



Manubrium  
sterni  
Costal mar  
and xiphoid  
process



## S T E R N U M

- \*Type:** flat bone.
- \*Site:** Anterior chest wall
- 1. Jugular notch.**
- 2. Clavicular notch.**
- \*Parts:** Manubrium sterni, body and Xiphoid process

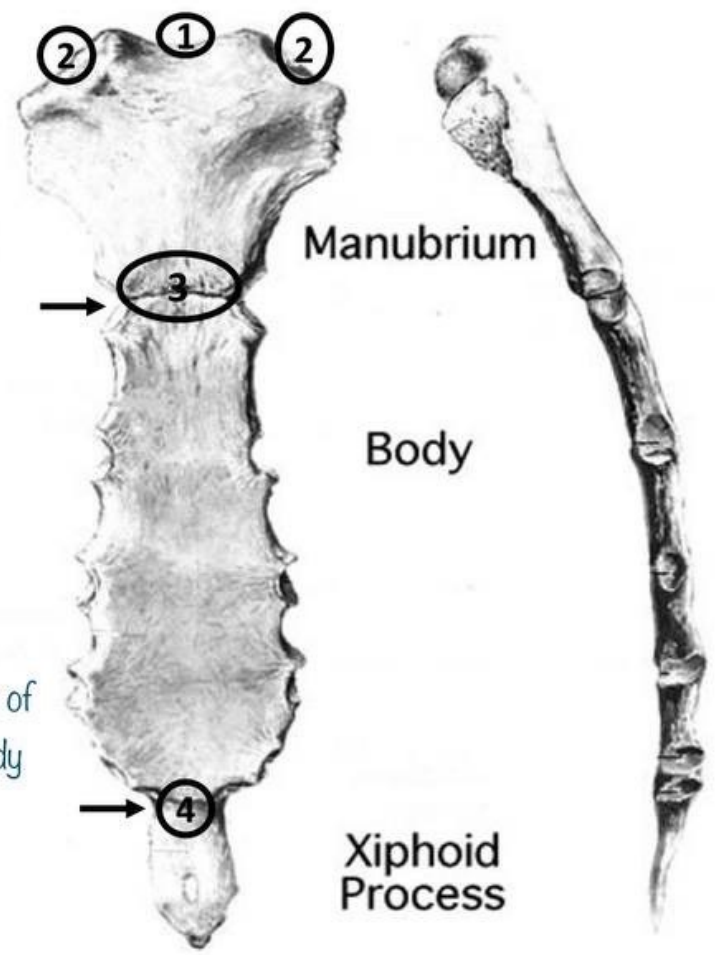
Pass Interval Jugular vein

- \*Joints formed by:**
- 1. Sternoclavicular joint .**  
(saddle synovial J). ➡
- 2. 1<sup>st</sup> sternocostal joint.**
- 3. Manubrio-sternal joint (sternal angle)**  
(2ry cartilagenous J).
- 4. Xiphi-sternal joint**  
(2ry cartilagenous J)

between the xiphoid process and the body of the sternum.

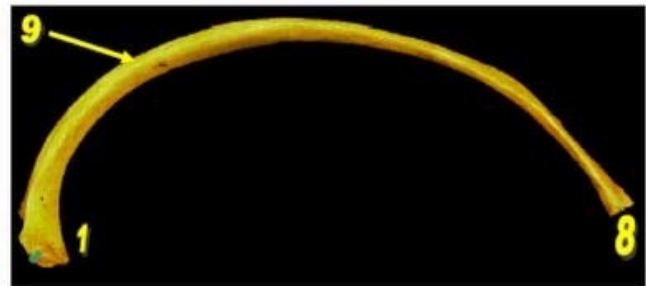
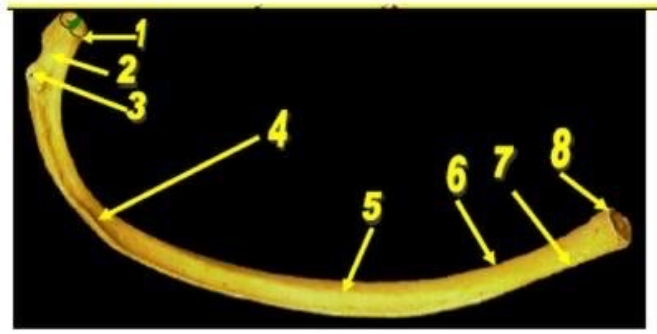
between the manubrium of the sternum and the body of the sternum

