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Introduction to cyclic changes in cervix

There are different phases that occur in the female reproductive system before menstruation occur: follicular phase, ovulation and luteal phase.

The follicular phase is the first part of the ovarian cycle. During this phase, the ovarian follicles mature and get ready to release an egg. The latter part of this phase overlaps with the proliferative phase of the uterine cycle.

Through the influence of a rise in follicle stimulating hormone (FSH) during the first days of the cycle, a few ovarian follicles are stimulated. These follicles, which were present at birth and have been developing for the better part of a year in a process known as folliculogenesis, compete with each other for dominance.

During the follicular phase, the developing follicle causes a rise in the level of oestrogen. The hypothalamus in the brain recognizes these rising levels and releases a chemical called gonadotrophin-releasing hormone (GnRH). This hormone prompts the pituitary gland to produce raised levels of luteinising hormone (LH) and FSH. Ovulation is the release of a mature egg from the surface of the ovary. This usually occurs mid-cycle, around two weeks or so before menstruation starts.

Within two days, ovulation is triggered by the high levels of LH. The egg is funnelled into the fallopian tube and toward the uterus by waves of small, hair-like projections. The life span of the typical egg is only around 24 hours. Unless it meets a sperm during this time, it will die. Luteal phase

Luteal phase: During ovulation, the egg bursts from its follicle, but the ruptured follicle stays on the surface of the ovary. For the next two weeks or so, the follicle transforms into a structure known as the corpus luteum. This structure starts releasing progesterone, along with small amounts of oestrogen. This combination of hormones maintains the thickened lining of the uterus, waiting for a fertilized egg to stick (implant).

If a fertilized egg implants in the lining of the uterus, it produces the hormones that are necessary to maintain the corpus luteum. This includes human chorionic gonadotrophin (HCG), the hormone that is detected in a urine test for pregnancy. The corpus luteum

keeps producing the raised levels of progesterone that are needed to maintain the thickened lining of the uterus.

If pregnancy does not occur, the corpus luteum withers and dies, usually around day 22 in a 28-day cycle. The drop in progesterone levels causes the lining of the uterus to fall away. This is known as menstruation. The cycle then repeats.

CYCLIC CHANGES IN CERVIX

The cervix secretes mucus that helps in carrying male sperms (deposited in the vagina during sexual intercourse) from the vaginal canal to the uterus. In the uterus, one of the sperms fertilizes a mature egg if you are ovulating. If you are not ovulating, your cervical mucus thickens and forms a barrier not allowing the sperms to enter the uterus.

The texture and position of the cervix change during the entire menstrual cycle. As ovulation is about to occur, the cervical position is high and the cervix is soft and moist. The cervix when ovulating becomes soft, open, and wet and rises high. This is called **SHOW** for soft, high, open, wet cervix. The cervix feels like your lips and the opening of the cervix is open so that sperms can enter inside it. The cervix is also more centrally placed during this time. You may increase your chances of getting pregnant by having sexual intercourse one to two days prior to ovulation.

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 uterus, the cervix rises higher in the vagina, and is softer when touched, The cervix softens slightly; this is the body's way of making sure that the blood flows out of your body during your period. It happens as a response to release of prostaglandins, which are small chemical messengers involved in the inflammatory response. The cervix will just slightly open before ovulation, Estrogen softens the cervical tissue making it feel softer (or less firm) when you are most fertile

Once bleeding stops, you may have a few days (possibly up to a week) as a 'pre-fertile' phase. This is the time from when the bleeding finishes and when the fertile phase begins.

During the pre-fertile phase, the lining of the uterus starts to thicken, regenerating after the period has finished. At the same time, a group of eggs in the ovaries start to ripen.

Feeling your cervix at this time, it should feel relatively low, firm and only slightly moist (or even dryish) and tightly closed when compared to other times in the menstrual cycle.

Fertile ground

After your pre-fertile phase, you move into the fertile phase of your cycle, which is when you really want to start noting any changes in your cervix, particularly if you're having trouble tracking your cervical mucous (CM).

