Female Reproductive Anatomy (Part 1)

1. What are the eight functions of the female reproductive system?

- Control activity of organs → Hormonally
- Produce oocyte (egg)
- Transport Sperm and oocyte
- Facilitate Fertilization
- Provide an environment for embryo and fetus
- Give birth to fetus
- Re-cycle to become pregnant again
- Provide nutrition to young

2. What is the exocrine function of the ovary?

   Sex cell production (eggs or ova)

   ⬇

   Once the egg is fertilized, it becomes a diploid (2N)

3. What is the endocrine function of the ovary?

   Follicles = estrogen ➡ secondary sex characteristics emerge

   CL = Progesterone ➡ Prepares uterus for pregnancy

4. Parts of the ovary **(fill out the chart)**

Structure	**Definition**	**Function**
Germinal Epithelium	Surface epithelium covering the tunica albuginea, continuous with peritoneal lining	Does NOT produce germ cells, breaks at ovulation
Tunica Albuginea	Dense connective tissue layers	Provides structure to ovary
Cortex	Outer inside portion of the ovary	Contains germ cells, oocyte population, follicles, Corpus Luteum
Medulla	Central part of the ovary	Contains connective tissue, houses blood and lymphatic vessels as well as nerves
Hilus	Where vessels, nerves, and ducts enter an organ	Entry point for vessels, nerves, and ducts which supply blood and help the ovary function

5. What are the differences between the mare's ovary and any other species' ovary?

Mare Ovary	Other Species' Ovary
- Ovulation: can ONLY occur at the ovulation fossa - Cortex ➡ INside Medulla➡ OUTside - CL can't be palpated, must use ultrasound	- Ovulation: can occur anywhere on the cortex layer of the ovary - Cortex ➡ OUTside Medulla➡ INside - CL can be palpated

6. What is Oogonia?
- Female stem cells
- Mitosis (cell # increase) produces primary oocytes
- Oogonia no longer exist by birth

7. What is the Primary Oocyte?
- Largest cell of body
- Suspended in dictyotene stage during *Prophase 1* since birth
- 2N (diploid)

8. What is the Secondary Oocyte?
- (+1st polar body)
- Completion of *Meiosis 1* (reducing genetic material) at the time of ovulation
- 1N (haploid)

9. What is the Ootid?
- The oocyte after *meiotic* divisions in which the polar bodies are present
- 2nd stage of oocyte arrest (paused development) = *Meiosis 2*

10. Ovarian Follicles

Follicle	**Characteristics**
Primordial Follicle	- Microscopic - Primary oocyte surrounded by single layer of squamous cells - Immature and smallest follicle in ovarian cortex
Primary Follicle	- Primary oocyte surrounded by a single layer of cuboidal cells - Stage of majority of follicles
Secondary Follicle	- Primary oocyte surrounded by several layers of cuboidal follicular cells (Granulosa) - NO ANTRUM (fluid filled cavity) - Zona Pellucida present - Actively secreting steroid hormones
Tertiary/Antral/Graafian Follicle	- Primary oocyte present, differentiation of several distinct cell layers within follicle - ANTRUM IS PRESENT - Actively secreting hormones

11. What are the functions of Progesterone?
- Inhibits estrus and parturition
- Blocks myometrial contractions
- Stimulates endometrial secretion nutrients to embryo
- Stimulates production of luteolytic agent to regress CL if no embryo is present
- Decrease basal GnRH amplitude and frequency - blocks preovulatory surge of LH