85



# RIBS

## Typical rib



- 1- Head
- 2- Neck
- 3- Tubercle
- 4- Costal groove
- 5- Inner surface
- 6- Upper border *round border*
- 7- Lower border *Sharp border*
- 8- Anterior end (concave)
- 9- Rib angle
- Two articular demifacets separated by a crest

connects the head of ribs to the vertebrae

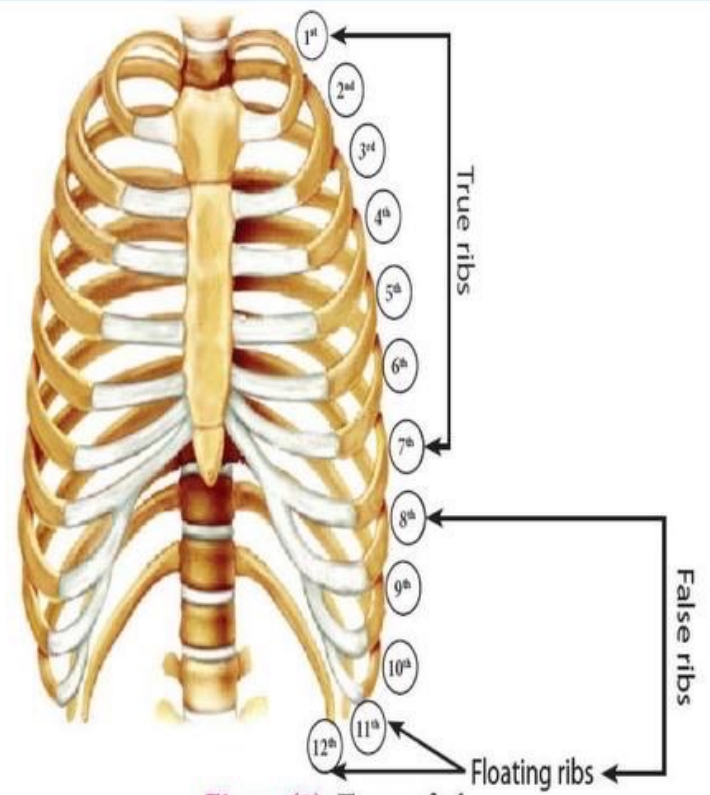


Figure (8): Types of ribs.

**Joints formed by the rib:**  
**1-costovertebral joint: plane synovial joint.**  
**2-costotransverse joint: plane synovial joint.**

between the tubercle of a rib and the transverse process of the corresponding thoracic vertebra

**How to identify a rib?**

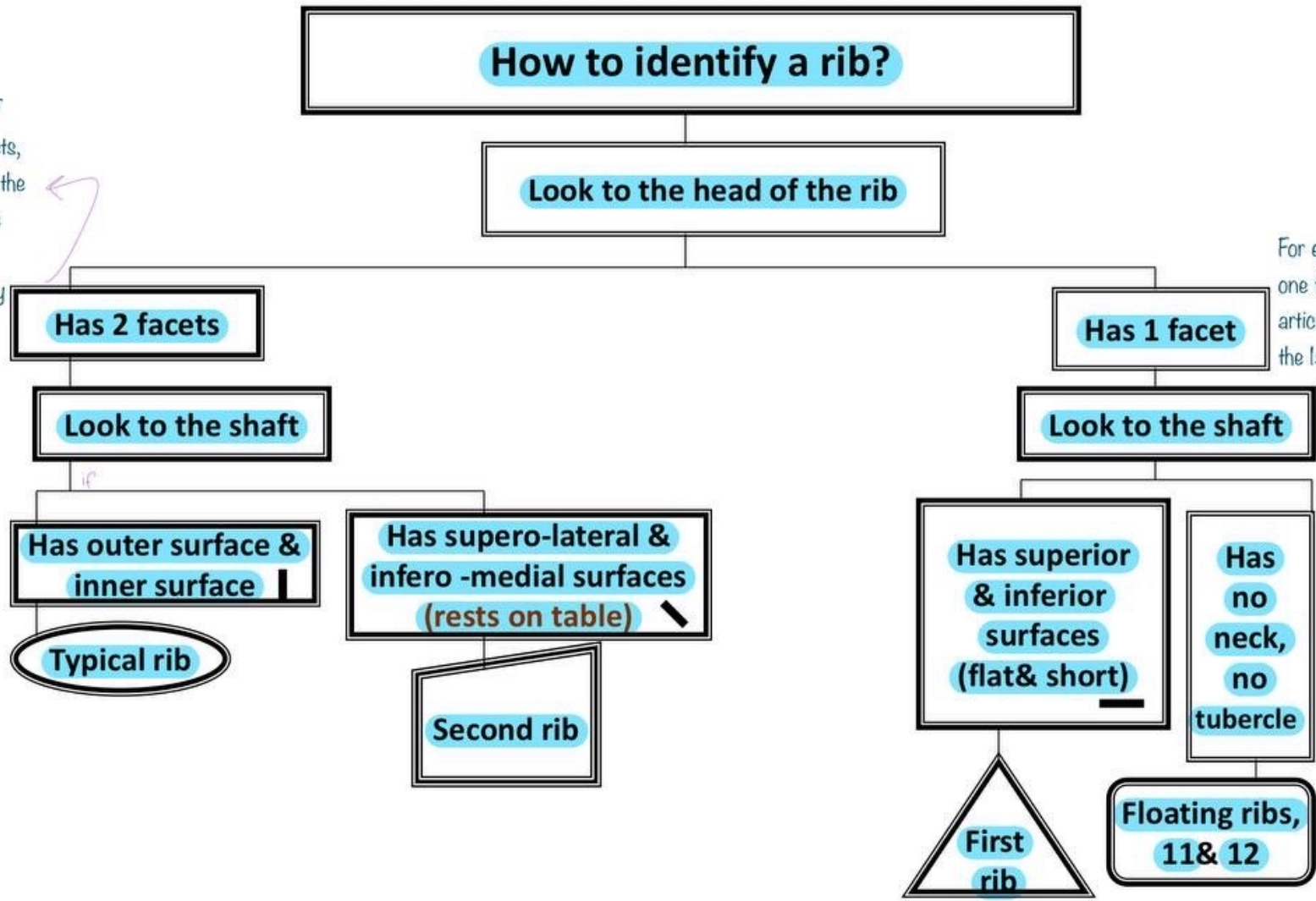
- 3- Tubercle
- 4- Costal groove
- 5- Inner surface
- 6- Upper border *round border*
- 7- Lower border *Sharp border*
- 8- Anterior end (concave)
- 9- Rib angle
- Two articular demifacets separated by a crest

