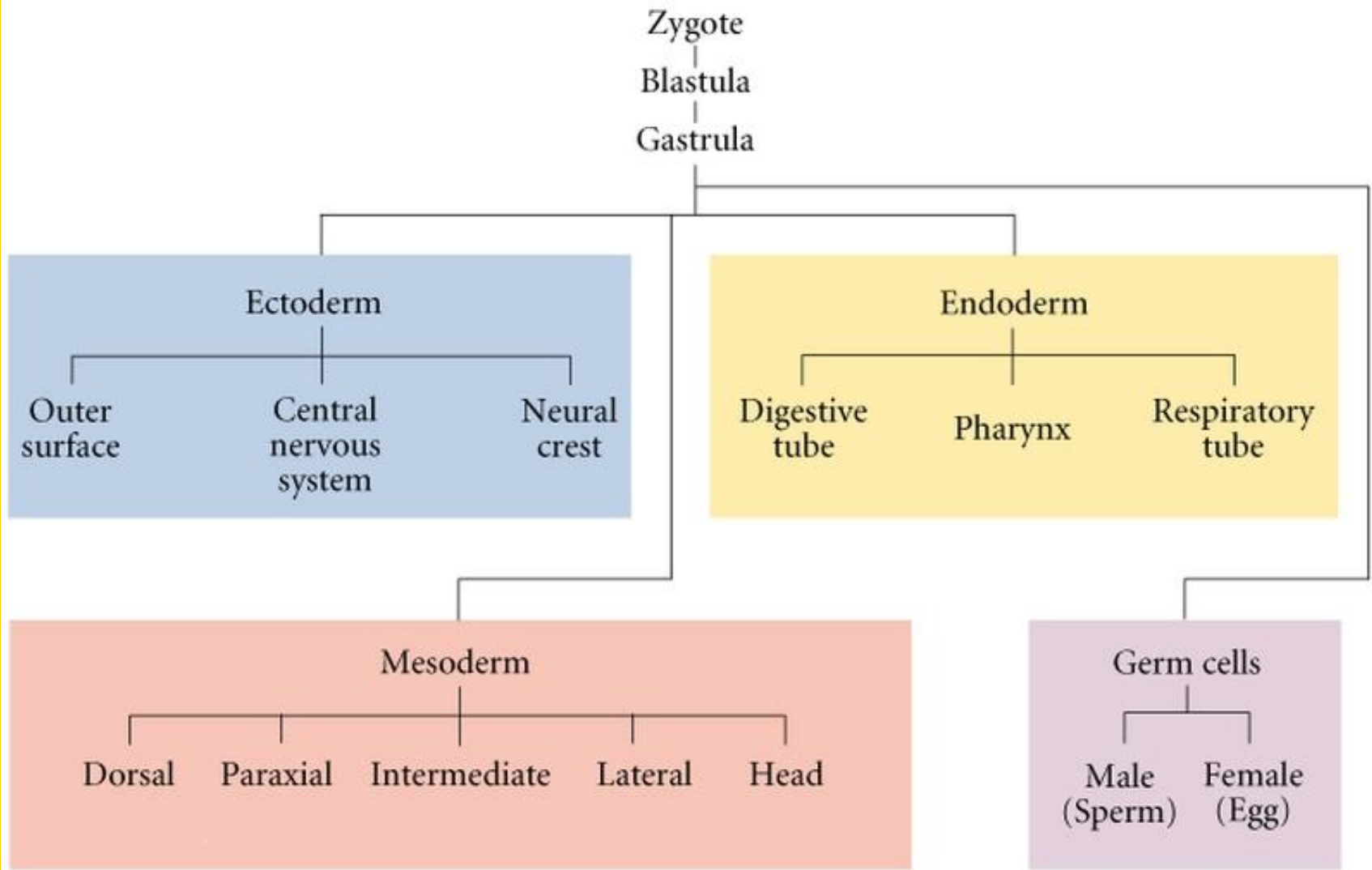
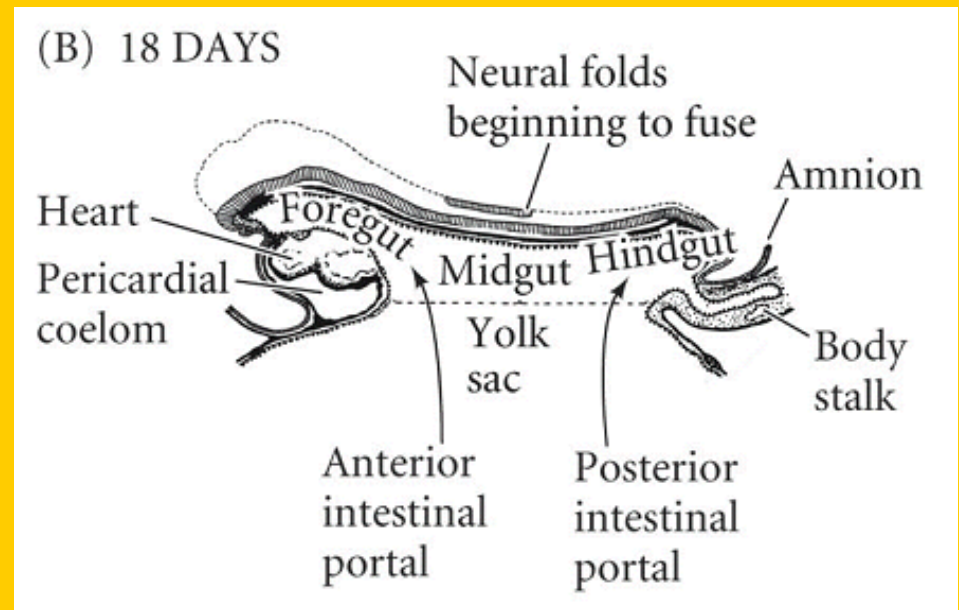


