

وَقُلْ رَبِّ زِدْنِي عِلْمًا



RESPIRATORY SYSTEM

HAYAT BATCH

SUBJECT : **Most important , Anatom**
LEC NO. : **final**
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<http://www.medclubhu.weebly.com/>

Lec 1

الدكتور ما حكا عن اشي مهم بها المحاضرة بس هحطلكم اللي بتوقع
ييجي عليهم اسئلة

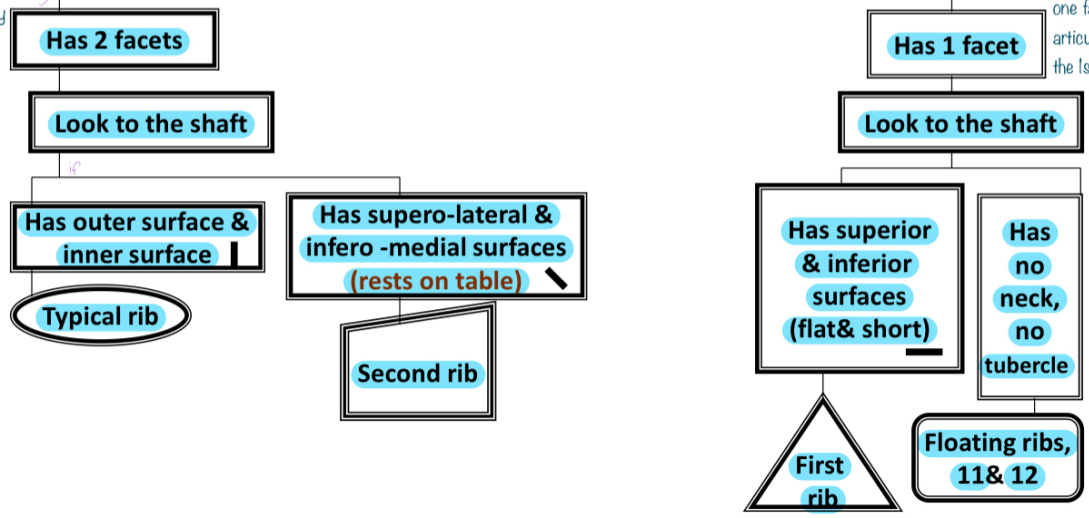
وصف ل rib or vertebra

How to identify a rib?

Look to the head of the rib

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.



- 1 complete facet on body
- Demifacet on lower border
- Complete facet on transverse process
- atypical (first)
- complete facet on body
- Complete facet on transverse process
- atypical (10)
- complete facet on body
- on transverse process
- (11/12)

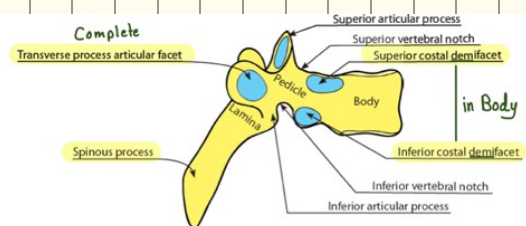


Figure (3): Typical thoracic vertebra, lateral view.

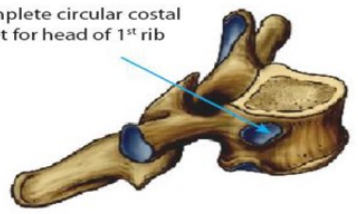


Figure (4): First thoracic vertebra.

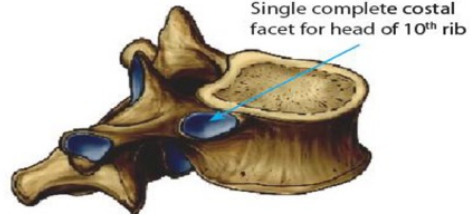
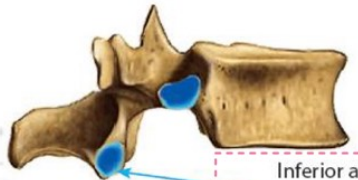
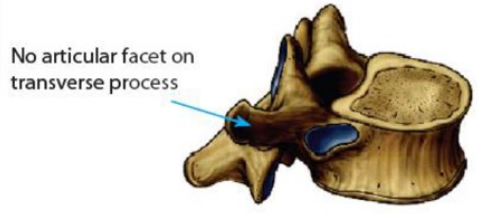


Figure (5): Tenth thoracic vertebra.



