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Ministry of Health and Population**

*FAMILY PLANNING / REPRODUCTIVE HEALTH/MCH  
PHYSICIANS SERVICE PROVIDER  
(BASIC UNIT)  
TRAINING CURRICULUM*

## **.1 eludoM Anatomy and Physiology**

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## ANATOMY AND PHYSIOLOGY OF HUMAN REPRODUCTION

### *Male Sexual and Reproductive Anatomy*

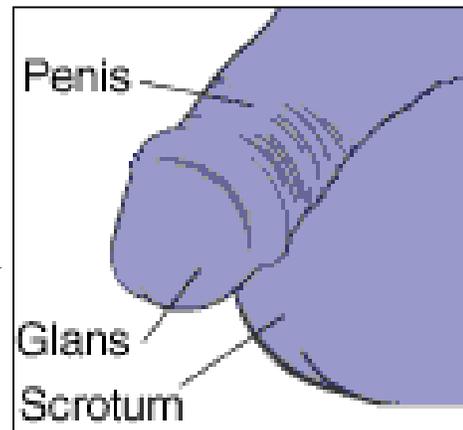
An understanding of sexual and reproductive anatomy and physiology helps providers understanding of contraceptive technology, reproduction, and reproductive health services. Also it help providers educates clients about their bodies and helps both clients and providers better discuss sexual and reproductive health issues.

When describing anatomy of the sexual organs to clients, be sure to use culturally accepted, and understandable language. Clients may not use medical terminology when discussing their genital structures; they might use slang, or might even be too embarrassed to mention the names. To communicate effectively with clients, learn their terminology as you share the technical names for body parts e.g bit el-weld instead of uterus.

Male sexual and reproductive organs

### *External male genitals*

The external male genitals consist of the penis and the scrotum. The **penis** is a cylindrical structure with the capacity to be flaccid or erect. The penis provides passage for both urine and semen. It can be a source of pleasure in response to sexual stimulation and is the organ that penetrates the mouth, vagina, or anus during penetrative sex. The head of the penis, the **glans (glans penis)**, is the part of the penis that is most sensitive and has the most nerve endings. The glans is covered by the foreskin, or **prepuce**, in men who are not circumcised.



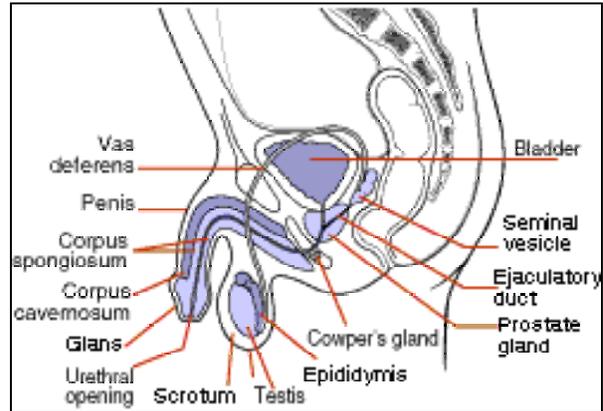
The **scrotum** is a pouch of skin hanging directly under the penis that contains the testes. The scrotum protects the testes and maintains the temperature necessary for the production of sperm.

### ***Internal male genitals***

The internal male genitals are: the testes, the epididymides, the vasa deferentia, the seminal vesicles, the prostate gland, and the Cowper's glands.

The **testes**, the paired, oval-shaped organs that produce sperm and male sex hormones, are located in the scrotum. They are highly innervated and sensitive to touch and

pressure. The testes produce **testosterone**, which is responsible for the development of male sexual characteristics and sex drive (**libido**).



The **epididymides** are the two highly coiled tubes against the back side of the testes where sperm mature and are stored until they are released during ejaculation.

The **vasa deferentia** are the paired tubes that carry the mature sperm from the epididymides to the urethra.

