

Embryology

Lab 2

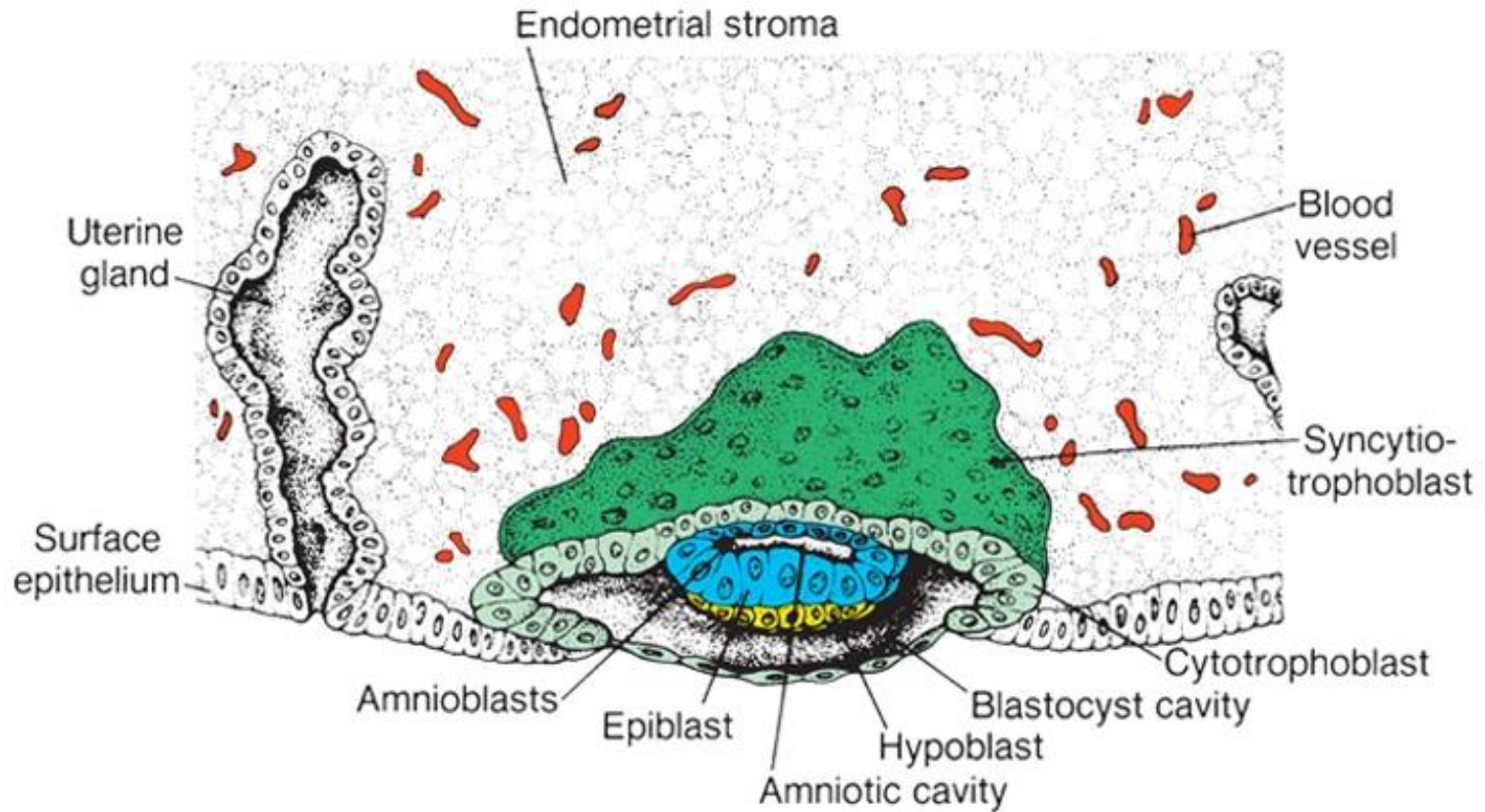
Ass.Lec. Sada AL_Musawi

Week 2: days 7-14

implantation

- Implanted embryo becomes more deeply embedded in endometrium
- Further development of trophoblast into placenta
- Development of a bi-laminar embryo, amniotic cavity, and yolk sac.