Inferior articular process is directed forward and laterally

Figure (6): Eleventh and twelfth thoracic vertebrae.

احفظ اللي تحتيهم خط بس

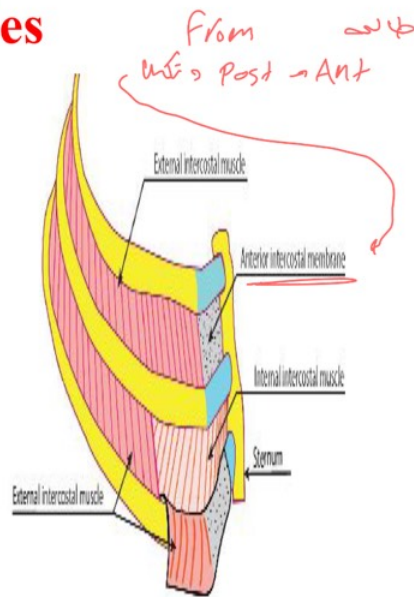
The intercostal muscles

1-External intercostal muscles:.,

Extent: from the tubercle of the ribs posteriorly to the costochondral junction anteriorly where it is replaced by an aponeurosis, the anterior (external) intercostal membrane.

Attachments: Each muscle passes from the lower border of one rib to the upper border of the rib below.

Direction of fibers: downwards & forwards (as one putting his hand in his pocket).



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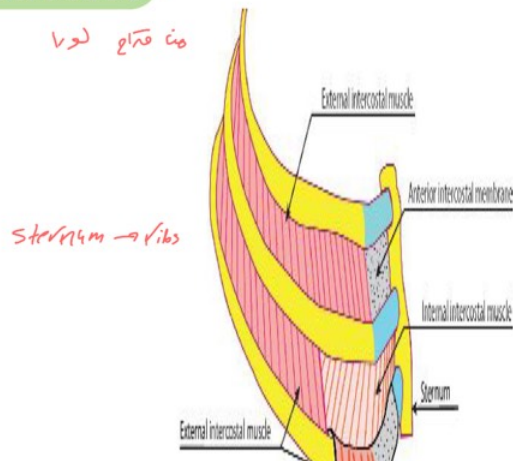
2-Internal intercostal muscles

Forms the intermediate layer.

Extent: from the sternum in front to the angle of the rib behind where each is replaced by internal (posterior) intercostal membrane.

Attachments: Each muscle descends from the floor of the costal groove of one rib to the upper border of the rib below.

Direction of fibers: downwards, backwards i.e. at right angles to those of the external intercostal muscle.



3.Innermost intercostal muscles

forms the deepest layer.

Extent: occupy the middle 2/4 of the intercostal spaces.

• **Attachments:** Each muscle is attached to internal aspects of two adjoining ribs (from the upper border of the costal groove of one rib to the upper border of the rib below).

• **Direction of fibers:** As internal intercostal; acutally it is considered to be a part of the internal intercostal which is split off by the intercostal nerves and vessels.

VAN 19

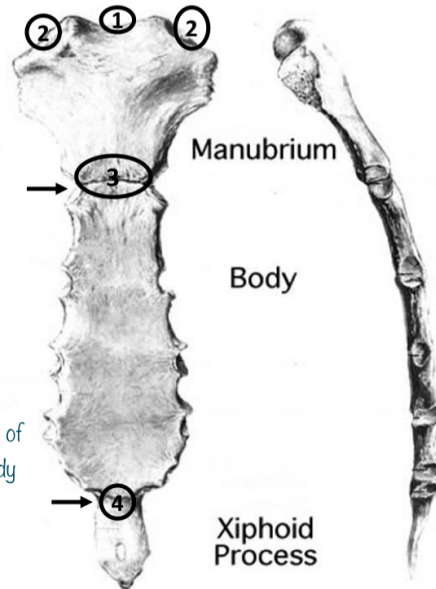
Pass Interval Jugular vein

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

- * Joints formed by:
- 1. Sternoclavicular joint . (saddle synovial J).
- 2. 1st 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.