The Endoderm and Extraembryonic Structures

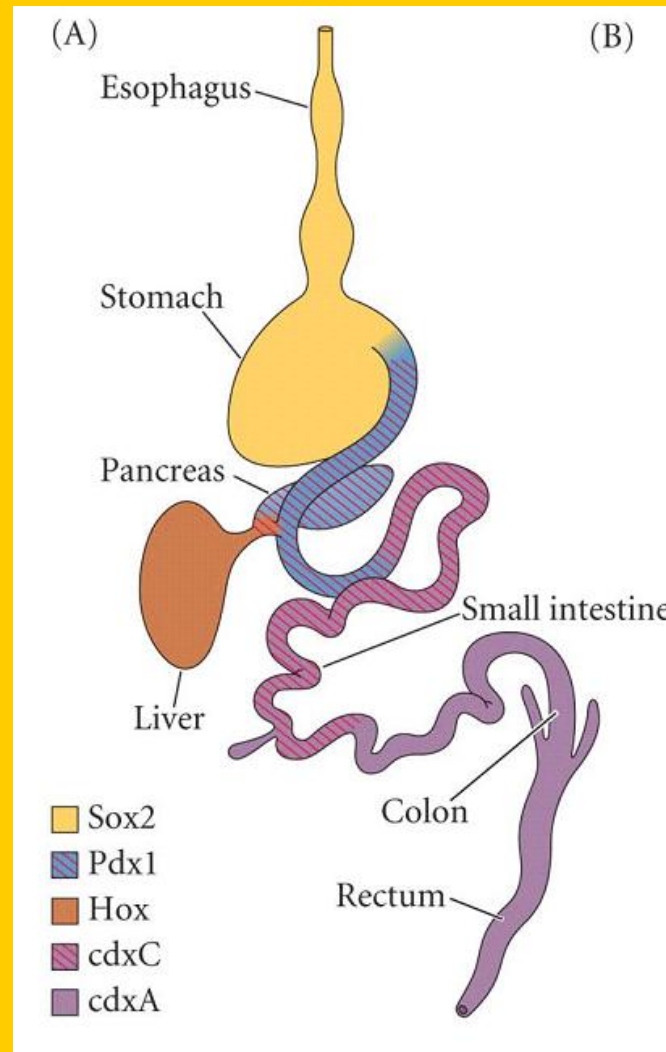


Endoderm: Linings of a Tube

- Divides into foregut, midgut, and hindgut
- Openings to yolk sac are intestinal portals that close to middle to form yolk stalk



