THIRD WEEK OF EMBRYOLOGICAL DEVELOPMENT

1

Thi-Qar University

College of Dentistry

2nd stage

Sub: Embryology

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Events during 3rd wk appear to occur in threes

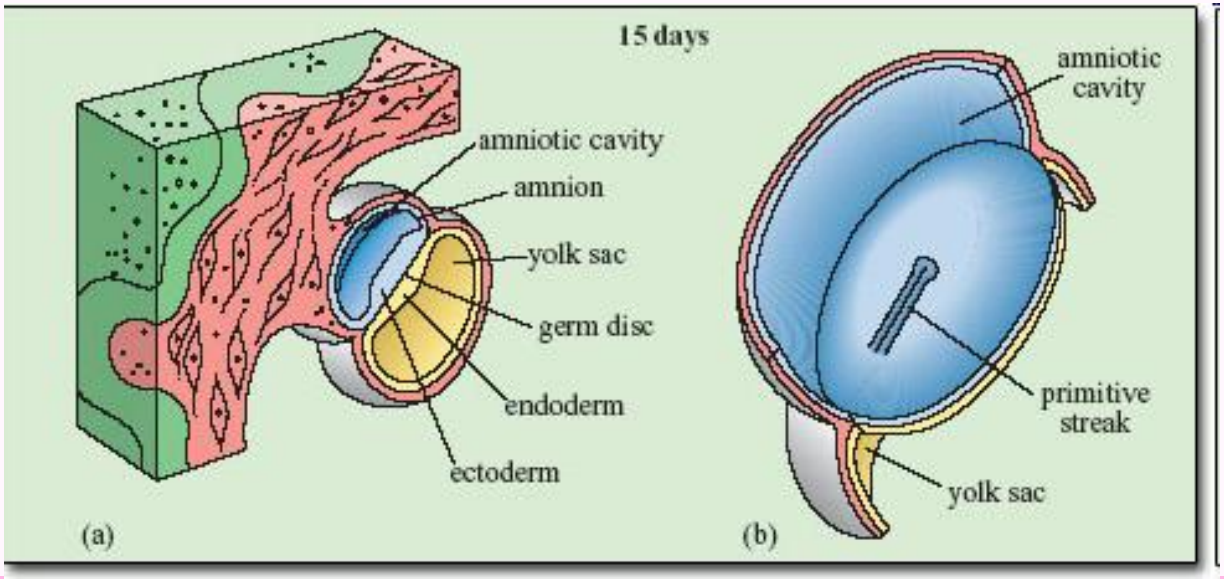
- **3 germ layers of derived from bilaminar embryonic disc**
- **3 new structures appear**
  - **Primitive streak, notochord & allantois**
- **3 layers appear in chorionic villi**
  - **Syncytiotrophoblast**
  - **Intermediate cytotrophoblast**
  - **Inner mesodermal layer**

Other events in third week

- **Formation of neural**
  - **-plate**
  - **-tube**
  - **-crest**
- **Formation of somites**
- **Formation of intraembryonic coelom**

GASTRULATION

- The **main event** that occurs during the third week of development is the **formation of the trilaminar embryo**. This process is called **gastrulation**.
- The first sign of gastrulation is the formation in the **epiblast** of the **primitive streak**.