Implantation and placentation (day 8)



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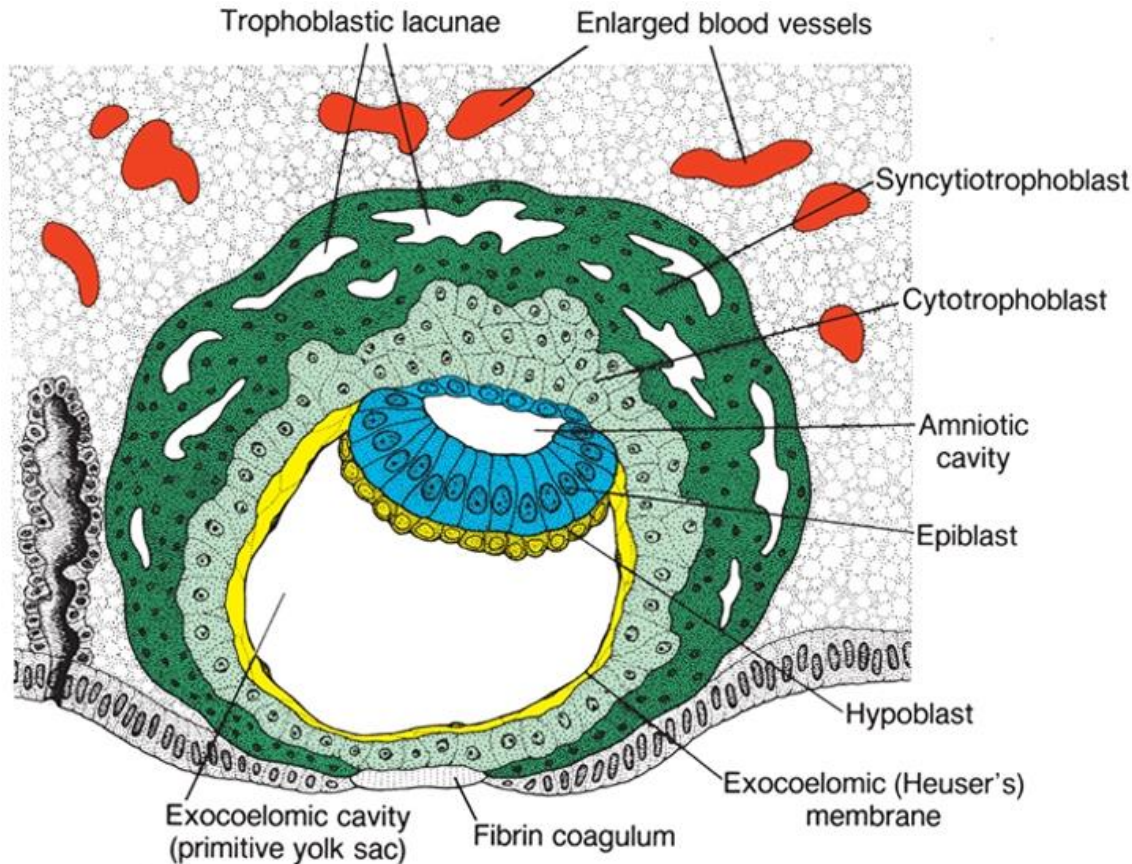
Trophoblast further differentiates and invades maternal tissues

- Cytotrophoblast: stem cell population
- Syncytiotrophoblast: invasive fused cells (syncytium) derived from cytotrophoblast
- Breaks maternal capillaries, trophoblastic lacunae fill with maternal blood

Inner cell mass divides into epiblast and hypoblast:

- Epiblast contributes to forming the overlying amniotic membrane and amniotic cavity
- Hypoblast contributes to forming the underlying yolk sac.

Implantation and placentation (day 9)



