



# The Reproductive System

Mr. Ashley Fernandis.

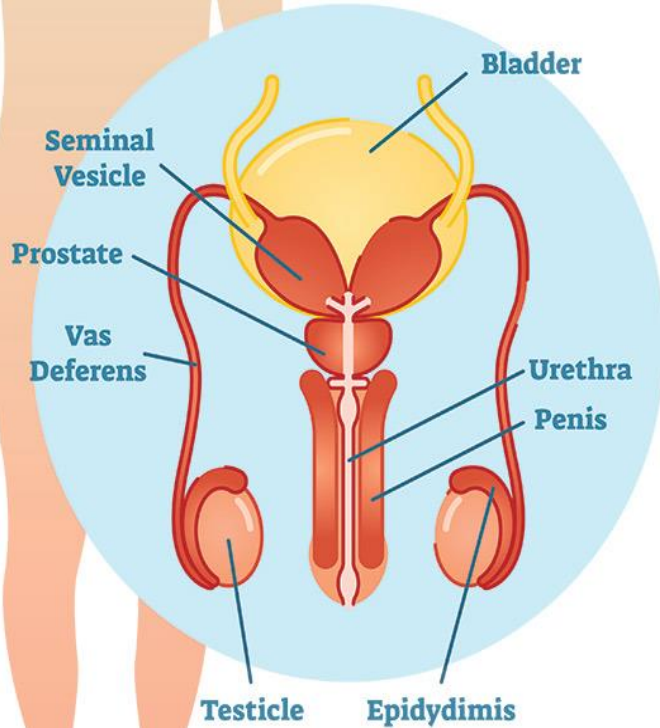
Clinical Instructor

MES College of Nursing,

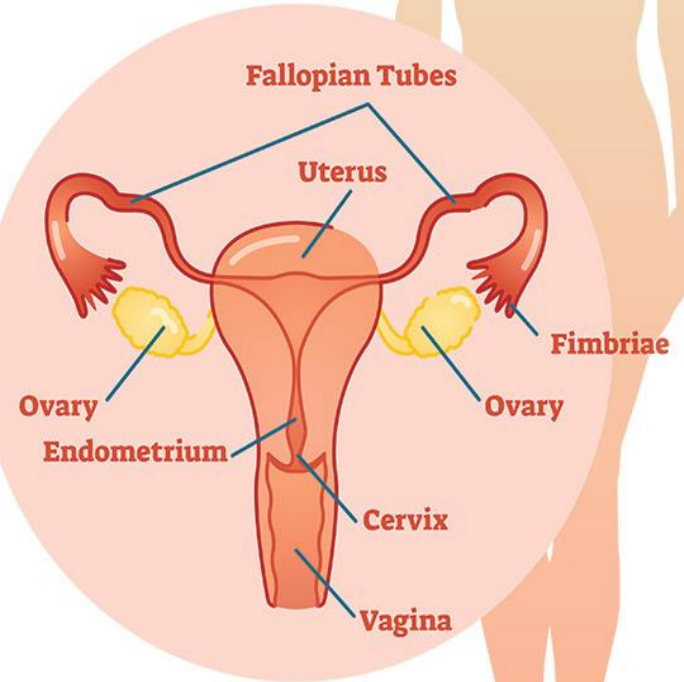
Ghanekhunt-Lote.

# HUMAN REPRODUCTIVE SYSTEM

## Male Organs



## Female Organs



The major function of the reproductive system is to ensure survival of the species. Other systems in the body, such as the **endocrine** and **urinary systems**, work continuously to maintain homeostasis for survival of the individual.

