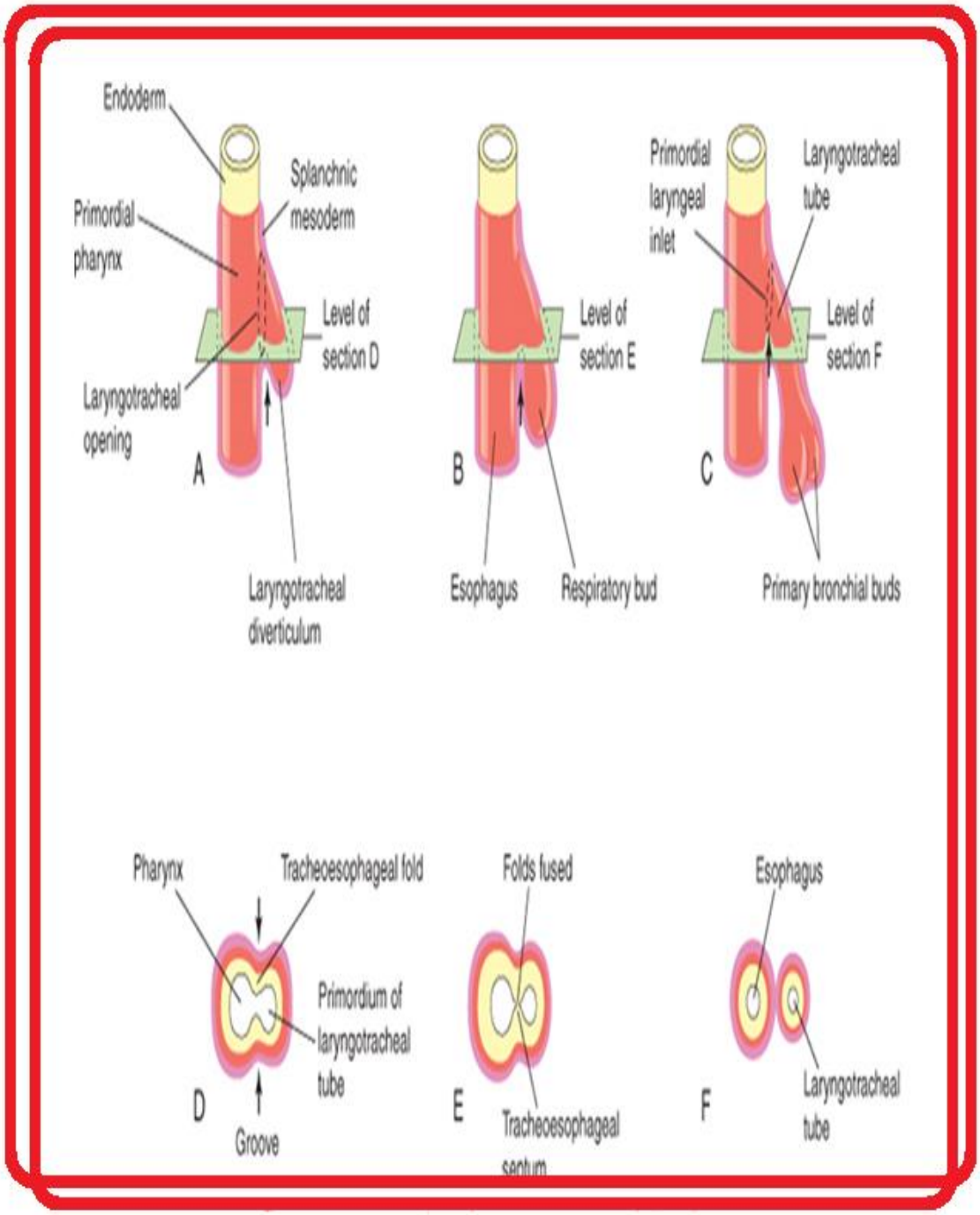
In the name of Allah, Most Gracious, Most Merciful.

The respiratory primordium is indicated at approximately 28 days by a median outgrowth-the **laryngotracheal groove**-

from the caudal end of the ventral wall of the primordial pharynx

(proximal part of esophagus) .



- The **endoderm** lining the foregut (esophagus) gives rise to the lining epithelium of respiratory system (larynx, trachea, and bronchi and alveoli).

- The connective tissue, cartilage, and smooth muscle in these structures develop from the **splanchnic mesoderm** surrounding the foregut.