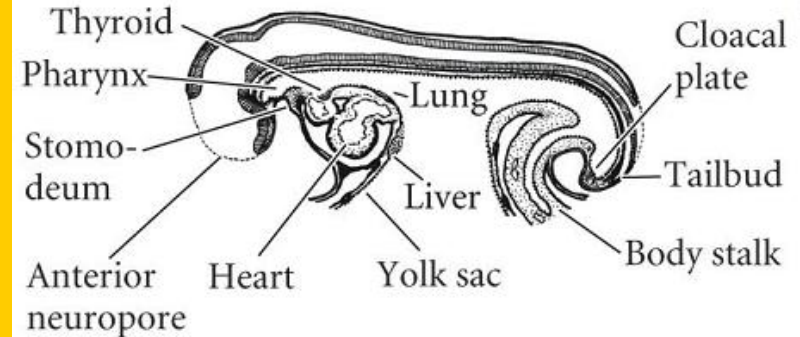
Gut Regions



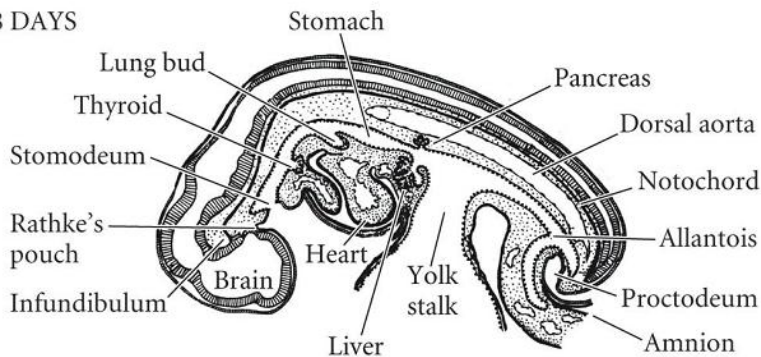
How do the Ends Form?

- Endodermal openings are stomodeum and proctodeum
- Endoderm meets invagination of ectoderm

(C) 22 DAYS

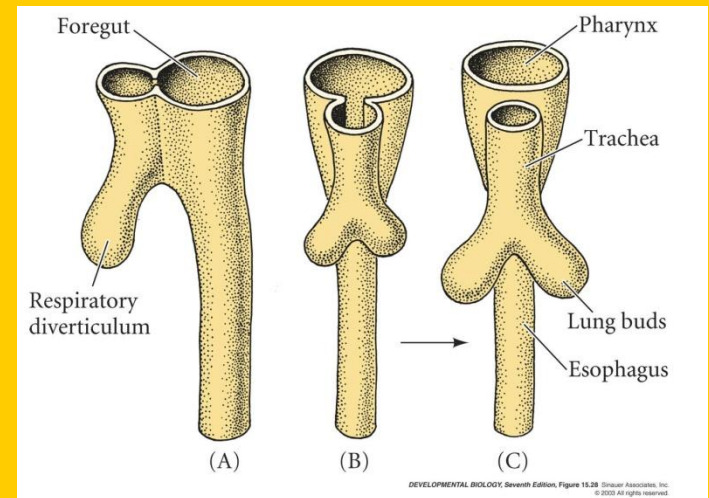
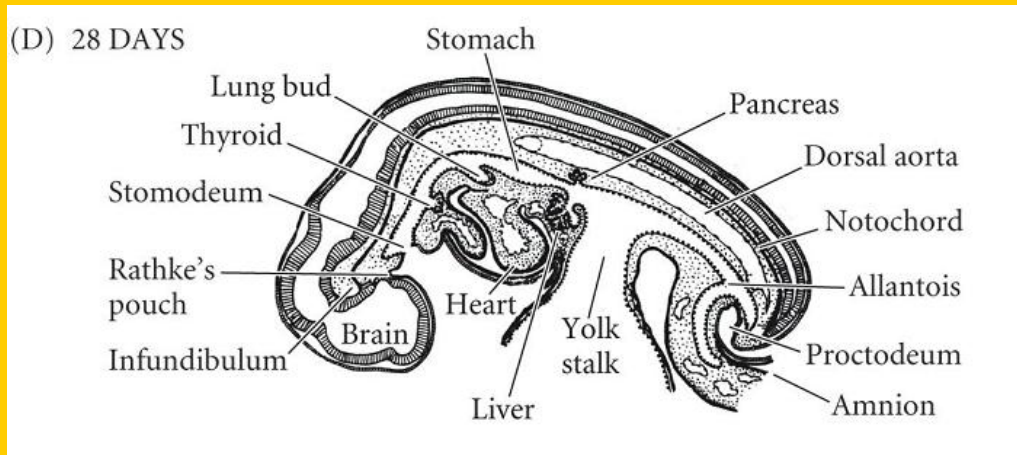