Within the context of producing offspring, the reproductive system has functions:

- To produce egg and sperm cells
- To transport and sustain these cells
- To nurture the developing offspring
- To produce hormones

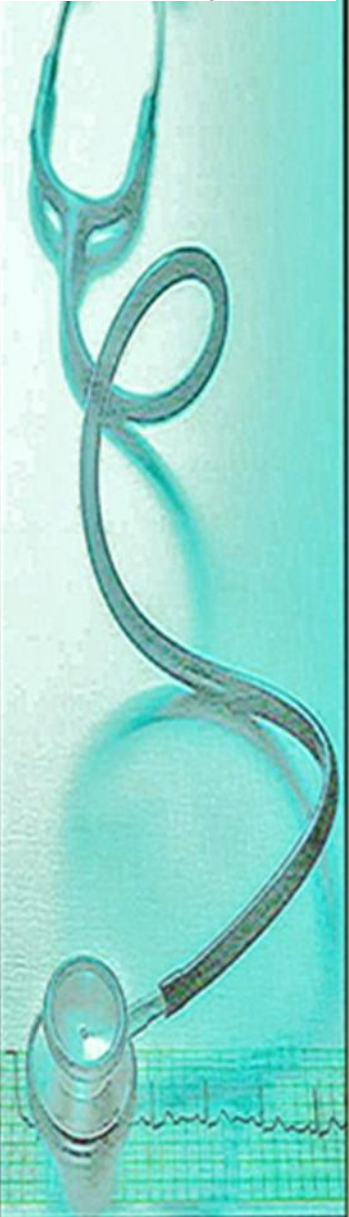






In mammals, including humans, the process is one of sexual reproduction, in which the male and female organs differ anatomically and physiologically, and new individual develops **from the fusion of different sex cells** (gametes).

The male gametes are called **spermatozoa** (**spermatozoon**) and the female gametes are called **ova** (**ovum**).





The functions of the female reproductive system are:

- Formation of ova
- Reception of spermatozoa
- Provision of suitable environments for fertilisation
- fetal development
- Childbirth
- Lactation, the production of breast milk, which provides complete nourishment for the baby in its early life





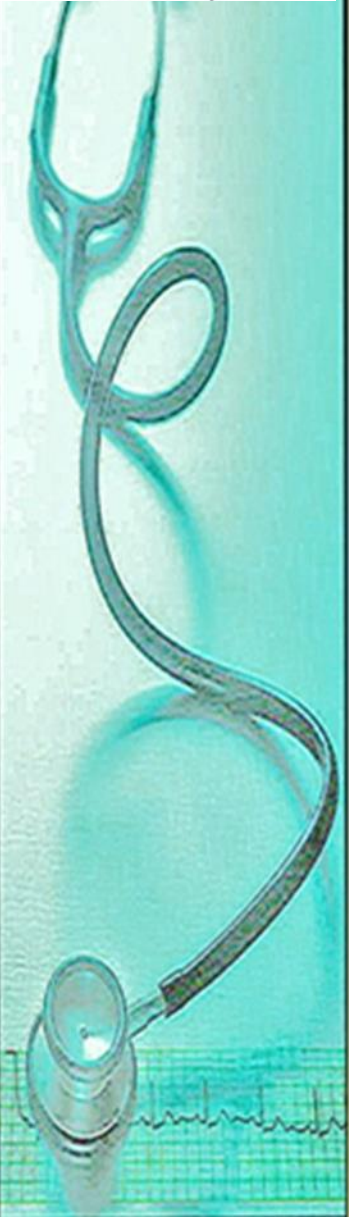
## Puberty in the female

- Puberty is the age at which the internal reproductive organs reach maturity, usually between the ages of 12 and 14 this is called the menarche and marks the beginning of the childbearing period.
- Puberty is characterised by a rise in the production of reproductive hormones and initiation of the female reproductive cycle.
- Ovarian activity is controlled by the gonadotrophins from the anterior pituitary: **Follicle Stimulating Hormone and Luteinizing Hormone.**



These changes are also called the secondary sexual characteristics and include:

- Maturation of the uterus, uterine tubes and ovaries  
Development and enlargement of the breasts
- Growth of pubic and axillary hair
- Increase in height and widening of the pelvis
- Increased fat deposition in the subcutaneous tissue, especially at the hips and breasts.







