أهلا وسهلا

الأستاذ الدكتور يوسف حسين

كلية الطب - جامعة مؤتة – الأردن

دكتوراة من جامعة كولونيا المانيا

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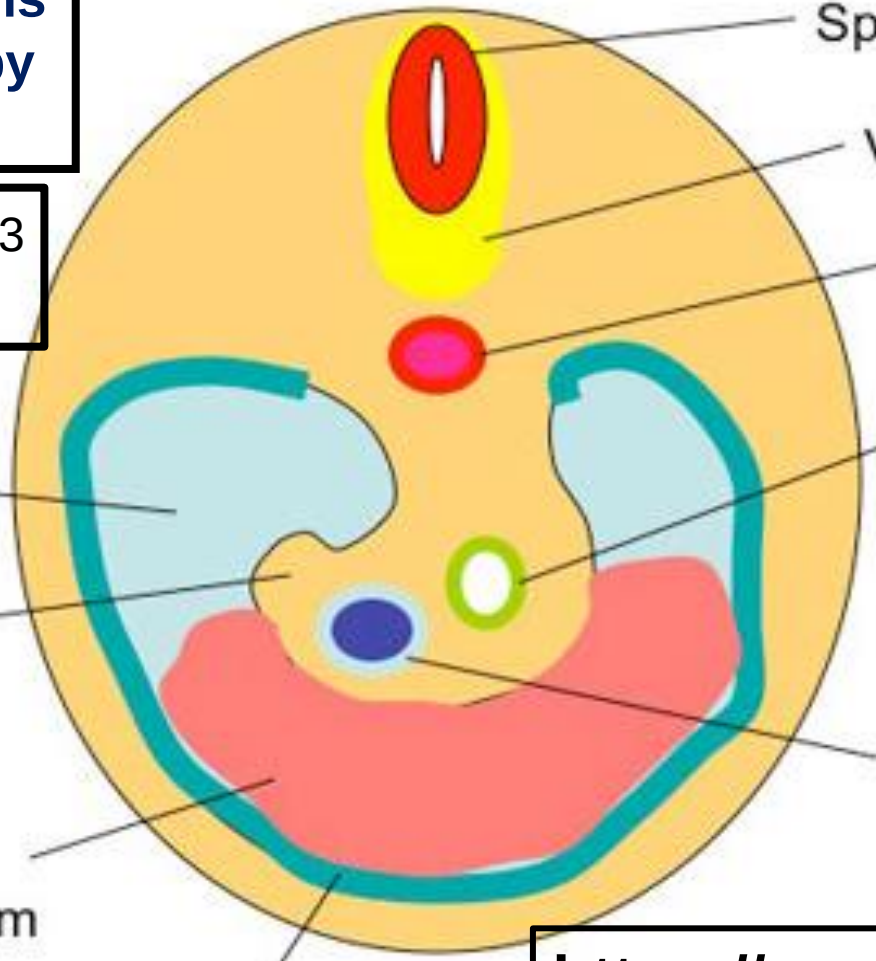
Intended Learning Outcomes (ILOs)

- Development and congenital anomalies of the Diaphragm
- Development and congenital anomalies of the Nose
- Development and congenital anomalies of the Trachea and Lungs

Developing Diaphragm

6 Cervical myotomes from the somites of C3, 4, 5; this explains innervation of the diaphragm by C3, 4, 5 (phrenic nerve).

