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### 1. Cyclic changes in uterine cervix

Mucosa of uterine cervix does not undergo cyclic desquamation as the body of uterus.

Regular changes in cervical mucus under influence results to

\_estrogens (ovulation) mucus thinner and more alkaline - promotion of survival and transport of sperm, spinnbarkeit at ovulation

\_progesterone (after ovulation, during pregnancy) mucus thick, tenacious, cellular.

The infantile uterus and cervix enlarge under the influence of estrogen during puberty. The endometrium and cervical glands then undergo cyclical changes in concert with cyclic ovarian function. In response to rising estrogen during the follicular phase of the cycle, the endometrial epithelium and stroma proliferate.

### \_Cyclic changes in the breast

Estrogen, which is produced by the ovaries in the first half of the menstrual cycle, stimulates the growth of milk ducts in the breasts. The increasing level of estrogen leads to ovulation halfway through the cycle, and then the hormone progesterone takes over in the second half of the cycle, stimulating the formation of the milk glands. These hormones are believed to be responsible for the cyclical changes such as the swelling, pain, and tenderness that many women experience in their breasts just before menstruation. Patients describe the pain like a heavy, dull ache. Some women describe it as a soreness with heaviness, while others say it is like a stabbing or burning pain. Many women also experience changes in breast texture with breast feeling particularly lumpy. This, too, is related to the glands in the breast enlarging in preparation for a possible pregnancy. If pregnancy does not occur, the breasts return to normal size.

### 2. The menstrual cycle

The menstrual cycle is controlled by a complex orchestra of hormones, produced by two structures in the brain, the pituitary gland and the hypothalamus along with the ovaries.

The menstrual cycle has three phases:

#### i. Follicular Phase (Days 1-14)

This phase of the menstrual cycle occurs from approximately day 1-14. Day 1 is the first day of bright red bleeding, and the end of this phase is marked by ovulation. While menstrual bleeding does happen in the early part of this phase, the ovaries are simultaneously preparing to ovulate again. The pituitary gland (located at the base of the brain) releases a hormone called FSH – follicle stimulating hormone. This hormone causes several ‘follicles’ to rise on the surface of the ovary. These fluid filled “bumps” each contain an egg. Eventually, one of these follicle becomes dominant and within it develops a single mature egg; the other follicles shrink back. If more than one follicle reaches maturity, this can lead to twins or more. The maturing follicle produces the hormone estrogen, which increases over the follicular phase and peaks in the day or two prior to ovulation. The lining of the uterus (endometrium) becomes thicker and more enriched with blood in the second part of this phase (after menstruation is over), in response to increasing levels of estrogen. High levels of estrogen stimulate the production of gonadotropin-releasing hormone (GnRH), which in turn stimulates the pituitary gland to secrete luteinizing hormone (LH). On about day 12, surges in LH and FSH cause the egg to be released from the follicle. The surge in LH also causes a brief surge in testosterone, which increases sex drive, right at the most fertile time of the cycle.

#### ii. Ovulatory Phase (Day 14)

The release of the mature egg happens on about day 14 as a result of a surge in LH and FSH over the previous day. After release, the egg enters the fallopian tube where fertilization may take place, if sperm are present. If the egg is not fertilized, it disintegrates after about 24 hours. Once the egg is released, the follicle seals over and this is called the corpus luteum.

#### iii. Luteal Phase (Days 14-28)

After the release of the egg, levels of FSH and LH decrease. The corpus luteum produces progesterone. If fertilization has occurred, the corpus luteum continues to produce progesterone which prevents the endometrial lining from being shed. If fertilization has not occurred, the corpus luteum disintegrates, which causes progesterone levels to drop and signals the endometrial lining to begin shedding.

The exact timing of the phases of the cycle is a little bit different for every woman and can change over time. Simply tracking your cycle on a calendar, along with some details of your bleeding and symptoms can help you understand your cycle.