## Ovaries

The ovaries are small, oval-shaped glands located on either side of your uterus.

They produce and store your eggs (also called ovum) and make hormones that control your menstrual cycle and pregnancy.

During ovulation, one of your ovaries releases an egg. If a sperm fertilizes this egg, you can become pregnant. Your ovaries continue to release an egg each menstrual cycle until you reach menopause.

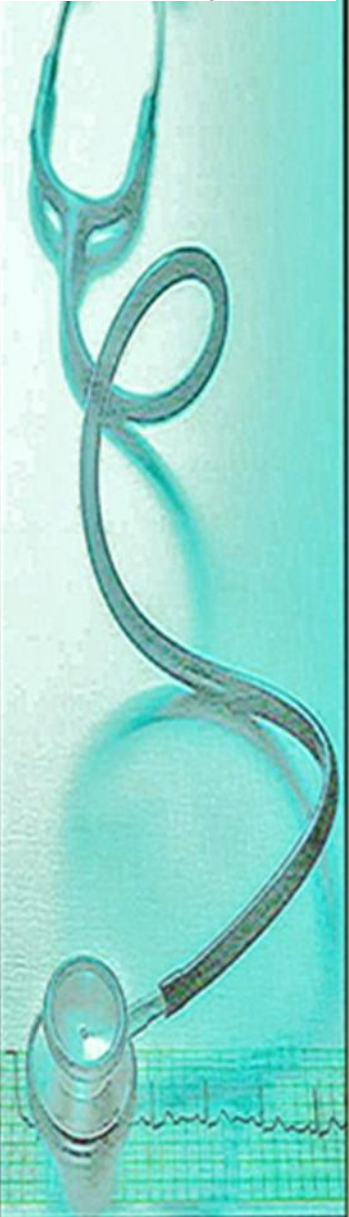






## FUNCTION

- Ovaries play a critical role in both menstruation and conception.
- They produce eggs for fertilization and they make the hormones estrogen and progesterone.
- An ovary releases an egg around the middle of your menstrual cycle (around day 14 of a 28-day cycle) in a process called ovulation.
- Ovarian follicles are small sacs in the ovaries that hold immature eggs.





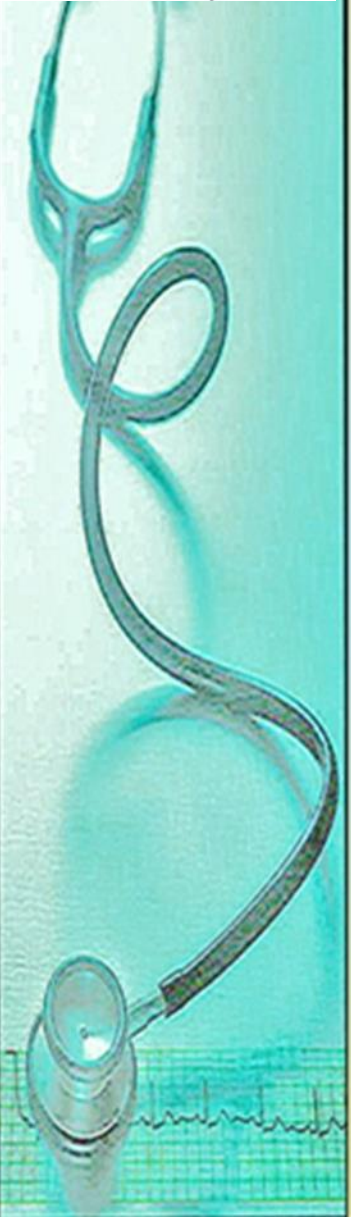
- The egg begins its travel through a narrow, hollow structure called the fallopian tube to the uterus.
- As the egg travels through the fallopian tube, the level of progesterone rises, which helps prepare the uterine lining for pregnancy.
- If you don't become pregnant that cycle, the egg disintegrates and gets reabsorbed by your body so menstruation can begin.