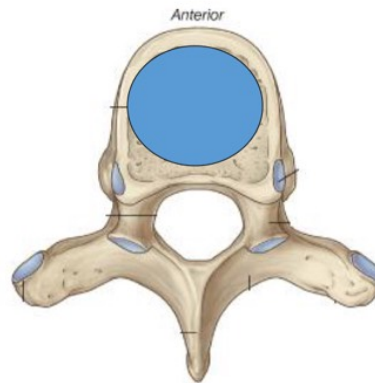
between the manubrium of the sternum and the body of the sternum



4

ال cartilagenous sec

The structure related to the marked area:
 between two vertebrae Inter - vertebral disc. (Secondary cartilagenous J).



Nerve supply of muscles of the thorax:

All the above mentioned muscles are supplied by the adjacent intercostal nerves.

Action of muscles of the thorax:

- 1-The external intercostal muscles are most active in inspiration (elevators of the ribs).
- 2-The internal and innermost intercostal muscles are most active in expiration (depressors of the ribs).
- 3-Subcostales muscle: depresses the ribs.
- 4-Transversus thoracis: draws down the costal cartilages to which it is attached.

تجبه لتحة

جسار وضع

depresses of ال 4/2 / 3 رح يعملو

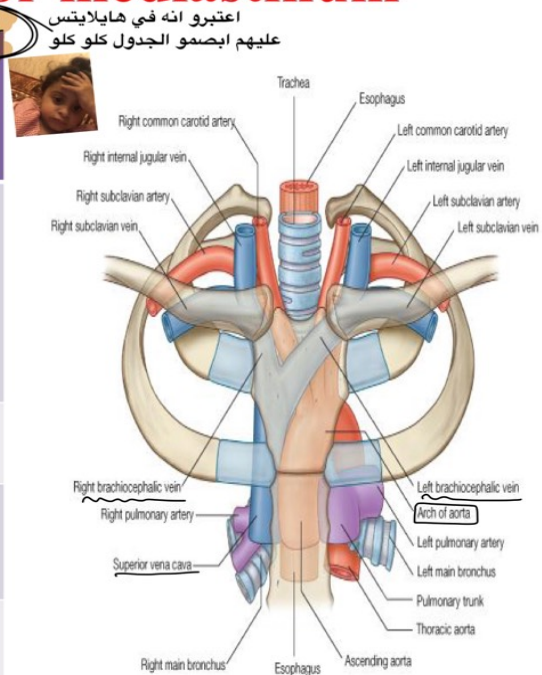
ribs

في ال الزفير

Lec 2

Contents of superior mediastinum

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



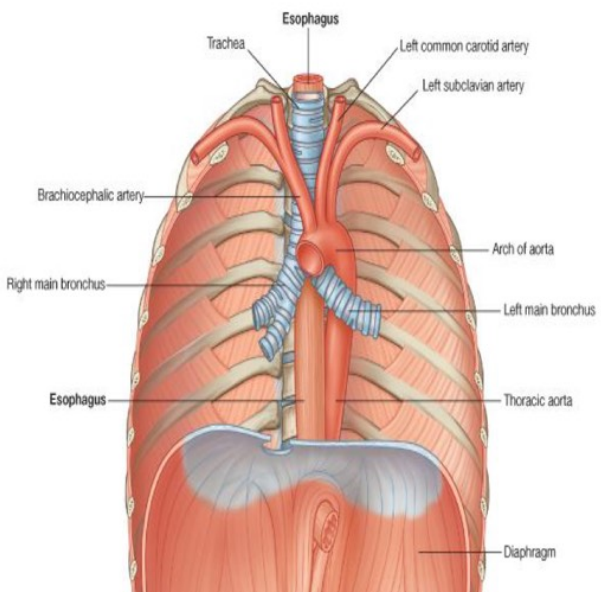
Contents of anterior mediastinum

- 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

Contents of Posterior mediastinum

The two most important components: thoracic aorta & esophagus

| | |
|----------|---|
| Tubes | ✓ Esophagus ✓ Thoracic duct |
| Arteries | ✓ Thoracic Aorta <i>descending</i> |
| Veins | ✓ Azygous vein |
| Nerves | ✓ *Thoracic sympathetic trunks ✓ *Thoracic splanchnic nerves |



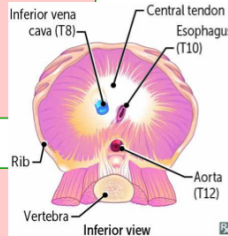
MAJOR OPENINGS

It has 3 main openings (Voice Of Arabs)

Esophageal opening **T10**

Transmits:

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



Caval opening **T8**

Thoracic vertebrae 8, i.e.

