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QUESTIONS:

WRITE SHORT NOTES ON THE FOLLOWING

1. Spermatogenesis
2. Testosterone
3. Semen
4. Male Orgasm
5. Male Infertility

**Spermatogenesis** is the process by which haploid spermatozoa develop from germ cells in the seminiferous tubules of the testis. This process starts with the mitotic division of the stem cells located close to the basement membrane of the tubules.These cells are called spermatogonial stem cells. The mitotic division of these produces two types of cells. Type A cells replenish the stem cells, and type B cells differentiate into primary spermatocytes. The primary spermatocyte divides meiotically (Meiosis I) into two secondary spermatocytes; each secondary spermatocyte divides into two equal haploid spermatids by Meiosis II. The spermatids are transformed into spermatozoa (sperm) by the process of spermiogenesis. These develop into mature spermatozoa, also known as sperm cells. Thus, the primary spermatocyte gives rise to two cells, the secondary spermatocytes, and the two secondary spermatocytes by their subdivision produce four spermatozoa and four haploid cells. Spermatogenesis starts in the bottom part of seminiferous tubes and, progressively, cells go deeper into tubes and moving along it until mature spermatozoa reaches the lumen, where mature spermatozoa are deposited. The division happens asynchronically; if the tube is cut transversally one could observe different maturation states. A group of cells with different maturation states that are being generated at the same time is called a spermatogenic wave.[[5]](https://en.wikipedia.org/wiki/Spermatogenesis#cite_note-5) Because the type A **spermatogonia** are stem cells, **spermatogenesis** can occur continuously. Each day, some 100 million **sperm** are made in each human testicle, and each ejaculation releases 200 million **sperm** Sperm is produced by the testes and is stored in the epididymis. Think of the epididymis as a reservoir in the back of the testicles. From this reservoir, the sperm travels upstream (through the vas deferens) with its eyes set on the ejaculatory ducts where it will be ready for launch **.**

**TESTOSTERONE**

Testosterone is a hormone found in humans, as well as in other animals. The testicles primarily make testosterone in men. Women’s ovaries also make testosterone, though in much smaller amounts.

The production of testosterone starts to increase significantly during [puberty](https://www.healthline.com/health/parenting/stages-of-puberty), and begins to dip after age 30 or so.

Testosterone is most often associated with sex drive, and plays a vital role in sperm production. It also affects bone and muscle mass, the way men store fat in the body, and even red blood cell production. A man’s testosterone levels can also affect his mood. In men, testosterone is thought to regulate a number of functions alongside sperm production. These include:

* sex drive
* bone mass
* fat distribution
* muscle size and strength
* red blood cell production

Without adequate amounts of testosterone, men become infertile. This is because testosterone assists the development of mature sperm.

Despite being a male sex hormone, testosterone also contributes to sex drive, bone density, and muscle strength in women. However, an excess of testosterone can also cause women to experience male pattern [baldness](https://www.medicalnewstoday.com/articles/70956.php) and infertility.

The brain and pituitary gland control testosterone

High or low levels of testosterone [can lead to dysfunction](http://www.hormone.org/diseases-and-conditions/mens-health/low-testosterone) in the parts of the body normally regulated by the hormone.

When a man has low testosterone, or hypogonadism, he may experience:

* reduced sex drive
* erectile dysfunction
* low sperm count
* enlarged or swollen breast tissue

Over time, these symptoms may develop in the following ways:

* loss of body hair
* loss of muscle bulk
* loss of strength
* increased body fat

In women, however, high testosterone levels can lead to male pattern baldness, a deep voice, and menstrual irregularities, as well as:

* growth and swelling of the clitoris
* changes in body shape
* reduction in breast size
* oily skin
* acne
* facial hair growth around the body, lips, and chin

Recent studies have also linked high testosterone levels in women to the risk of uterine fibroids.

Testosterone imbalances can be detected with a blood test and treated accordingly.

Testosterone levels naturally decrease as a man ages.

The effects of gradually lowering testosterone levels as men age have received increasing attention in recent years. It is known as late-onset hypogonadism.

After the age of 40, the concentration of circulating testosterone falls by about 1.6 percent every year for most men. By the age of 60, the low levels of testosterone would lead to a diagnosis of hypogonadism in younger men.

About 4 in 10 men have hypogonadism by the time they reach 45 years old. The number of cases in which older men have been diagnosed as having low testosterone increased 170 percent since 2012.

SEMEN

also known as **seminal fluid**, is an organic fluid that contains spermatozoa. It is secreted by the gonads (sexual glands) and other sexual organs of male or hermaphroditic animals and can fertilize the female ovum. In humans, seminal fluid contains several components besides spermatozoa: proteolytic and other enzymes as well as fructose are elements of seminal fluid which promote the survival of spermatozoa, and provide a medium through which they can move or "swim". Semen is produced and originates from the seminal vesicle, which is located in the pelvis. The process that results in the discharge of semen is called *ejaculation*. Semen is also a form of genetic material. In animals, semen has been collected for cryoconservation. Cryoconservation of animal genetic resources is a practice that calls for the collection of genetic material in efforts for conservation of a particular breed.

