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THE CYCLIC CHANGES THAT OCCUR IN THE BREAST:

 At puberty, the ovaries secrete estrogen, fat in the connective tissues start to collect resulting to the enlargement of the breast. Once ovulation and menstruation begin, the maturation of the breasts begins with the formation of secretory glands at the end of the milk ducts. The ducts and the milk system continue to grow and mature, with the development of many glands and lobules.

***During the menstrual cycle:***

The hormone estrogen is produced by the ovaries in the first half of the menstrual cycle and stimulates growth of milk ducts in the breast. The increasing level of estrogen leads to ovulation halfway through the cycle. Next, the hormone progesterone takes over in the second half of the cycle. It stimulates the formation of milk glands. These hormones are believed to be responsible for the cyclical changes that many women feel in their breast just before menstruation. These include swelling, pain and soreness.

***During pregnancy and milk production*:**

 Many health care providers believe the breasts are not fully mature until a woman has given birth and made milk. Breast changes are one of the earliest signs of pregnancy. This is a result of the hormone progesterone. By the fifth to sixth month of pregnancy, the breasts are fully capable of producing milk. As in puberty, estrogen controls the growth of ducts and progesterone controls the growth of granular buds. Many other hormones play a role in milk production. These include; Follicle stimulating hormone (FSH), Luteinizing hormone (LH), Prolactin, Oxytocin and human placental lactogen (HPL).

***At Menopause****:*

Perimenopause begins at late 40s and early 50s. At this time, the levels of estrogen and progesterone begin to change. Without estrogen, the breast’s connective tissue becomes dehydrated and is no longer elastic. The breast tissue, which was prepared to make milk, shrinks and loses shape. This leads to the saggy breasts associated to the women of this age.

 THE CYCLIC CHANGES THAT OCCUR IN THE VAGINA

 During the luteal and follicular phases of the estrous cycle the structure of the structure of the vaginal epithelium varies. The numbers of cell layers vary during the days of the estrous cycle:

* Day 10, 22 layers
* Day 12-14, 46 layers
* Day 19, 32 layers
* Day 24, 24 layers

The glycogen levels in the cell is at its highest immediately before ovulation.

 **MENSTRUAL CYCLE**

* The menstrual cycle is a regular natural change that occurs in the female reproductive system (specifically the uterus and ovaries) which makes pregnancy possible. It constitutes the monthly internal layer of the uterus.
* The cycle is required for the production of oocytes and for the preparation of the uterus for pregnancy. The menstrual cycle occurs due to the rise and fall of estrogen. It results in the thickening of the lining of the uterus and the growth of an egg. The egg is released from an ovary around day fourteen in the cycle, the thickened lining of the uterus provides nutrients to an embryo after implantation and if pregnancy doesn’t occur, the lining is released as **menstruation**.

 The menstrual cycle is governed by hormonal changes. These changes can be altered by using hormonal birth control to prevent pregnancy. Each cycle can be divided into three phases based on events in the ovary or in the uterus

 *PHASES OF THE MENSTRUAL CYCLE*

* Menstrual phase
* Proliferative phase
* Luteal phase
* Ischemic phase



***Menstrual cycle***

* Menstruation is the first phase of the uterine cycle
* An enzyme called plasmin inhibits the clothing factor in the menstrual fluid
* The functional layer of the uterus 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
* After menstruation, the eroded endometrium is thin

***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 thickness of 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

***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
* 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