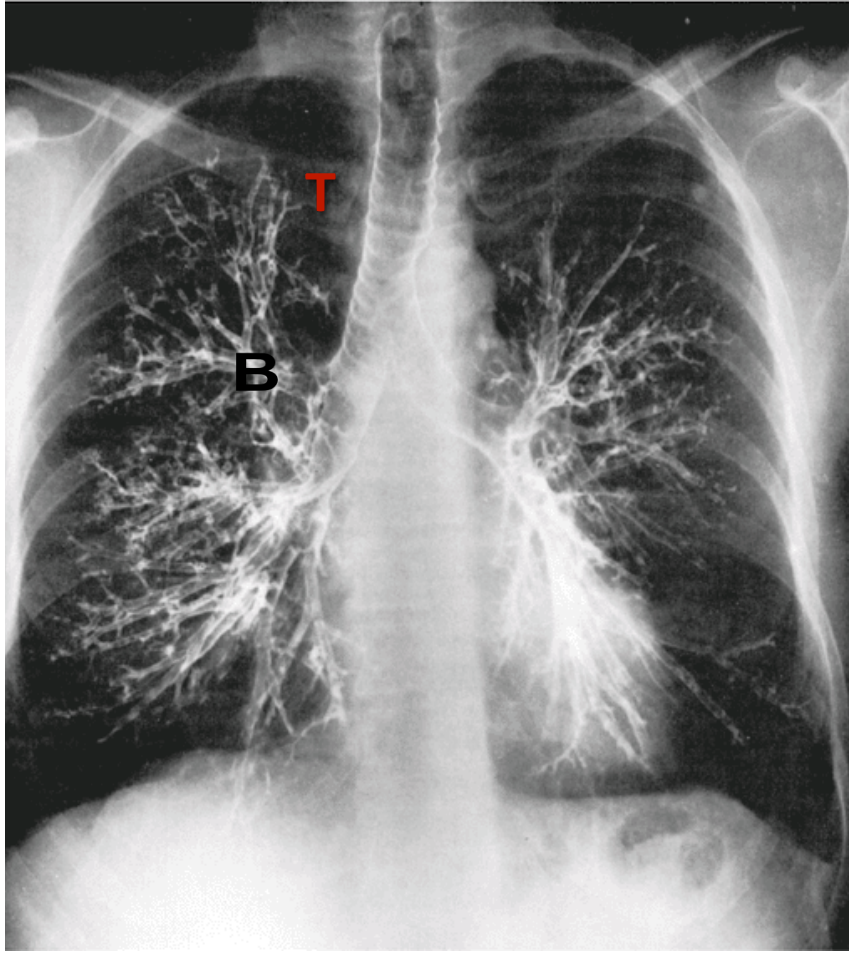
Left lateral radiograph of the chest of a normal adult man after a barium swallow.

Other barium contrast studies:

Barium meal: stomach

Barium follow through: small intestine

Barium enema: large intestine



what is the name of this film ?

bronchography

T= trachea

B=bronchi

Bronchography is a special study of the bronchial tree by means of the introduction of contrast medium into a particular bronchus or bronchi, usually under **fluoroscopic** control.

The **contrast media** are nonirritating and sufficiently radiopaque to allow good visualization of the bronchi. After the radiographic examination is completed, the patient is asked to **cough and expectorate the contrast medium**.



وفي الختام نأمل أن الله قد وفقنا في هذا العمل وحققنا غايتنا منه وكان خفيف الحمل سهل المحتوى :")
نود أن نشكر كل عضو/ة مد لنا يد العون وامتنعنا بأعماله و عطاءه المثمر
وتتمنى للجميع مستقبلا زاخرا بالانجاز والتوفيق

Done by :

Anjod almuhareb , Rheema Alfadhil , Sarah alseneidi,
Hanan Aldossari , Sarah Alkharashi, Waad Almanie