**Composition**

During the process of ejaculation, sperm passes through the ejaculatory ducts and mixes with fluids from the seminal vesicles the prostate, and the bulbourethral glands to form the semen. The seminal vesicles produce a yellowish viscous fluid rich in fructose and other substances that makes up about 70% of human semen. The prostatic secretion, influenced by dihydrotestosterone, is a whitish (sometimes clear), thin fluid containing proteolytic enzymes, citric acid, acid phosphatase and lipids. The bulbourethral glands secrete a clear secretion into the lumen of the urethra to lubricate it.

**Fertilization**

Depending on the species, spermatozoa can fertilize ova externally or internally. In external fertilization, the spermatozoa fertilize the ova directly, outside of the female's sexual organs. Female fish, for example, spawn ova into their aquatic environment, where they are fertilized by the semen of the male fish.

During internal fertilization, however, fertilization occurs inside the female's sexual organs. Internal fertilization takes place after insemination of a female by a male through copulation. In most vertebrates, including amphibians, reptiles, birds and monotreme mammals, copulation is achieved through the physical mating of the cloaca of the male and female. In marsupial and placental mammals, copulation occurs through the vagina.

**MALE ORGASM**

Male orgasm is an all-encompassing term for any type of orgasm related to male genitalia . . It could be ejaculatory or non ejaculatory or even a mix or botThe **male orgasm** is a complex experience.

 **Physiology**

The male orgasm is a complex system involving multiple hormones, organs, and nerve pathways.

The hormone testosterone, produced in the testicles, plays a central role by enhancing the sexual desire (libido) that leads to arousal, erection, and ultimately orgasm. By contrast, low testosterone not only decreases a man's energy and mood, it makes him less responsive to sexual stimuli, both physical and mental.

  **It can be an ejaculatory orgasm**

Orgasm and ejaculation often happen simultaneously, but they’re actually two separate events that don’t necessarily have to happen at the same time.

If your pleasure mounts and you shoot — or dribble — semen from your penis, then you’ve had an ejaculatory orgasm.

**Or a non-ejaculatory orgasm**

Again, you don’t need to expel semen to have an orgasm.

Not everyone ejaculates with orgasm, and even those that do may not ejaculate every time.

This is also referred to as a dry orgasm.

Unless you and your partner are trying to conceive — in which case you should see a doctor — dry orgasms are usually harmless and just as enjoyable as an ejaculatory orgasm.

 The major function of the **male orgasm** is to ejaculate sperm, although not all **men** will ejaculate during an **orgasm**. Beyond delivering pleasure, the role of the female **orgasm** is less clear.

 **4 Phases of the Male Orgasm**

The route to ejaculation in men is a

**Arousal**

Arousal is the stage in which physical, sensory, and emotional cues prompt the brain to release a neurotransmitter known as acetylcholine. This, in turn, triggers the release of nitric oxide into the arteries of the penis, causing them to expand and rapidly fill with blood. The resulting erection is generally accompanied by changes in respiration, increased overall muscle tension, and the retraction of the scrotal sac.

**Plateau**

Plateau is the phase immediately preceding orgasm in which the voluntary thrusts of the body, specifically the pelvis, suddenly become involuntary, increasing both in intensity and speed.2﻿ It is at this stage that the heart rate increases to between 150 and 175 beats per minute, accompanied by a marked rise in blood pressure and body temperature.

Traces of seminal fluid ("pre-cum") may leak from the urethra. The release of pre-ejaculatory fluid is more than just incidental; it alters the pH of the urethra so that the sperm has a better chance of survival.3﻿

All told, the plateau phase lasts between 30 seconds and two minutes.

**Orgasm**

The orgasm phase is divided into two parts. The first, known as emission, is the stage where ejaculation is inevitable. This is immediately followed by the second stage, ejaculation, in which strong contractions of the penile muscle, anus, and perineal muscles help propel the semen from the body.4﻿

During orgasm, the reward center of the brain (specifically the cerebellum, amygdala, nucleus accumbens, and ventral tegmental area) is flooded with neurochemicals, inciting the intense emotional response associated with an orgasm.

At the same time, the [lateral orbitofrontal cortex](https://www.verywellhealth.com/the-frontal-lobes-2488715) located behind the left eye shuts down entirely. This is the part of the brain that plays a central role in judgment and self-control. The effect explains why people often describe an orgasm as a state where "nothing else matters."

ctually delineated by four distinct phases, of which orgasm is the third. While the duration and intensity of these phases can vary, the experience will proceed in a strictly

**Resolution and Refraction**

Resolution is the phase following orgasm where the penis starts to lose its erection. This is often accompanied by feelings of extreme relaxation or even drowsiness.

specific way.

