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**MATRIC NO: 18/MHS02/107**

**DEPARTMENT: NURSING SCIENCE**

**COURSE: PHS212 ASSIGNMENT**

**QUESTION 1:** Briefly discuss the cyclic changes in the any of the two; cervix, breast, vagina.

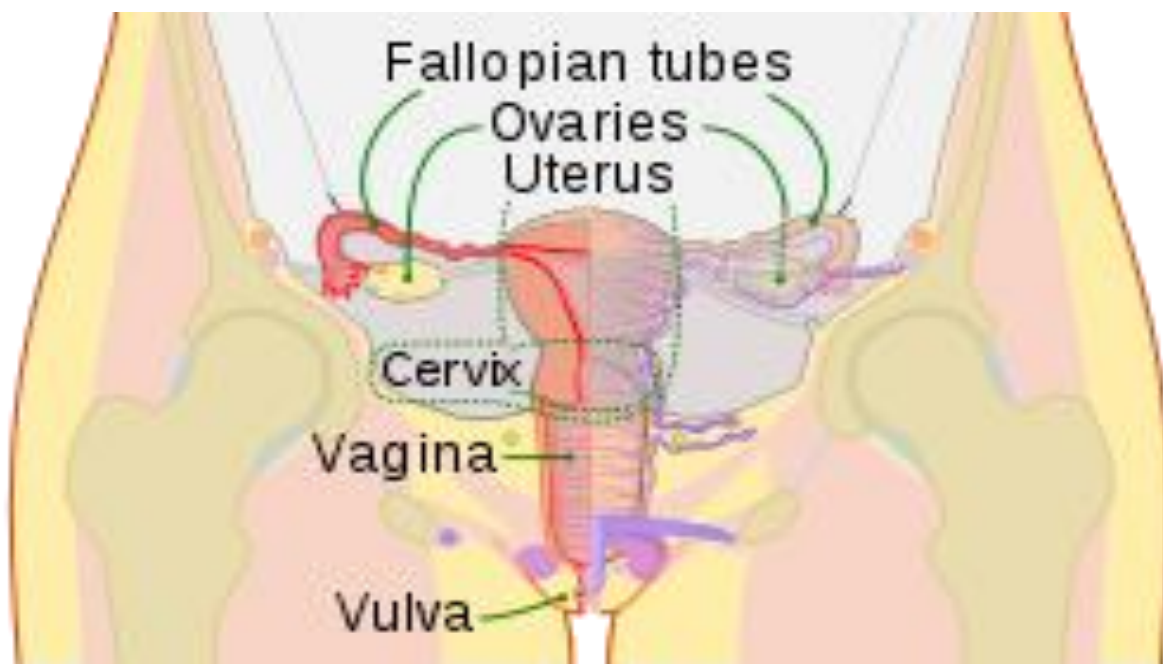
**INTRODUCTION:**

The **cervix** (Latin, 'neck of the uterus') is the lower part of the uterus in the human female reproductive system. The cervix is usually 2 to 3 cm long (~1 inch) and roughly cylindrical in shape, which changes during pregnancy. The narrow, centralcervical canal runs along its entire length, connecting the uterine cavity and the lumen of the vagina. The opening into the uterus is called the internal os, and the opening into the vagina is called the external os. The lower part of the cervix, known as the vaginal portion of the cervix (or ectocervix), bulges into the top of the vagina. The cervix has been documented anatomically since at least the time of Hippocrates, over 2,000 years ago.

The cervical canal is a passage through which sperm must travel to fertilize an egg cell after sexual intercourse. Several methods of contraception, including cervical caps and cervical diaphragms, aim to block or prevent the passage of sperm through the cervical canal. Cervical mucus is used in several methods of fertility awareness, such as the Creighton model and Billings method, due to its changes in consistency throughout the menstrual period. During vaginal childbirth, the cervix must flatten and dilate to allow the fetusto progress along the birth canal.