(D) 28 DAYS



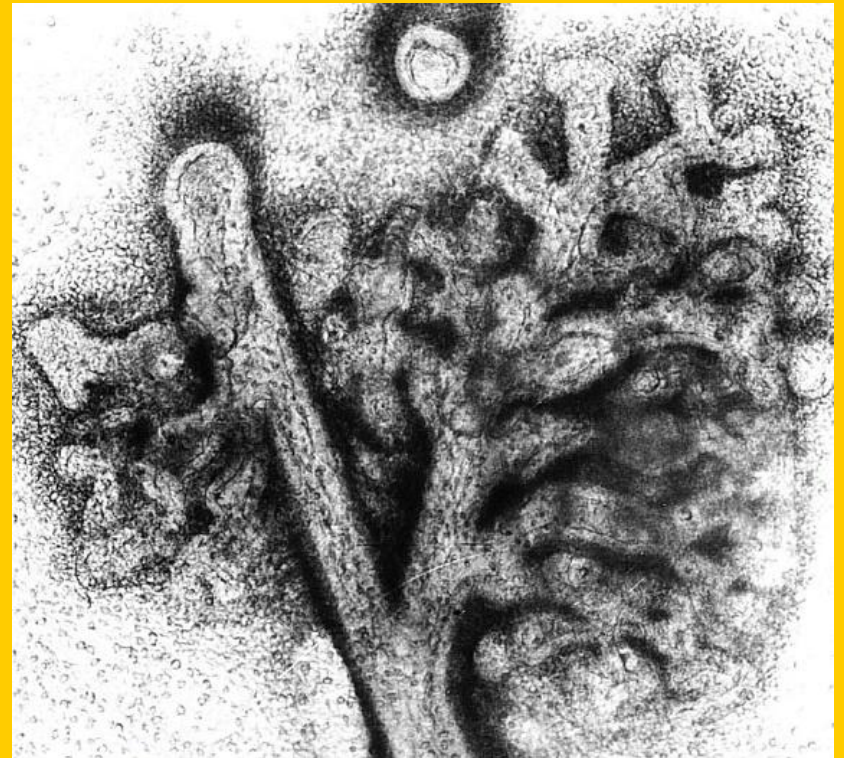
What Comes from Foregut?

- Foregut forms pharyngeal pouches, body tongue, thyroid, trachea, lung



The Lungs

- Lung develops by endothelial branching also typical of many glands
- Depends on mesenchyme