The **seminal vesicles** are a pair of glandular sacs that secrete about 60% of the fluid that makes up the semen in which sperm are transported. Seminal fluid provides nourishment for sperm.

The **prostate gland** is a walnut-sized, glandular structure that secretes about 30% of the fluid that makes up semen. The alkaline quality of the fluid neutralizes the acidic environment of the male and female reproductive tracts. A muscle at the bottom of the prostate gland keeps the sperm out of the urethra until ejaculation begins. The prostate gland is very sensitive to stimulation and can be a source of sexual pleasure for some men.

The **Cowper's glands** are two pea-sized glands at the base of the penis under the prostate gland that secrete a clear alkaline fluid into the urethra during sexual arousal and before orgasm and ejaculation. These glands produce mucus-like, pre-ejaculatory fluid in the urethra that acts as a lubricant for the sperm and coats the urethra as semen flows out of the penis.

Female sexual and reproductive organs

### ***External female genitals***

The external female genitals are: the mons pubis, the clitoris, the labia majora, and the labia minora. Together, along with the opening of the vagina, they are known as the vulva.

The **mons pubis** is a pad of fatty tissue over the pubic bone. This structure, which becomes covered with hair during puberty, protects the internal sexual and reproductive organs.

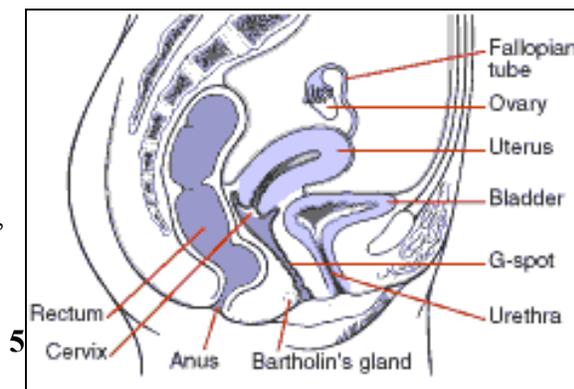
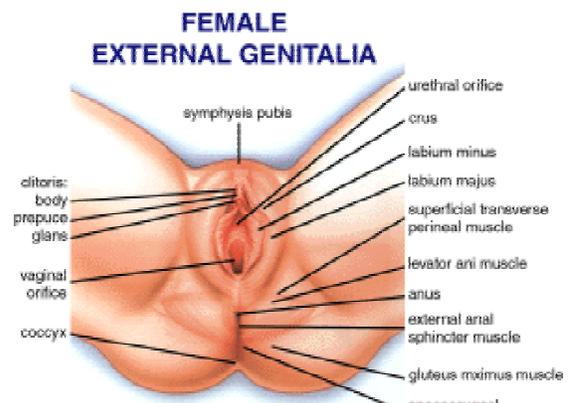
The **clitoris** is an erectile, hooded organ at the upper joining of the labia that contains a high concentration of nerve endings and is very sensitive to stimulation. The clitoris is the only anatomical organ whose sole function is providing sexual pleasure.

The **labia majora** are two spongy folds of skin, one on either side of the vaginal opening, that cover and protect the genital structures. The **labia minora** are the two erectile folds of skin between the labia majora that extend from the clitoris on both sides of the urethral and vaginal openings. (The area covered by the labia minora that includes the openings to the vagina and urethra, as well as the Bartholin's and Skene's glands, is called the **vestibule**.)

The **perineum** is a network of muscles located between and surrounding the vagina and the anus that support the pelvic cavity and help keep pelvic organs in place.

### ***Internal female genitals***

The internal female genitals are: the vagina,



the cervix, the uterus, the fallopian tubes, and the ovaries.

The **vagina** is a muscular, highly expandable, tubular cavity leading from the vestibule to the uterus. The vagina is the structure penetrated during vaginal intercourse, and it also serves as an exit channel for menstrual flow. During vaginal intercourse, contact with this structure provides sexual pleasure in some women. The anterior vaginal wall is more densely innervated and more highly sensitive to stimulation than the posterior vaginal wall.