As oestrogen levels increase, a woman's uterus and cervix start to produce a special fertile mucous which is capable of protecting the man's sperm and helping them survive for up to three to five days in the woman's body. The fertile mucus sits in the opening of the woman's cervix and lines her uterus and fallopian tubes. The mucus acts as a continuous stream to transport sperm up into a woman's fallopian tubes, in readiness for when an egg is released. Once the woman releases an egg (or ovulates) it only survives for around 12 to 24 hours.

The fertile phase is also called the follicular or proliferative stages, as the egg is still maturing and the lining of the uterus continues to thicken. A woman's fertile phase usually starts about three to five days before ovulation, until the egg is released.

If you feel your cervix it should be higher, softer, wetter and slightly more open when compared to the previous days.

During ovulation, your cervix will now be at its highest point and may even be difficult to reach. It should feel very wet, soft and open.

After ovulation

The time after ovulation is the post-fertile phase of the menstrual cycle. The post-fertile phase lasts for about 14 days (ranging from 12 to 16 days) until the bleeding starts again. The medical terms for this phase are the 'Luteal phase' – which refers to the capsule left in the ovary that encased the released egg called the 'Corpus Luteum' (or 'white body'). The corpus luteum produces the progesterone hormone, bringing the lining of the uterus (or 'endometrium') to maturity. Or the alternative, the 'Secretory phase', because the lining of the uterus is now able to secrete glucose, aimed at feeding a developing baby until they fully implant in the lining of the uterus and start to draw on their mother for nourishment.

At this time, your cervix should feel quite similar to the pre-fertile phase: lower, firmer, only slightly moist or even dry and tightly closed again.

After the menstrual period stops, the cervix remains low and hard and the opening to the uterus remains closed, as a woman approaches ovulation, the cervix rises up to the top of the vagina and becomes softer and moister. At the height of ovulation, the female is most fertile

B.) CYCLIC CHANGES IN BREAST

Breasts can go through changes during a menstrual cycle. They get tender, and even seem to shift a bit in size and shape.

Chalk it up to the ebb and flow of hormones such as estrogen and progesterone over the course of your cycle.

Breast symptoms are the strongest just before your period starts, and improve either during or right after it.

What's Normal?

Every woman is different. But it's common to have one or more of the following:

- Swelling
- Tenderness
- Aches
- Soreness
- Changes in texture

The first few days of your cycle (when your period starts), the texture of your boobs may suddenly feel uneven and nodular. Why the sudden rough patch? "During menstruation, breasts may feel lumpier as milk glands enlarge in preparation for a possible pregnancy," says Sara Gottfried, MD, a gynecologist in Berkeley, CA and author of *The Hormone Cure*. The bumpy feel isn't permanent. As soon as your body realizes you're not pregnant, your breasts will smooth out, she adds.

Phase 2: They're softer and smaller

Toward the end of menstruation (depending on the length of your cycle, it's typically around day 3 or 7), your breasts are suddenly pulling a disappearing act. Breasts are at their lowest volume at this time because estrogen and progesterone are at their lowest. This is actually the most accurate depiction of your true size because you're not being pumped up with hormones. A perk of the smaller state: "They also tend to soften up towards the end of bleeding," Dr. Gottfried says.

Phase 3: They're perky

As you get closer to ovulation (this is known as the follicular phase and it happens around day 12), estrogen starts to rise. And according to the Journal of Ultrasound Medicine this causes your breasts to look extra buoyant. That's because estrogen improves skin elasticity. Consider it a natural lift.

Phase 4: They're full and firm

In what's considered the luteal phase (this occurs after ovulation, which is generally around day 15 and up through the end of your cycle), expect to be at your largest cup size. "Progesterone is really peaking, so this is a time associated with the largest breast size and density," Dr. Booth says. They may even look swollen or slightly veiny, and feel tender.

Phase 5: They're lopsided

Research published in the journal *Ethology and Sociobiology* found that when estrogen is low during your premenstrual week, breasts become less symmetrical. That could be why your left boob looks crooked all of a sudden. But don't sweat it! Once your period arrives, your boobs will even out.

2. Explicate on menstrual cycle

Menstruation, also called a **period or menses**, is a monthly discharge of blood and endometrial tissue. Period length ranges from for 3-7 days with 5 being the average.¹ A menstrual cycle is the time from the first day of a period to the first day of the next.