* It migrates caudally from level of C3 to the level of T12



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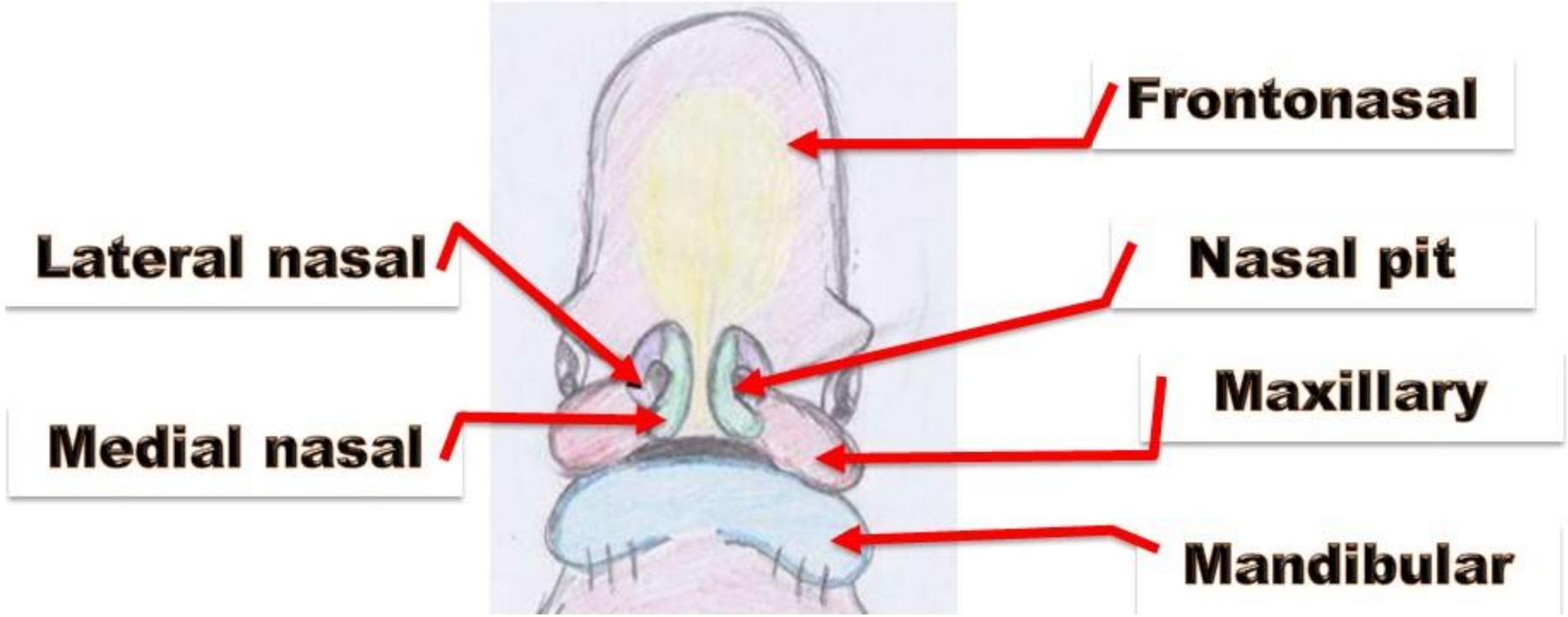
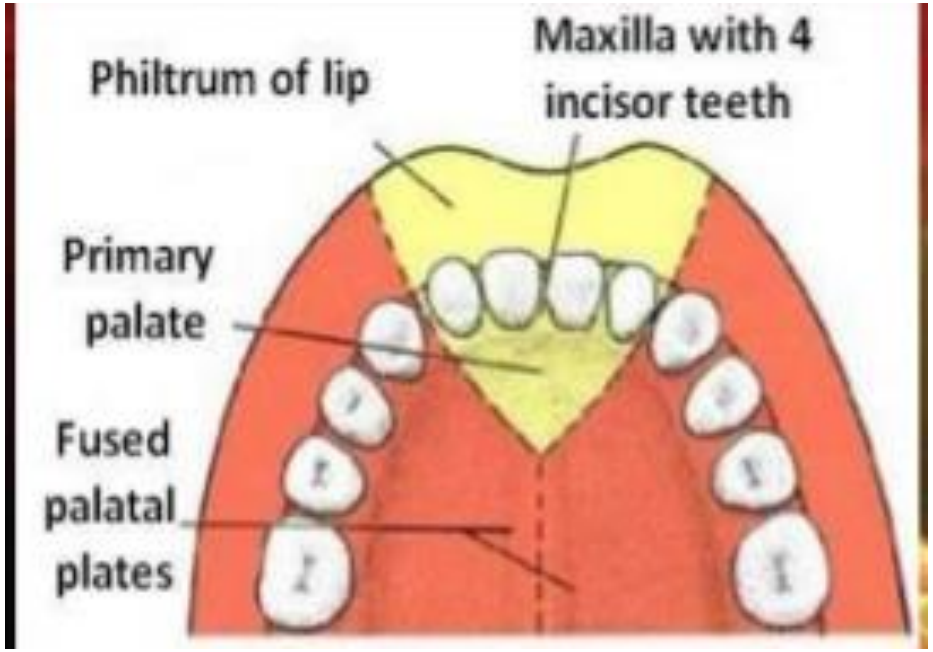
• Congenital malformations