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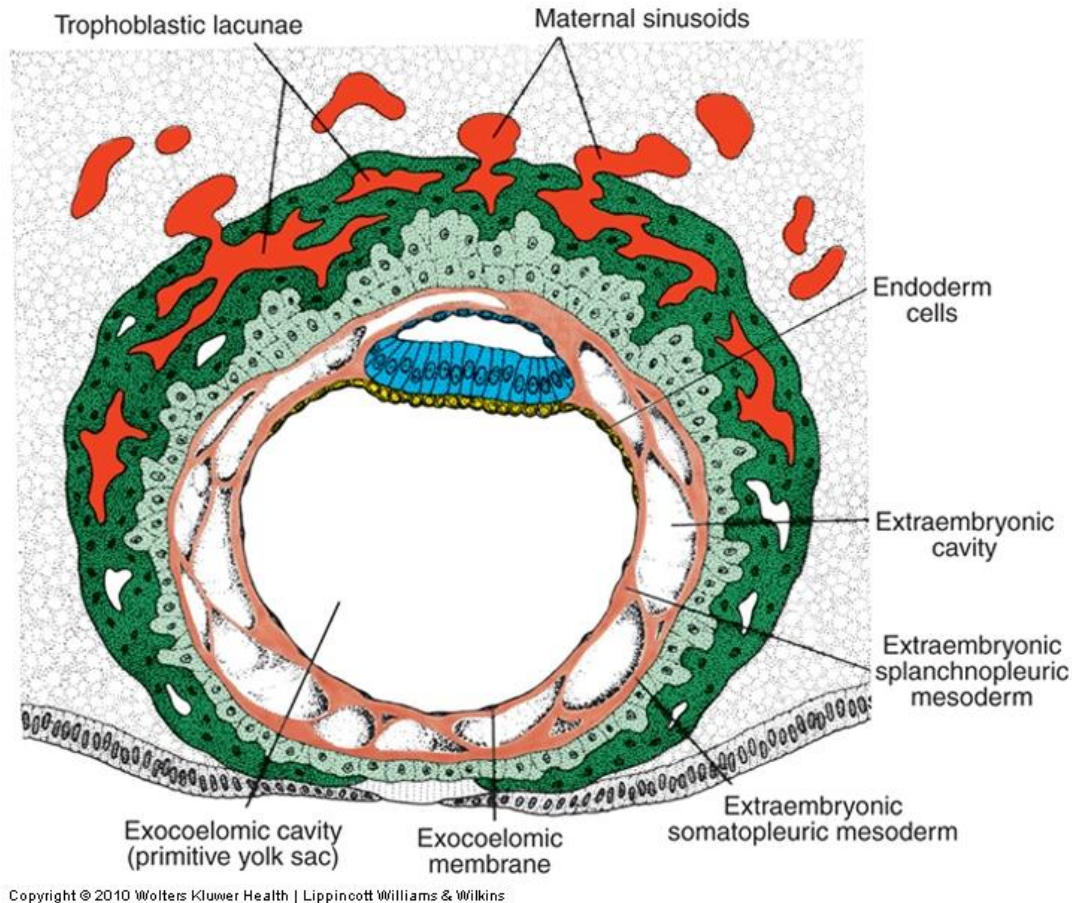
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Implantation and placentation (day 12)