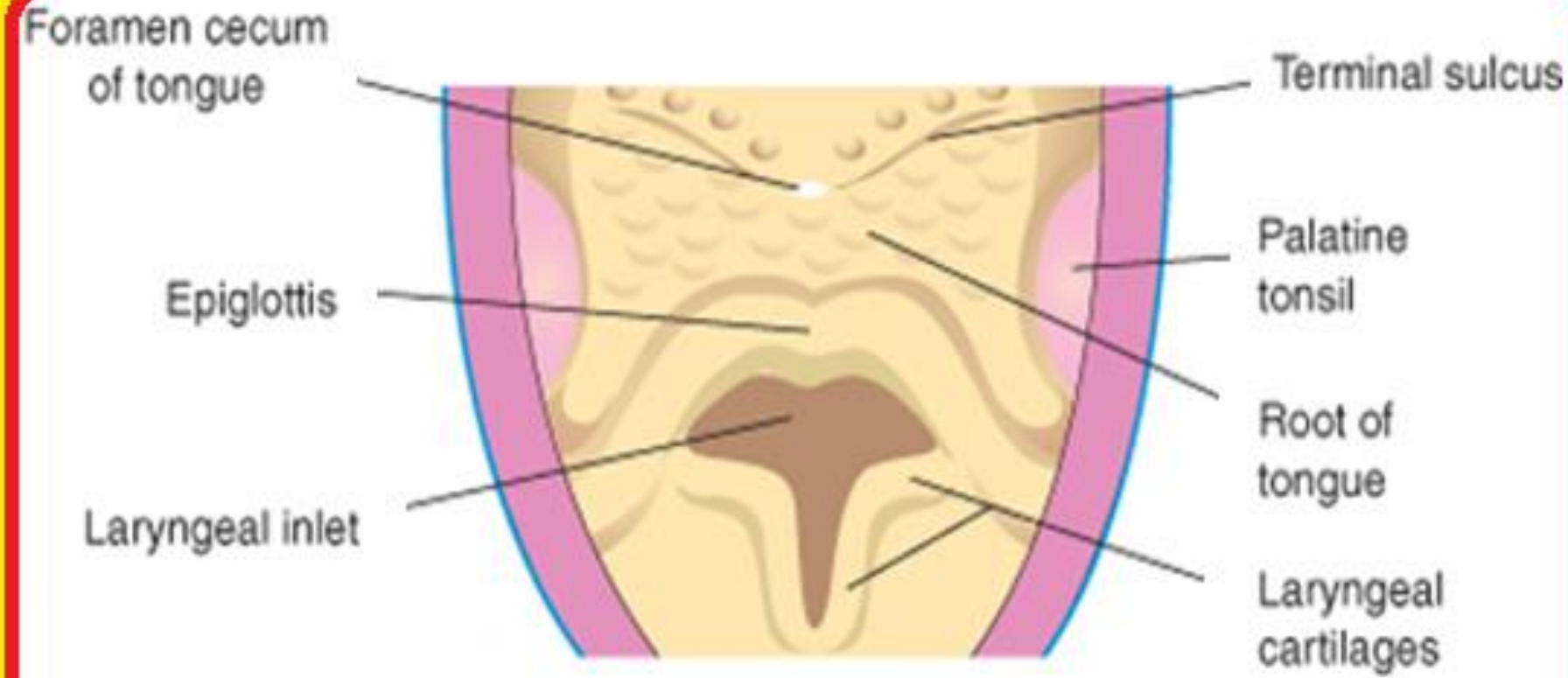
- By the end of the fourth week the **laryngotracheal diverticulum.**