1. **Congenital diaphragmatic hernia:** a common malformation in the newborn due to **failure of fusion of its parts,** abdominal viscera herniate to the thoracic cavity**.**
2. **Congenital hiatus hernia:** if **esophagus is shorter** than normal or large esophageal opening, part of stomach may appear in the thorax leading to constriction of stomach
3. **Retrosternal or parasternal hernia of Morgagni:** a rare **defect between sternal and costal parts** of diaphragm.
4. **Congenial eventration of diaphragm:** rare; **defective muscles of** half of diaphragm and balloons up into chest cavity. Upward displacement of abdominal contents

Development of Nose and paranasal sinuses



- ** **Development of the frontonasal process:**
  - a- The upper part forms the frontal bone.
  - b- The lower part forms the nasal process.
- At the 4th week **2 Nasal placodes** (**2 ectodermal swellings**) develop in the lower border of the nasal process.
- - **Two nasal pits** (nostril) appear in the nasal placode divide the nasal process:
  - a- Two lateral nasal processes form the ala of the nose.
  - b- Two medial nasal processes unit with each other in the midline forming **median nasal process**



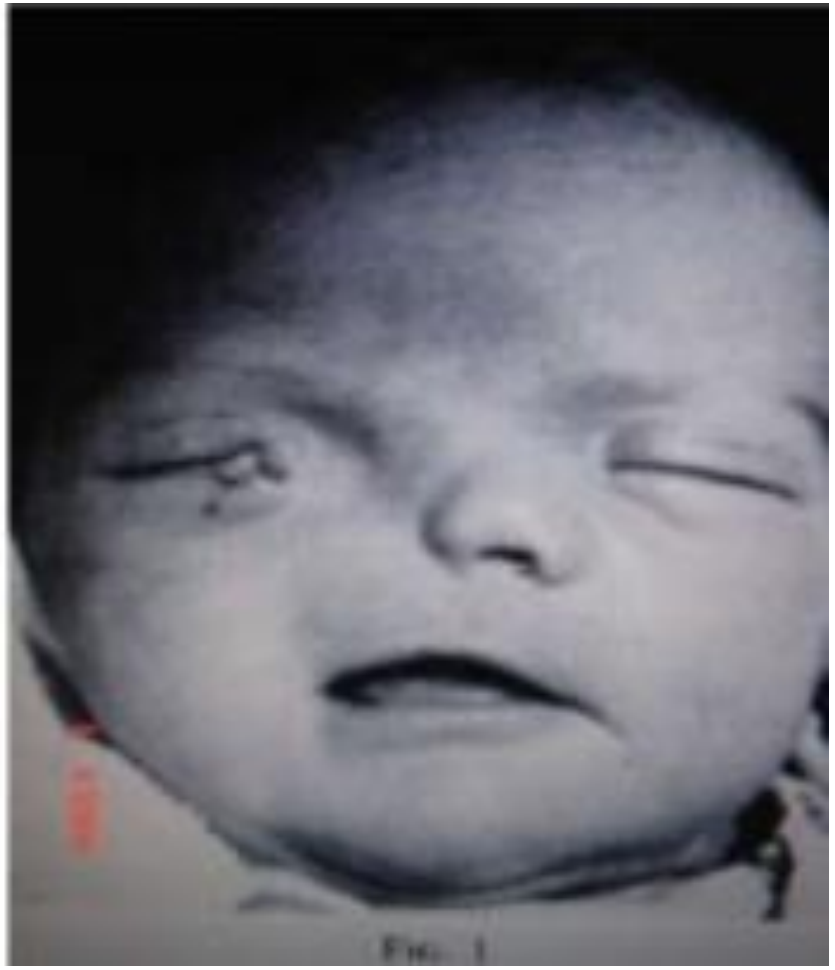
- **Median nasal process that gives rise to:**
  1- Part of the nasal septum.
  2- Philtrum (middle) of the upper lib.
  3- Premaxilla (upper jaw that carries the 4 incisor teeth).
  4- Primary palate.

