

1. CYCLIC CHANGES IN VAGINA AND BREAST

CYCLIC CHANGES IN VAGINA

The vagina also changes in response to hormonal fluctuations of the menstrual cycle. Around mid-cycle, estrogen is highest, vaginal tissue becomes thicker and fuller. The cervix, at the top of the vagina moves and changes shape throughout the cycle. Before and after the fertile window the cervix is low and can be felt in the vagina, with a firm texture and the hole in the center of the cervix is closed. During the fertile window, the hole in the cervix opens to facilitate the entrance of sperm into the vagina and is softer when touched.

The changes in hormonal levels of estrogen and progesterone also have characteristic effects on the vaginal epithelium. During the early follicular phase, exfoliated vaginal epithelial cells have vesicular nuclei and are basophilic. During the late follicular phase, and the influence of the rising estradiol level, the vaginal epithelial cells display pyknotic nuclei and are acidophilic. As progesterone rises during the luteal phase, the acidophilic cells decrease in number and are replaced by an increasing number of leukocytes.

CYCLIC CHANGES IN BREAST

Each month, women go through changes in the hormones that make up the normal menstrual cycle. The hormone estrogen is produced by the ovaries in the first half of the menstrual cycle. It stimulates the growth of milk ducts in the breasts. 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 the milk glands. These hormones are believed to be responsible for the cyclical changes that many women feel in their breasts just before menstruation. These include swelling, pain, and soreness. During menstruation, many women also have changes in breast texture. Their breasts may feel very lumpy. This is because the glands in the breasts are enlarging to get ready for a possible pregnancy. If pregnancy does not happen, the breasts go

back to their normal size. Once menstruation starts, the cycle begins again.

2. HORMONAL REGULATION OF THE MENSTRUAL CYCLE

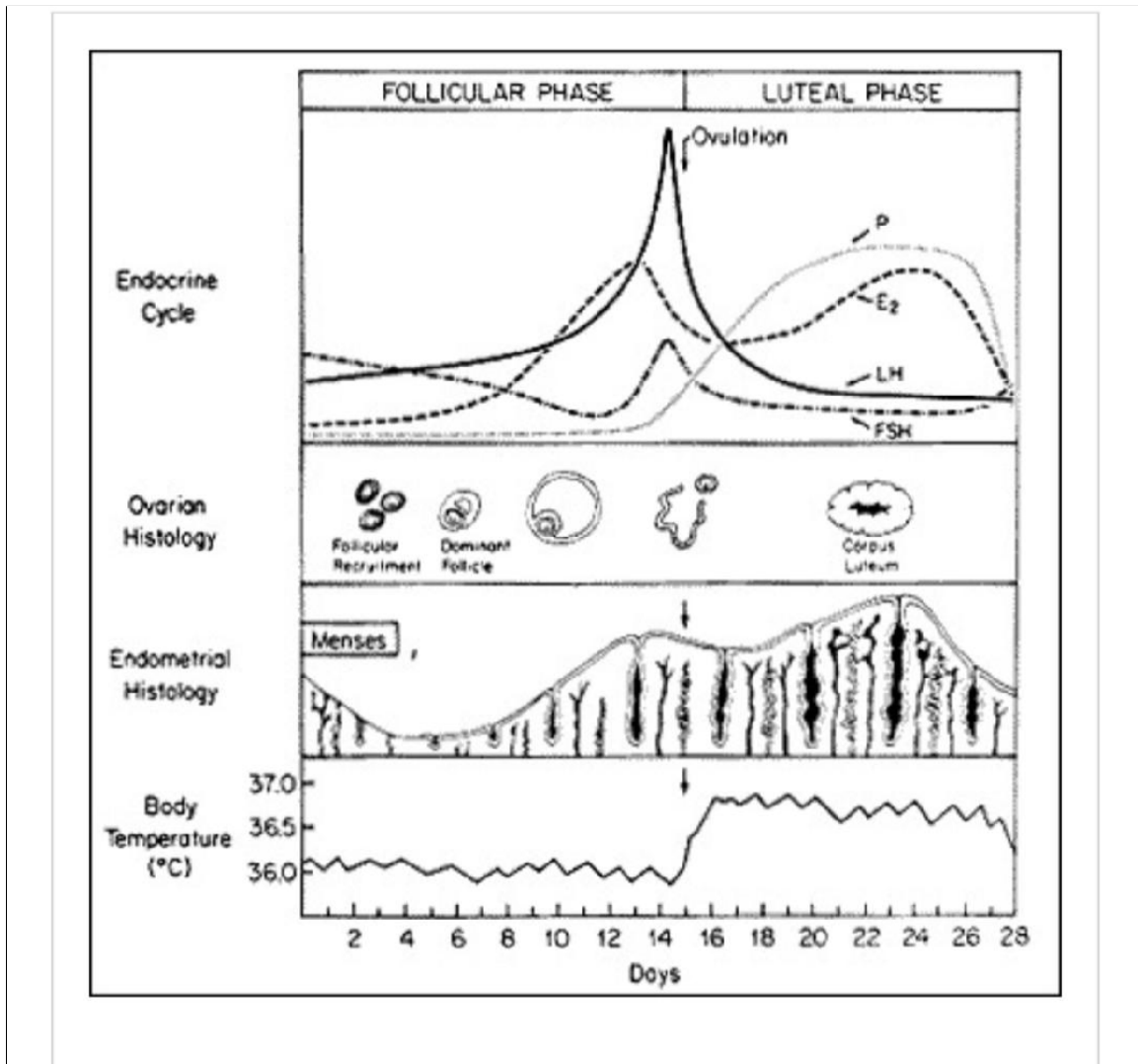
Menstruation is the shedding of the lining of the uterus (*endometrium*) accompanied by bleeding. It occurs in approximately monthly cycles throughout a woman's reproductive life, except during pregnancy. Menstruation starts during puberty and stops permanently at menopause.