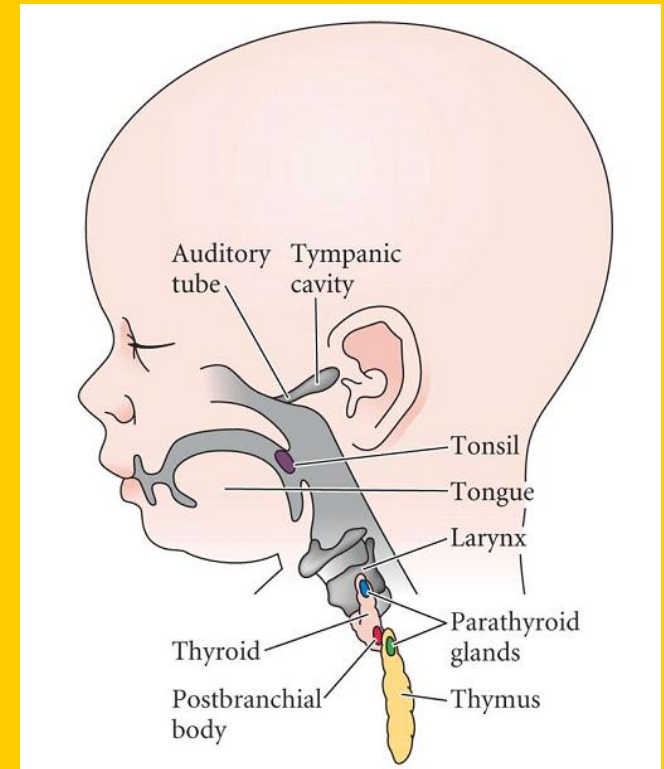
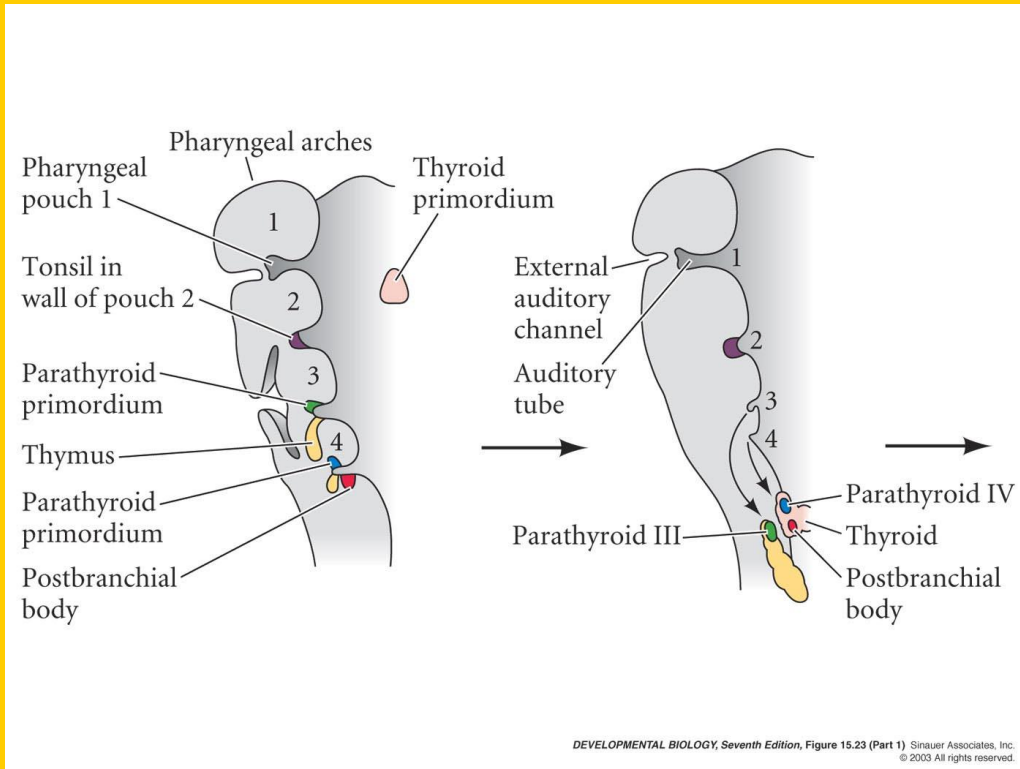


No mesenchyme--Mesenchyme

What Comes from Foregut?

- Pharyngeal region forms gills, eardrums, parathyroid, thymus
- Breaks through to form gill slits with ectoderm
- Connective tissue (cartilage) from neural crest