**Joints formed by the rib:**  
 synovial joint.  
**2-costotransverse joint: plane synovial joint.**

between the tubercle of a rib and the transverse process of the corresponding thoracic vertebra

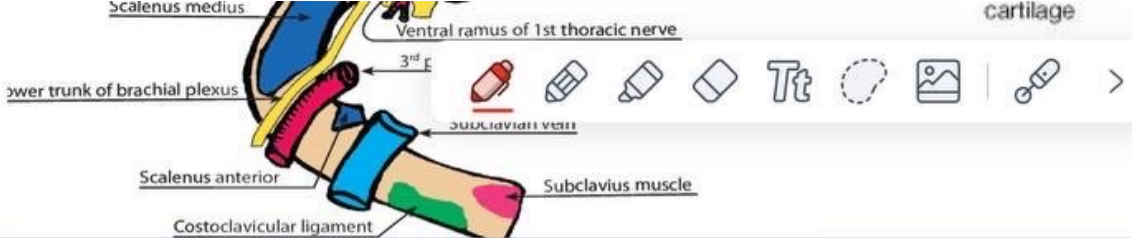
For example, the head of the 5th rib has two facets, one for articulation with the body of the 5th thoracic vertebra and one for articulation with the body of the 4th thoracic vertebra.

For example, the 1st rib has one facet on its shaft, which articulates with the body of the 1st thoracic vertebra.



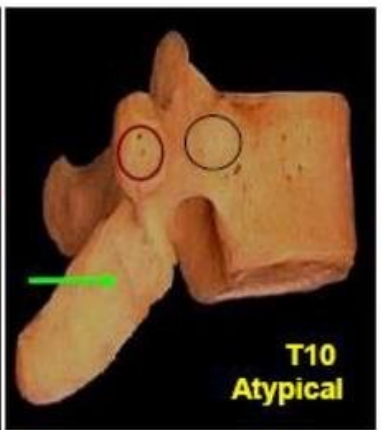
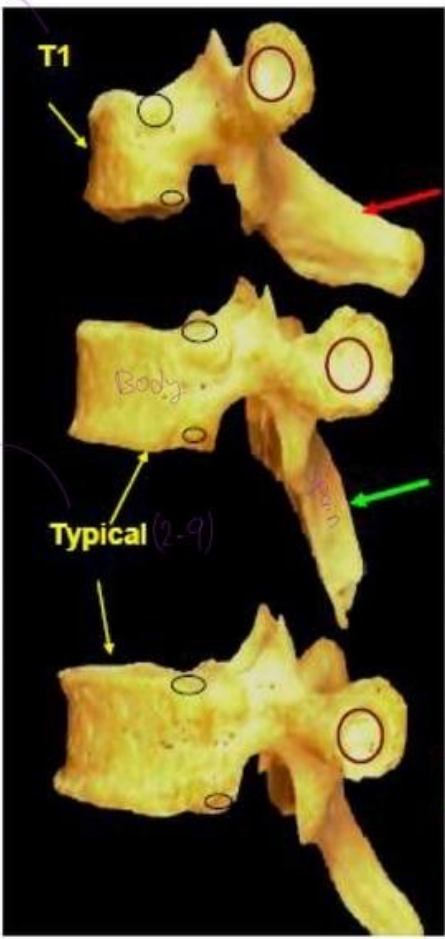
Neck | Head





# THORACIC VERTEBRAE

\*Long horizontal spine  
 \*Smaller-body than Typical  
 \*Complete Facet in transverse process



12 thoracic vertebra  
 2-9 typical  
 1, 10, 11, 12 Atypical

\*\* Long // down wade  
 Sharp // oblique Spine

\*body has complete facet ( no Demi facet )

\*\* Long // down wade  
 Sharp // oblique Spine  
 \*\*body has Demi or half facet  
 \*\*Complete facet in transverse process

