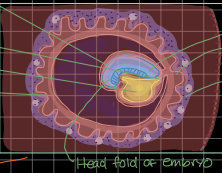


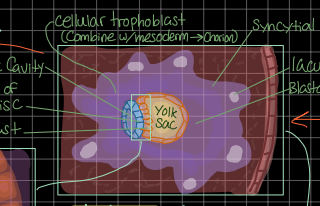
Extraembryonic Membranes

- Aminion:** ecto/mesoderm
- Secrete Amniotic Fluid
- Allantois:** out pocket at base of yolk sac → bladder
- Chorion:** mesodermal
- Blood circulation 3rd wk
- Yolk sac: hypoblast cells
- BVs → early blood cell form



③ Implantation

- Chorionic Villi of Placenta:** syncytiotrophoblast
- Amniotic Cavity:** Ectoblast of blastodisc
- Mesoderm - Epiblast:**
 - ectoderm
 - line amniotic
- Hypoblast:**
 - endoderm
 - line yolk sac

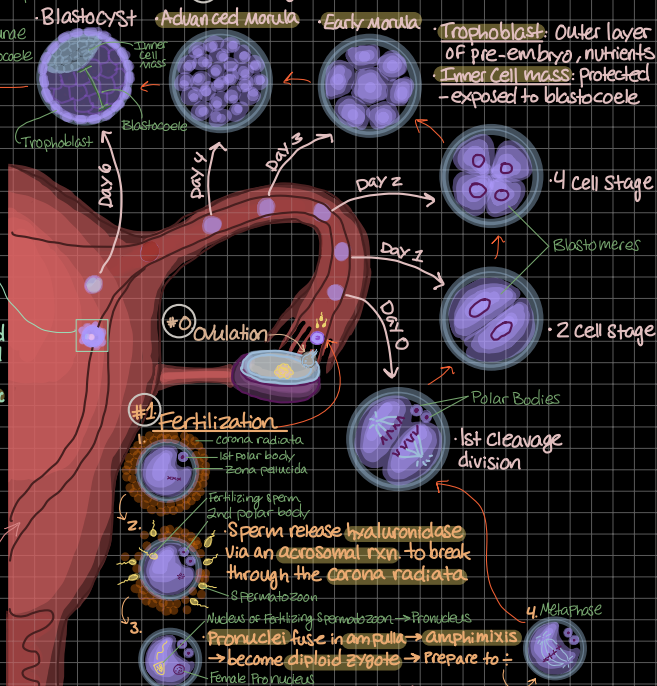


- Blastocyst adheres to uterine lining on cell mass side**
- Trophoblast cells:** rapidly form layer of cytoplasm called syncytial trophoblast
- USE hyaluronidase to erode path into thru epithelium**
- Lacunae form, bring mam blood**
- Becomes completely embedded**
- Inner cell mass separates to form amniotic cavity/blastodisc**

① Fertilization

- Embryogenesis:** form amniotic cavity/blastodisc
- By week 4 head & tail fold develops**
- Embryo becomes separated from rest of blastodisc & embryonic membranes**
- 1st 12 wks: organogenesis (organ formation)**
- Second Trimester:** organs/organ systems finish development, fetus covered by amnion
- Fetus grows faster than placenta, weighs ~1.9lb**
- Third Trimester:** rapid fetal growth, weighs ~5.7lb
- Major organ systems become fully functional**
- Infant born 1-2 months early → viable (usually)**
- *EPISiotomy:** surgical incision of peritoneum & inferior vaginal wall to enlarge vaginal orifice → decrease perineal tearing & uncontrolled muscle tears

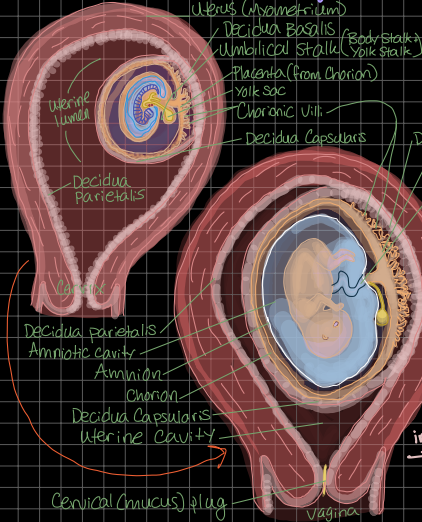
② Cleavage



① Fertilization

- After conception, endometrium controlled by progesterone**
- Uterine glandular epithelium:** make/secret glyco-gen & steroid proteins
- Endometrium:** secrete cholesterol, steroids, nutrients, & matrix components

