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THE CYCLIC CHANGES IN THE:

**1) CERVIX**: Cervical mucus at midcycle is increased in amount, acellularity, water content, and fluidity. Furthermore, cervical mucus at this time is well supplied with carbohydrate and presumably amino acids. From a teleologic standpoint, we may conclude that because of these characteristics the sperm, on deposition in the vagina, find an environment propitious for their nutrition and migration through the cervical canal.

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. 16

At the peak of this secretory activity, prior to ovulation, these glands pro-

duce 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 crystalli-

zation 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 progestins, as prescribed

for oral contraception, might be expected to have a similar effect.

The purpose of this report is to present our data on sperm penetrability

and the cyclic variations of certain properties of cervical mucus in a group

of women during normal menstrual cycles and cycles in which oral pro-

gestogens were administered.

**3) BREASTS**: 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 breast are enlarging to get ready for a possible pregnancy. If pregnancy does not happen, the breasts go back to normal size. Once menstruation starts, the cycle begins again.

## What happens to the breasts during pregnancy and milk production?

Many healthcare 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. In addition, the dark areas of skin around the nipples (the areolas) begin to swell. This is followed by the rapid swelling of the breasts themselves. Most pregnant women feel soreness down the sides of the breasts, and nipple tingling or soreness. This is because of the growth of the milk duct system and the formation of many more lobules.

By the fifth or sixth month of pregnancy, the breasts are fully capable of producing milk. As in puberty, estrogen controls the growth of the ducts, and progesterone controls the growth of the glandular buds. Many other hormones also play vital roles in milk production. These include follicle-stimulating hormone (FSH), luteinizing hormone (LH), prolactin, oxytocin, and human placental lactogen (HPL).

Other physical changes happen as well. These include the blood vessels in the breast becoming more visible and the areola getting larger and darker. All of these changes are in preparation for breastfeeding the baby after birth.

## What happens to the breasts at menopause?

By the time a woman reaches her late 40s and early 50s, perimenopause is starting or is well underway. At this time, the levels of estrogen and progesterone begin to change. Estrogen levels dramatically decrease. This leads to many of the symptoms commonly linked to menopause. 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 with women of this age.

Women who are taking hormone therapy may have some of the premenstrual breast symptoms that they had while they were still menstruating, such as soreness and swelling. But if a woman’s breasts were saggy before menopause, this will not change with hormone therapy.

**Menstrual cycle**

#### The menstrual cycle is the monthly series of changes a woman's body goes through in preparation for the possibility of pregnancy. Each month, one of the ovaries releases an egg — a process called ovulation. At the same time, hormonal changes prepare the uterus for pregnancy. If ovulation takes place and the egg isn't fertilized, the lining of the uterus sheds through the vagina. This is a menstrual period. Everyone (adolescent boys and girls) who is about to enter [puberty](https://www.medicinenet.com/puberty/article.htm) (the process of body changes that cause a child’s body to become an adult body capable of reproduction) should be taught or know the basic medical definition of [menstruation](https://www.medicinenet.com/menstruation_symptoms_and_signs/symptoms.htm) and that it is a normal process that females go through as their bodies prepare themselves for potential [pregnancy](https://www.medicinenet.com/pregnancy_planning_preparing_for_pregnancy/article.htm). It is a part of the monthly menstrual cycle (regular [cycling](https://www.medicinenet.com/cycling_biking_or_bicycling/article.htm) of hormones) that occur in the [female reproductive system](https://www.medicinenet.com/female_reproductive_system/article.htm) that makes pregnancy possible. Medically, menstruation (also termed period or bleeding) is the process in a woman of discharging (through the vagina) blood and other materials from the lining of the uterus at about one monthly interval from puberty until [menopause](https://www.medicinenet.com/menopause/article.htm) (ceasing of regular menstrual cycles), except during pregnancy. This discharging process lasts about 3-5 days. What are the signs and symptoms of menstruation?

Beside the bleeding, other signs and symptoms of menstruation may include [headache](https://www.medicinenet.com/headache/article.htm), [acne](https://www.medicinenet.com/acne/article.htm), [bloating](https://www.medicinenet.com/why_am_i_so_bloated/article.htm), pains in the low abdomen, [tiredness](https://www.medicinenet.com/fatigue/article.htm), [mood changes](https://www.medicinenet.com/mood_swings/symptoms.htm), food cravings, breast soreness, and [diarrhea](https://www.medicinenet.com/diarrhea/article.htm).

The menstrual cycle is the hormonal driven cycle; Day 1 is the first day of your period (bleeding) while day 14 is the approximate day you ovulate and if an egg is not fertilized, hormone levels eventually drop and at about day 25; the egg begins to dissolve and the cycle begins again with the period at about day 30. Menstruation begins day 1 and normally ends days 3-5 of the menstrual cycle.

At what age do girls go through puberty and begin and start their period (begin to menstruate)?  
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The average age for a girl to get her first period in the US is 12, but the range of age is about 8 to 15 years old. Women usually have periods until about ages 45 to 55. The menstrual cycle is the hormonal driven cycle. Day 1 is the first day of your period (bleeding) while day 14 is the approximate day you ovulate and if an egg is not fertilized, hormone levels eventually drop and at about day 25. The egg then begins to dissolve and the cycle begins again with the period at about day 30.  
Most periods vary somewhat, the flow may be light, moderate or heavy and can vary in length from about 2 to 7 days; with age, the cycle usually shortens and becomes more regular.

The menstrual cycle is regulated by the complex interaction of hormones: luteinizing hormone, follicle-stimulating hormone, and the female sex hormones estrogen and progesterone.

The menstrual cycle has three phases:

Follicular (before release of the egg)

Ovulatory (egg release)

Luteal (after egg release)

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 break down 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.