*Typical Thoracic vertebrae*-  
 Upper and lower demifacet ○

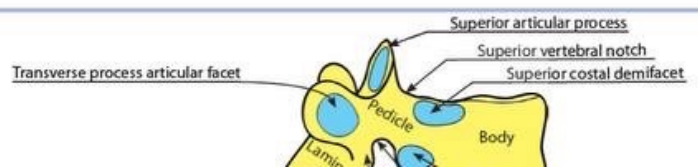
*Atypical Thoracic vertebrae*-  
 one complete facet ○

*T1*-Upper complete facet and lower demifacet ○

→ *T1*- Horizontal spine

→ Oblique spine

○ Articular facet on transverse process



# Subdivision of mediastinum

- A transverse plane extending from the sternal angle (the junction between the manubrium and the body of the sternum) to the intervertebral disc between vertebrae TIV and TV separates the mediastinum into :

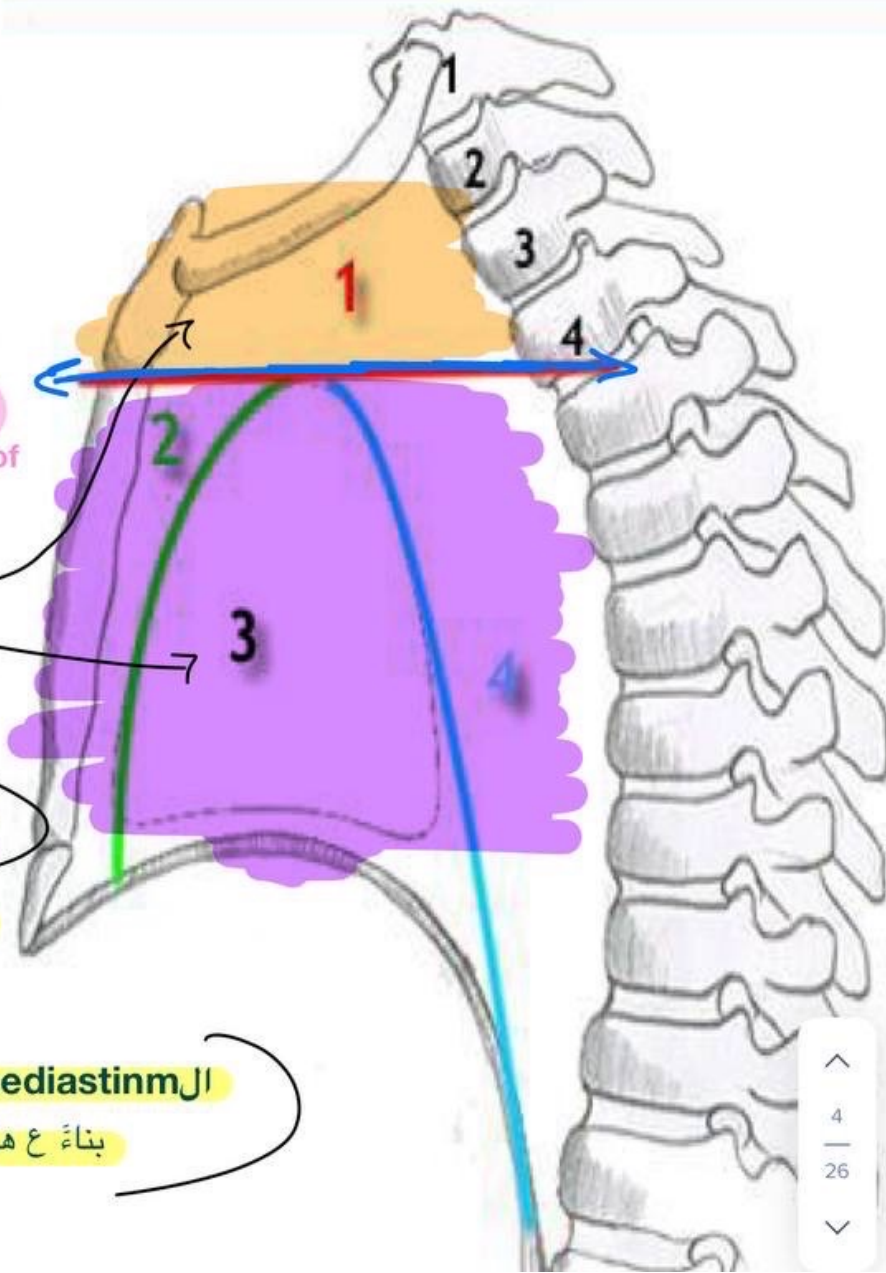
Imaginary line From lower border of manubrium to lower border of thoracic vertebrae 4

**1-superior mediastinum.**

**2-inferior mediastinum**, which is further partitioned into the **anterior (2)**, **middle (3)**, and **posterior mediastinum (4)** by the **heart and pericardium.**