The **Bartholin's glands** are two small, round structures, one on either side of the vaginal opening. These glands secrete a mucus-like fluid during sexual arousal, providing vaginal lubrication.

The **cervix** (the lower part of the uterus that protrudes into the vaginal canal) has an orifice that allows passage for menstrual flow from the uterus and passage of sperm into the uterus. During vaginal intercourse, contact with this structure may provide sexual pleasure in some women.

The **uterus** is a hollow, thick-walled, pear-shaped, muscular organ located between the bladder and rectum. It is the site for implantation of the fertilized ovum (egg), the location where the fetus develops during pregnancy, and the structure that sheds its lining monthly during menstruation.

The **fallopian tubes (oviducts)** are a pair of tubes that extend from the upper uterus, extending out toward the ovaries (but not touching them), through which ova (eggs) travel from the ovaries toward the uterus and in which fertilization of the ovum takes place. The fallopian tubes contract during orgasm.

The **ovaries** are two organs located at the end of each fallopian tube, that produce ova (releasing one per month from puberty to menopause). The ovaries produce **estrogen** and **progesterone**, the hormones responsible for the development of sex characteristics. These hormones are also responsible for elasticity of the genitalia, integrity of the vaginal lining, and lubrication of the genitalia. **Testosterone** is also produced—although in smaller amounts than is produced in men—and is responsible for sexual desire.

## Physiology of Reproduction:

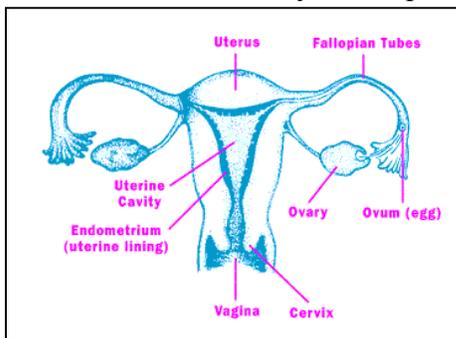
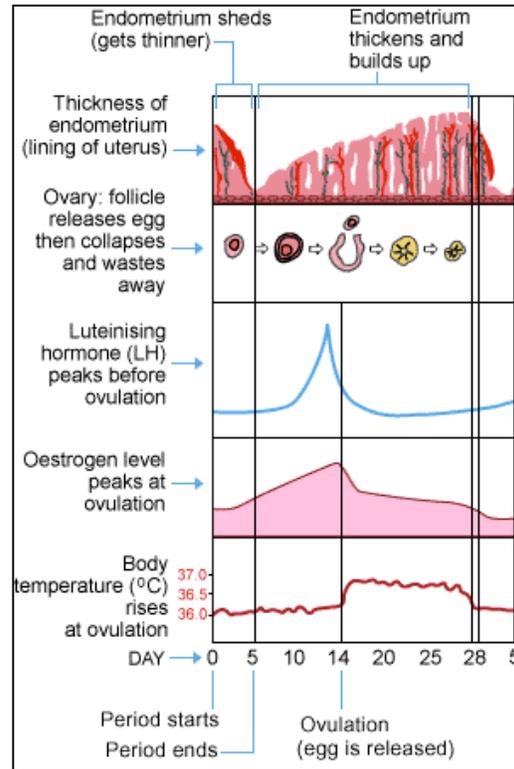
### Menstruation

#### What is menstruation?

Menstruation is a woman's monthly bleeding. It is also called menses, menstrual period, or period. When a woman has her period, she is menstruating. The menstrual blood is partly blood and partly tissue from the inside of the uterus (endometrium shading). It flows from the uterus through the small opening in the cervix, and passes out of the body through the vagina. Most menstrual periods last from three to five days.

