"Day 8 of Development (Implantation Phase)"

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1. Status of Blastocyst

- The blastocyst is partially embedded in the endometrial stroma
- Implantation is actively progressing

Endometrial Changes

- Edematous stroma → due to fluid accumulation
- Highly vascular → supports embryo nutrition
- Endometrial glands:
    - Enlarged and tortuous
    - Secrete glycogen + mucus → early nutrition for embryo

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2. Trophoblast Differentiation

The trophoblast differentiates into two distinct layers:

Layers of Trophoblast

Feature	Cytotrophoblast	Syncytiotrophoblast
Structure	Mononucleated cells	Multinucleated mass
Cell boundaries	Distinct	No clear boundaries
Mitosis	Present	Absent
Function	Proliferative layer	Invasive + nutritive
Role	Supplies new cells	Invades endometrium

Key Concept

- Cytotrophoblast = growth layer

- Syncytiotrophoblast = invasive layer

Mechanism of Syncytium Formation

Cytotrophoblast cells → Undergo mitosis → Migrate outward → Fuse with syncytiotrophoblast → Lose cell membranes → Form multinucleated mass

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3. Embryoblast Differentiation (Bilaminar Disc Formation)

The embryoblast differentiates into two layers, forming the bilaminar germ disc:

Layers of Embryoblast:

Layer	Cell Type	Location	Function

Epiblast	Columnar cells	Adjacent to amniotic cavity	Forms embryo proper
Hypoblast	Cuboidal cells	Adjacent to blastocyst cavity	Contributes to yolk sac

High-Yield Concept

- Epiblast → gives rise to all three germ layers (later)
- Hypoblast → extraembryonic structures (not embryo proper)

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4. Formation of Bilaminar Disc (Flowchart)

Embryoblast → Differentiates into two layers → Epiblast (columnar) + Hypoblast (cuboidal) → Forms bilaminar germ disc

5. Amniotic Cavity Formation

- A small cavity appears within the epiblast
- This cavity enlarges to form the amniotic cavity

Amniotic Cavity Development (Flowchart)

Epiblast → Small cavity appears within epiblast → Cavity enlarges → Forms amniotic cavity

6. Amnioblast Formation

- Some epiblast cells differentiate into amnioblasts

Key Features

- Located adjacent to cytotrophoblast
- Line the amniotic cavity

Flowchart

Epiblast cells (adjacent to cytotrophoblast) →

Differentiate into amnioblasts → Line amniotic cavity

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7. Integrated Summary

- Blastocyst (partially embedded) → Trophoblast differentiates
  - Cytotrophoblast (mitotic, inner layer)
  - Syncytiotrophoblast (invasive, outer layer)
- Embryoblast differentiates → Epiblast (columnar) + Hypoblast (cuboidal) → Formation of bilaminar disc
- Epiblast develops cavity → Amniotic cavity → Lined by amnioblasts
- Endometrium response → Edema → Increased vascularity → Glycogen-rich secretions

8. Clinical Correlation

Syncytiotrophoblast Function

- Responsible for invasion into maternal endometrium
- Begins early maternal-embryo interaction

Exam Insight

- No mitosis in syncytiotrophoblast → commonly tested MCQ
- Epiblast is the source of the embryo proper → very high-yield

9. Quick Revision Points

- Day 8 = bilaminar disc formation begins

- Trophoblast splits into:
    - Cytotrophoblast (mitotic)
    - Syncytiotrophoblast (invasive)
- Embryoblast splits into:
    - Epiblast (→ embryo)
    - Hypoblast (→ extraembryonic)
- Amniotic cavity appears
- Endometrium becomes nutrient-rich and vascular

-> The End <-