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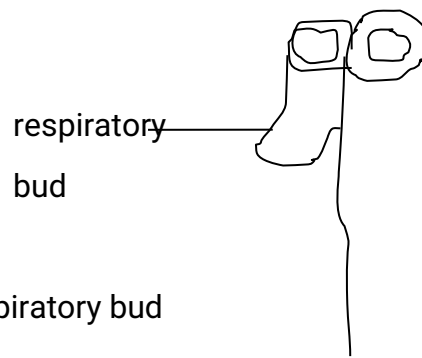
18/MHS05/004

PHYSIOLOGY DEPARTMENT

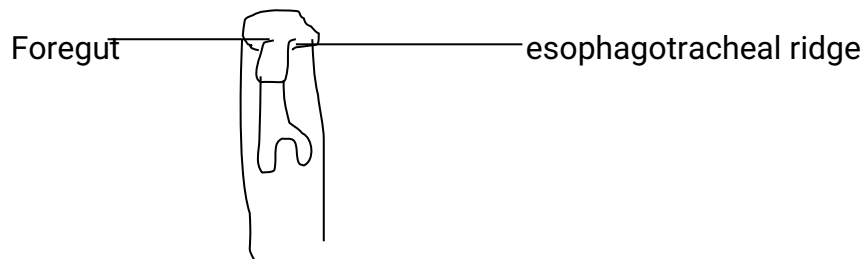
ORGANOGENESIS

### DEVELOPMENT OF THE LUNGS

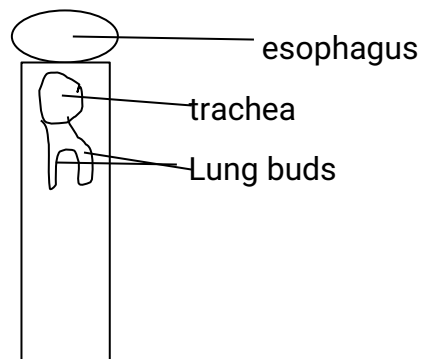
During the 4<sup>th</sup> week of development, a respiratory bud develops at the caudal end of the laryngotracheal diverticulum.



a. Formation of respiratory bud



b. Formation of lung buds.



c. Formation of septum splitting the foregut into esophagus and trachea with lungs.

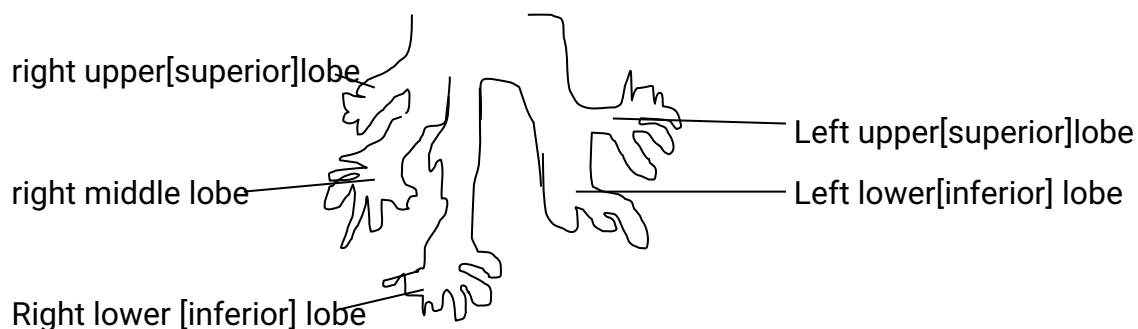
Together with the surrounding splanchnic mesenchyme, the bronchial buds differentiate into bronchi and their ramifications in the lung. Early in the 5<sup>th</sup> week, the connection of each bronchial bud with the trachea enlarges to form the primordial of the main bronchi.

The embryonic right main bronchus is slightly larger than the left one and is oriented more vertically



This relationship persists in the adult; consequently, a foreign body is more likely to enter the right main bronchus than the left.

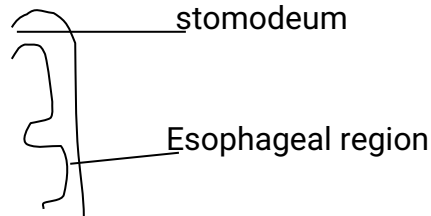
The main bronchus sub divides into secondary bronchi that form lobar, segmental and intrasegmental branches. On the right, the superior lobar bronchus will supply the upper[superior] lobe of the lung, whereas the inferior bronchus subdivides into two bronchi, one to the middle lobe of the right lung and the other to the lower [inferior] lobe. On the left, the two secondary bronchi supply the upper and lower lobes of the lung. Each lobar bronchus undergoes progressive branching.