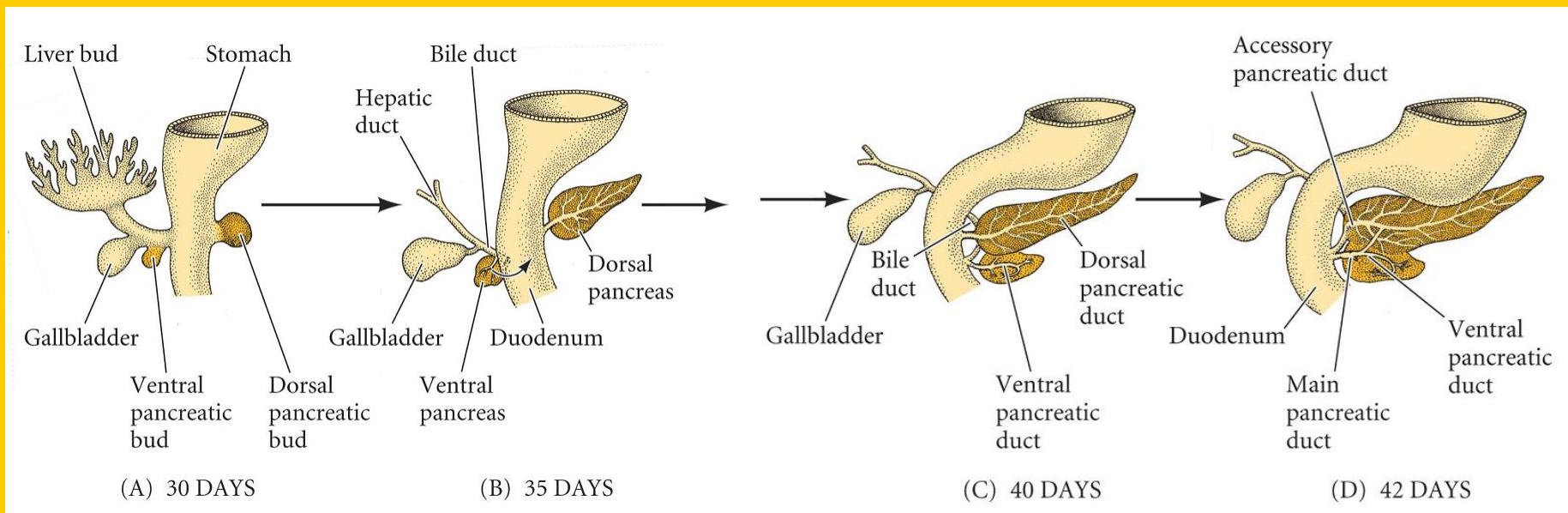
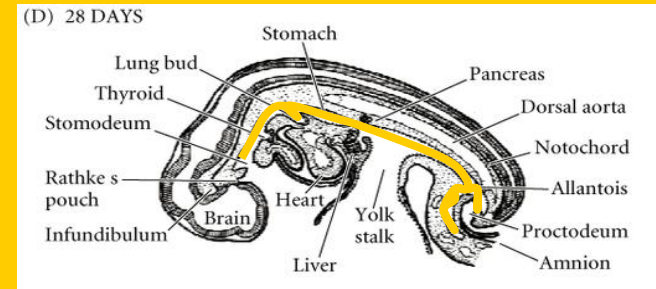
The Pharynx



Pouches and arches

Further Down Liver and Pancreas

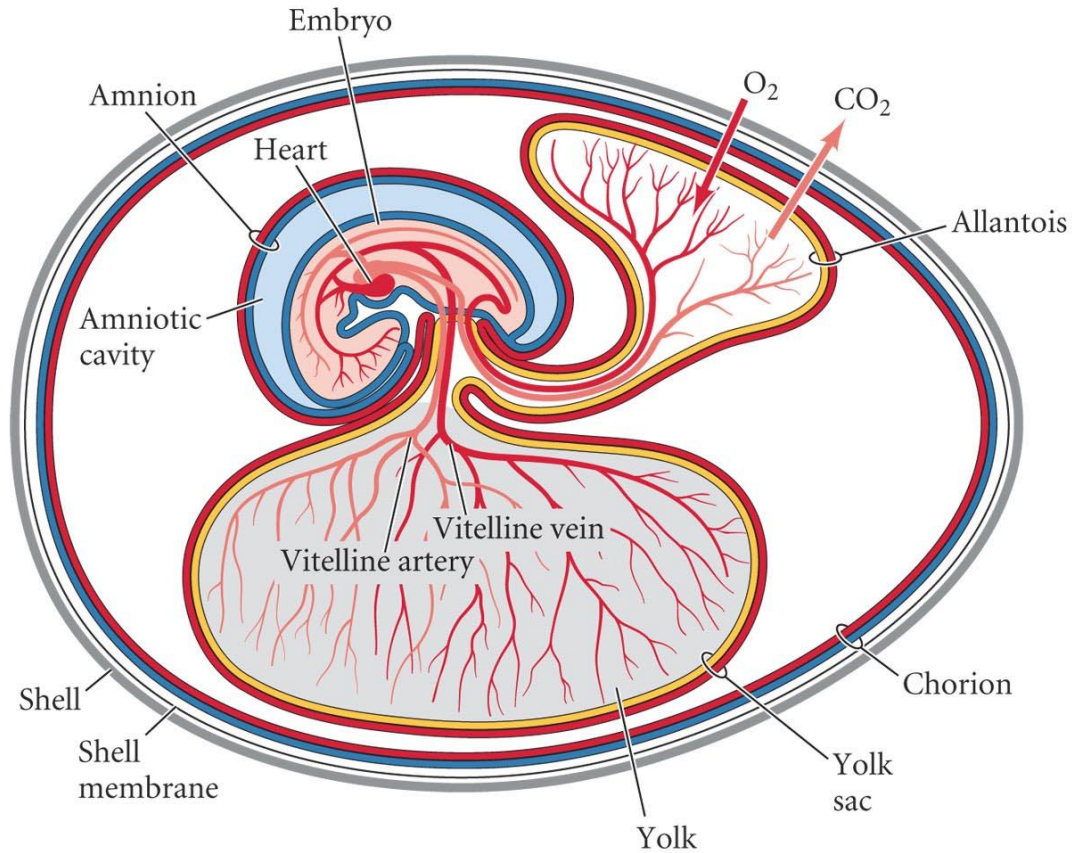
- Linings from endoderm
- Connective tissue from splanchnic mesoderm