## Hormones of ovary

- Ovaries secrete estrogen and progesterone.
- These hormones play an important role in reproductive development and menstruation.
- Estrogen production is highest in the first half of your menstrual cycle before ovulation.
- Progesterone rises during the second half of your cycle to prepare your uterus for a fertilized egg (if conception occurs).





## Oogenesis

“Oogenesis is the process of formation of female gametes.”

Oogenesis is the type of gametogenesis through which ova, also called the female gametes are formed and the produced female gamete is known as an ovum.

Oogenesis is the differentiation of the ovum. **Spermatogenesis** and **oogenesis** are two different forms of gametogenesis. Gametogenesis in the male is known **spermatogenesis** and in the female is known **oogenesis**, which results in the formation of ova in the female.







Oogenesis: The process of the formation of egg within ovary is called as oogenesis.

This process is also involved in the following three phases:

(1) Proliferation phase: The cell of generative layer of the ovary divides to produce follicle. A cell of the follicle enlarging to produce oogonium **(An immature female reproductive cell that gives rise to primary oocytes by mitosis.)**

(2) Growth Phase: In this stage oogonia increase in size and form primary oocytes **(An egg before maturation: a female gametocyte).**

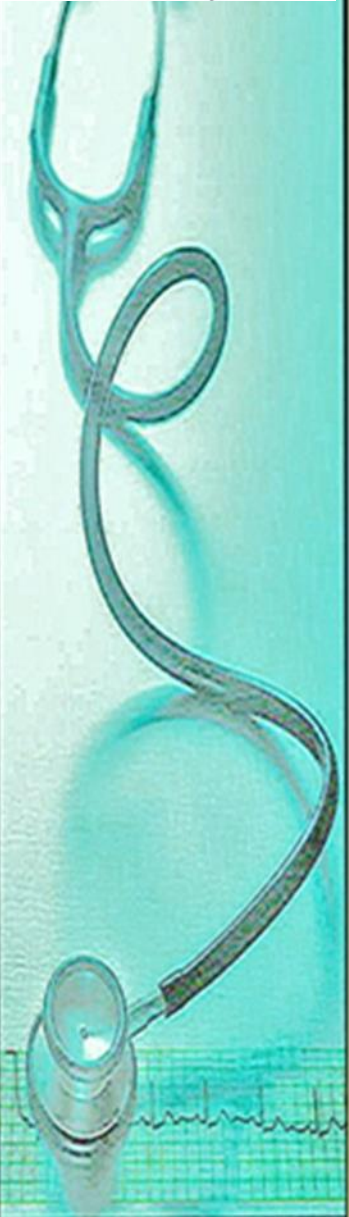
(3) Maturation phase: In this phase primary oocytes divide meiotically to produce one eggs and three polar cells.



## Fertilization

“Fertilization in humans refers to **the fusion of male and female gametes that facilitates the development of a new organism.**”

Fertilization is the union of the ovum and the sperm. After the ovum is shed from the ovary (ovulation), the ovum moves towards the Fallopian tube.





- When a sperm comes in contact with the surroundings of the ovum, it releases hydrolytic enzymes from the acrosome (acrosomal reaction).
- The enzymes aid the penetration of the sperm into the ovum.
- Once a sperm has entered an ovum, there are mechanisms, not fully understood, which prevent the entry of any other sperm.
- Then the nucleus of the ovum and the nucleus of the sperm fuse to form a single nucleus.
- After the fusion, the ovum becomes the zygote.
- Zygote the beginning of the baby.