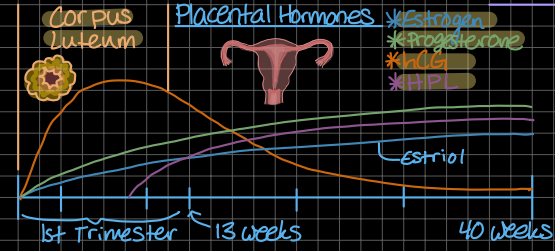
#4/5 Placentation & Embryogenesis



① Fertilization

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Physiologic Changes in a Pregnant Woman



- Progesterone:** made by follicular cells → immature oocyte, grow uterine lining, develop breasts, develop 2nd sex characteristics
- Progesterone → rises significantly**
- Fun:** maintain pregnancy, mammary gland develop, ↓ uterine motility, & contractions
- Made by Corpus luteum (also makes estrogen)**
- Developing placenta:** major source (estro) after 8wk
- Maternal-placental-fetal unit:** maintain ↑ levels after 8wk
- Relaxin:** keep uterus sweet during prog., labor: soften/dilate cervix
- made by corpus luteum, placenta (8wk developed), duadua (endomet)**
- Prostaglandins:** ↑ uterine contraction → initiate labor, ↑ near term
- ↑ OT contractions by ↑ gap junctions in uterine muscle**
- Soften, dilate, thin cervix; ↑ by OT stim. decidual cells**
- Made by uterus, placenta, fetal membranes; Precursor: arachidonic acid**
- Prolactin:** mammogenic, lactogenic, galactopoietic
- Dopamine:** inhibits release, inhibit dopa. to ↑ release
- Secreted by lactotroph in anterior pituitary**
- Oxytocin:** ↑ late labor contractions, ↑ PG release
- Constrict uterine BV @ placenta → 3rd stage contractions**
- Released from posterior pituitary**
- Triggered by cervical distension = Ferguson reflex**
- Estrogen ↑ ↑ OT receptors in myometrium & endometrium**
- uterus insensitive to OT until ~20 wks, always susceptible to PG**
- Human Chorionic Gonadotropin (hCG):** functionally like TSH/LH
- In maternal blood/urine soon after implant: reliable test**
- Corpus luteum doesn't regenerate in presence of hCG**
- Human placental lactogen (HPL):** made by placenta
- Convert glucose → fatty acid/ketone → fetus/placenta**
- Store fuel for early neonate period, develop mammaryaries**
- Corticotropin releasing hormone:** regulate duration of preg & fetal maturation (mature organs just before labor, influence timing of birth)
- Made by: Placenta → pass into maternal & fetal circulations; Irg. role in pituit.-adrenal axis & physiologic response to stress**

Thyroid Hormone Metabolism

- ↑ TH from hCG & estrogen
- ↑ Thyroid binding globulin
- ↑ Thyroxine binding globulin
- Critical for fetal development of brain & nervous system
- Hypothyroid → ↓ organ size

Prolactin

- ↑ mammary growth
- initiates milk secretion
- Maintains milk secretion
- Dopamine inhibits release from lactotrophs, remove inhibition