Why Do Women Menstruate?

From a biological standpoint, the purpose of the menstrual cycle and all of the hormone-driven physiological changes that occur in the body is to **prepare the body for a possible pregnancy**.

How Long Do Women Menstruate?

Women menstruate from puberty until menopause, defined as 12 consecutive months without a period. The average age of puberty is 11, while for menopause, it is 51.

Menstrual Cycle Length

Though every woman's length varies, a menstrual cycle is considered healthy when it lasts between 21 to 35 days, with **28 days being the average**.

Anything that falls outside this range is considered an irregular period and - if other symptoms are present - could be indicative of an underlying menstrual disorder, like premenstrual syndrome (PMS) or premenstrual dysphoric disorder (PMDD). As such, it requires prompt evaluation

Menstrual cycle phases

For simplicity, the following breakdown is **based on a 28-day menstrual cycle**. It is divided into two phases: follicular and luteal with ovulation occurring right in between

MENSTRUAL CYCLE

Each month during the years between puberty and menopause, a woman's body goes through a number of changes to get it ready for a possible pregnancy. This series of hormone-driven events is called the menstrual cycle.

During each menstrual cycle, an egg develops and is released from the ovaries. The lining of the uterus builds up. If a pregnancy doesn't happen, the uterine lining sheds during a menstrual period. Then the cycle starts again.

A woman's menstrual cycle is divided into four phases:

1. menstrual phase
2. follicular phase
3. ovulation phase
4. luteal phase

The length of each phase can differ from woman to woman, and it can change over time.

Menstrual phase

The menstrual phase is the first stage of the menstrual cycle. It's also when you get your period.

This phase starts when an egg from the previous cycle isn't fertilized. Because pregnancy hasn't taken place, levels of the hormones estrogen and progesterone drop.

The thickened lining of your uterus, which would support a pregnancy, is no longer needed, so it sheds through your vagina. During your period, you release a combination of blood, mucus, and tissue from your uterus.

You may have period symptoms like these:

1. cramps
2. tender breasts
3. bloating
4. mood swings
5. irritability
6. headaches
7. tiredness
8. low back pain

On average, women are in the menstrual phase of their cycle for 3 to 7 days. Some women have longer periods than others.

Follicular phase

The follicular phase starts on the first day of your period (so there is some overlap with the menstrual phase) and ends when you ovulate.

It starts when the hypothalamus sends a signal to your pituitary gland to release follicle-stimulating hormone (FSH). This hormone stimulates your ovaries to produce around 5 to 20 small sacs called follicles. Each follicle contains an immature egg.

Only the healthiest egg will eventually mature. (On rare occasions, a woman may have two eggs mature.) The rest of the follicles will be reabsorbed into your body.

The maturing follicle sets off a surge in estrogen that thickens the lining of your uterus. This creates a nutrient-rich environment for an embryo to grow.

The average follicular phase lasts for about 16 days. It can range from 11 to 27 days, depending on your cycle.

Ovulation phase

Rising estrogen levels during the follicular phase trigger your pituitary gland to release luteinizing hormone (LH). This is what starts the process of ovulation.

Ovulation is when your ovary releases a mature egg. The egg travels down the fallopian tube toward the uterus to be fertilized by sperm.

The ovulation phase is the only time during your menstrual cycle when you can get pregnant. You can tell that you're ovulating by symptoms like these:

- a slight rise in basal body temperature

- thicker discharge that has the texture of egg whites

Ovulation happens at around day 14 if you have a 28-day cycle — right in the middle of your menstrual cycle. It lasts about 24 hours. After a day, the egg will die or dissolve if it isn't fertilized.

Because sperm can live up to five days, pregnancy can occur if a woman has sex as much as five days prior to ovulation.

Luteal phase

After the follicle releases its egg, it changes into the corpus luteum. This structure releases hormones, mainly progesterone and some estrogen. The rise in hormones keeps your uterine lining thick and ready for a fertilized egg to implant.

If you do get pregnant, your body will produce human chorionic gonadotropin (hCG). This is the hormone pregnancy tests detect. It helps maintain the corpus luteum and keeps the uterine lining thick.