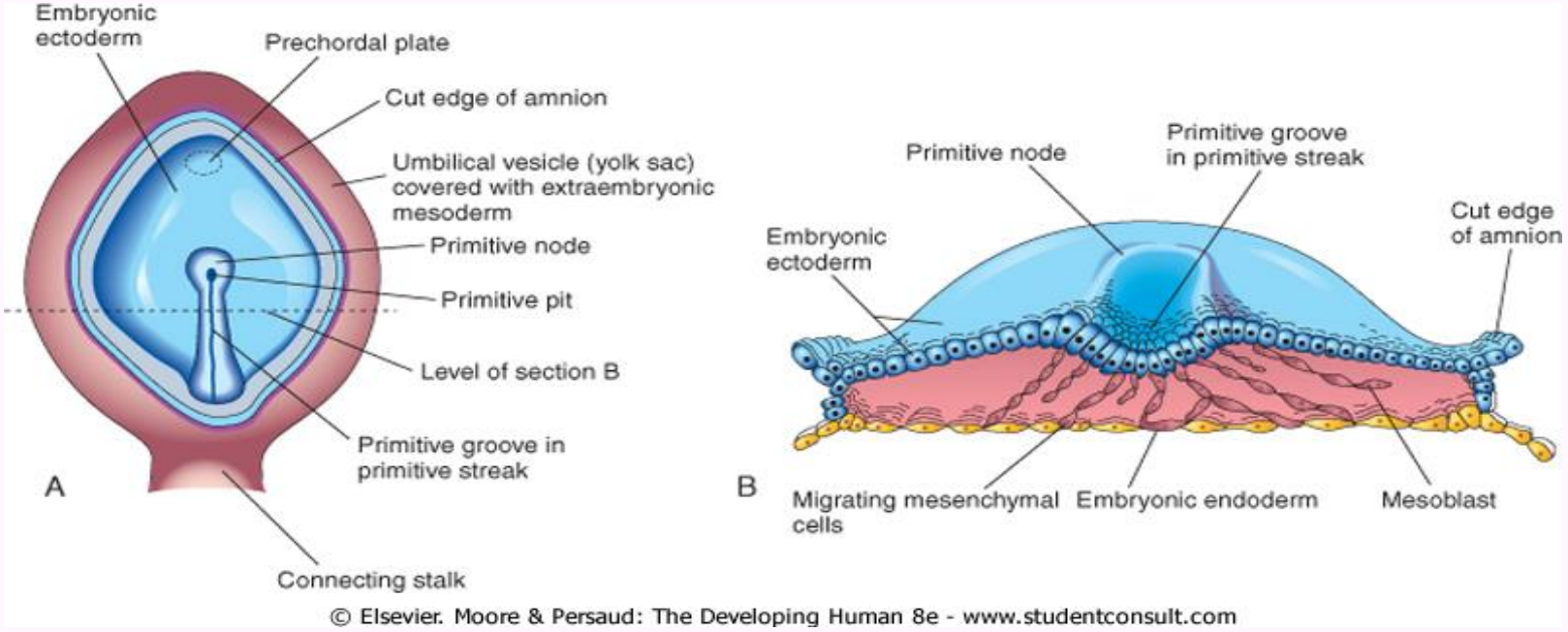


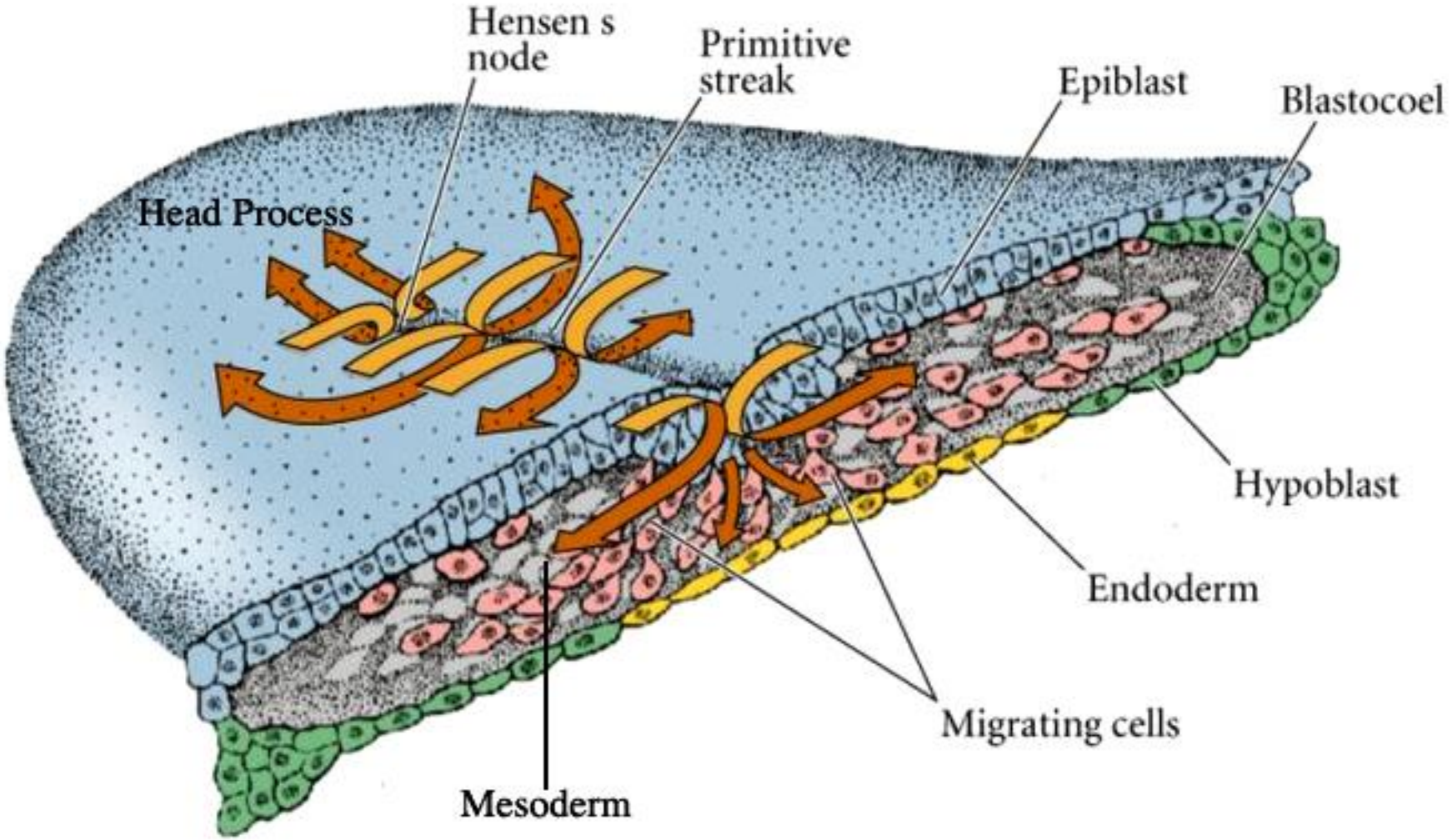
Events in Gastrulation

- 1. **Cell proliferation** – cells from the epiblast in the caudal half proliferate at the future median plane causing heaping up of the cells and is the source of a new layer of cells
- 2. **Cell migration** by amoeboid movement – the cells insinuate themselves between the epiblast and hypoblast
- 3. **Cell determination** - the cells arising from the primitive streak are determined to give rise to different tissues

Gastrulation…

- At the cranial end of the primitive streak, cells proliferate to form the **primitive node**, which finally undergo apoptosis to form the **primitive pit**
- Within the primitive streak there is apoptosis to form the **primitive groove**