- At first the primitive nasal cavity is continuous with the mouth cavity.
- Later; the nasal cavity is separated from mouth cavity by secondary palate to from the definitive nasal cavity.
- The definitive nasal cavity is divided into 2 cavities by a nasal septum.
- Nasal conchae (turbinate's) developed as bony projections from lateral wall of the nose.

Development of Paranasal sinuses

- They Develop as out pouching from mucus membrane of the lateral wall of the nose.
- They extend into the maxilla, ethmoid, frontal and sphenoid bones during childhood and early adult life.

Arhinia (nasal aplasia) due to bilateral absent of nasal placodes



Half nose due to unilateral absent of nasal placodes

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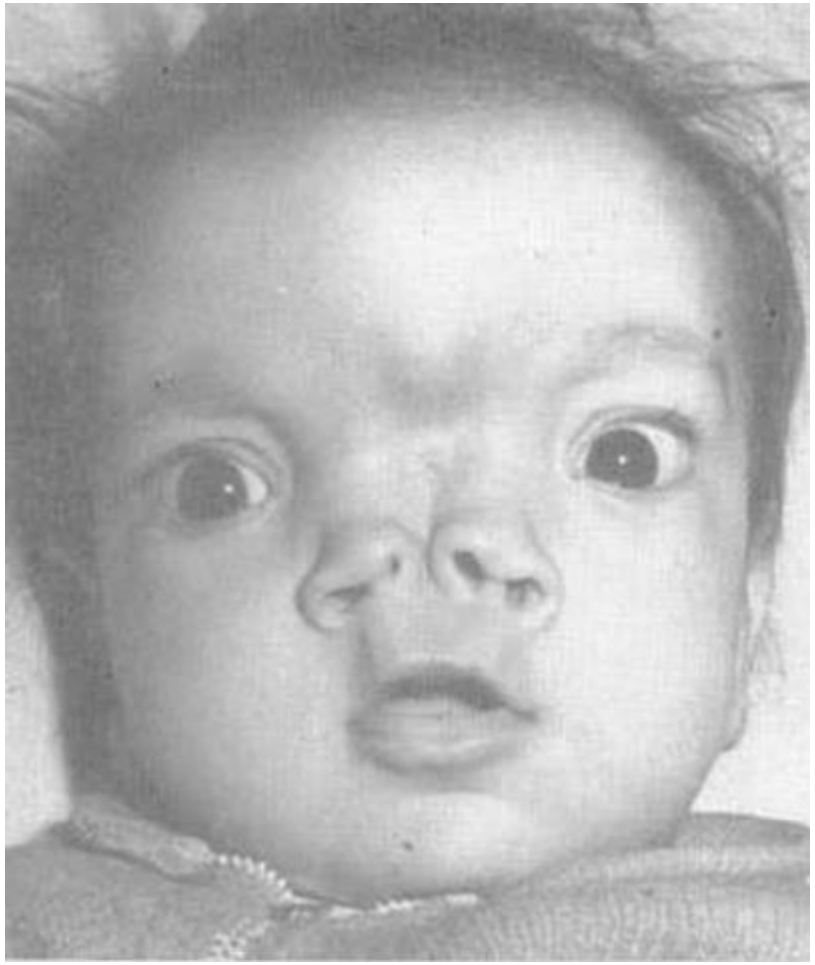
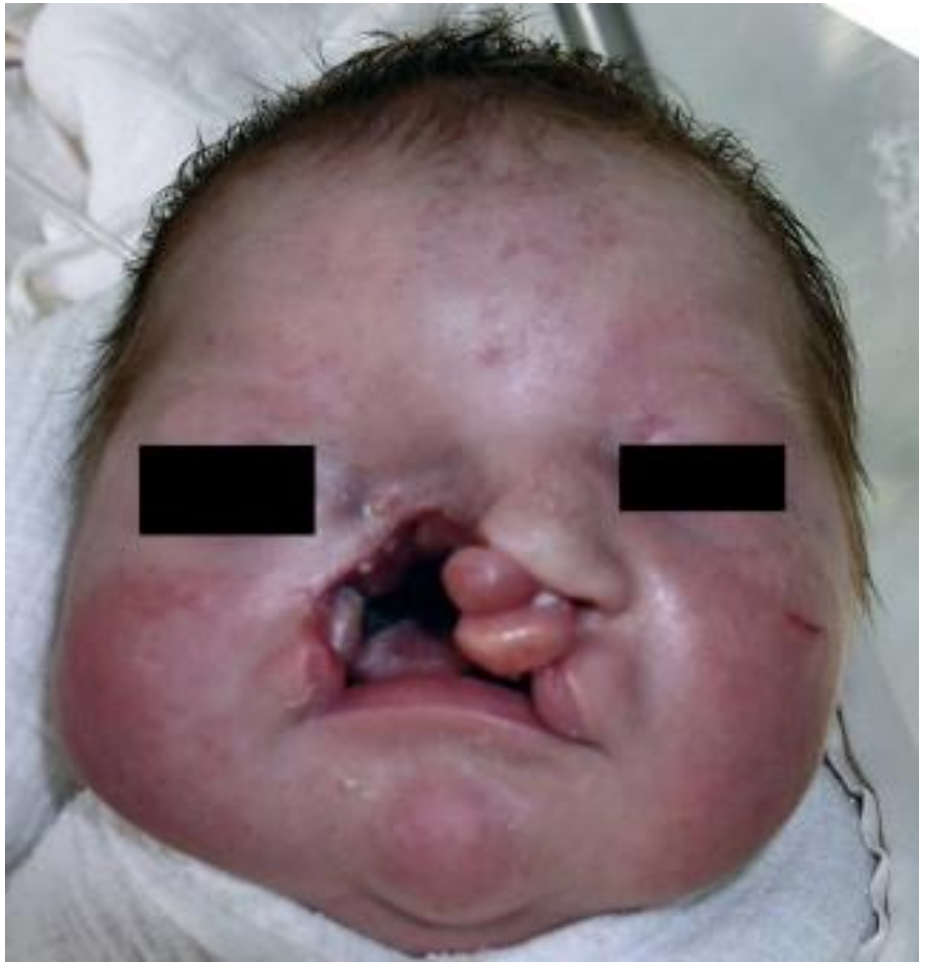