Midwives and doctors use the extent of the dilation of the cervix to assist decision-making during childbirth.

The cervical canal is lined with a single layer of column-shaped cells, while the ectocervix is covered with multiple layers of cells topped with flat cells. The two types of epithelia meet at the squamocolumnar junction. Infection with the human papillomavirus (HPV) can cause changes in the epithelium, which can lead to cancer of the cervix. Cervical cytology tests can often detect cervical cancer and its precursors, and enable early successful treatment. Ways to avoid HPV include avoiding sex, using condoms, and HPV vaccination. HPV vaccines, developed in the early 21st century, reduce the risk of cervical cancer by preventing infections from the main cancer-causing strains of HPV.



*The diagram of the female reproductive system, the cervix is the narrow portion of the uterus.*

After menstruation and directly under the influence of estrogen, the cervix undergoes a series of changes in position and texture. During most of the menstrual cycle, the cervix remains firm, and is positioned low and closed. However, as ovulation approaches, the cervix becomes softer and rises to open in response to the higher levels of estrogen present.<sup>[11]</sup> These changes are also accompanied by changes in cervical mucus,<sup>[12]</sup> described below.

### **Development:**

As a component of the female reproductive system, the cervix is derived from the two paramesonephric ducts (also called Müllerian ducts), which develop around the sixth week of embryogenesis. During development, the outer parts of the two ducts fuse, forming a single urogenital canal that will become the vagina, cervix and uterus. The cervix grows in size at a smaller rate than the body of the uterus, so the relative size of the cervix over time decreases, decreasing from being much larger than the body of the uterus in fetal life, twice as large during childhood, and decreasing to its adult size, smaller than the uterus, after puberty. Previously it was thought that during fetal development, the original squamous epithelium of the cervix is derived from the urogenital sinus and the original columnar epithelium is derived from the paramesonephric duct. The point at which these two original epithelia meet is called the original squamocolumnar junction. New studies show, however, that all the cervical as well as large part of the vaginal

epithelium are derived from Müllerian duct tissue and that phenotypic differences might be due to other causes.

## **2. BREAST:**

### **INTRODUCTION:**

Breast development is a vital part of a woman's reproduction. Breast development happens in certain stages during a woman's life: first before birth, again at puberty, and later during the childbearing years. Changes also happen to the breasts during the menstrual cycle and when a woman reaches menopause.

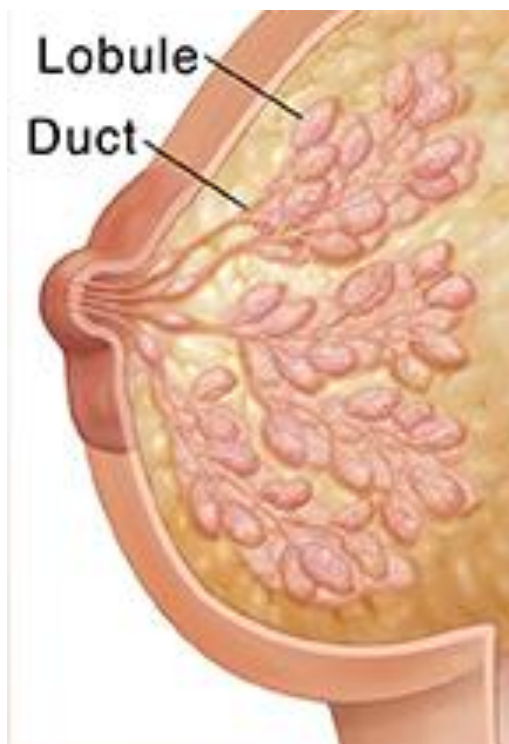
Breasts begin to form while the unborn baby is still growing in the mother's uterus. This starts with a thickening in the chest area called the mammary ridge or milk line. By the time a baby girl is born, nipples and the beginnings of the milk-duct system have formed.