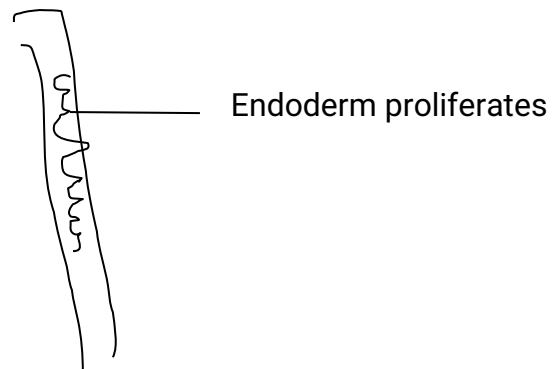
The segmental bronchi, 10 in the right lung and 8 or 9 in the left, begin to form in the 7<sup>th</sup> week. As this occurs, the surrounding mesenchyme also divides. The segmental bronchi, with the surrounding mass of mesenchyme, form the primordial of the bronchopulmonary segments. By the 24<sup>th</sup> week, approximately 17 orders of branches have formed and respiratory bronchioles have developed. An additional seven orders of airways develop after birth.

## Development of Esophagus

The esophagus develops from the foregut immediately caudal to the pharynx – after the esophagus has been separated from trachea by the oesophageal septum.

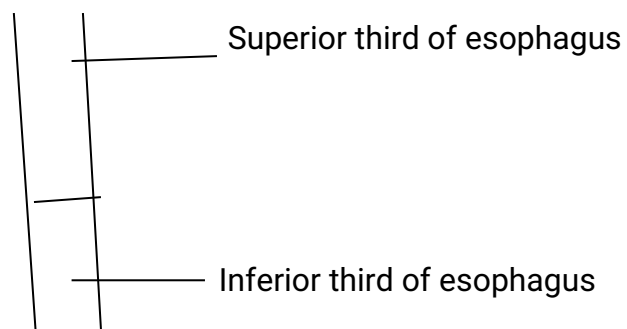


Initially, the esophagus is short, but elongates rapidly mainly because of the growth and relocation of the heart and lung. The esophagus reaches its final relative length by the 7<sup>th</sup> week. Its epithelium and glands are derived from endoderm proliferates - partially or completely, obliterates the lumen of the esophagus.



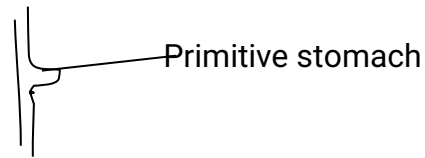
Recanalisation of the esophagus normally occurs at the end of the 8<sup>th</sup> week. The striated muscle forming the muscularis externa of the superior third of the esophagus is derived from mesenchyme in the fourth and sixth pharyngeal arches.

The smooth muscle [mainly in the inferior third of the esophagus] develops from the surrounding splanchnic mesenchyme



## Rotation of stomach

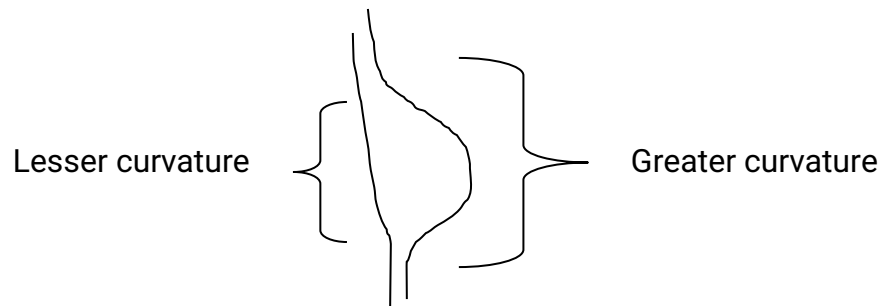
The primordial stomach develops at the 4<sup>th</sup> week. A slight dilation indicates the site of the primordial stomach.



The primordial stomach soon enlarges and broadens ventrodorsally.



During the next 2 weeks, the dorsal border of the stomach grows faster than its ventral border; marking the greater and lesser curvature.



The growth of the stomach walls contribute to the rotation of the stomach. As the stomach enlarges and acquires its shape, it slowly rotates 90<sup>0</sup> in a clockwise direction, when viewed from the cranial end.