Polyrhinia due to duplication of the medial nasal process



Oblique facial cleft due to failure of fusion of the maxillary process with the lateral nasal process

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Development of Larynx, Trachea, Bronchi and Lungs

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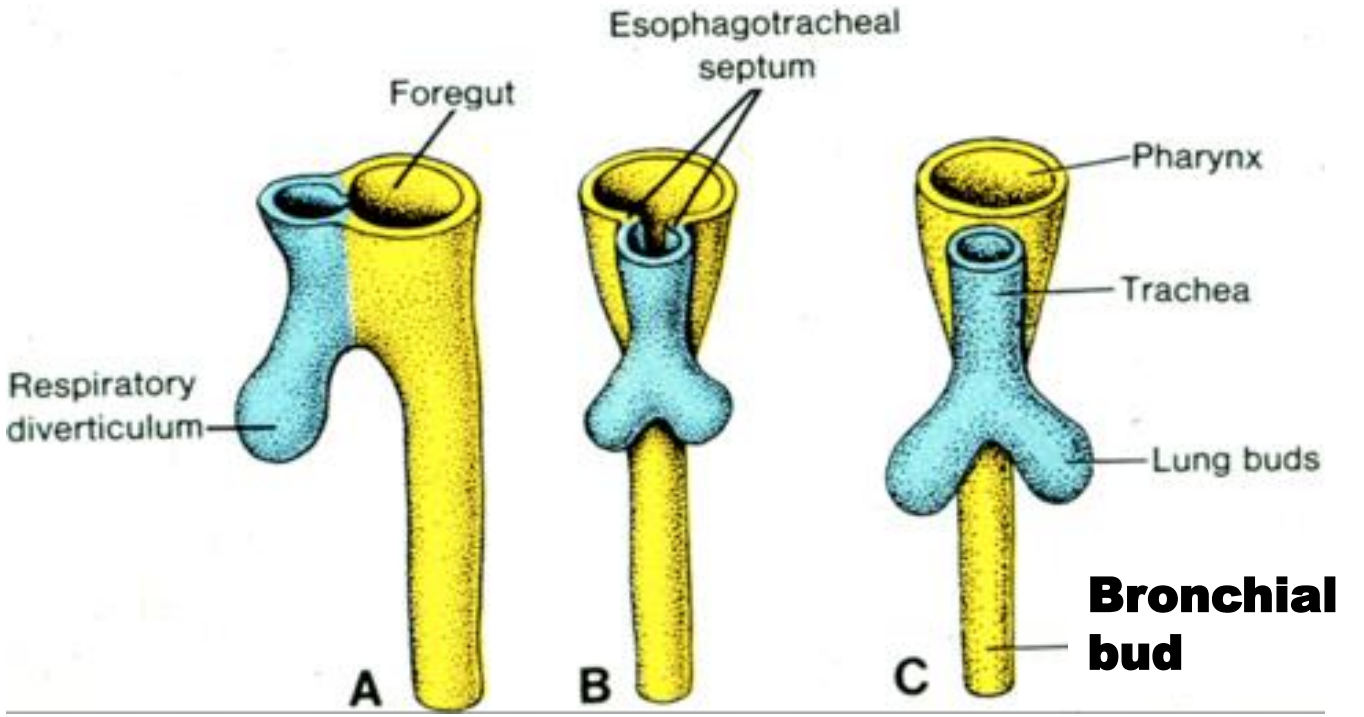