Amniotes Have Four Extra-embryonic “Membranes”

- Amnion - maintains aqueous environment
 - amniote vertebrates
- Chorion - gas exchange
 - in mammals --> placenta
 - also provides nutrition, hormones, immunity
- Allantoic membrane - waste disposal/respiration
 - not necessary in humans because of placenta
- Yolk Sac - nutrition
 - no yolk in humans (yolk sac holds primordial germ cells)

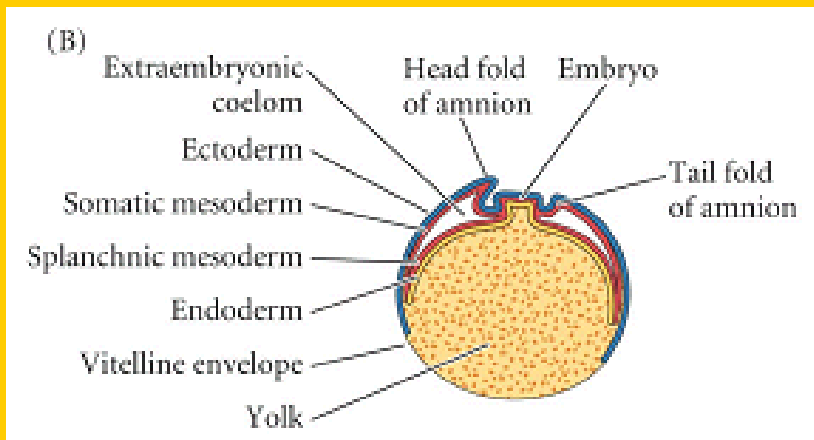
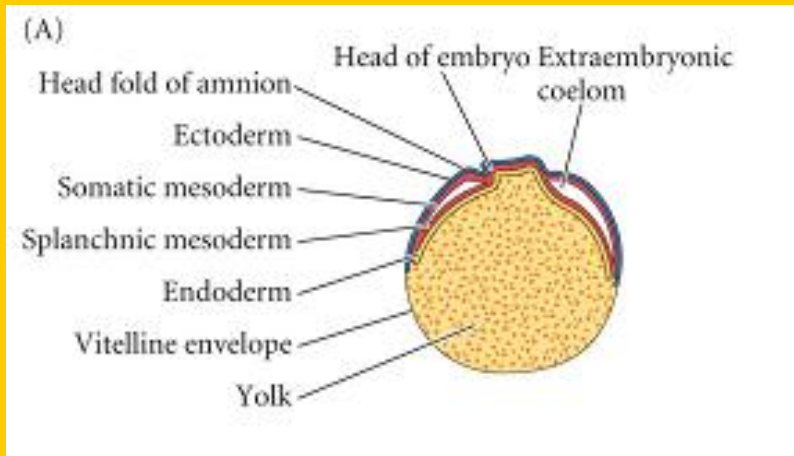
Four “Membranes”



Where do Membranes Originate?