# Implantation

Implantation is defined as **the process by which the embryo attaches to the endometrial surface of the uterus and invades the epithelium and then the maternal circulation to form the placenta.**

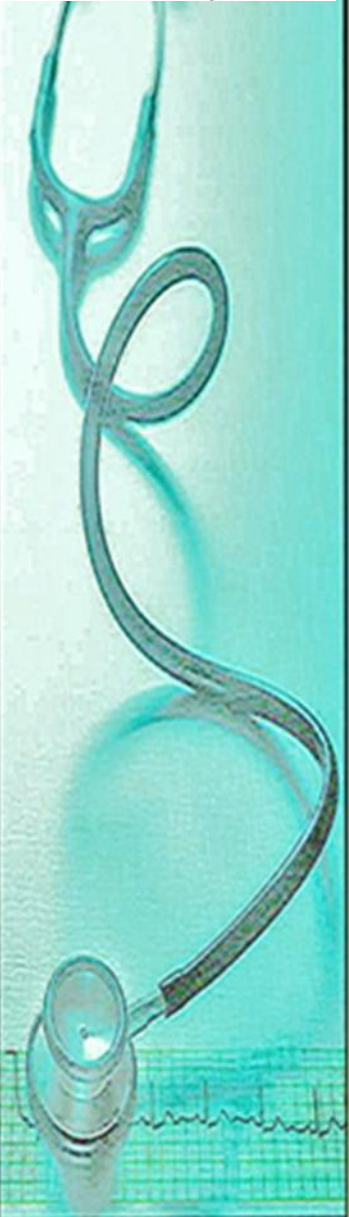
- Implantation is the process by which the embryo sticks to the uterus. The embryo takes about 3 days to travel through the fallopian tube to reach the uterus.
- It takes another 3 days to get implanted
- Thus the embryo is about 1 week old when it gets implanted.
- When the embryo comes close to the wall of the uterus, the embryonic cells in contact with the uterus, called trophoblastic cells







- The embryo sinks a little in the wall of the uterus, and gets attached (implanted) there.
- The trophoblastic cells which are nearest the embryo and are still well organized are called the cytotrophoblast.