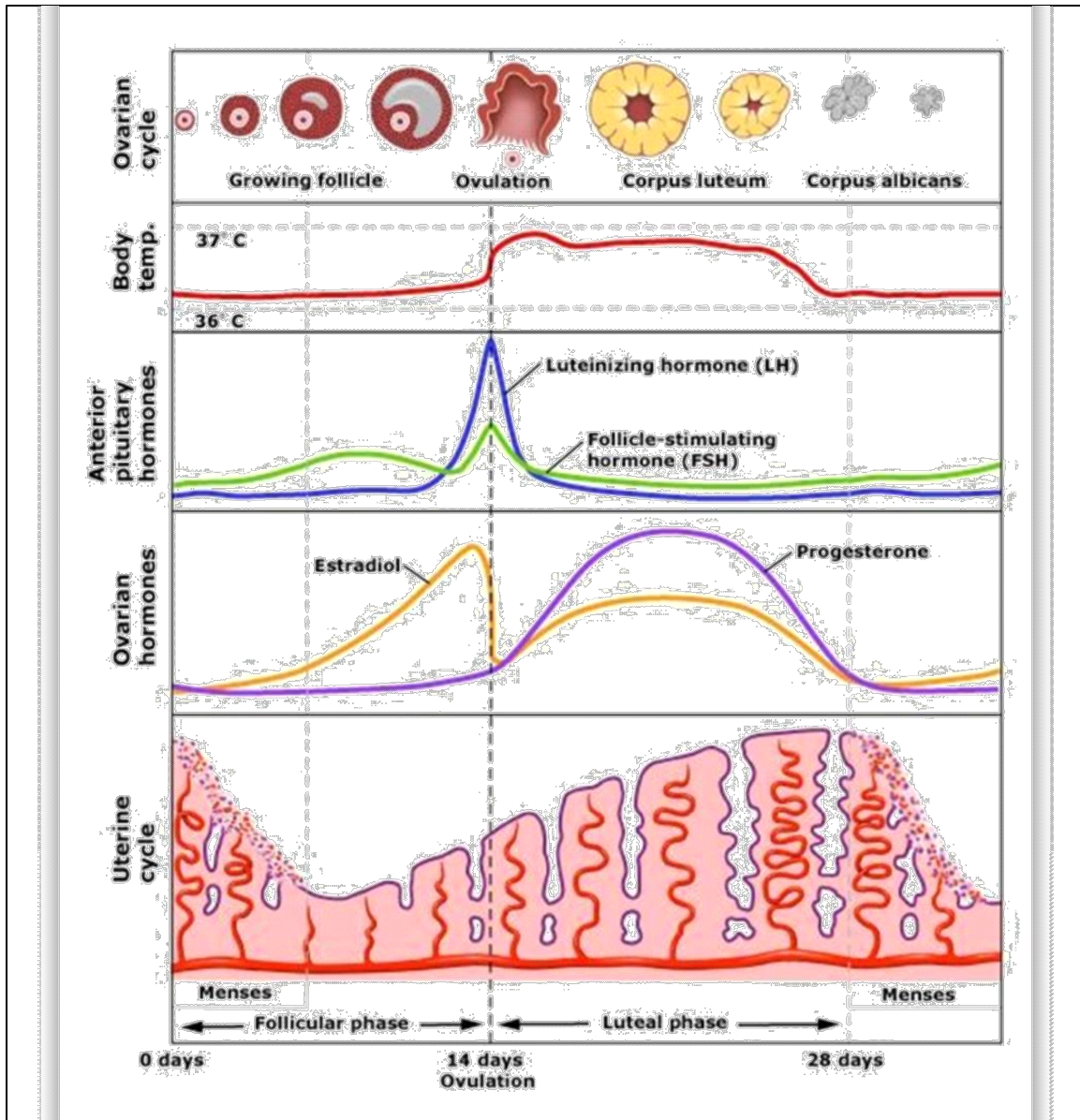
By definition, the menstrual cycle begins with the first day of bleeding, which is counted as day 1. The cycle ends just before the next menstrual period. Menstrual cycles normally range from about 25 to 36 days. Only 10 to 15% of women have cycles that are exactly 28 days. Also, in at least 20% of women, cycles are irregular. That is, they are longer or shorter than the normal range. Usually, the cycles vary the most and the intervals between periods are longest in the years immediately after menstruation starts and before menopause.