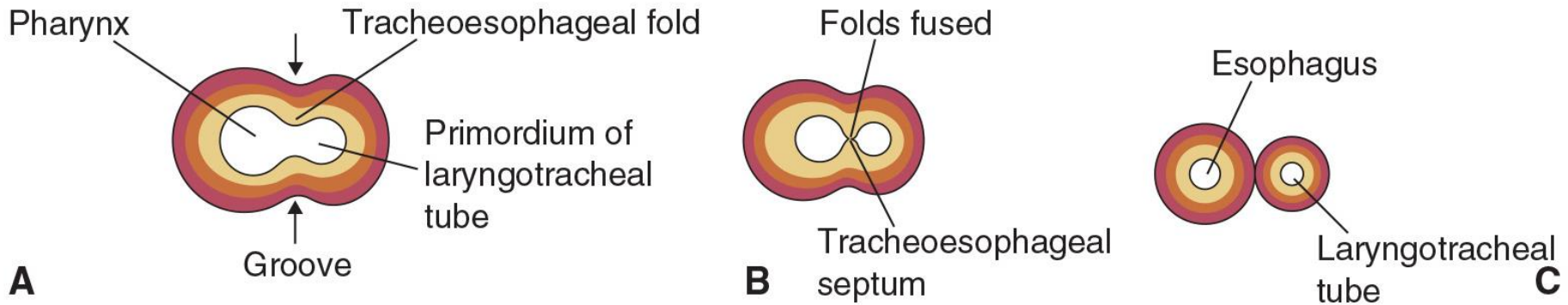

- **Two tracheoesophageal folds approximate and fuse with each other forming tracheoesophageal septum.**
- **The septum divides foregut into laryngotracheal tube (ventral) and pharynx and esophagus (dorsal).**

- **Development of the larynx**

- **The mucosa is developed from cranial part of the laryngotracheal tube.**
- **The cartilage and muscles: from the mesoderm of the 4th and 6th pharyngeal arches.**

- **Development o the Trachea**

- **The mucosa is developed from caudal part of the laryngotracheal tube.**
- **The cartilages: from the mesoderm around the laryngotracheal tube.**

- **Development of the bronchi**

- **The lower end of the tube derived into two bronchial buds forming right and left bronchus.**

- The cartilages: from the mesoderm around the buds.