Hensen s node
Primitive streak
Epiblast
Blastocoel
Head Process
Hypoblast
Endoderm
Migrating cells
Mesoderm
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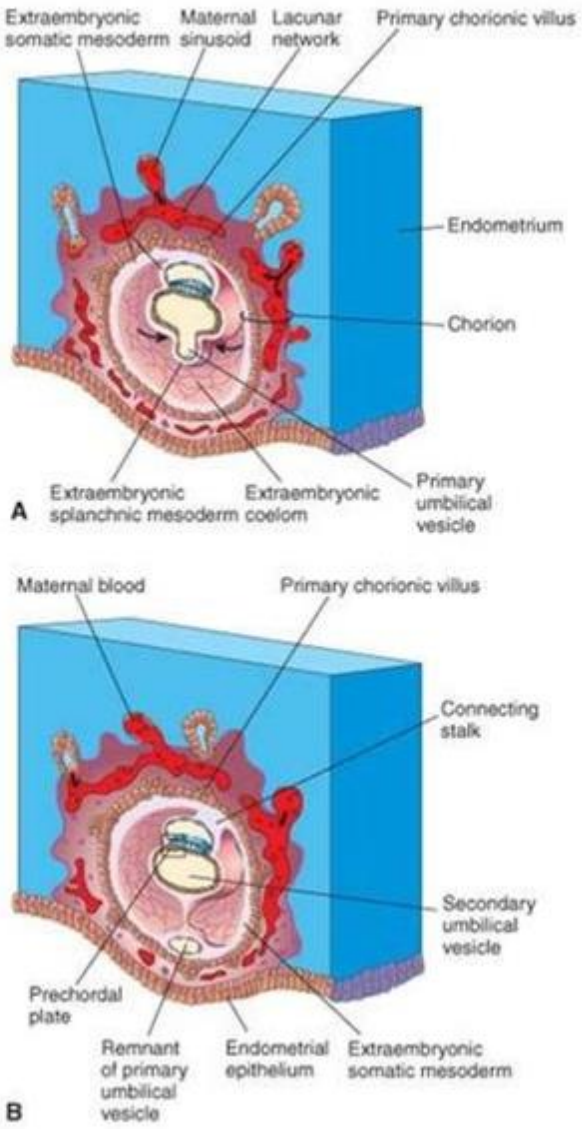
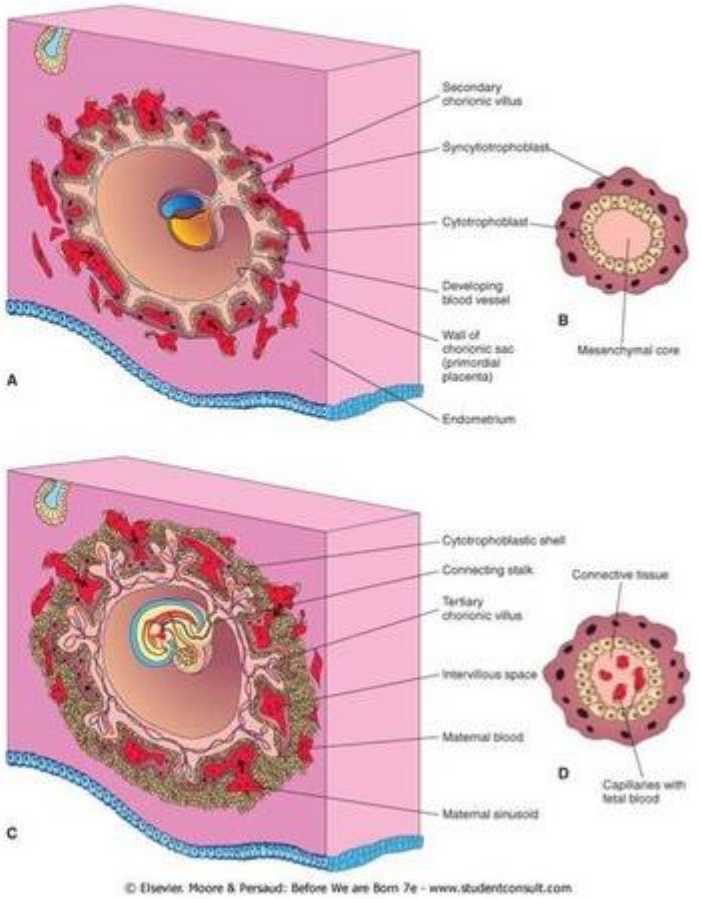
Development of chorionic sac

- Primary chorionic villi begin to appear by the end of the second week, induced by the extraembryonic somatic mesoderm
- Extrembryonic somatic mesoderm + cytotrophoblast + syncytiotrophoblast = Chorion = walls of chorionic (gestational) sac
- The Extrembryonic coelom become chorionic cavity



Development of the chorionic villi

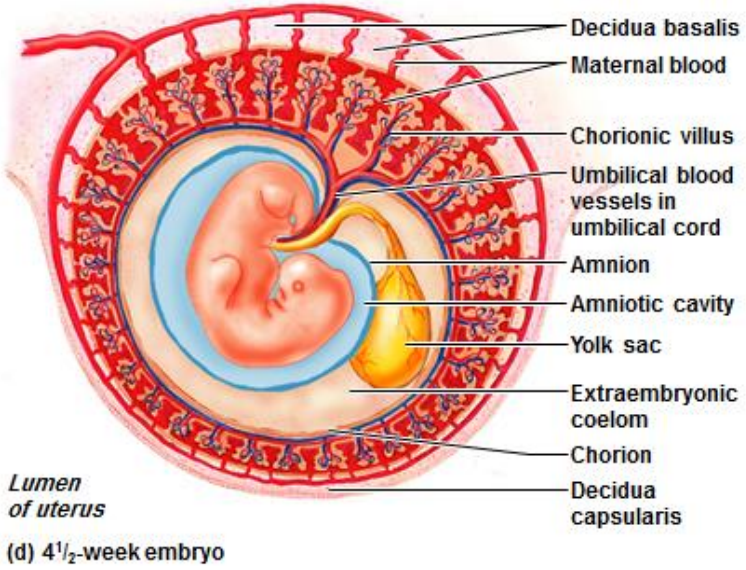
- Primary chorionic villi →secondary chorionic villi (with mesenchymal tissue inside) →tertiary chorionic villi (with blood vessels inside)
- Cytotrophoblastic cells proliferate and form cytotrophoblastic shell that surronds the chorion and attach it to the endometrium
- exchange occur between the embryonic blood in the BV of the tertiary chorionic villi and the maternal blood in the intervillous spaces