الinferior mediastinum موجود فيه الheart & pericardium

بناءً ع هاد الشئ: قسمنا الinferior mediastinum ل ثلاث مناطق





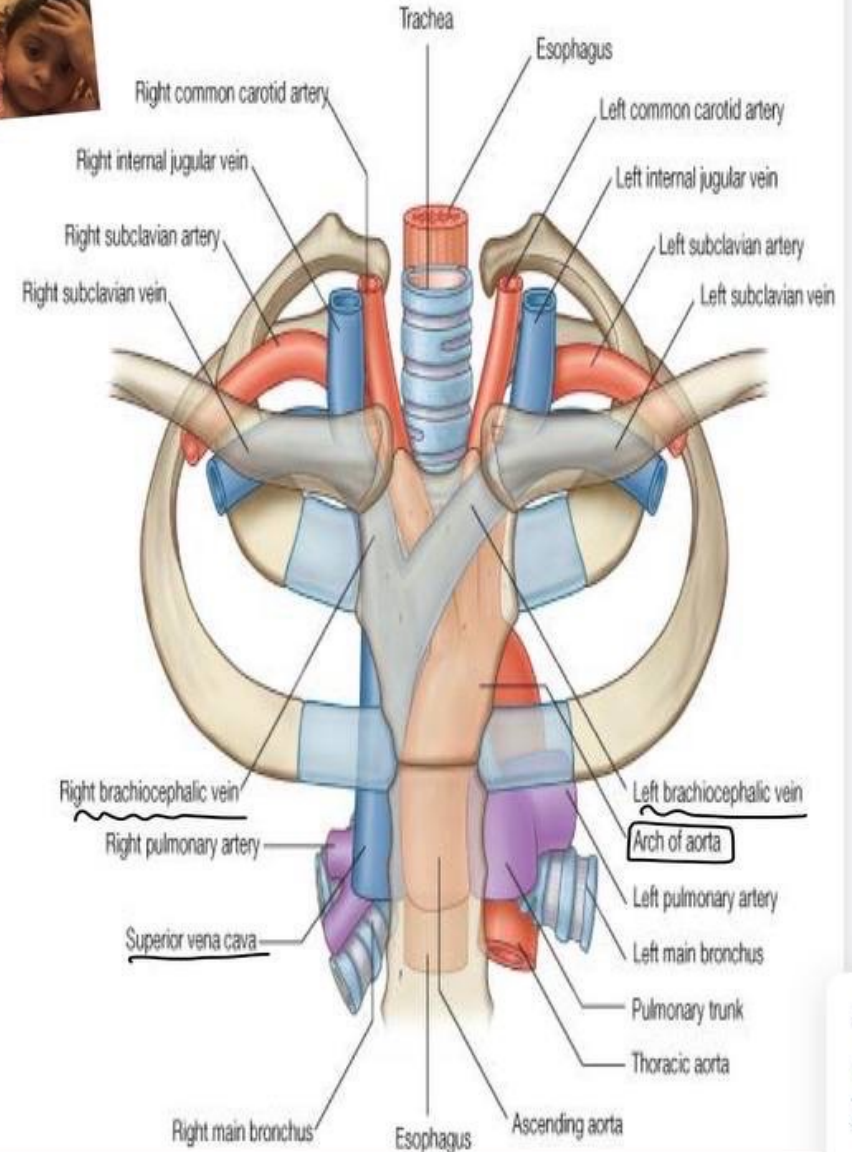
# Contents of superior mediastinum

اعتبروه انه في هايلايتس عليهم ابصمو الجدول كلو كلو

important



<p><b>*Veins</b></p>	<p><b>*Right and left brachiocephalic veins</b>  <b>*Superior vena cava</b></p>
<p><b>*Arteries</b></p>	<p><b>*Arch of aorta and its branches</b>  <b>(brachiocephalic a, left common carotid and left subclavian artery)</b></p>
<p><b>*Tubes</b></p>	<p><b>*Trachea, esophagus and thoracic duct.</b></p>
<p><b>*Nerves</b></p>	<p><b>*Vagus n, phrenic n and left recurrent laryngeal n</b></p>
<p><b>*Others</b></p>	<p><b>*Thymus gland &amp; lymphatics.</b></p>



# Contents of anterior mediastinum

- Thymus.
- Fat, connective tissue, lymph nodes.
- Mediastinal branches of the internal thoracic vessels.

• **Sternopericardial ligaments.** the function is Fixing the Heart in place.

(تثبيت القلب في مكانه)