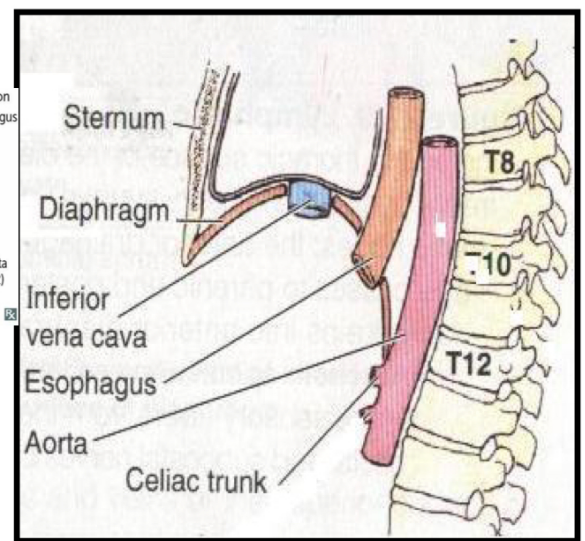
Transmits:

- ✓ IVC,
- ✓ right phrenic nerve

Aortic opening **T12**

Transmits:

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



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Motor & Sensory → Phrenic Nerve

Nerve Supply of the diaphragm

Motor through phrenic nerve (C3, 4 & 5)

Function

Muscle of Inspiration

It is the chief muscle of respiration:

Lec 3

lateral wall من الجدار الجانبي • nasal cavities التجويفات الأنفية • nasal prominence التورم الأنفي
 meatus ممرات الأنف • nasal conchae السويجيات الأنفية • air sinuses التجويفات الهوائية

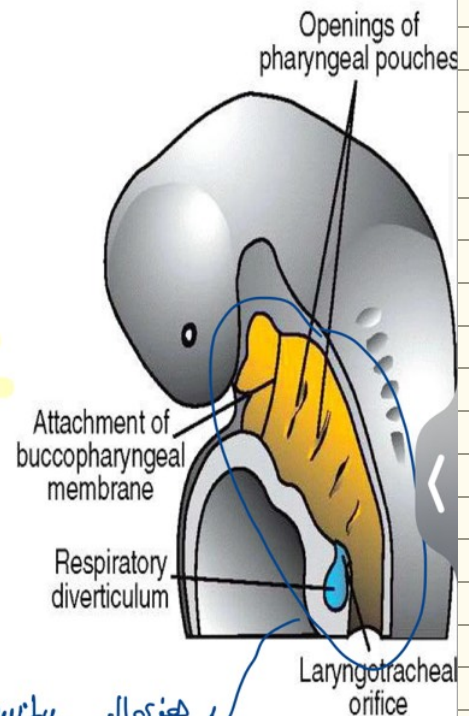
- **3 conchae** develop as elevations on the lateral wall of the nasal cavity
- The **paranasal sinuses** develop as diverticula from the lateral wall of the nose. At birth, they are either very small or absent; their enlargement continues through childhood and contributes to the shape of the face.
- **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.
- **2. The frontal and sphenoid sinuses** develop postnatally; the frontal during the 7th year & the sphenoidal around the 2nd year.

من الجدار الجانبي
 من الجدار الجانبي
 من الجدار الجانبي
 من الجدار الجانبي

مخضبات الأسنان Milk teeth
 Adult ← بعد سن 12 سنة

DEVELOPMENT OF THE RESPIRATORY SYSTEM

- Time: Middle of the 4th week.
- Development:
- The laryngo-tracheal groove appears as a median longitudinal groove in the floor of the primitive pharynx
- * The 2 margins of the laryngo-tracheal groove (called the **tracheo-oesophageal** folds or ridges) fuse together in a caudo-cranial direction forming the **tracheo-oesophageal septum** which separates the lumen of the primitive pharynx
- into 2 parts:
 - a. Dorsal part the pharynx & oesophagus.
 - b. Ventral part called laryngo-tracheal tube.



Respiratory Tube
 (أبيرت) Primitive Pharyngeal Cavity

The lung buds undergo the following

Trachea → 2 main Bronchi → then each Bronchus will divide inside lung buds

A- Division:

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).

The 2 ry. bronchi divide giving tertiary (segmental) bronchi, each becomes surrounded by a mass of splanchnic mesoderm a bronchopulmonary segment.