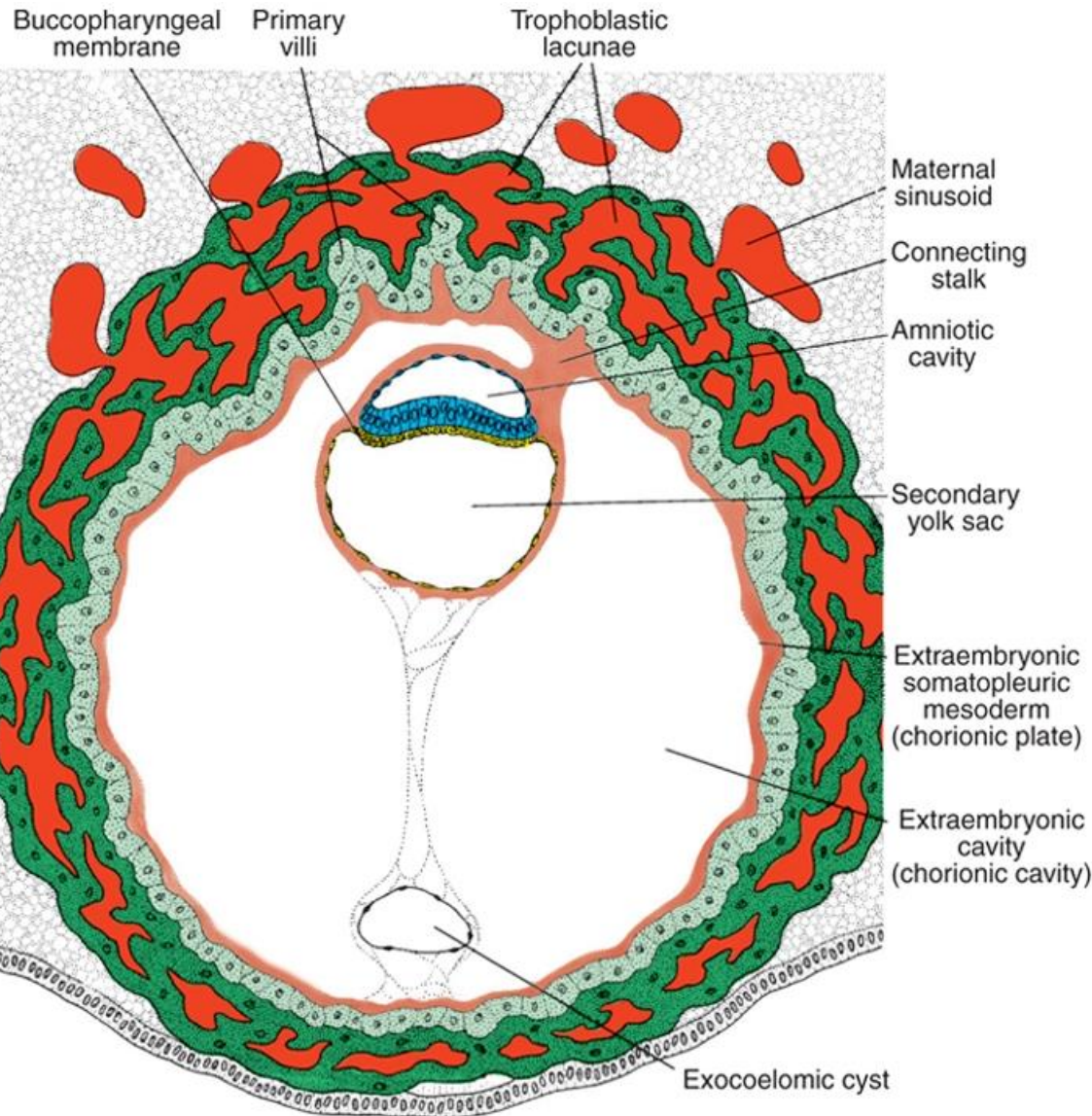
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Implantation and placentation (day 13)