Breast changes continue to happen over a woman's life. The first thing to develop are lobes, or small subdivisions of breast tissue. Mammary glands develop next and consist of 15 to 24 lobes. Mammary glands are influenced by hormones activated in puberty. Shrinkage (involution) of the milk ducts is the final major change that happens in the breast tissue. The mammary glands slowly start to shrink. This often starts around age.

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<b>Female breast developmental stages</b>	<b>Description</b>
Stage 1:	Preteen. Only the tip of the nipple is raised
Stage 2:	Buds appears and breast and nipple are raised. The dark area of the skin around the nipple (areola) get larger.
Stage 3:	Breast are slightly larger, with glandular breast tissue present.
Stage 4:	The areola and nipple becomes raised and forms a second mound above the rest of the breast.
Stage 5:	Mature adult breast, the breast become rounded and only the nipple is raised.

The cyclical changes that happens to the breasts during the menstrual cycle?

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 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.

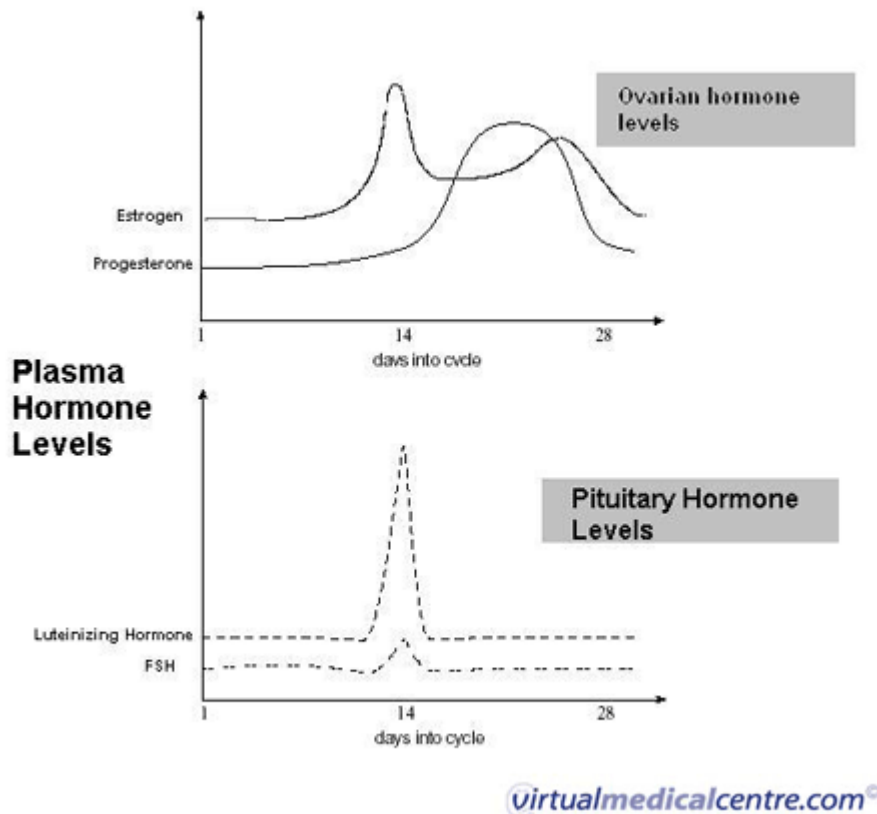
**QUESTION 2: Explicate any one of the following; menstrual cycle, and Hormonal regulation of the menstrual cycle.**

**INTRODUCTION:**

**What is menstruation?**

Menstruation describes the female period. The menstruation cycle begins when a woman gets her periods. The menstrual blood which leaves her body are products shed from the uterus (the uterine lining also called the endometrium). During the remainder of the menstrual cycle the uterine lining regrows. It does so in preparation for pregnancy, which occurs if the egg (oocyte) a woman releases about half way through her menstrual cycle is fertilised. When fertilisation occurs, the lining stays in place to nourish the fertilised egg. When fertilisation does not occur the menstrual cycle continues and the uterine lining is shed marking the start of the woman's next menstrual period. Women begin menstruation at an average age of 13 (called menarche) and on average continue menstruating till age 51 (called menopause). Menstruation involves highly complex hormonal interactions. The key hormones involved in menstruation are oestrogen and progesterone (produced by the ovaries) and luteinising hormone and follicle stimulating produced by the pituitary gland, under the influence of hormones secreted by the hypothalamus. The interactions between these organs are referred to as the hypothalamic-pituitary-ovarian axis (HPO axis).