#### What is the menstrual cycle?

Menstruation is part of the menstrual cycle, which helps a woman's body prepare for the possibility of pregnancy each month. A cycle starts on the first day of a period (the 1<sup>st</sup>



bleeding day). The average menstrual cycle is 28 days long. However, a cycle can range anywhere from 23 days to 35 days.

The parts of the body involved in the menstrual cycle include the brain, pituitary gland, uterus and cervix, ovaries, fallopian tubes, and vagina. Body hormones rise and fall during the month and make

the menstrual cycle happen. The ovaries make two important female hormones, estrogen and progesterone. Other hormones involved in the menstrual cycle include *follicle-stimulating hormone (FSH)* and *luteinizing hormone (LH)*, made by the pituitary gland.

#### What happens during the menstrual cycle?

In the first half of the menstrual cycle, levels of *estrogen* rise and make the lining of the uterus (endometrium) grow and thicken. In response to *follicle-stimulating hormone*, an

Graafian Follicle in one of the ovaries starts to mature. At about day 14 of a typical 28-day cycle, in response to a surge of *luteinizing hormone*, the Graafian Follicle ruptures and an egg leaves the ovary. This is called ovulation.

In the second half of the menstrual cycle, the egg begins to travel through the *fallopian tube* to the *uterus*. Progesterone levels rise and help prepare the uterine lining for pregnancy. If the egg becomes fertilized by a sperm cell and attaches itself to the uterine wall, the woman becomes pregnant. If the egg is not fertilized, it either dissolves or is absorbed into the body. If pregnancy does not occur, estrogen and progesterone levels drop, and the thickened lining of the uterus is shed during the menstrual period.

In the illustration below, an egg has left an ovary after ovulation and is on its way through a fallopian tube to the uterus.

### **What is a typical menstrual period like?**

During the menstrual period, the thickened uterine lining and extra blood are shed through the vaginal canal. A woman's period may not be the same every month, and it may not be the same as other women's periods. Periods can be light, moderate, or heavy, and the length of the period also varies. While most menstrual periods last from three to five days, anywhere from two to seven days is considered normal. For the first few years after menstruation begins, periods may be very irregular. They may also become irregular in women approaching menopause. Sometimes birth control pills are prescribed to help with irregular periods or other problems with the menstrual cycle.

What kinds of problems do women have with their periods?

Women can have various kinds of problems with their periods, including pain (dysmenorrhoea), heavy bleeding, and skipped periods.

**Amenorrhea** - the lack of a menstrual period. This term is used to describe the absence of a period in young women who haven't started menstruating by age 16, or the absence of a period in women who used to have a regular period. Causes of amenorrhea include pregnancy, breastfeeding, and extreme weight loss caused by serious illness, eating disorders, excessive exercising, or stress.

**Dysmenorrhea** - painful periods, including severe menstrual cramps. In younger women, there is often no known disease or condition associated with the pain. A hormone called prostaglandin is responsible for the symptoms. Some pain medicines available over the counter, such as ibuprofen, can help with these symptoms. Sometimes a disease or

condition, such as uterine fibroid or endometriosis, causes the pain. Treatment depends on what is causing the problem and how severe it is.

*Abnormal uterine bleeding-vaginal bleeding that is different from normal menstrual periods. It includes very heavy bleeding or unusually long periods (also called menorrhagia), periods too close together, and bleeding between periods. In adolescents and women approaching menopause, hormone imbalance problems often cause menorrhagia along with irregular cycles. Sometimes this is called dysfunctional uterine bleeding (DUB). Other causes of abnormal bleeding include uterine fibroids and polyps. Treatment for abnormal bleeding depends on the cause.*

**At what age does a girl get her first period?**

Menarche is another name for the beginning of menstruation. The average age a girl starts menstruating is 12. However, this does not mean that all girls start at the same age. A girl can begin menstruating anytime between the ages of 8 and 16. Menstruation will not occur until all parts of a girl's reproductive system have matured and are working together.

