Prenatal Development:

What are the three embryonic germ layers?

Endoderm- endocrine system

Ectoderm- nervous system

Mesoderm- reproductive system

How do the Anterior Pituitary and Posterior Pituitary develop?

Anterior Pituitary- develops from roof of mouth, gives rise to Rathke's pouch

Posterior Pituitary- develops from floor of brain

- Wolffian vs. Mullerian Ducts

Wolffian/Mesonephric Ducts (MALE)- develops into ductus deferens and epididymis

Mullerian/Paramesonephric Ducts (FEMALE)- develops into cervix, uterus, oviducts, and parts of cranial vagina

- Surge vs. Tonic Hypothalamus

Female- alpha fetoprotein binds to estrogen and prevents it from entering the brain. The hypothalamus is "feminized" and the surge center develops

Male- testosterone freely enters the brain because alpha fetoprotein doesn't bind to it. Testosterone is aromatized into estradiol and the male brain is "defeminized" and the surge center does not develop

Cell Type	**Function/Ability**
Totipotent	Have the ability to form all cell types of the conceptus
Pluripotent	Have the ability to form several types of cells in all three germ layers but not the whole organism

Multipotent	Have the ability to form a limited range of cells and tissues appropriate to their location

What is gastrulation?

Where we establish different layers of cells which eventually differentiate into the 3 germ layers.

What is the function of the mesoderm?

- Structural support
- Movement
- Transport within the body

What is the function of the ectoderm?

- Protection and communication
- Interacts with the outside environment

What is the function of the endoderm?

Internal regulation

How do the functions of the Anterior and Posterior Pituitary Glands differ?

Anterior: makes and releases hormones

Posterior: stores and releases hormones

What does the development of the Reproductive system look like?

1st trimester:

- Migration of primordial germ cells
- Sex cord develops in gonads
- Formation of evident sex structures

2nd trimester:

- Development of tubular components of the reproductive tracts (ducts & testes or ovaries)
- Formation of the broad ligament

3rd trimester:

- Testicular descent

What does sexual differentiation look like in the male? Female?

MALE XY:

- Y chromosome contains SRY gene which undergoes transcription and translation to become the SRY protein
- SRY protein stimulates development of male repro tract
- Sertoli Cells
    - Support cell in male gonad
    - Secrete AMH
- Leydig Cells
    - Steroid producing cell in male gonad
    - Secrete Testosterone

FEMALE XX:

- no Y chromosome, no SRY gene, no testes, no AMH

What is the importance of freemartinism?

Heifer born twin to a bull

Abnormal embryogenesis of female reproductive tract because the heifer is exposed to AMH through the shared blood supply within the dam