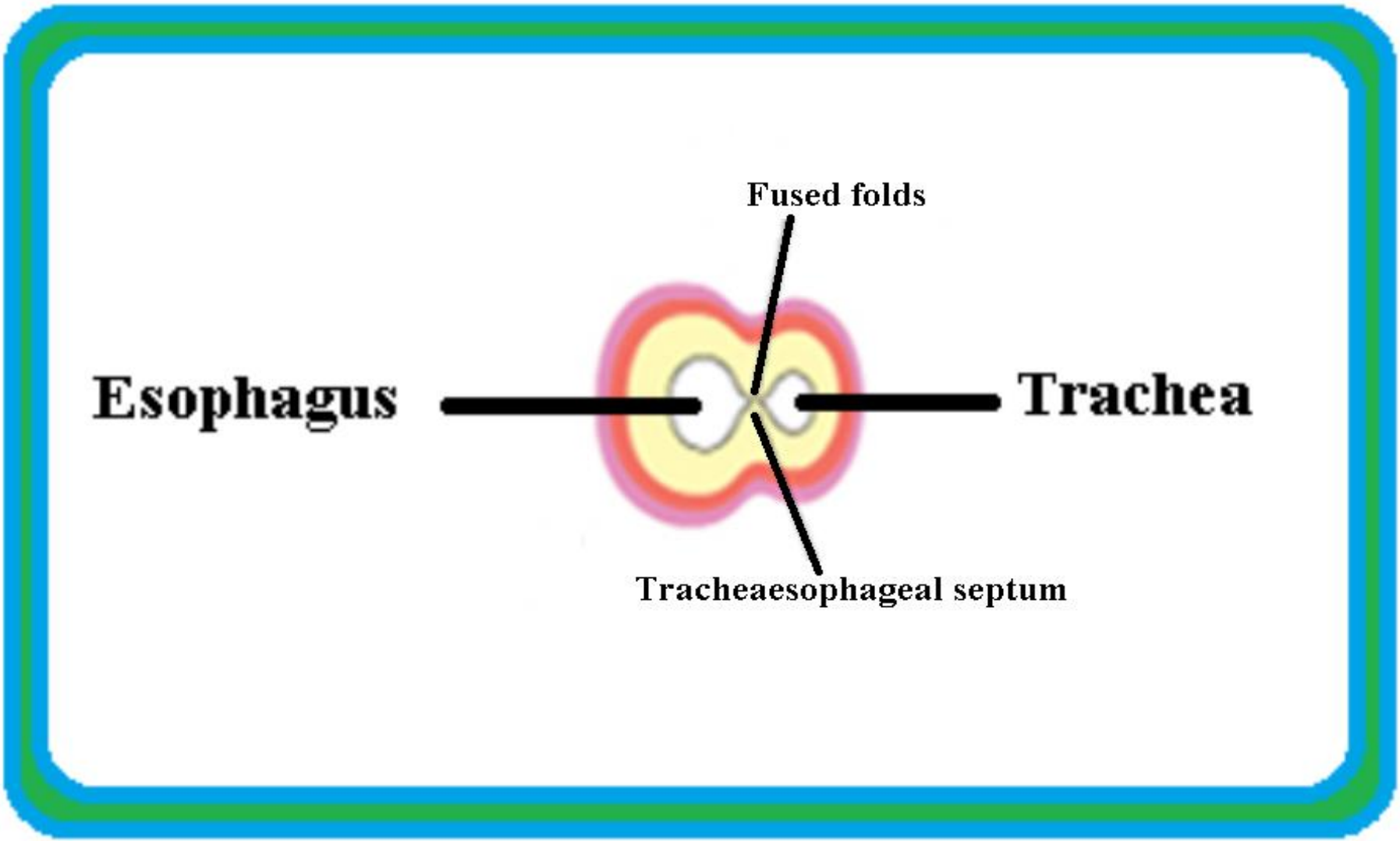
- As this diverticulum elongates and surrounded by splanchnic mesenchyme forming a **globular respiratory bud.**

- The laryngotracheal diverticulum soon separates from the primordial pharynx or proximal part of esophagus.

- It is communicated which pharynx by laryngeal inlet .

