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 **Cyclic changes in the vagina**: The most striking changes in the vagina, is the marked basal cell proliferation and thickening of the stratum granulosum during the follicular phase of the menstrual cycle. The histological changes observed in the vagina demonstrated a good correlation with the observation on cytological examination of the smears. During the menstrual cycle definite proliferative and destructive changes occur in the human vaginal epithelium. In the first days after the beginning of the last menstrual period a division of the vaginal epithelium into three layers is noticeable. This is more strikingly marked during the premenstrual period through the early appearance of an intra-epithelial zone of cornification. The human vaginal epithelium may be divided into a functionalize layer of regeneration and change.

**Cyclic changes in the cervix**: Cervical mucus appears to have an important function in the process of human reproduction. In response to stimulation by estrogen, cervical glands produce increasing amounts of a characteristic mucoid secretion. At the peak of this secretory activity, prior to ovulation, these glands produce copious amounts of a thin, isotonic mucus which is easily penetrated by the sperm. 5 , 7, 15, 16 Progesterone, on the other hand, is known to bring about both quantitative and qualitative alterations in the cervical secretion. During the luteal phase of the menstrual cycle, cervical mucus has been shown to become scanty in amount, as well as viscous and cellular. During the progestational phase also, such properties as spinnbarkeit and crystallization of the cervical mucus, which characterize estrogen stimulation, are markedly reduced or absent and consequently sperm migration is inhibited. Since endogenous progesterone causes an inhibition of sperm migration through cervical mucus, exogenously administered progestin, as prescribed for oral contraception, might be expected to have a similar effect.

**THE MENSTRUAL CYCLE;**

* Also called the **endometrial cycle**
* It constitutes the monthly changes in the internal layer of the uterus
* During this period, **menstruation (flow of blood from the uterus) is an obvious event**
* The average menstrual cycle is 28 days
* day 1 of this (28 days) cycle designated as the day on which menstrual flow begins
* Menstrual cycles normally vary in length by several days
* In 90% of women, the length of the cycles ranges between **23** and **35** days
* Almost all these variations result from alterations in the duration of the **proliferative phase** of the menstrual cycle. Phases of menstrual cycle include;
* **Menstrual Phase**
* Usually lasts 4 to 5 days
* The **functional layer** of the uterine wall is sloughed off and discarded with the menstrual flow-menses (monthly bleeding)
* The blood discharged through the vagina is combined with small pieces of endometrial tissue
* **Proliferative Phase**.
* Also known as the **follicular /estrogenic phase**
* lasting approximately **9 days**
* **coincides with growth of ovarian follicles** and is controlled by estrogen secreted by these follicles
* There is a 2-3 fold increase in the thicknessof the endometrium and in its water content

 • Early during this phase, the surface epithelium reforms and covers the endometrium

 uterine glands increase in number and length

the spiral arteries elongate

* **Luteal Phase**
* also called the secretory/ progesterone phase
* lasting approximately 13 days
* coincides with the formation, functioning, and growth of the corpus luteum
* The progesterone produced by the corpus luteum stimulates the glandular epithelium to secrete a glycogen-rich material
* The uterine glands become wide, tortuous, and saccular, and the endometrium thickens because of;
* the influence of progesterone and estrogen from the corpus luteum
* and because of **increased fluid** in the connective tissue
* As the **spiral arteries** grow into the superficial compact layer, they become increasingly coiled
* The venous network becomes complex and large lacunae (venous spaces) develop
* **Direct arteriovenous anastomoses are prominent features of this stage**

**If fertilization does not occur:**

* The corpus luteum degenerates
* Estrogen and progesterone levels fall and the secretory endometrium enters an ischemic phase
* Menstruation occurs
* **Ischemic Phase**
* occurs when the oocyte is not fertilized
* Ischemia (reduced blood supply) occurs as a result of constriction of spiral arteries giving the endometrium a pale appearance
* There is decrease secretion of hormones, primarily progesterone, by the degenerating corpus luteum
* a loss of interstitial fluid
* shrinking of the endometrium
* This results in venous stasis and patchy ischemic necrosis (death) in the superficial tissues
* Eventually, rupture of damaged vessel walls follows and blood seeps into the surrounding connective tissue
* Small pools of blood form and break through the endometrial surface, resulting in bleeding into the uterine lumen and from the vagina