The Placenta

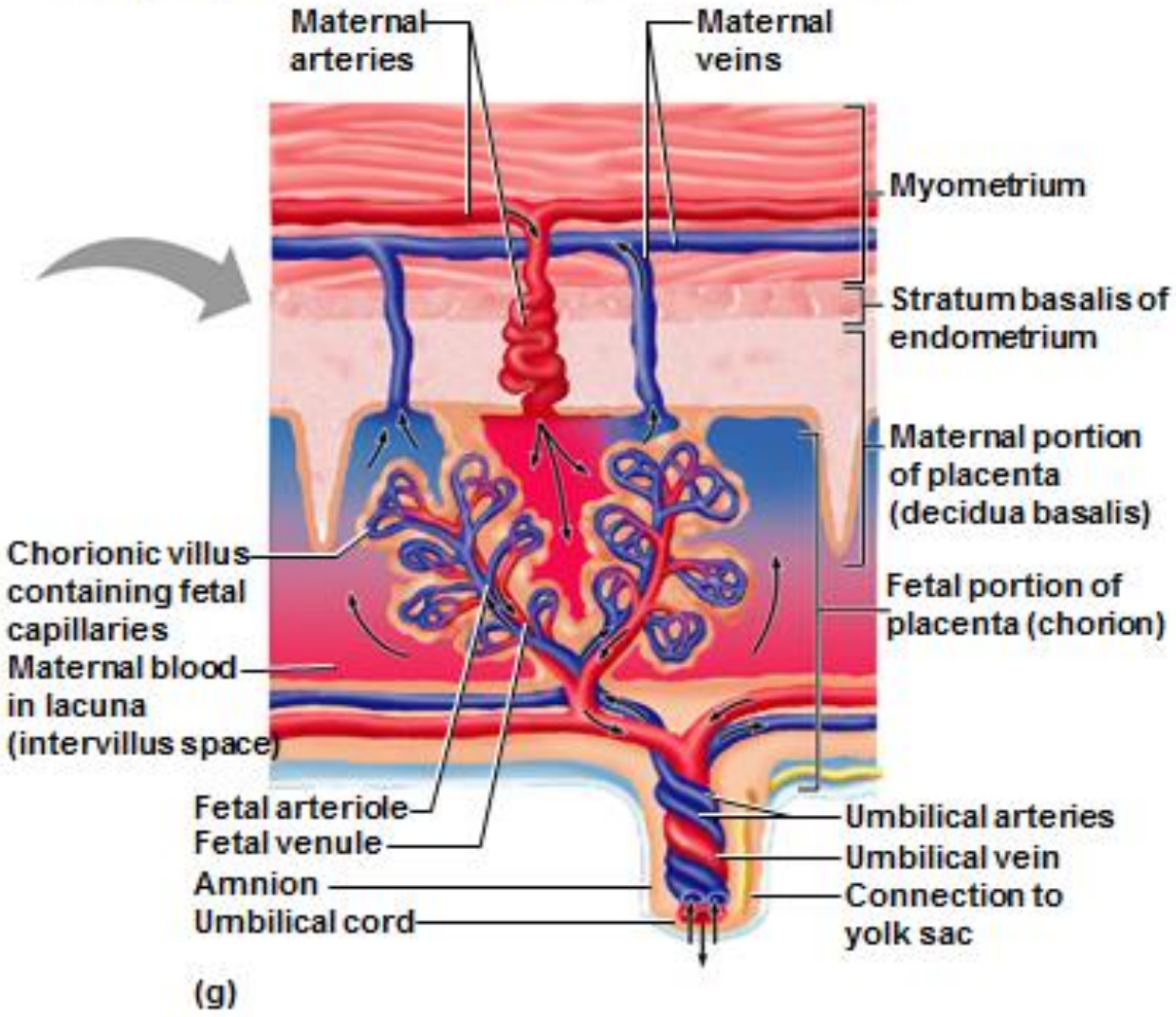
- Placenta is the site of exchange (nutrients and wastes) between the mother and the fetus
- Placenta is composed from two parts:
  - Fetal portion, which is part of the chorion; the villous chorion
  - Maternal portion, which develop from the endometrium; the decidua basalis

