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**QUESTIONS**

1. Briefly discuss the cycle changes in the following:
2. Cervix
3. Breasts
4. Explicate the menstrual cycle.

1.

a. **The Cervix**

When you start your period (Day One of your cycle), there’s no need to feel your cervix for changes, as you’re clearly menstruating.

Once your 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 and tightly closed when compared to other times in the menstrual cycle.

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 it highest point and may even be difficult to reach. It should feel very wet, soft and open.

The time after ovulation is the post-fertile phase of the menstrual cycle. The post-fertile phase lasts for about 14 days (ranging from12 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.

1. **The Breasts**

 The flow of hormones throughout your monthly cycle is what forms the cycles of the breasts. Hormones affect many aspects of our breasts, it’s what inspired their development. The first few days of your cycle (when your period starts), the texture of your boobs may suddenly feel uneven and nodular. During menstruation, breasts may feel lumpier as milk glands enlarge in preparation for a possible pregnancy. Toward the end of menstruation (depending on the length of your cycle, it’s typically around day 3 or 7), your boobs 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.

As you get closer to ovulation (this is known as the follicular phase and it happens around day 12), estrogen starts to rise and make the breasts perky. That’s because estrogen improves skin elasticity. Consider it a natural lift they become full and firm which is what is considered he 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. They then become lopsided in the premenstrual week because estrogene is low.

 2. **THE MENSTRUAL CYCLE**

The menstrual cycle can be described by the ovarian or uterine cycle. The ovarian cycle describes changes that occur in the follicles of the ovary whereas the uterine cycle describes changes in the endometrial lining of the uterus. Both cycles can be divided into three phases. The ovarian cycle consists of the follicular phase, ovulation, and the luteal phase, whereas the uterine cycle consists of menstruation, proliferative phase, and secretory phase.

**OVARIAN CYCLE**

**Follicular 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. Under the influence of several hormones, all but one of these follicles will stop growing, while one dominant follicle in the ovary will continue to maturity. The follicle that reaches maturity is called a tertiary or Graafian follicle, and it contains the ovum.

**Ovulation**

Ovulation is the second phase of the ovarian cycle in which a mature egg is released from the ovarian follicles into the oviduct. During the follicular phase, estradiol suppresses release of luteinizing hormone (LH) from the anterior pituitary gland. When the egg has nearly matured, levels of estradiol reach a threshold above which this effect is reversed and estrogen stimulates the production of a large amount of LH. This process, known as the LH surge, starts around day 12 of the average cycle and may last 48 hours.

The release of LH matures the egg and weakens the wall of the follicle in the ovary, causing the fully developed follicle to release its secondary oocyte. If it is fertilized by a sperm, the secondary oocyte promptly matures into an ootid and then becomes a mature ovum. If it is not fertilized by a sperm, the secondary oocyte will degenerate. The mature ovum has a diameter of about 0.2 mm.

Which of the two ovaries—left or right—ovulates appears essentially random; no known left and right co-ordination exists. Occasionally, both ovaries will release an egg; if both eggs are fertilized, the result is fraternal twins.

After being released from the ovary, the egg is swept into the fallopian tube by the fimbria, which is a fringe of tissue at the end of each fallopian tube. After about a day, an unfertilized egg will disintegrate or dissolve in the fallopian tube.

Fertilization by a spermatozoon, when it occurs, usually takes place in the ampulla, the widest section of the fallopian tubes. A fertilized egg immediately begins the process of embryogenesis, or development. The developing embryo takes about three days to reach the uterus and another three days to implant into the endometrium. It has usually reached the blastocyst stage at the time of implantation.

**Luteal phase**

The luteal phase is the final phase of the ovarian cycle and it corresponds to the secretory phase of the uterine cycle. During the luteal phase, the pituitary hormones FSH and LH cause the remaining parts of the dominant follicle to transform into the corpus luteum, which produces progesterone. The increased progesterone in the adrenals starts to induce the production of estrogen. The hormones produced by the corpus luteum also suppress production of the FSH and LH that the corpus luteum needs to maintain itself. Consequently, the level of FSH and LH fall quickly over time, and the corpus luteum subsequently atrophies. Falling levels of progesterone trigger menstruation and the beginning of the next cycle. From the time of ovulation until progesterone withdrawal has caused menstruation to begin, the process typically takes about two weeks, with 14 days considered normal.

The loss of the corpus luteum is prevented by fertilization of the egg. The syncytiotrophoblast, which is the outer layer of the resulting embryo-containing structure (the blastocyst) and later also becomes the outer layer of the placenta, produces human chorionic gonadotropin (hCG), which is very similar to LH and which preserves the corpus luteum. The corpus luteum can then continue to secrete progesterone to maintain the new pregnancy. Most pregnancy tests look for the presence of hCG.

**UTERINE CYCLE**

**Menstruation**

Menstruation is the first phase of the uterine cycle. The flow of menses normally serves as a sign that a woman has not become pregnant.

Levels of estradiol (the main estrogen), progesterone, luteinizing hormone, and follicle-stimulating hormone during the menstrual cycle, taking inter-cycle and inter-woman variability into account.

Eumenorrhea denotes normal, regular menstruation that lasts for a few days (usually 3 to 5 days, but anywhere from 2 to 7 days is considered normal). Women who experience menorrhagia (heavy menstrual bleeding) are more susceptible to iron deficiency than the average person. An enzyme called plasmin inhibits clotting in the menstrual fluid.

Painful cramping in the abdomen, back, or upper thighs is common during the first few days of menstruation. Severe uterine pain during menstruation is known as dysmenorrhea, and it is most common among adolescents and younger women. When menstruation begins, symptoms of premenstrual syndrome (PMS) such as breast tenderness and irritability generally decrease.

**Proliferative phase**

The proliferative phase is the second phase of the uterine cycle when estrogen causes the lining of the uterus to grow, or proliferate, during this time. As they mature, the ovarian follicles secrete increasing amounts of estradiol, and estrogen. The estrogens initiate the formation of a new layer of endometrium in the uterus, histologically identified as the proliferative endometrium. The estrogen also stimulates crypts in the cervix to produce cervical mucus, which causes vaginal discharge regardless of arousal, and can be tracked by women practicing fertility awareness.

**Secretory phase**

The secretory phase is the final phase of the uterine cycle and it corresponds to the luteal phase of the ovarian cycle. During the secretory phase, the corpus luteum produces progesterone, which plays a vital role in making the endometrium receptive to implantation of the blastocyst and supportive of the early pregnancy, by increasing blood flow and uterine secretions and reducing the contractility of the smooth muscle in the uterus.