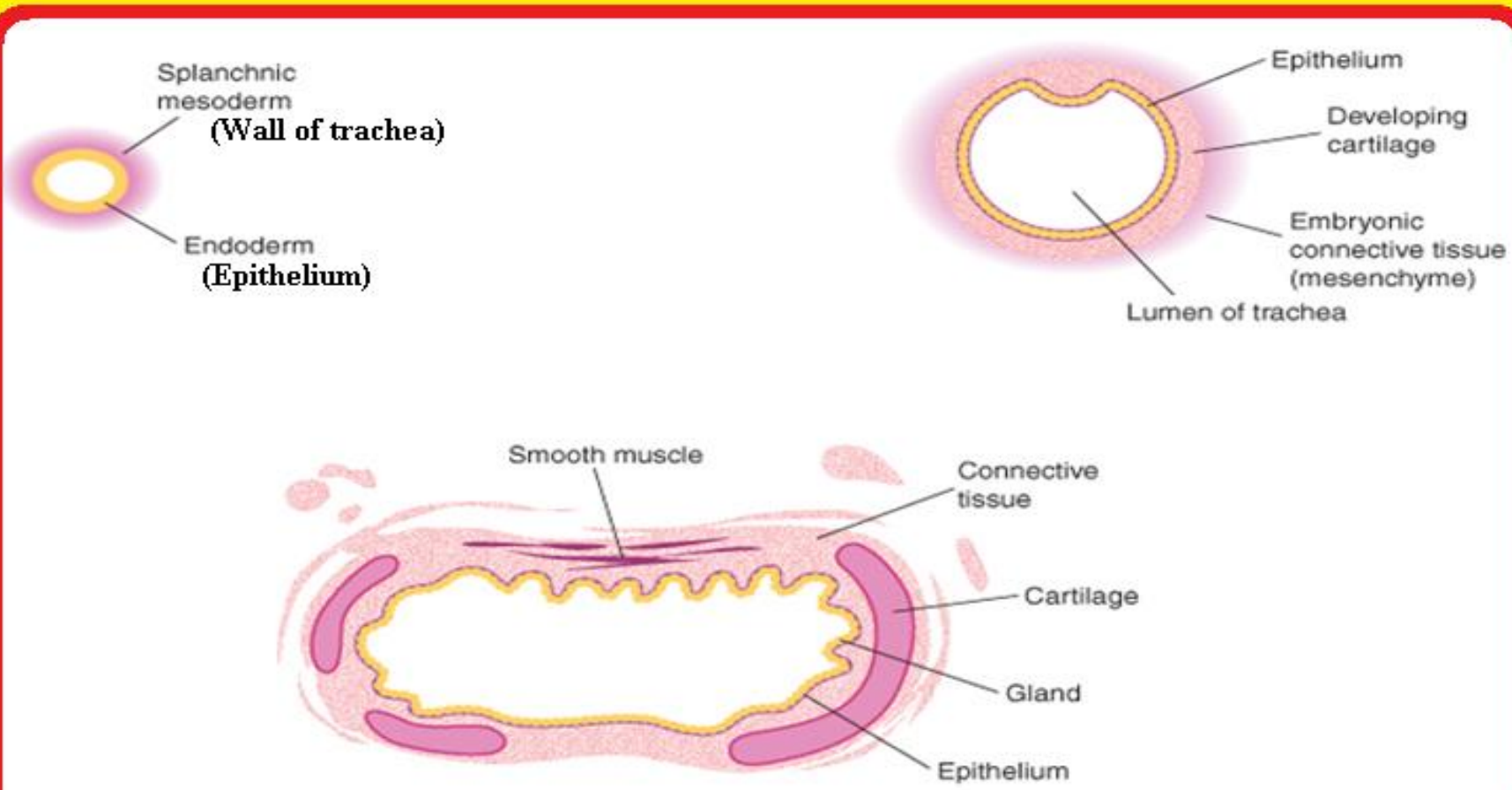
The opening of the laryngotracheal tube into the pharynx becomes the primordial laryngeal inlet.