Events of placentation, early embryonic development, and extraembryonic membrane formation



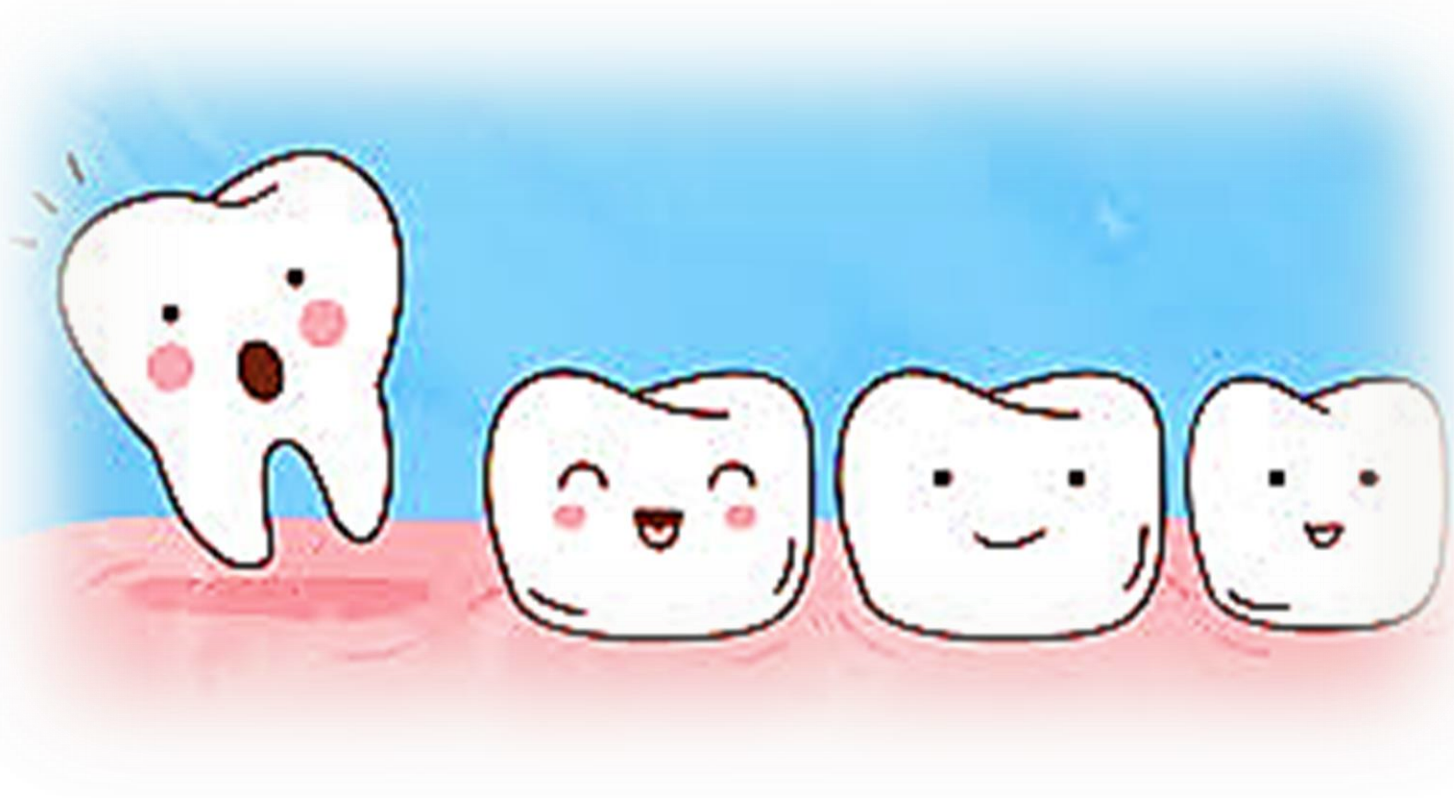
(d) $4^1/_2$-week embryo

Events of placentation, early embryonic development, and extraembryonic membrane formation



(g)

Human Anatomy and Physiology, 7e
by Elaine Marieb & Katja Hoehn



All The Best