2
branch from
P. arteries
→ vein

Bronchus ← يطبخ منها الدم لـ supply
دئونة الـ

Repeated division by the 6th Month to 17 orders of branches ending in terminal bronchioles.

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).

complete maturation of lung

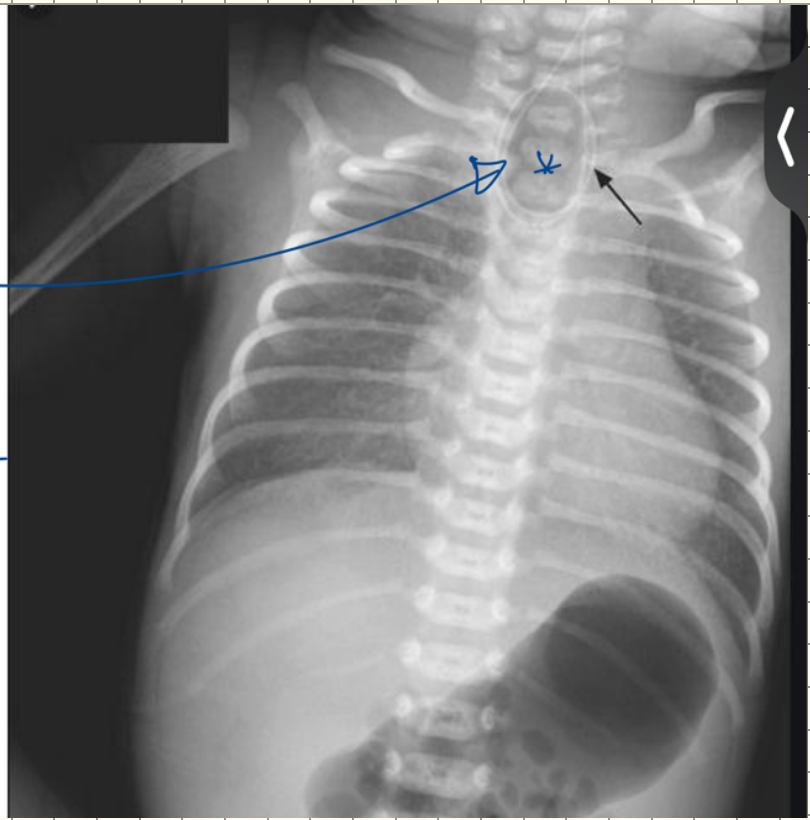
Stages of Lung maturation

| Stage | time | Change formation | Baby survive |
|---------------------|---|---|--|
| 1- Pseudo glandular | 5 to 16 weeks | Appear Bronchi and terminal bronchioles | Not (due to no element of gases exchange) |
| 2- Canalicular | 17 to 24 weeks | Appear of respiratory bronchioles and alveolar ducts | Not (no element of gases exchange) |
| 3- Terminal sac | 24 to birth | Appear of alveoli lined by type I pneumocytes Appear of type II pneumocytes which secrete surfactant (begin of secretion from 20 th week) | Can survive with intensive care |
| 4- Alveolar period | From late perinatal period till 8 years after birth | The number of alveoli increases (95% of the alveoli develop after birth). | Survive |

الانواع حبة و هيك بس اكلها ابيض و هيا
البريط

pneumocytes type II اذا بال canalicular في

Radiological picture of Tracheo-esophageal fistula "Coiled Ryle tube"



في ابتداء ٢١ وتبين انك انه انبعاث
 ما تدريه يستغري ووزنه بقه انت
 كمانه طولك تروح تحكي للعرضه
 ركبي Ryle tube المعروف بـ
 Normal تصدال esophageus
 وتبعد ال Funulus of Stomach
 هذي الكالة ال Ryle عنده من esophageus
 ال Trachea ولغته بها في العنبر *

من اسئلة السنوات ، جاب كيسيز وكان ذاكر فيها انه بال x ray يكون فيه coiled ryle tube

Breath Movements

Placenta به لقوا انه فيه

- Before birth, they can be detected by ultrasonography. As the lung is not a respiratory organ before birth, these prenatal breath movements cause:
 1. Suction of amniotic fluid into the airway.
 2. Training of the respiratory muscles.

الطفل اول ما يتولد يكون داخل ال bronchi tree ايش ؟
 amniotic fluid