**How long does a woman have periods?**

Women usually continue having periods until menopause. Menopause occurs around the age of 51, on average. Menopause means that a woman is no longer ovulating (producing eggs) and therefore can no longer become pregnant. Like menstruation, menopause can vary from woman to woman and may take several years to occur. Some women have early menopause because of surgery or other treatment, illness, or other reasons.

Ovulation

## Ovulation

### Hormones and releasing factors affecting ovulation:

**Estrogens:** secreted by the ovaries and responsible for the following:

- Secondary sex characteristics.
- Uterine lining development.

**Progesterone:** secreted by the ovaries and responsible for the following:

- Strongly inhibits GnRH release (stops production of LH and FSH)
- Uterine lining development (promotes gestation, hence 'progesterone')

**Gonadotropin Releasing Hormone (GnRH)** stimulates the hypothalamus adenohypophysis to release FSH and LH.

#### Luteinizing Lormone (LH)

Stimulates follicle development so the follicle becomes a corpus luteum.

Oocyte development.

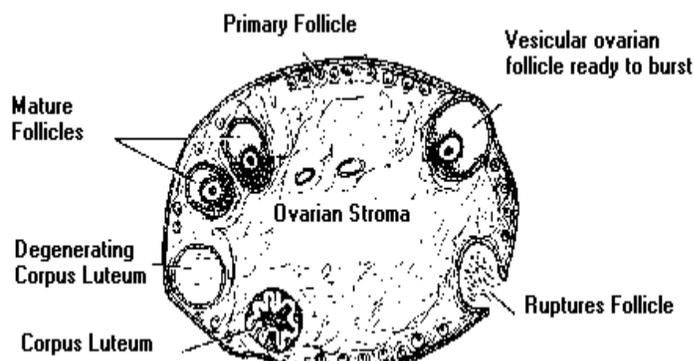
Oocyte release from follicle (ovulation).

#### Follicle Stimulating Hormone (FSH)

Follicle development

**Human Chorionic Gonadotropin (HCG):** maintains the corpus luteum and helps develop chorionic lining.

**Oxytocin** is a hormone from the neurohypophysis that stimulates smooth muscle and in so doing stimulates uterine contractions, milk letdown, and sexual arousal (in both sexes).



Under the influence of FSH, the ovarian primary follicles start a process of maturation to reach the phase of Mature *Graafian follicle*. The process of maturation also influenced by the level of estrogen. This phase occurs during the first half of the menstrual cycle along with changes that takes place at the uterine lining (endometrium) that undergoes thickening, secretory glands hypertrophy, and increase of blood supply.

At the end of this phase (around the day 14), the LH level increased causing rupture of the mature Graafian follicle and the release of the ovum to the peritoneal cavity to be picked up by the fimbriated end of the Fallopian tubes. If the ovum met a sperm in the proper time and proper place, fertilization occurs. The remaining follicle is now called the corpus luteum, and continues to play an important role.

If no implantation, the corpus luteum degenerates and form the **corpus albicans**.

### **Fertilization**

Male role in fertilization is the ejaculation of the semen (containing sufficient number of motile and normal sperms) out of the male body into the vagina during sexual intercourse.

*Conception* occurs if an active sperm fertilizes the ovum. Although millions of sperms are deposited in the vagina, only a few numbers of them reach the Fallopian tubes. They move upward and rapidly through the cervix, uterus, and reach the Fallopian tubes within minutes or hours after intercourse. The sperm must be exposed to the fluid of the genital tract, the tubal fluid in particular, in order to undergo capacitation. This is the process make the sperm able to penetrate the ovum and producing a fertilized ovum.

The sperm can fertilize an ovum within approximately 48 hours and the ovum can survive for approximately 24 hours following ovulation in each menstrual cycle.

This means that the women's fertile period is 72 hours each menstrual cycle (48 hours for sperm viability + 24 hours for ovum viability). Seven days after fertilization the zygote is implanted in the uterine epithelium.