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Congenital anomalies of the Tracheoesophageal septum

- **An abnormal opening between esophagus and trachea caused by failure of complete closure of the tracheoesophageal septum.**

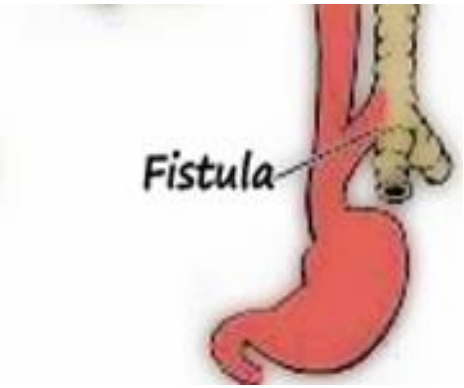
- **Types of the fistula:**

1. **Proximal part of esophagus ends as a blind sac and distal part continues with the trachea.**
2. **Proximal part of esophagus continues with trachea and distal part ends as blind sac.**
3. **Proximal and distal parts of esophagus continue with trachea separately.**
4. **Proximal and distal parts of continue with trachea by single tube (fistula) .**

1

3

2



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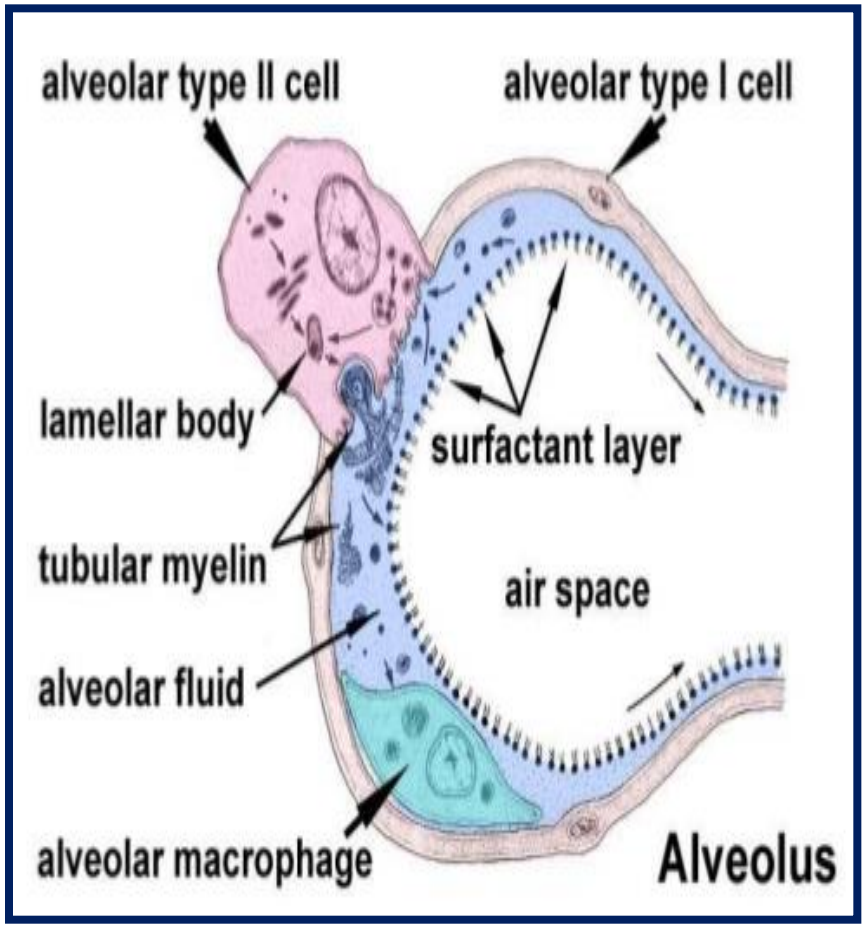
- **Development of the lungs**

- **Each bronchus divides repeatedly forming bronchioles and alveoli**
- **The blood capillaries and connective tissue developed from the mesoderm**
- **No mature alveoli before birth**
- **The cells line the alveoli become gradually thinner (Type-I blood air barrier, alveolar type I, Pneumocyte type I)**
- **Another epithelial cells developed (surfactant cells) to low the surface tension of the barrier**



- **The amount of the surfactant increases especially during the first two weeks after birth**
- **The fluid in the alveoli is absorbed and alveoli expanded with air after birth**

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- ** **Congenital anomalies of the lungs:**

➢ **Agenesis of one or both lungs:** is rare and caused by failure of the **bronchial buds** to develop.

➢ **Abnormal number of lung lobes**: due to abnormal division of the **bronchial buds**.

