

NAME: UHUNMWANGHO EFOSA GOD'S GIFT

COLLEGE: MEDICINE AND HEALTH SCIENCES

DEPARTMENT: PHYSIOLOGY

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COURSE: SYSTEMIC EMBRYOLOGY (ANA 206)

1) Development of the lungs

It can be divided into two phases, lung growth (structural development) and lung maturation (functional development). Lung growth can be influenced by a host of physical factors. Lung maturation and the achievement of functionality is primarily a biochemical process and is under the control of a number of different hormones. Lung growth proceeds through gestation. There is progressive branching of the airways and finally development of alveolar spaces capable of gas exchange in the last trimester. The surfactant system, composed of phospholipids that decrease surface tension within the alveoli and prevent alveolar collapse during exhalation develops in the last trimester and reaches maturity by approximately 36 weeks. Lung growth continues after birth as alveolar number continues to

increase. The end result of the development of the lung is an organ with a tremendously large surface area that is approximately 50– 100m² , capable of exchanging oxyy and carbon dioxide across a very thin membrane.

2) Rotation of the stomach and the formation of the omental bursa

The Omental bursa or lesser sac is a hollow space that is formed by the greater and lesser omentum and it's adjacent organs. It communicates with the greater sac via the epiploic foramen of Winslow, which is known as the general cavity of the abdomen that sits within the peritoneum, but outside the lesser sac.

This space has well-defined borders which are represented by certain organs or their parts, so they are quite easy to spot and form a mental image of the Omental bursa. In addition, like anything in anatomy, the Omental bursa doesn't just exist as a standard one and isolated entity, but rather it communicates with several other spaces and recesses found throughout the body.

3) Development of the oesophagus

- Notocord induces formation of foregut from endoderm
- At day 21 (end of week 3), lateral walls of foregut develop septa that fuse and divide foregut into oesophagus and trachea
- At week 4, myenteric plexus develops
- At week 5–6, septation of walls ends initial lining is stratified columnar epithelium, which proliferates and almost occludes the lumen.
- At week 6– 7, epithelial vacuolization appears vacuoles coalesce to form a single esophageal lumen.
- At week 8, ciliated cells appears and extend to almost entire columnar epithelium.
- At week 9, longitudinal muscle layers develops interstitial cells of cajal appear.
- At week 10, a single layer of columnar cells covers entire oesophagus.
- At month 4, submucosal glands appear due to downward growth of columnar cells, extend distally to cardiac mucosa.

- At month 5, stratified squamous epithelium initially appears mid esophagus and replace ciliated epithelium cephalad and caudally, proximal oesophagus may retain ciliated epithelium at birth.
- At month 5, upper oesophagus has both striated and smooth muscle.