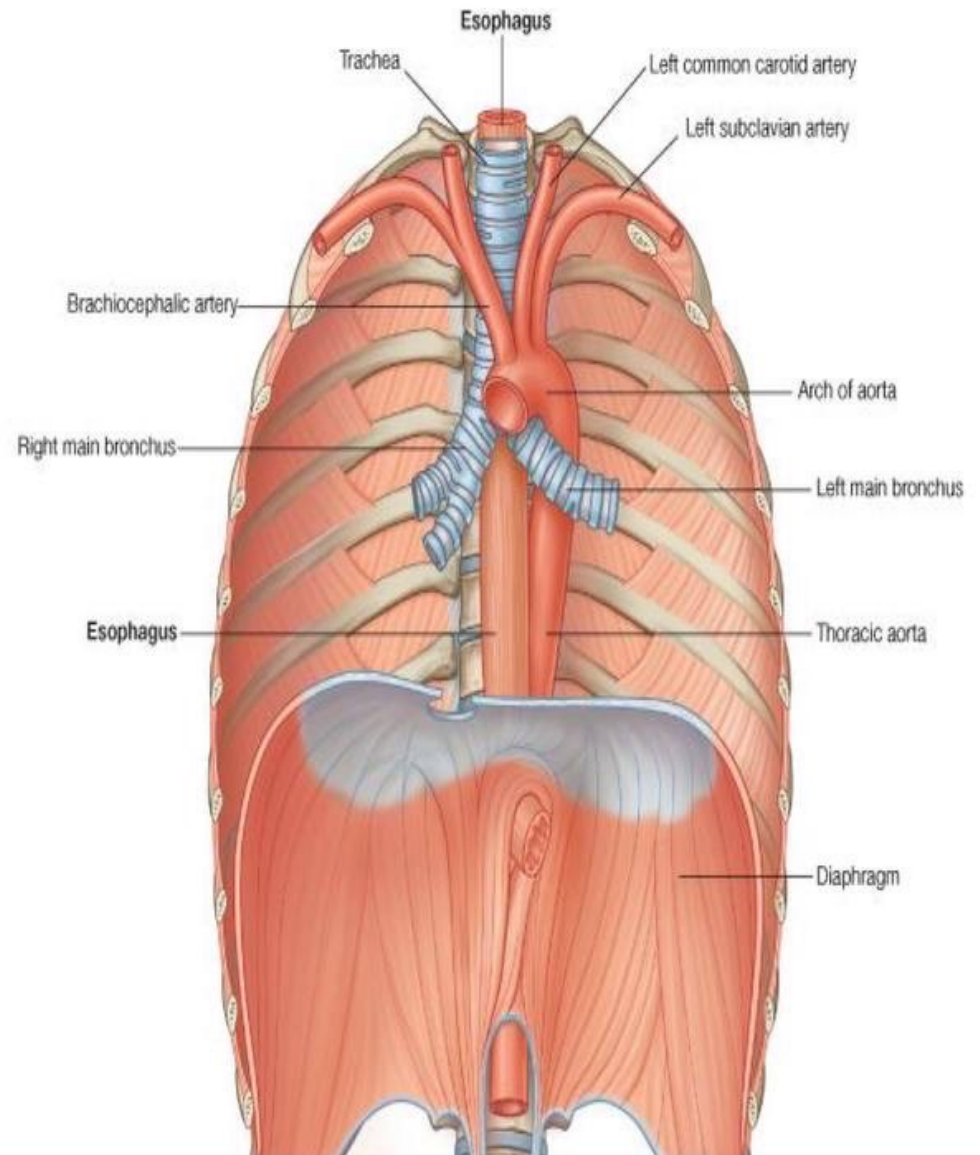
↳ The most important structure in anterior mediastinum

Most imp structure  
in ant. mediastinum.

# Contents of Posterior mediastinum

The two most important components: thoracic aorta & esophagus

<b>Tubes</b>	✓ <b>Esophagus</b> ✓ <b>Thoracic duct</b>
<b>Arteries</b>	✓ <b>Thoracic Aorta</b>
<b>Veins</b>	✓ <b>Azygous vein</b>
<b>Nerves</b>	① ✓ <b>*Thoracic sympathetic trunks</b> ② ✓ <b>*Thoracic splanchnic nerves</b>





# MAJOR OPENINGS

It has 3 main openings (Voice Of Arabs)

## Esophageal opening **T10**

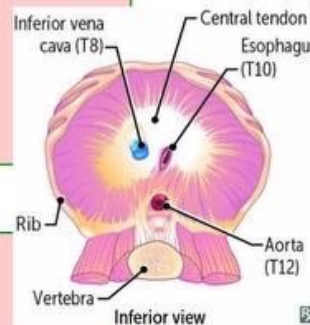
Transmits:

- ✓ Esophagus,
- ✓ Vagi,
- ✓ Esophageal branches of left gastric vessels &
- ✓ Lymph vessels

## Aortic opening **T12**

Transmits:

- ✓ Aorta,
- ✓ Thoracic duct &
- ✓ Azygous vein

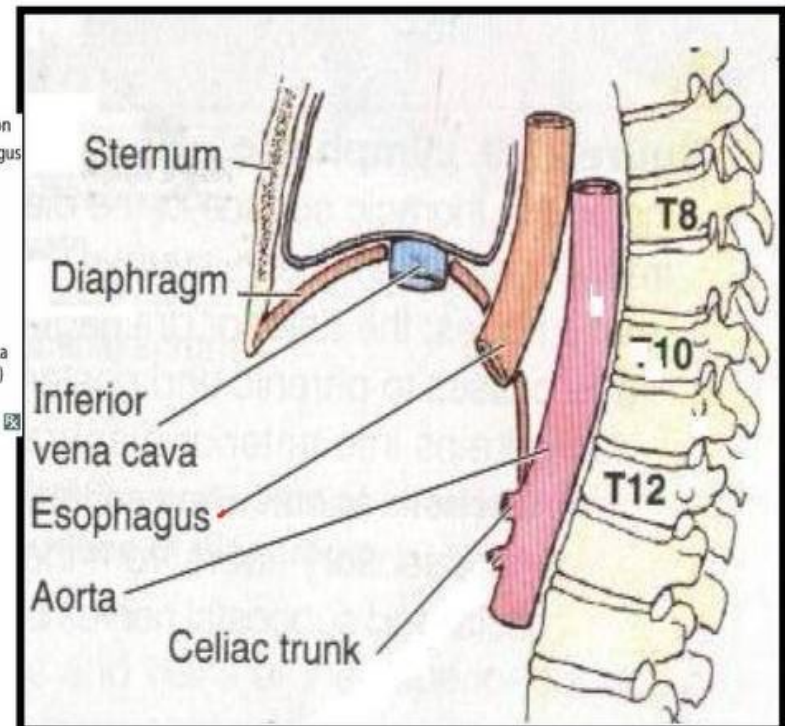


## Caval opening **T8**

Thoracic vertebrae 8, ثامن

Transmits:

- ✓ IVC,
- ✓ right phrenic nerve



Motor & Sensory → phrenic Nerve

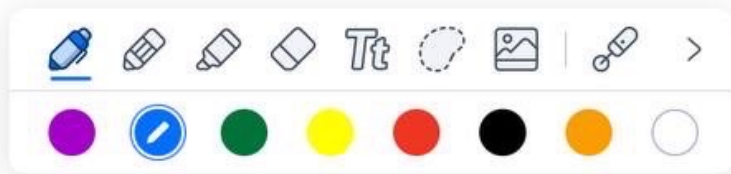
## **Nerve Supply of the diaphragm**

Motor through phrenic nerve (C3, 4 & 5)

Sensory supply to the central tendon (phrenic nerve)

But the periphery is from the lower five intercostal nerves & subcostal nerve.





- 3 conchae develop as elevations on the lateral wall of the nasal cavity

- The paranasal sinuses develop as diverticula from the lateral wall of the nose. At birth, they are either very small or absent; their enlargement continues through childhood and contributes to the shape of the face.

- 1. The maxillary and ethmoid sinuses are present at birth, but are small; the development of the maxillary is not completed until the eruption of all adult teeth; while the ethmoid is developed by about 8 years.

تبدأ عند 6 months ↪

- 2. The frontal and sphenoid sinuses develop postnatally; the frontal during the 7<sup>th</sup> year & the sphenoidal around the 2<sup>nd</sup> year.

وتكتمل عند 16 years ↪

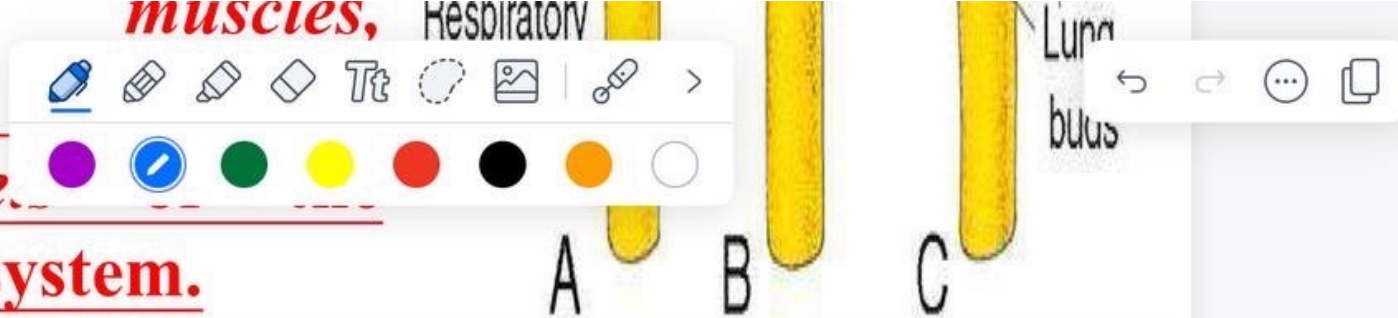
أي سنة أو شهر حفظ

smooth muscles, Respiratorv

connective

blood vesse.

respiratory system.



- Fusion of the laryngo-tracheal folds stops cranially leaving a communication between the laryngo-tracheal tube and the pharynx. This opening is called the laryngeal inlet.

يعني احنا قفلنا من caudo-cranial direction وبس وصلنا فوق عن pharynx  
هسا بنعرف انه مقابله في larynx وبفصلهم laryngeal inlet هاذ بنتم تشكيه ثم بنكمل نزول لحد ما نوصل لتشكيل ال lung

- The *inlet* is a vertical slit which ends cranially opposite a median elevation in the floor of the pharynx, called the *copula* (epiglottis).

توجد فتحة عمودية تسمى "المدخل" وتنتهي مقابل منطقة مرتفعة وسطية في قاعدة الحلق تسمى epiglottis

- Later, the inlet becomes T-shaped and is obliterated transiently between the 8<sup>th</sup> and 10<sup>th</sup> weeks.