The menstrual cycle phases:

The menstruation cycle refers to the cycles in which a woman's uterus grows and sheds a lining (the endometrium) which could support the development of a fertilised egg. It typically occurs in 28 day cycles, so a woman generally gets her period every 28 days. However, cycle length may be as short as 21 days or as long as 40 days in some women. The inner lining of the uterus (the endometrium) goes through three phases during the typically 28 day menstrual cycle: the menstrual phase (days 1-5), the proliferative phase (days 6-14) and the secretory phase (days 15-28).

The ovarian cycle, refers to the cycle in which a woman's ovaries prepare an egg to be released during ovulation. It is divided into two phases: the follicular phase

(days 1-14) and the luteal phase (days 15-28), during which different levels of hormones are released. These two cycle occur in a synchronised manner; day 1 of the ovarian cycle is always also day 1 of the menstrual cycle.

Day 1 of the menstrual cycle coincides with the start of a woman's period (menstrual bleeding) in which the uterus sheds the lining (endometrium) built up in the previous menstrual cycle. The lining of the uterus is regrown during each menstrual cycle. Menstrual bleeding typically continues for 3-5 days in what is known as the menstrual phase of the cycle. Between 50-150 ml of blood is released during this period.

After the woman's period, the proliferative phase of the menstrual cycle begins. The uterine lining is regenerated in preparation for receiving a fertilised egg (should fertilisation occur). The regrowth of the lining each month is needed to create an environment suitable for development of a fertilised egg. If the egg released during ovulation is fertilised and the woman becomes pregnant, the uterine lining stays in place and nourishes the fertilised egg.

If the egg is not fertilised then the menstrual cycle continues for another 14-15 days (the secretory phase). This period is usually the same length, regardless of the total length of the woman's menstrual cycle. Levels of oestrogen, progesterone, luteinising hormone and follicle stimulating hormone all decline.

This causes the blood vessels supplying the uterine lining to deprive the endometrium of the nutrients and oxygen it needs to survive. The cells of the endometrium begin to die and shed, resulting in menstrual bleeding and the commencement of a new menstrual cycle.

As the uterus is preparing its lining in the proliferative phase, the woman's ovaries are preparing an egg for release. Her oestrogen levels rise stimulating the growth of several ovarian follicles. Each of the follicles contains one egg (oocyte) which matures as the follicle grows. Usually only one follicle (known as the dominant follicle) fully matures and releases the egg it contains. The release of the egg is referred to as ovulation. Rarely a woman will develop and release two or more eggs, and this is when multiple pregnancy occurs (e.g. triplets, depending on the number of eggs released).

In a typical 28 day cycle, ovulation or the release of a mature egg occurs on Day 14, marking the end of the follicular phase. Ovulation will occur earlier in shorter cycles and later in longer cycles. Ovulation occurs when levels of luteinising hormone (a hormone secreted by the pituitary gland in the brain) in the woman's body rise rapidly. The surge in luteinising hormone signals the ovaries to release the mature egg/s and marks the beginning of the luteal phase of the ovarian cycle. Once released from the ovaries an egg may be fertilised by male sperm, in which case it will be nourished by the uterine lining and establish a pregnancy. Pregnancy changes the woman's hormonal balance and interrupts the menstrual

and ovarian cycles. If the egg is not fertilised it will exit the woman's body and the ovarian and menstrual cycles continue.