The multiorgasmic state can be classified in one of two ways:

* **Condensed**, in which two to four individual and defined orgasms occur within a few seconds to two minutes
* **Sporadic**, in which refraction is delayed and multiple orgasms can be achieved within the span of several minutes

Male Orgasm Disorders \_Common ejaculation disorders include [premature ejaculation](https://www.verywellhealth.com/premature-ejaculation-2328534), [retrograde ejaculation](https://www.verywellhealth.com/is-a-generic-version-of-flomax-available-1124023) (in which semen is redirected to the bladder), and anejaculation (inability to ejaculate).

s[anorgasmia](https://www.verywellhealth.com/anorgasmia-causes-and-treatment-options-2328525) is a condition in which a man or woman is unable to achieve orgasm. Anorgasmia may be caused by psychological problems, such as stress, trauma, and performance anxiety, or physical ones, such as diabetes, hypertension, and hypogonadism (low testosterone). Prostate surgery ([prostatectomy](https://www.verywellhealth.com/is-orgasm-possible-after-prostate-cancer-treatment-2782000)) is also a common cause, as are certain medications such as [selective serotonin reuptake inhibitors](https://www.verywellhealth.com/serotonin-s-role-in-the-biology-of-ejaculation-4156268) (SSRIs[)](https://www.verywellmind.com/how-do-ssris-compare-to-maois-1066856?_ga=2.100815617.1811875598.1529451040-1453487952.1525879403) used to treat depression.

* Avoid exposure to pesticides, heavy metals and other toxins.

**What happens in the body when you orgasm?**

Excitement :

During this phase your heart rate and breathing speed up, your blood pressure increases, and increased blood flow to the genitals causes an erection.

**Plateau**

This is an intensified version of the excitement phase, during which your penis and testicles continue to increase in size.

**Resolution and refraction**

During the resolution phase, your body begins to return to an unaroused state. Your erection gradually subsides, your muscles relax, and you feel drowsy and relaxed.

Some people go through [refractory period](https://www.healthline.com/health/healthy-sex/refractory-period) after orgasm, during which you may not be able to get an erection or have an orgasm. Further stimulation may feel too sensitive or even painful.

This is when your pleasure peaks and releases. It can last from a few seconds to a few minutes

**Different types of orgasm**

 1: Blended Orgasm

A blended orgasm is essentially when you climax while several areas of your body are being stimulated simultaneously.

2: Wet Dream

There is a myth that wet dreams only happen to teenage boys during pubety

3: Pelvic Orgasm The aim is two fold to gain better control of your orgasms and to increase the intensity for when you finally do decide let go

4:Prostrate Orgasm.

**MALE INFERTILITY**

This refers to male inability to cause pregnancy in a fertile female. In humans it accounts for 40 – 50% of infertility. It affects approximately 7% of all men. Male infertility is commonly due to deficiencies in the semen and semen quality is used as a surrogate measure of male fecundity.

Factors relating to male infertility include :

* 1. Immune Fertility

Antisperm antibodies (ASA) have been considered as infertility cause in around 10 – 30% of infertile couples. Risk factors for the formation of antisperm antibodies in men include the breakdown of the blood- testis barrier , trauma , surgery .

* 1. Genetics
	2. Kinefelter Syndrome

SYMPTOMS

Problems with sexual function – Difficulty with ejaculation . reduced sexual desire

 Pain swelling or a lump in the testicle area

 Inability to swell

 A lower than normal sperm count

* Recurrent respiratory infections
* Abnormal breast growth (gynecomastia)
* Decreased facial or body hair or other signs of a chromosomal or hormonal abnormality
* A lower than normal sperm count (fewer than 15 million sperm per milliliter of semen

**Causes**

Male fertility is a complex process. To get your partner pregnant, the following must occur:

* **You must produce healthy sperm.** Initially, this involves the growth and formation of the male reproductive organs during puberty. At least one of your testicles must be functioning correctly, and your body must produce testosterone and other hormones to trigger and maintain sperm production.
* **Sperm have to be carried into the semen.** Once sperm are produced in the testicles, delicate tubes transport them until they mix with semen and are ejaculated out of the penis.
* **There needs to be enough sperm in the semen.** If the number of sperm in your semen (sperm count) is low, it decreases the odds that one of your sperm will fertilize your partner's egg. A low sperm count is fewer than 15 million sperm per milliliter of semen or fewer than 39 million per ejaculate.
* **Sperm must be functional and able to move.** If the movement (motility) or function of your sperm is abnormal, the sperm may not be able to reach or penetrate your partner's egg.
* rm count of less than 39 million per ejaculate

**Environmental causes**

Overexposure to certain environmental elements such as heat, toxins and chemicals can reduce sperm production or sperm function. Specific causes include:

* **Industrial chemicals.** Extended exposure to benzenes, toluene, xylene, pesticides, herbicides, organic solvents, painting materials and lead may contribute to low sperm counts.
* **Heavy metal exposure.** Exposure to lead or other heavy metals also may cause infertility.
* **Radiation or X-rays.** Exposure to radiation can reduce sperm production, though it will often eventually return to normal. With high doses of radiation, sperm production can be permanently reduced.
* **Overheating the testicles.** Elevated temperatures impair sperm production and function. Although studies are limited and are inconclusive, frequent use of saunas or hot tubs may temporarily impair your sperm count.

Sitting for long periods, wearing tight clothing or working on a laptop computer for long stretches of time also may increase the temperature in your scrotum and may slightly reduce sperm production.