If you don't get pregnant, the corpus luteum will shrink away and be resorbed. This leads to decreased levels of estrogen and progesterone, which causes the onset of your period. The uterine lining will shed during your period.

During this phase, if you don't get pregnant, you may experience symptoms of premenstrual syndrome (PMS). These include:

1. bloating
2. breast swelling, pain, or tenderness
3. mood changes
4. headache
5. weight gain
6. changes in sexual desire
7. food cravings
8. trouble sleeping

The luteal phase lasts for 11 to 17 days. The average length is 14 days.

Identifying common issues

Every woman's menstrual cycle is different. Some women get their period at the same time each month. Others are more irregular. Some women bleed more heavily or for a longer number of days than others.

Your menstrual cycle can also change during certain times of your life. For example, it can get more irregular as you get close to menopause.

One way to find out if you're having any issues with your menstrual cycle is to track your periods. Write down when they start and end. Also record any changes to the amount or number of days you bleed, and whether you have spotting between periods.

Any of these things can alter your menstrual cycle:

1. **Birth control**. The birth control pill may make your periods shorter and lighter. While on some pills, you won't get a period at all.
2. **Pregnancy**. Your periods should stop during pregnancy. Missed periods are one of the most obvious first signs that you're pregnant.
3. **Polycystic ovary syndrome (PCOS)**. This hormonal imbalance prevents an egg from developing normally in the ovaries. PCOS causes irregular menstrual cycles and missed periods.
4. **Uterine fibroids**. These noncancerous growths in your uterus can make your periods longer and heavier than usual.
5. **Eating disorders**. Anorexia, bulimia, and other eating disorders can disrupt your menstrual cycle and make your periods stop.

Here are a few signs of a problem with your menstrual cycle:

1. You've skipped periods, or your periods have stopped entirely.
2. Your periods are irregular.
3. You bleed for more than seven days.
4. Your periods are less than 21 days or more than 35 days apart.
5. You bleed between periods (heavier than spotting).

If a female has any these or other problems with her menstrual cycle or periods, she should talk to a healthcare provider.

Every woman's menstrual cycle is different. What's normal for you might not be normal for someone else. It's important to get familiar with your cycle — including when you get your periods and how long they last. Be alert for any changes, and report them to your healthcare provider.

Menstrual Cycle Hormones

There are four main reproductive hormones during the menstrual cycle, including:

Follicle-Stimulating Hormone (FSH)

On the first day of the follicular phase of the menstrual cycle, the pituitary gland in the brain triggers the release of FSH, whose rise - as the name suggest - will stimulate the ovaries to begin maturing the eggs within the follicles.

Estrogen

As the eggs in the follicles mature, they begin to release estrogen, which will peak a day or two before ovulation. Increasing estrogen triggers the endometrial thickening and stimulates the production of gonadotropin-releasing hormone (GnRH), which, in turn, triggers the pituitary gland to **secrete luteinizing hormone (LH)**.

Luteinizing Hormone (LH)

LH continues to surge until it peaks about 36-48 hours before ovulation. It also triggers a short-lived surge of testosterone to boost libido, just in time for the most fertile part of the cycle.⁴

Progesterone: After ovulation, FSH and LH decrease. The remnants of the follicle that released the egg become a structure called the corpus luteum, which begins producing progesterone. If pregnancy occurred, progesterone will maintain the endometrial lining and prevent it from shedding. If pregnancy has not occurred, the corpus luteum will disintegrate, causing a drop in progesterone that initiates the entire menstrual cycle again, starting with the shedding of the egg and endometrial lining

Though individual menstrual cycle patterns vary from woman to woman, a cycle is considered healthy when it is **between 21 and 35 days long**. It is divided into **two phases**, follicular and luteal, which begin on the first day of a period and end on the first day of the next period. Right in between them is ovulation, which is the only time in the cycle when a woman can conceive a baby. Behind that complex physiology are a **handful of hormones**, such as FSH, estrogen, and progesterone, which work in unison to prepare the body for a potential pregnancy. Any deviation along the way can result in a **menstrual disorder** and have a series of health consequences.

Luckily, women can keep an eye on their menstrual patterns with period trackers, which will not only help them nurture their fertility, but also overall health