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|  | **During Fetal Development** | | |  |
|  | **Oogenesis** | **Folliculogenesis** | **Uterine Wall** |  |
|  | **Oogonia** (stem cells) undergo mitosis and makes millions of cells, some become **Primary oocytes** and start **Meiosis I**  Shortly before birth, goes into a state of arrested development | **Primordial follicles** formed by foliicular cells (simple squamous epi) surround the primary oocyte |  |  |
|  | **At Puberty** | | |  |
| **Follicular Phase (Day 1-13)** | FSH stimulates Primary oocytes complete Meiosis I to produce unequal cells: **Secondary oocyte** and **Polar body** (undergoes atresia) | FSH stimulates ~ 20 to 25 Primordial follicles to develop into primary follicles (simple cuboidal epi) that surrounds the Secondary oocyte  Primary follicles continue to develop into Secondary follicles formed by granulosa cells (stratified cuboidal epi). The secondary follicle is surrounded by the **theca folliculi** (husk; provides blood supply). The secondary follicle also produces a layer called the **zona pellucida** (glycoprotein gel).  Secondary follicles continue to develop into **Tertiary follicles** where the granulosa cells secrete fluid into the **antrum.** The first tertiary follicle will:  - produce estradiol which leads to the reduction of FSH, causing other developing follicles/oocytes to degenerate  The tertiary follicle will develop into a **mature follicle**. As Estradiol increases this leads to the increase in LH which causes ovulation | Stratum functionalis of the endometrium and blood is shed through a process called menstruation  This is due to decrease in progesterone caused by shrinking corpus luteum | **Menstrual Phase**  **(Day 1-5)** |
| Estradiol produced by the developing follicles stimulate mitosis of the stratum basalis to regenerate the stratum functionalis lost in the previous step. | **Proliferative Phase**  **(Day 6-13)** |
| **Ovulation**  **(Day 14)** | Secondary oocyte is released from the ovary | Mature follicle becomes the corpus luteum, which secretes progesterone. |  | **Ovulation**  **(Day 14)** |
| **Luteal Phase (Day 15-28)** | \* If fertilization does not occur, secondary oocyte degenerates.  \*If fertilization does occur (must happen along the uterine tube) the secondary oocyte will undergo meiosis II (oocyte and polar body) and combine genetic information from sperm and become a zygote (46 chromosomes).  Zygote will undergo mitosis to develop | Progesterone inhibits LH which causes the corpus luteum to degenerate  \*If pregnancy does not occur, corpus luteum completely degenerates and progesterone is no longer produced  \* If pregnancy does occur, the fetus produces HCG (pregnancy hormone) that replaces LH and maintains the corpus luteum | Progesterone secreted by corpus luteum stimulates the stratum functionalis to thicken with blood (to nourish potential fetus) | **Secretory Phase**  **(Day 15-26)** |
| If pregnancy does not occur, the decrease in progesterone cause the stratum functionalis to thin and will eventually shed. | **Premenstrual**  **(Day 27-28)** |