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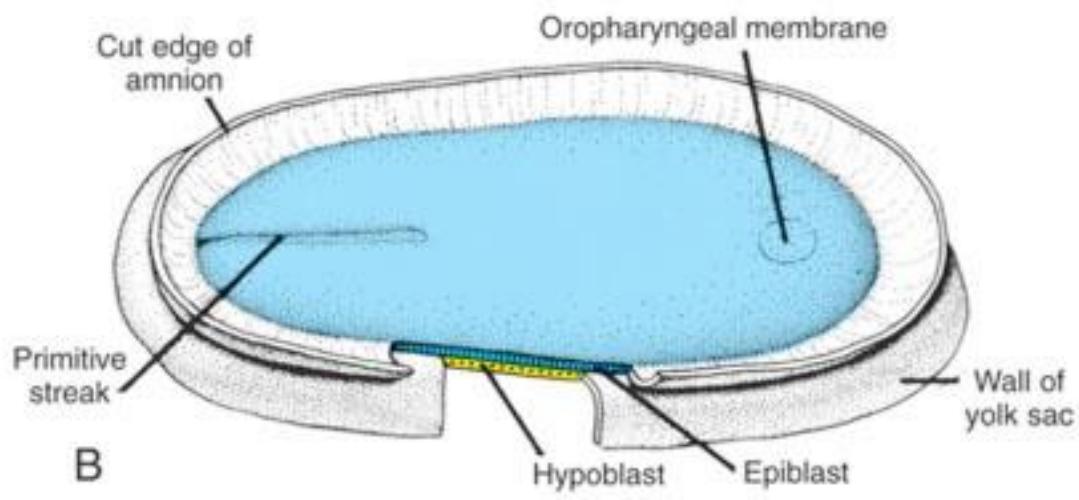
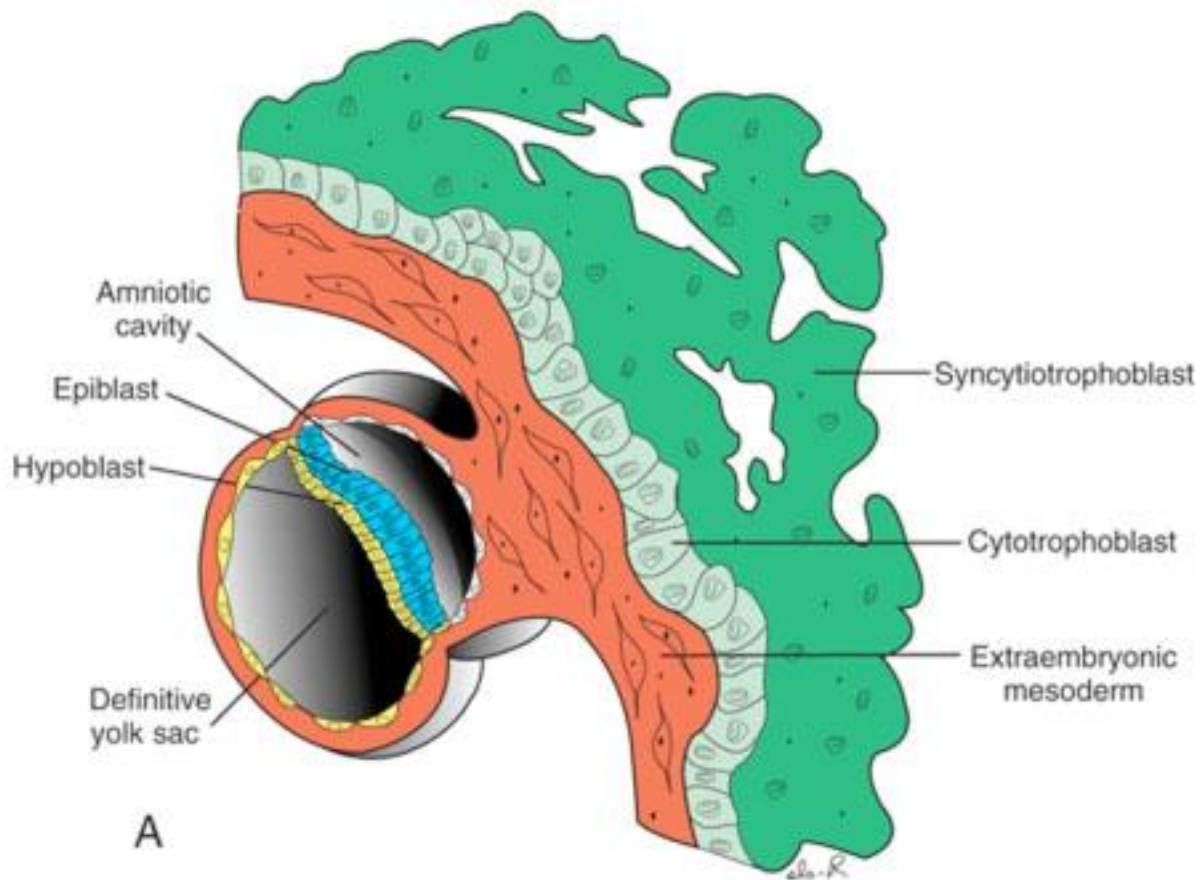
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Week 3: Days 14-21

- Two layer germ disc
- Primitive streak forms
- Gastrulation forms tri-laminar embryo
- Neural induction
- Left-right asymmetry
- 0.4mm - 2.0mm