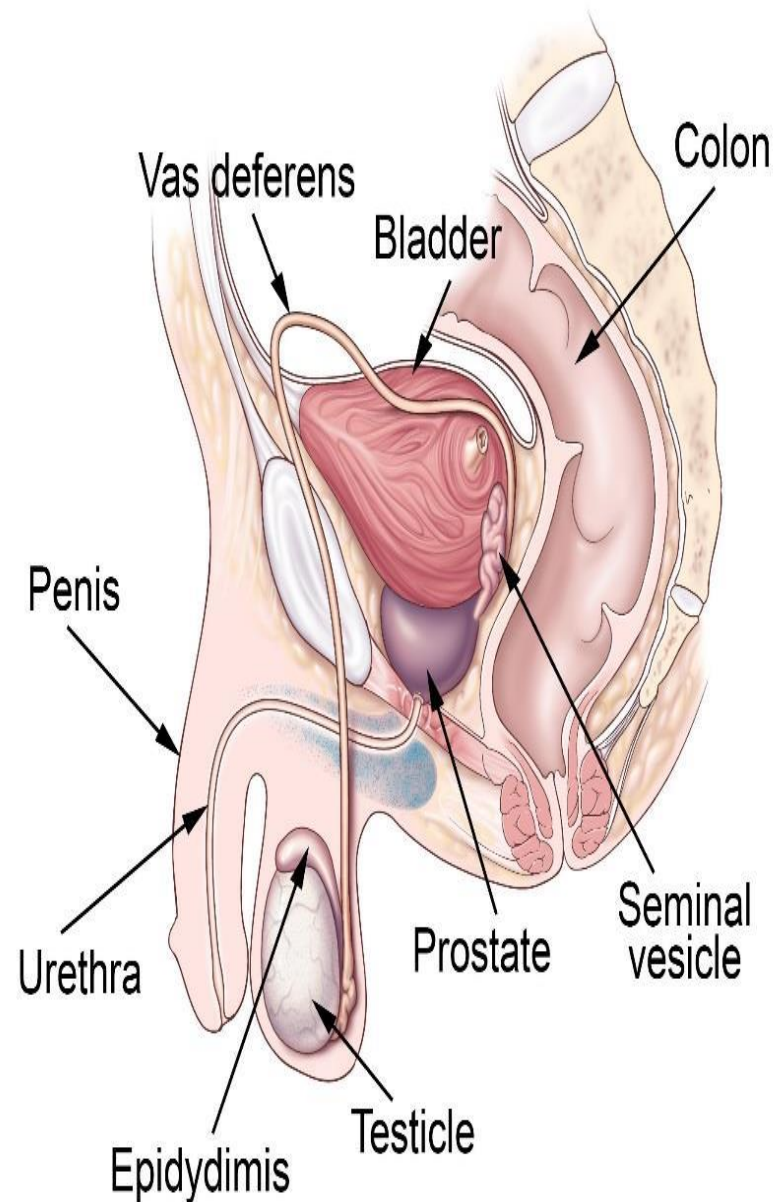
## Functions of Breast

- The primary function of breasts is to provide nourishment to the infant through breastfeeding. When an infant sucks on the mother's nipples, the mother's brain secretes oxytocin.
- In addition to their primary function of providing nutrients to the infant.



## Male Reproductive System

- The male reproductive system is mostly located outside of the body.
- These external organs include the penis, scrotum and testicles.
- Internal organs include the vas deferens, prostate and urethra.
- The male reproductive system is responsible for sexual function, as well as urination.





The male reproductive system includes a group of organs that make up a man's reproductive and urinary system.

These organs do the following jobs within your body:

- They produce, maintain and transport sperm (the male reproductive cells) and semen (the protective fluid around sperm).
- They discharge sperm into the female reproductive tract.
- They produce and secrete male sex hormones.

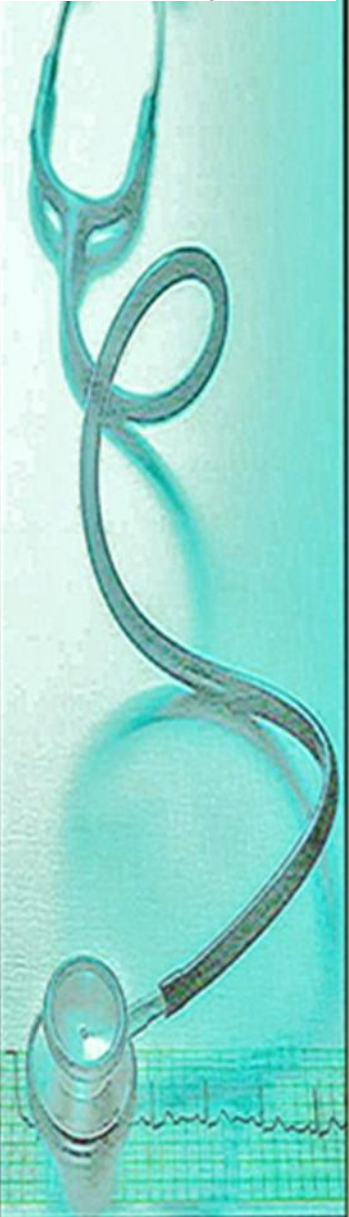






The entire male reproductive system is dependent on **hormones**, which are chemicals that regulate the activity of many different types of cells or organs.

- The primary hormones involved in the male reproductive system are **follicle-stimulating hormone, luteinizing hormone, and testosterone**.
- **Follicle-stimulating hormone** is necessary for sperm production (spermatogenesis),
- And **luteinizing hormone** stimulates the production of testosterone, which is also needed to make sperm.
- **Testosterone** is responsible for the development of male characteristics, including muscle mass and strength, fat distribution, bone mass, facial hair growth, voice change, and sex drive.