بعد عمر 10 اسابيع بقدر اقول انه ال The laryngo-tracheal groove عملت larynx  
وتم فصله عن الباقي وبعدها ال larynx يكمل trachea tube  
قبل 10 اسابيع لا يمكن



# The lung buds undergo the following

## **A- Division:**

هذا يفسر ما درسناه انه لو في foreign body راح يعدي على right side وليس left

- Each lung bud forms a *main bronchus*. The right bud is wider and more vertical than the left. Each main bronchus divides into *secondary* (lobar) bronchi (3 on the right side & 2 on the left side).  
على عدد lobe
- The 2 ry. bronchi divide giving *tertiary* (segmental) bronchi, each becomes surrounded by a mass of splanchnic mesoderm a *broncho-pulmonary segment*.  
بالمحاضرة الرابعة اخذناهم لو تتذكروا ، المهم صورتهم تحت
- Repeated division by the 6<sup>th</sup> Month to 17 orders of branches ending in *terminal bronchioles*.  
بتضل تنقسم 17 مرة لنوصل لتشكيل ال terminal bronchiole
- Further division continues for sometime **after birth** (up to 8 years) till the *respiratory bronchioles* and *alveoli* are formed after 7 additional orders of divisions (i.e., **total of 24 orders**).

**B- The surrounding splanchnic mesoderm** cartilaginous plates, smooth muscles, connective tissue & blood capillaries (bronchial & pulmonary).

جدول مهم جدا وهم أربع مراحل فلندرس واحدة واحدة

# Stages of Lung maturation

سنة  
سنة

Stage	time	Change formation	Baby survive
1- <b>Pseudo glandular</b> مرحلة واضحة جدا	<b>5 to 16 weeks</b>	<b>Appear Bronchi and terminal bronchioles</b>	<b>Not</b> (due to no element of gases exchange)
2- <b>Canalicular</b>	<b>17 to 24 weeks</b>	<b>Appear of respiratory bronchioles and alveolar ducts</b>	<b>Not</b> (no element of gases exchange)
3- <b>Terminal sac</b>	<b>24 to birth</b>	<b>Appear of alveoli lined by type I pneumocytes</b> <b>Appear of type II pneumocytes which secret surfactant (begin of secretion from 20<sup>th</sup> week)</b>	<b>Can survive with intensive care</b> إذا ولد بهذا المرحلة
4- <b>Alveolar period</b>	<b>From late perinatal period till 8 years after birth</b> نتبه لا تكتمل تكوين ال lung تماما إلا بعد 8 سنوات مهم جدا	<b>The number of alveoli increases (95% of the alveoli develop after birth).</b>	<b>Survive</b>

صح تم تشكيلها لكن لسا unfunctionly

في ملاحظة على هذه المرحلة بالاسلايد الجاي

ملاحظة هنا وهي انه نعلم انه surfactant ينتج من type 1 pneumocyte



# Anomalies of respiratory system

Past papers.

(1) **Oesophageal atresia & tracheo-oesophageal fistula:** (*Atresia = obliteration & fistula = abnormal communication*). The tracheo-oesophageal fistula results from *incomplete fusion* of the tracheo-oesophageal folds. Four varieties may occur (the most common is atresia of the upper portion of esophagus & fistula of its lower portion with the trachea impossible feeding & aspiration of milk into the lungs. (before birth, it causes polyhydramnios).  
الي انشرح عليهم بالاسلايد القادم موجود

(2) **Surfactant deficiency hyaline membrane disease (HMD)** which is the major cause of **respiratory distress syndrome (RDS)**. Thyroxin and cortisone increase surfactant production.

(3) **Other lung problems:** include agenesis, hypoplasia (small lung), variation in lobes number, accessory lung, ectopic lung lobes (from the trachea or oesophagus) and congenital lung cyst.  
شرح تحت

"Oesophageal atresia"

هي حالة خلقية نادرة تحدث عندما يكون الرئيس (المريء) مغلقًا جزئيًا أو كليًا، مما يعيق

# Breath Movements

- **Before birth**, they can be detected by ultrasonography. As the lung is not a respiratory organ before birth, these prenatal breath movements cause:

نعلم انه الطفل بالرحم يتنفس من الأم عن طريق ال placenta ونرى

1. **Suction of amniotic fluid into the airway.**

مثل المي بس تتحرك بالخرطوم breath movement بهذه المرحلة

2. **Training of the respiratory muscles.**

بال ultrasound لسبيين :

\* **At birth**, the fluid in the airways (**amniotic fluid + bronchial secretions**) **becomes replaced by air via 2 mechanisms:**

بتلاحظ اول ما ينولد الطفل الدكتور يكون ماسك الطفل بحيث راسه للأسفل لخروج ال

amniotic fluid وبوخذ اول شهيق بحياته

1. **Some become expelled by pressure on the thorax during labour.**

2. **The majority is absorbed by pulmonary capillaries & more importantly by pulmonary lymphatics.**

الي ما بطلع من السائل بأول طريقة يتم امتصاصه