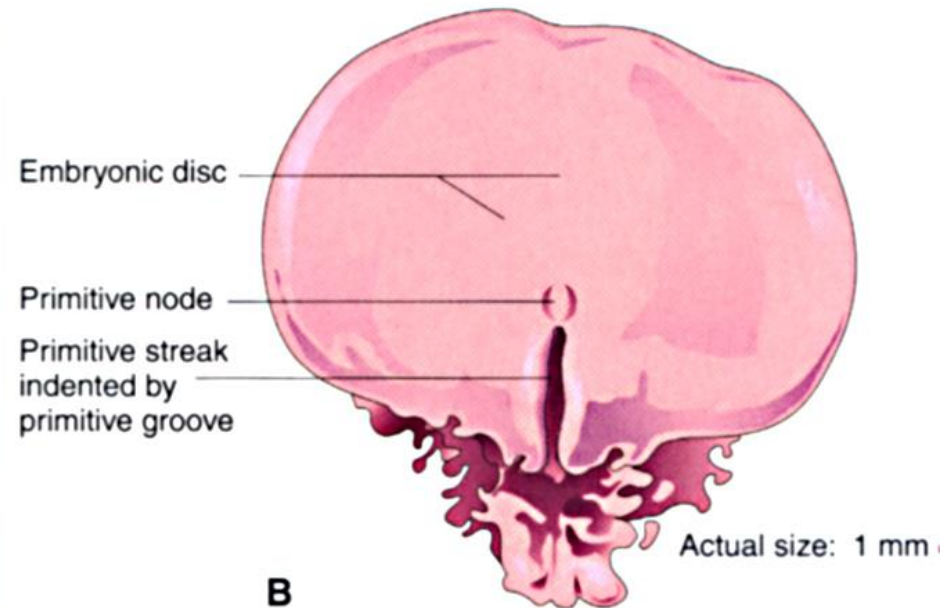


Gastrulation

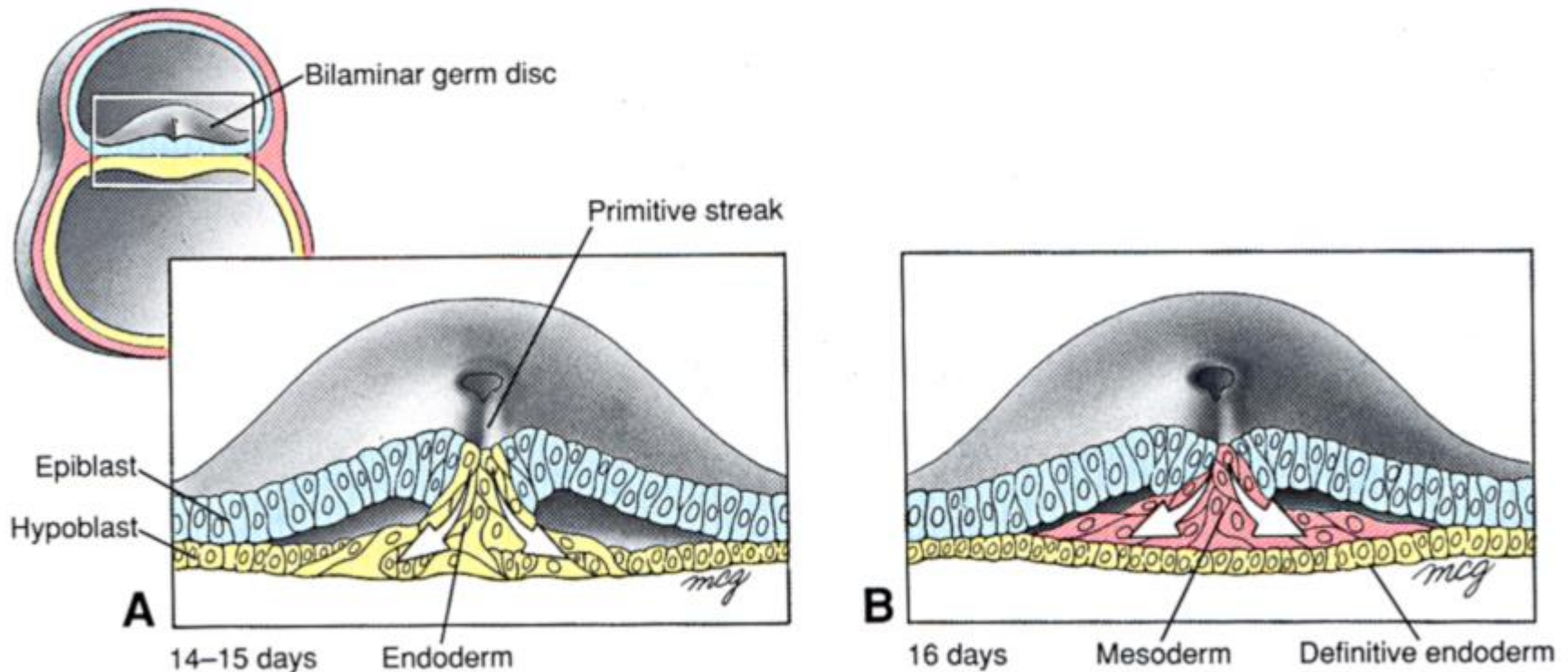
At gastrulation the two layered epiblast is converted into the three primary embryonic germ layers:

- Ectoderm: outside, surrounds other layers later in development, generates **skin** and **nervous tissue**
- Mesoderm: middle layer, generates most of the **muscle, blood** and **connective tissues** of the body and placenta
- Endoderm: eventually most interior of embryo, generates the **epithelial lining** and associated **glands** of the **gut, lung, and urogenital tracts**