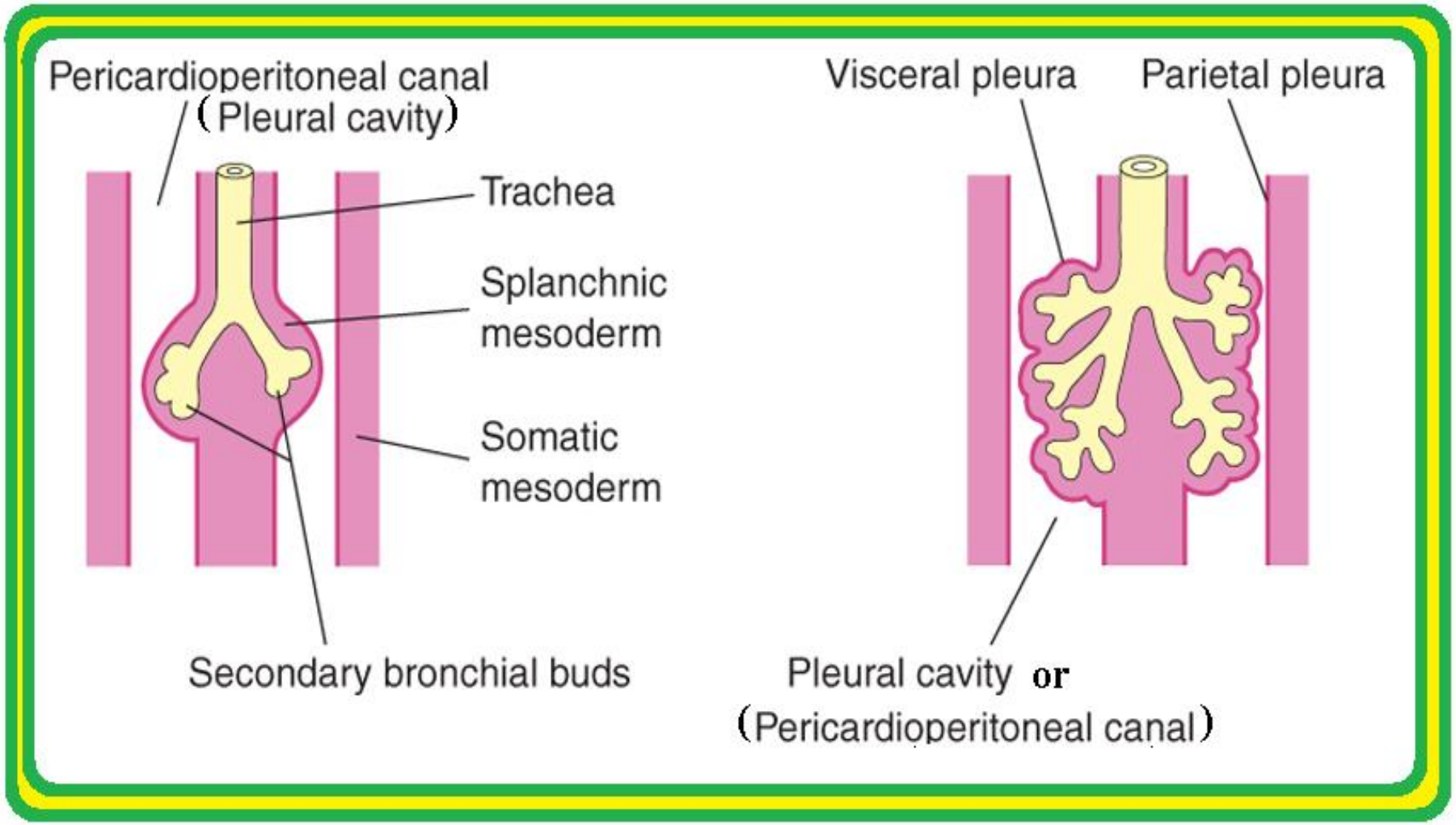


The tracheoesophageal septum separate the primordium of larynx, trachea, bronchi, and lungs from esophagus.

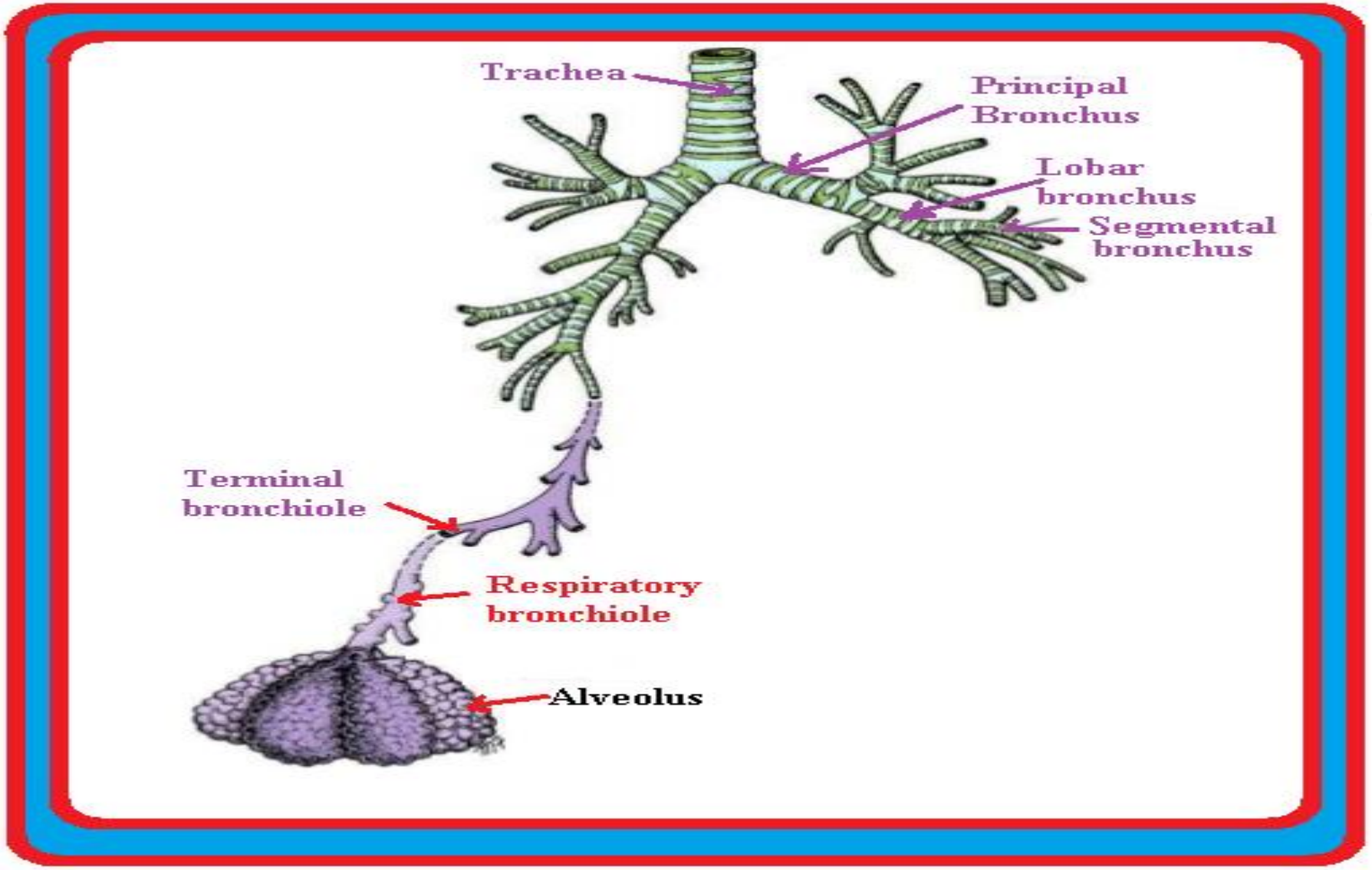
General development of respiratory tract