# Spermatogenesis

Spermatogenesis means the formation of male gametes called spermatozoa or simply sperms.

## Purpose of Spermatogenesis

The process of Spermatogenesis occurs to create mature male gametes, which then fertilize female gametes to create a zygote, a single-celled organism. This results in **cell division** and multiplication to create a fetus.





## Semen

Semen is a complex substance created by the male reproductive organs.

The fluid is made mostly of water, plasma, and mucus (a lubricating substance). It also contains 5 to 25 calories, and is made up of small amounts of essential nutrients including:

- Calcium
- Citrate
- Fructose
- Glucose
- Lactic Acid
- Magnesium
- Potassium
- Protein
- Zinc





## Why Semen Contains Nutrients

In addition to nutrients, semen also contains sperm. Sperm are the cells that can fertilize a female's eggs to create offspring.

They need nutrients because they must travel a great distance and withstand the harsh environment of the vagina.

The nutrients found in semen will keep the sperm alive and provide energy while they race to the egg. Their main energy source is fructose, a type of sugar.



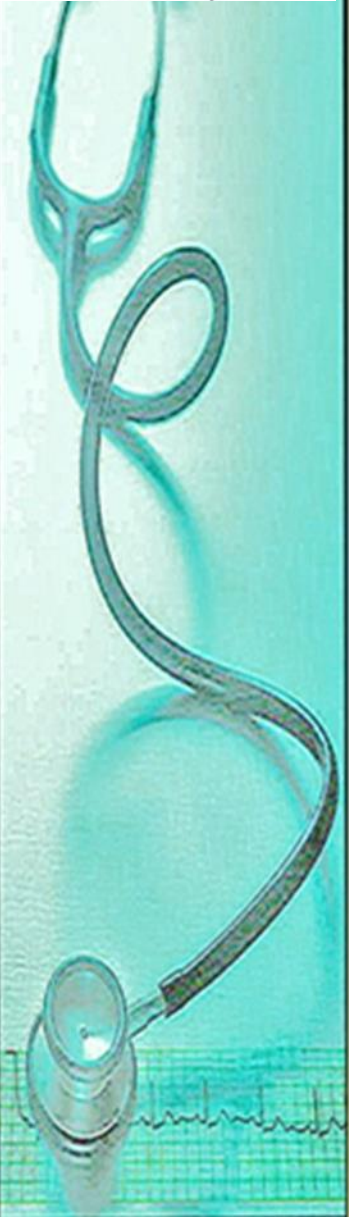




# Menstrual cycle

The **menstrual cycle** is a series of natural changes in hormone production and the structures of the uterus and ovaries of the female reproductive system that make pregnancy possible.

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.

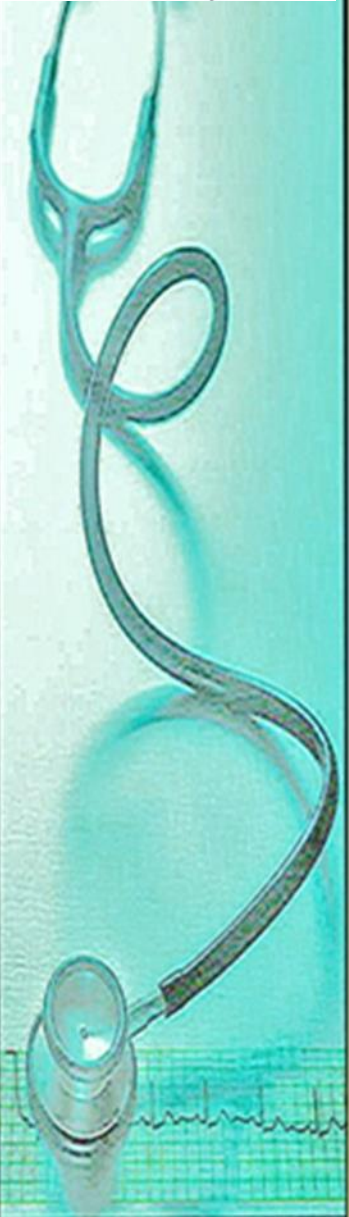




A woman's menstrual cycle is divided into four phases:

- Menstrual phase
- Follicular phase
- Ovulation phase
- 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.