Respiratory System

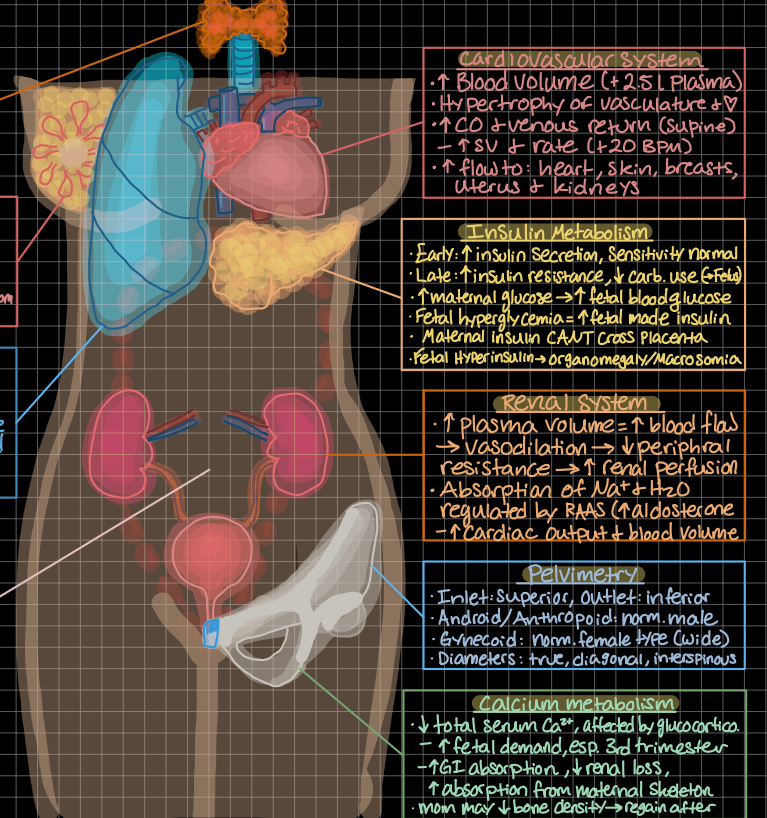
- ↑ alveolar ventilation
- ↓ net RV & FRC
- ↑ tidal volume, ↓ resistance
- VC & Compliance Unchanged
- Abd. muscles ↓ effective in forced expiration

Amniotic Fluid

- Nutrients: macros, lytes, enzymes, lactate
- Growth factors, hormones, waste products
- Protective: Cushion & antimicrobial proteins
- Dx: Prostaglandins ↑ w/ labor, Chromosomes, lungs
- turns over > 1x per day
- @ 10-12 wks: fetal kidneys mature → fluid mostly renal/urine excretions
- Polylhydramnios = ↑, oligo = ↓

Glucocorticoids

- Cortisol, Cortisone, Corticosterone
- ↑ glucose metabolism, ↓ immune/inflam., CNS
- Fetus: ↑ storage of glucose as glycogen in liver
- mature → fluid mostly renal/urine excretions
- Polylhydramnios = ↑, oligo = ↓



Cardiovascular System

- ↑ Blood Volume (+2.5L Plasma)
- ↑ Hypertrophy of vasculature & ↑ V
- ↑ CO & venous return (Supine)
- ↑ SV & rate (+20 BPM)
- ↑ Flow to: heart, skin, breasts, uterus & kidneys

Insulin Metabolism

- Early: ↑ insulin secretion, sensitivity normal
- Late: ↑ insulin resistance, ↓ carb. use (fetal)
- ↑ maternal glucose → ↑ fetal blood glucose
- Fetal hyperglycemia = ↑ fetal made insulin
- Maternal insulin CAUT cross Placenta
- Fetal hyperinsulin → organomegaly/Macro somia

Renal System

- ↑ Plasma Volume = ↑ blood flow → vasodilation → ↓ peripheral resistance → ↑ renal perfusion
- Absorption of Na⁺ & H₂O regulated by RAAS (Aldosterone)
- ↑ Cardiac output & blood volume

Pelvimetry

- Inlet: superior, Outlet: inferior
- Android/Anthropoid: norm. male
- Gynecoid: Norm. female type (wide)
- Diameters: true, diagonal, interspinous

Calcium Metabolism

- ↓ total serum Ca²⁺, affected by glucocorticoids
- ↑ fetal demand, esp. 3rd trimester
- ↑ GI absorption, ↓ renal loss
- ↑ absorption from maternal skeleton
- woman may ↓ bone density → regain after

Androgens: male sex steroid (2nd character), affects nearly every tissue

- made by thecal cells in ovaries & adrenal glands in Ft/M
- Tell less dominant follicle → atresia, converted → estrogen in granulosa