Epithelium of trachea derived from endoderm. Connective tissue, muscle and cartilage are from splanchnopleuric mesoderm .



Developing respiratory tract and look at the somatic mesoderm (thoracic wall) and visceral or splanchnic mesoderm(respiratory tract wall)



Development of tracheobronchial tree. The last and functional part endoderm lined cavity is **Alveolus**

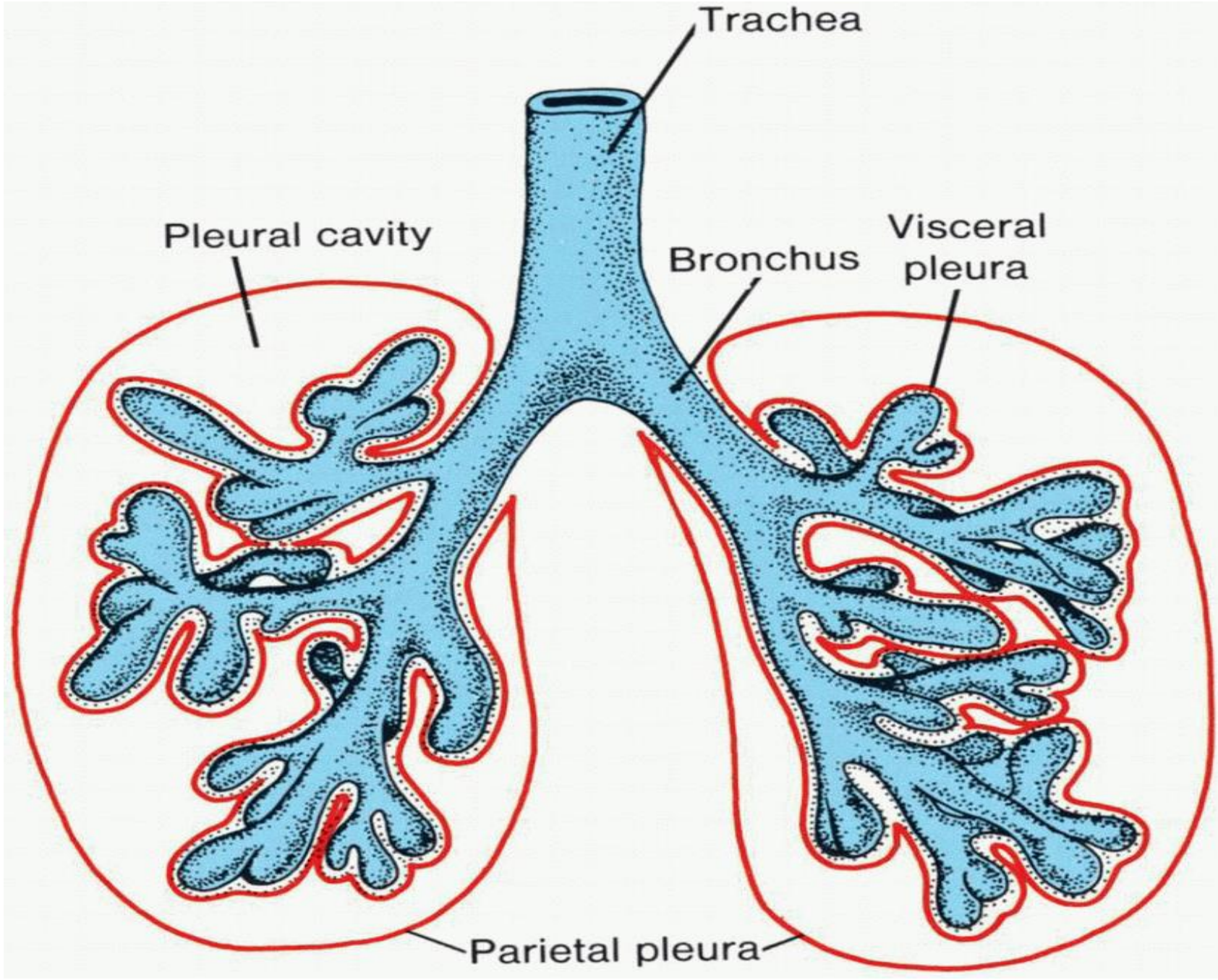
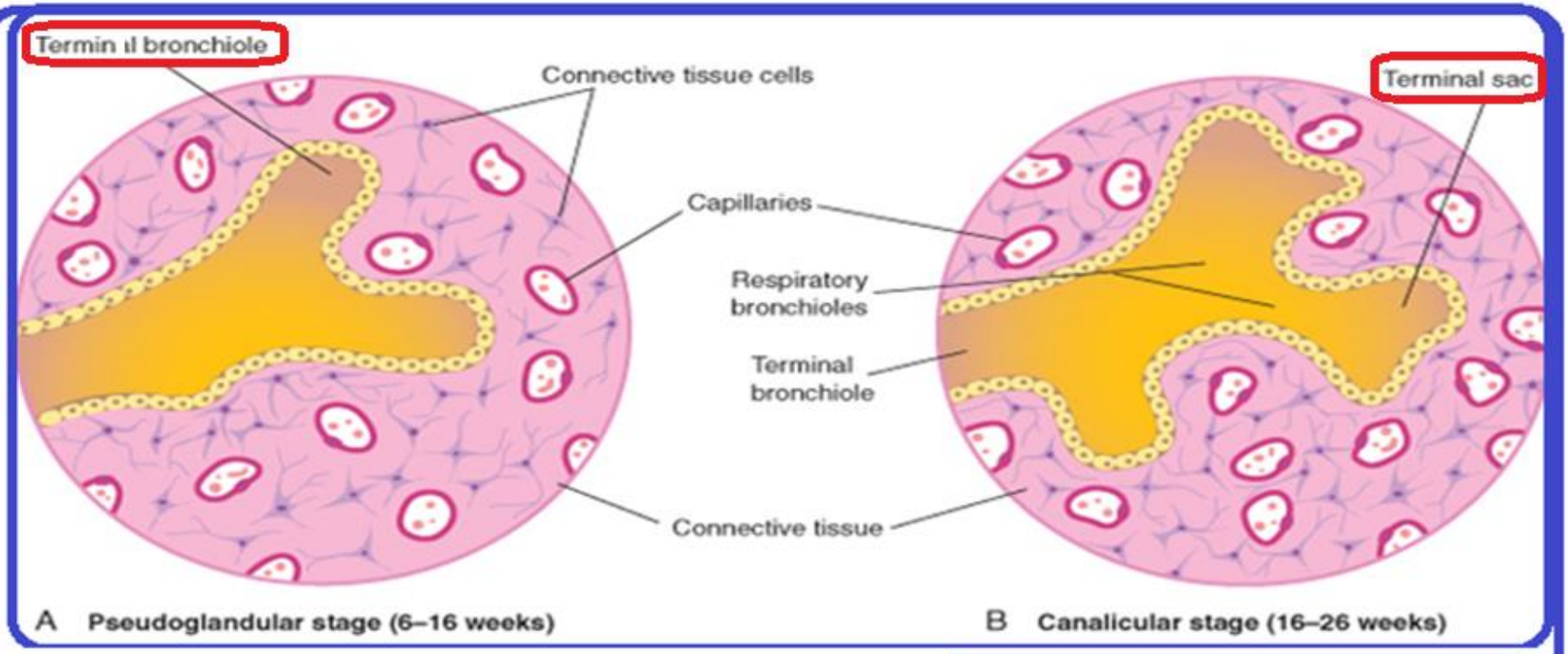

Trachea
Pleural cavity
Bronchus
Visceral pleura
Parietal pleura

TABLE 13.1 ***Maturation of the Lungs***

Pseudoglandular period	5-16 wk	Branching has continued to form terminal bronchioles. No respiratory bronchioles or alveoli are present.
Canalicular period	16-26 wk	Each terminal bronchiole divides into 2 or more respiratory bronchioles, which in turn divide into 3-6 alveolar ducts.
Terminal sac period	26 wk to birth	Terminal sacs (primitive alveoli) form, and capillaries establish close contact.
Alveolar period	8 mo to childhood	Mature alveoli have well-developed epithelial endothelial (capillary) contacts.