The menstrual cycle is regulated by hormones. Luteinizing hormone and Follicle-stimulating hormone, which are produced by the pituitary gland, promote ovulation and stimulate the ovaries to produce estrogen and progesterone. Estrogen and progesterone stimulate the uterus and breasts to prepare for possible fertilization. The menstrual cycle has three phases:

- Follicular phase(before release of the egg)
- Ovulatory phase(egg release)
- Luteal phase(after egg release)

CHANGES DURING THE MENSTRUAL CYCLE





The menstrual cycle begins with menstrual bleeding (menstruation), which marks the first day of the follicular phase.

When the **follicular** phase begins, levels of estrogen and progesterone are low. As a result, the top layers of the thickened lining of the uterus (endometrium) break down and are shed, and menstrual bleeding occurs. About this time, the follicle-stimulating hormone level increases slightly, stimulating the development of several follicles in the ovaries. Each follicle contains an egg. Later in this phase, as the follicle-stimulating hormone level decreases, only one follicle

continues to develop. This follicle produces estrogen.

The **ovulatory** phase begins with a surge in luteinizing hormone and follicle-stimulating hormone levels. Luteinizing hormone stimulates egg release (ovulation), which usually occurs 16 to 32 hours after the surge begins. The estrogen level decreases during the surge, and the progesterone level starts to increase.

During the **Luteal** phase, luteinizing hormone and follicle-stimulating hormone levels decrease. The ruptured follicle closes after releasing the egg and forms a corpus luteum, which produces progesterone. During most of this phase, the estrogen level is high. Progesterone and estrogen cause the lining of the uterus to thicken more, to prepare for possible fertilization.

If the egg is not fertilized, the corpus luteum degenerates and no longer produces progesterone, the estrogen level decreases, the top layers of the lining breakdown and are shed, and menstrual bleeding occurs (the start of a new menstrual cycle). If the egg is fertilized, the corpus luteum continues to function during early pregnancy. It helps maintain the pregnancy.

Ways to Balance Hormonal Fluctuation

1. Eat enough protein at every meal.
2. Engage in regular exercise.
3. Avoid sugar and refined carbs.
4. Learn to manage stress.
5. Consume healthy fats.
6. Avoid overeating and undereating.
7. Drink green tea.
8. Eat fatty fish often.