➢ **Congenital cysts of the lung:** either single or multiple. This give rises to **honeycomb appearance** in the X-ray.

➢ **Congenital collapse of the lung** (respiratory distress syndrome of neonate): due to congenital absence of the **surfactant**. It is one of the common causes of death in the premature infants.

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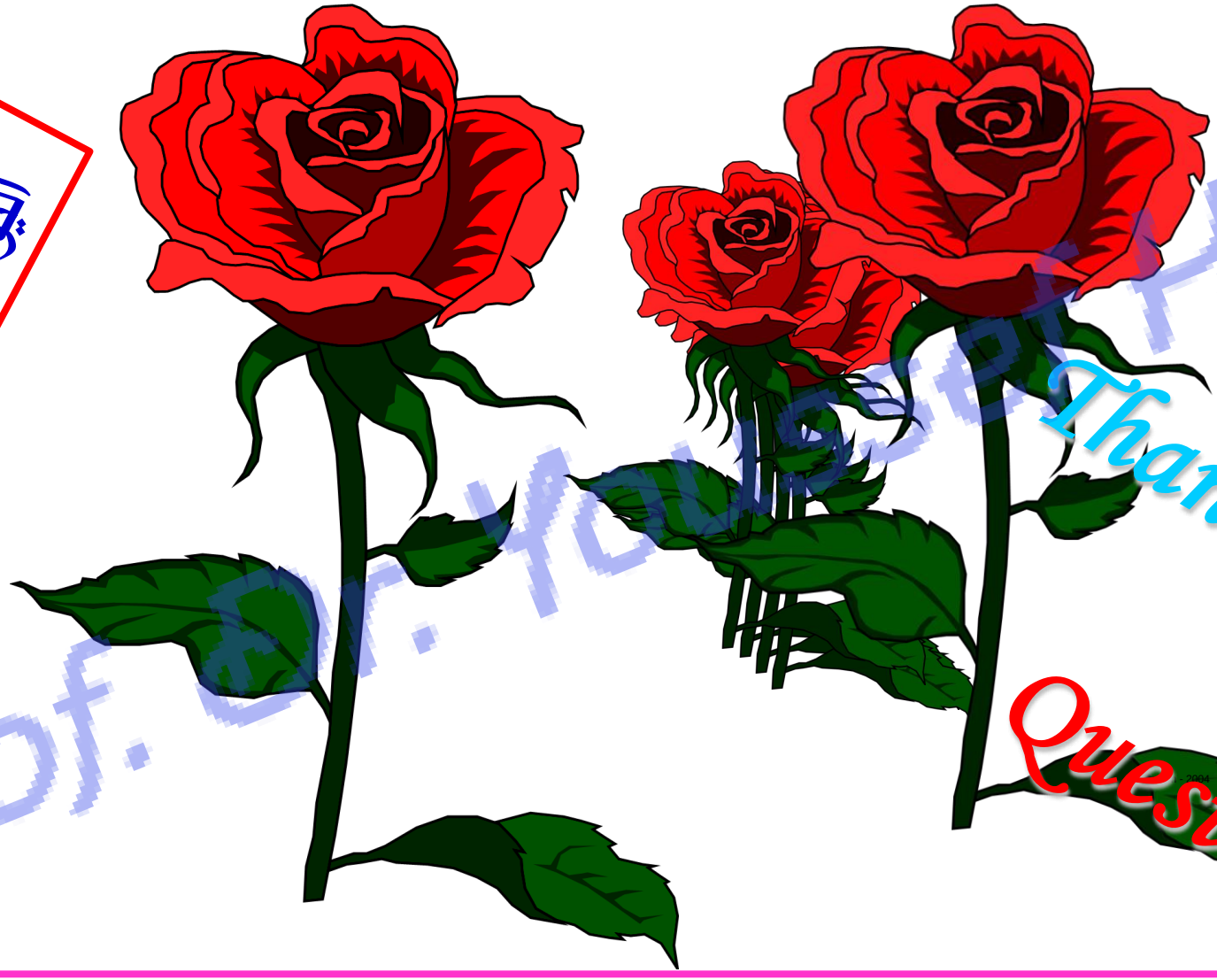

Thank you

Questions

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