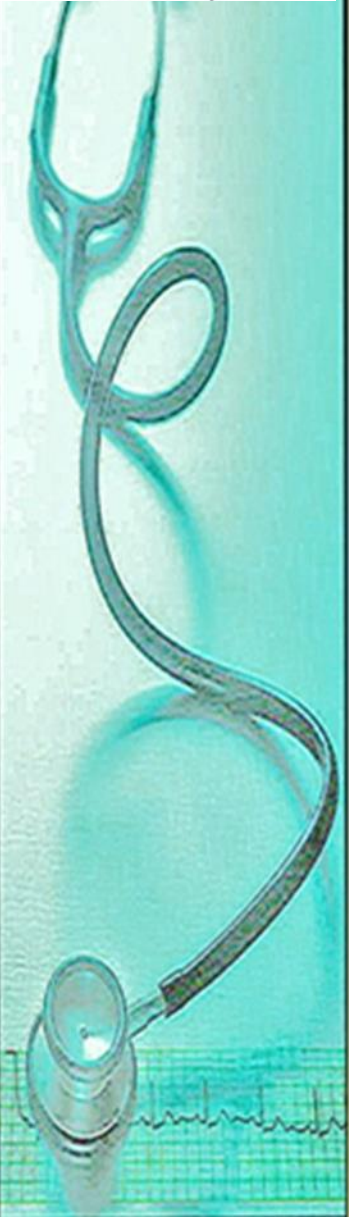
The thickened lining of your uterus, which would support a pregnancy, is no longer needed, so it sheds through your vagina. During your period, you release a combination of blood, mucus, and tissue from your uterus.





Symptoms like these:

- cramps
- tender breasts
- bloating
- mood swings
- irritability
- headaches
- tiredness
- 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.



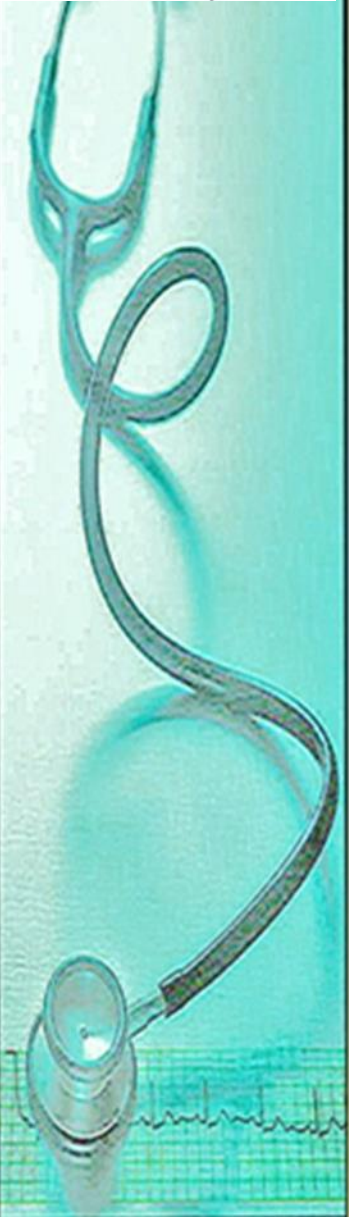




## Follicular phase

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.





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. 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.

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 isn't fertilized.





## 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.





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

- bloating
- breast swelling, pain, or tenderness
- mood changes
- headache
- weight gain
- changes in sexual desire
- food cravings (**desire for a specific food**)
- trouble sleeping

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