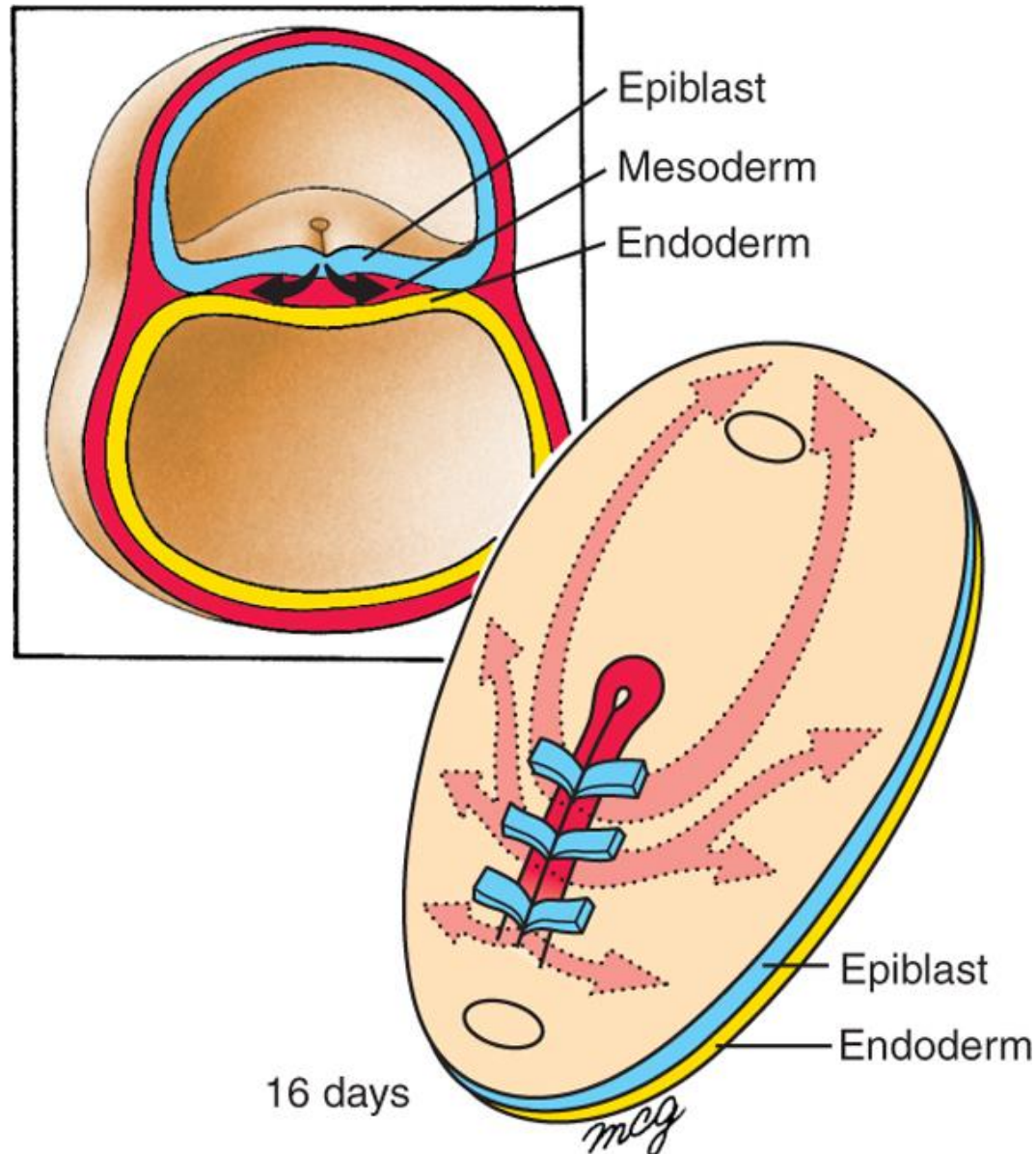
The human embryo at gastrulation



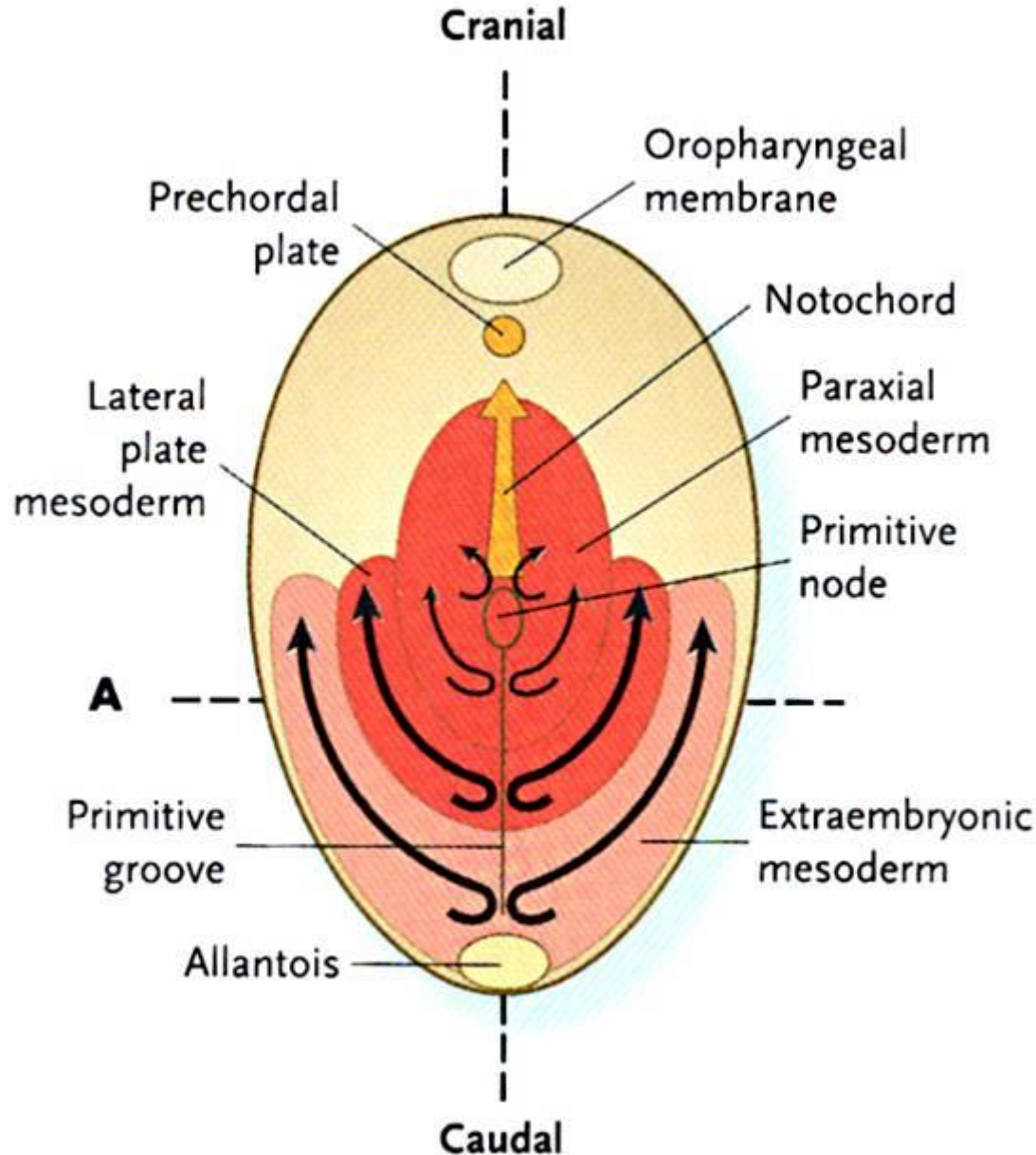
At gastrulation, primitive endoderm is replaced by definitive or embryonic endoderm then mesoderm is formed



Cell movements during gastrulation



Mesoderm is patterned in a cranial to caudal gradient



Axial mesoderm: passes through the node and migrates along the midline –forms the notochord

Paraxial mesoderm: passes just caudal to the node and migrates slightly laterally –forms cartilage, skeletal muscle, and dermis

Lateral plate mesoderm: passes more caudal and migrates more laterally –forms circulatory system and body cavity linings.

Extraembryonic mesoderm: passes most caudal and migrates most laterally –forms extraembryonic membranes and associated connective tissue & blood vessels.

Fate of the “axial” mesoderm

The **notochord** and **pre-chordal plate** develops from mesoderm arising from cells that passed directly through the node and migrated cranially along the midline

The notochord and pre-chordal plate are important signaling centers that pattern the overlying ectoderm and underlying endoderm.