Pseudoglandular period

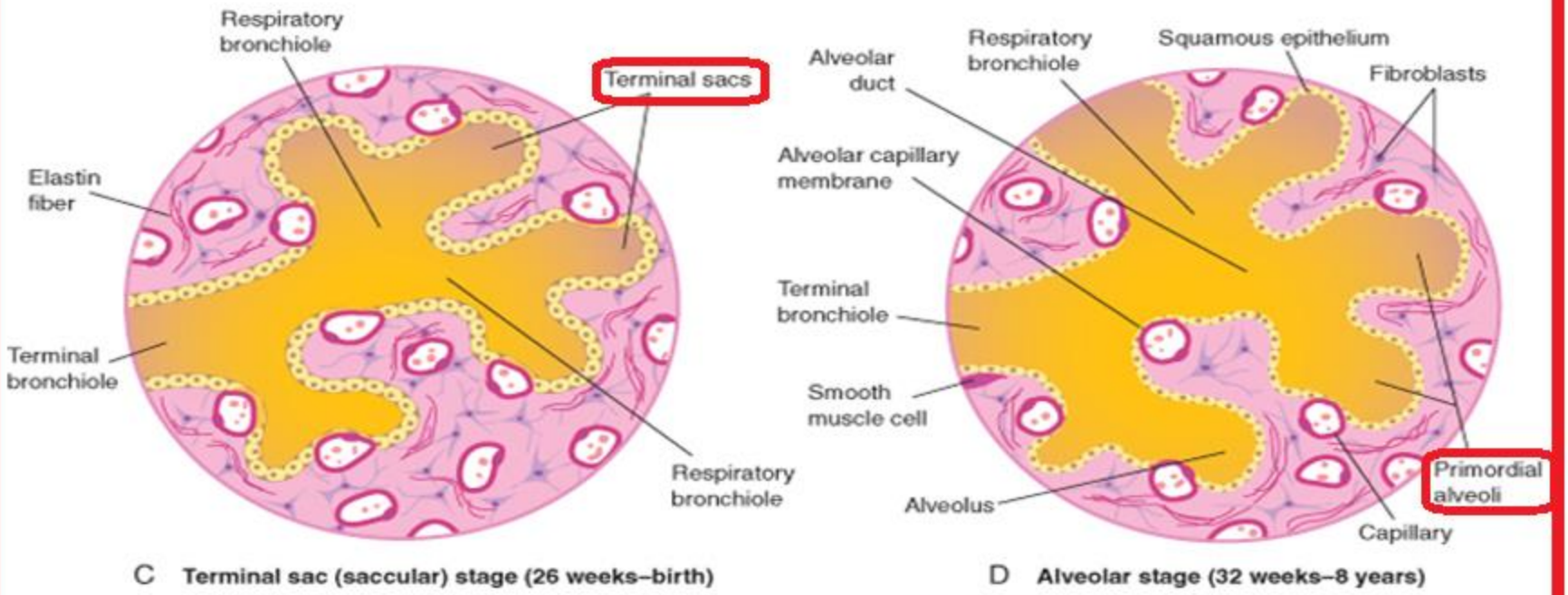
6 week to 16 week fetus

Branching has continued to form terminal bronchioles. No respiratory bronchioles or alveoli are present.

Canalicular period

16 week to 26 week fetus

Each terminal bronchiole divides into 2 or more respiratory bronchioles, which in turn divide into 3-6 alveolar ducts.



Terminal sac period
26 wk to birth
Terminal sacs (primitive alveoli) form, and capillaries establish close contact

Alveolar period

(8 month fetus to 8 years childhood)

Mature alveoli have well-developed epithelial endothelial (capillary) contacts.

How to remember the maturation stages of lung

Stage	Main feature	Age
Pseudoglandular	Terminal bronchiole	2 to 4 months
Canalicular period	Respiratory bronchiole	4 to 6 months
Terminal sac	Terminal sac	6 to 8 months
Alveolar	Mature Alveolus	8 month fetus to 8 year child

Various types of esophageal atresia and/or tracheoesophageal fistulae.

A. The most frequent abnormality (90% of cases) occurs with the upper esophagus ending in a blind pouch and the lower segment forming a fistula with the trachea.

B. Isolated esophageal atresia (4% of cases).

C. H-type tracheoesophageal fistula (4% of cases).

D,E. Other variations (each 1% of cases).