- Chorion and amnion from ectoderm and somatic mesoderm
 - = body wall or somatopleure
- Allantois and yolk sac from endoderm and splanchnic mesoderm
 - = gut wall or splanchnopleure

Extraembryonic Membranes



- Membranous folds gradually separate embryo from the extraembryonic regions

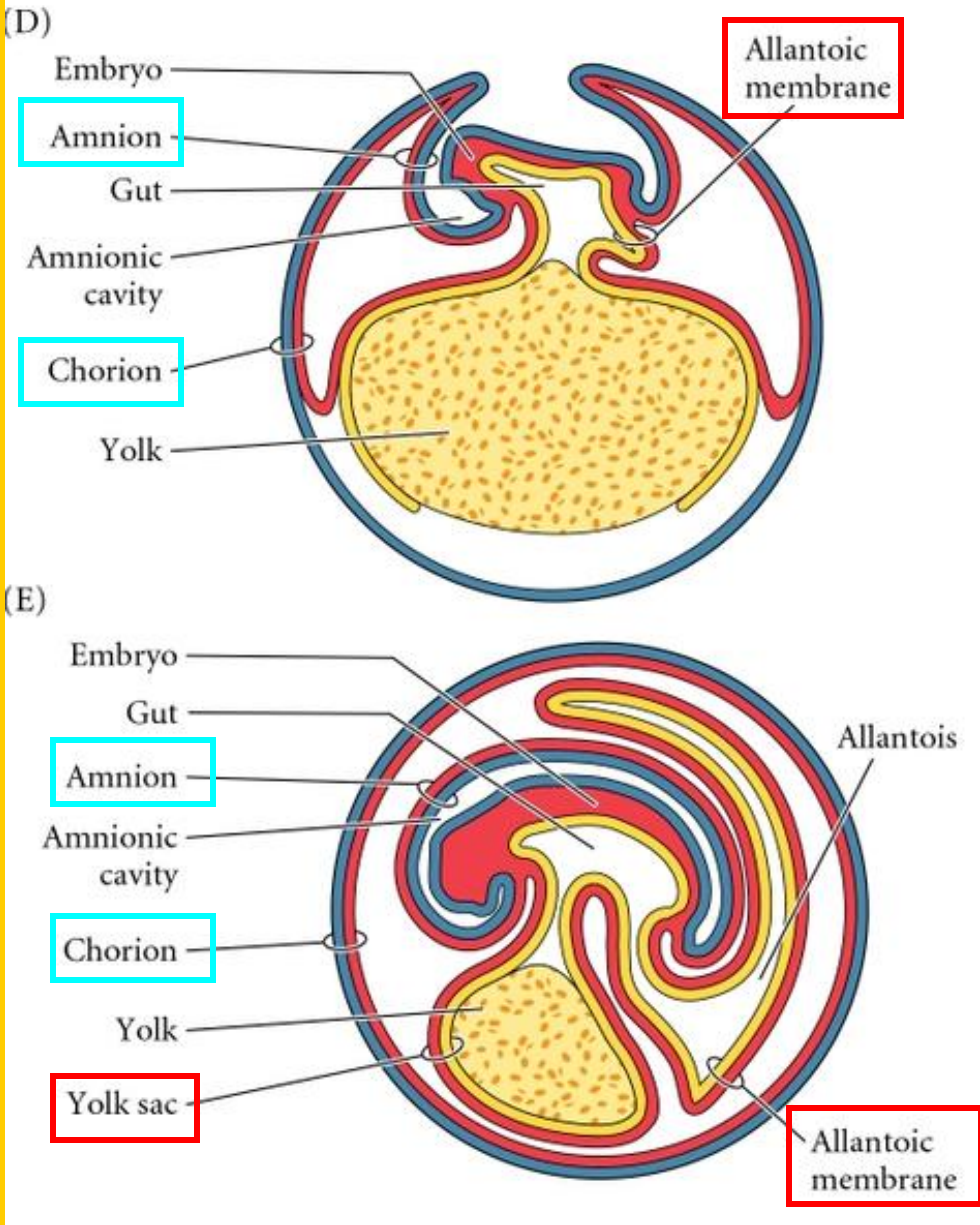
- Ectoderm + Mesoderm:

- Amnion
 - Chorion
- } Somatopleure (body wall)

- Endoderm + Mesoderm:

- Yolk sac
 - Allantois
- } Splanchnopleure (gut wall)

And More Folding



The Caudal Region

