NAME: OYELADE ESTHER KOREDE

DEPARTMENT: NURSING

MATRIC-NUMBER: 18/MHS02/172

COURSE CODE: PHY 202

1. **Write short note on spermatogenesis**

Spermatogenesis, the origin and development of the [sperm cells](https://www.britannica.com/science/sperm) within the male [reproductive](https://www.britannica.com/science/human-reproductive-system) organs, the [testes](https://www.britannica.com/science/testis). The testes are composed of numerous thin, tightly coiled tubules known as the [seminiferous tubules;](https://www.britannica.com/science/seminiferous-tubule) the sperm cells are produced within the walls of the tubules. Within the walls of the tubules, also, are many randomly scattered cells, called [Sertoli cells](https://www.britannica.com/science/Sertoli-cell), that function to support and nourish the immature sperm cells by giving them nutrients and blood products. As the young germ cells grow, the Sertoli cells help to transport them from the outer surface of the seminiferous tubule to the central channel of the tubule.

Sperm cells are continually being produced by the testes, but not all areas of the seminiferous tubules produce sperm cells at the same time. One immature germ [cell](https://www.britannica.com/science/cell-biology) takes as long as 74 days to reach final maturation, and during this growth process there are [intermittent](https://www.merriam-webster.com/dictionary/intermittent) resting phases.

The immature cells (called [spermatogonia](https://www.britannica.com/science/spermatogonium)) are all derived from cells called [stem cells](https://www.britannica.com/science/stem-cell) in the outer wall of the seminiferous tubules. The stem cells are composed almost entirely of nuclear material. (The nucleus of the cell is the portion containing the chromosomes.) The stem cells begin their process by multiplying in the process of cell duplication known as [mitosis](https://www.britannica.com/science/mitosis). Half of the new cells from this initial crop go on to become the future sperm cells, and the other half remain as stem cells so that there is a constant source of additional germ cells. Spermatogonia destined to develop into mature sperm cells are known as primary sperm cells. These move from the outer portion of the seminiferous tubule to a more central location and attach themselves around the Sertoli cells. The primary sperm cells then develop somewhat by increasing the amount of [cytoplasm](https://www.britannica.com/science/cytoplasm) (substances outside of the nucleus) and structures called organelles within the cytoplasm. After a resting phase the primary cells [divide into a form](https://www.britannica.com/science/meiosis-cytology) called a secondary sperm cell. During this [cell division](https://www.britannica.com/science/cell-division) there is a splitting of the nuclear material. In the nucleus of the primary sperm cells there are 46 chromosomes; in each of the secondary sperm cells there are only 23 chromosomes, as there are in the egg. When the egg and sperm combine and their chromosomes unite, the characteristics of both individuals blend and the new organism starts to grow.

1. **Write short note on testosterone**

Testosterone is the major sex hormone in males and plays a number of important roles, such as:

* The development of the penis and testes
* The deepening of the voice during puberty
* The appearance of facial and pubic hair starting at puberty; later in life, it may play a role in balding
* Muscle size and strength
* Bone growth and strength
* Sex drive (libido)
* Sperm production
* Adolescent boys with too little testosterone may not experience normal masculinization. For example, the genitals may not enlarge, facial and body hair may be scant and the voice may not deepen normally.
* Testosterone may also help maintain normal mood. There may be other important functions of this hormone that have not yet been discovered.
* Signals sent from the brain to the pituitary gland at the base of the brain control the production of testosterone in men. The pituitary gland then relays signals to the testes to produce testosterone. A "feedback loop" closely regulates the amount of hormone in the blood. When testosterone levels rise too high, the brain sends signals to the pituitary to reduce production

**THE PERILS OF TOO MUCH TESTOSTERONE**

Having too much naturally-occurring testosterone is not a common problem among men. That may surprise you given what people might consider obvious evidence of testosterone excess: road rage, fighting among fathers at Little League games and sexual promiscuity.

Part of this may be due to the difficulty defining "normal" testosterone levels and "normal" behavior. Blood levels of testosterone vary dramatically over time and even during the course of a day. In addition, what may seem like a symptom of testosterone excess (see below) may actually be unrelated to this hormone.

In fact, most of what we know about abnormally high testosterone levels in men comes from athletes who use anabolic steroids, testosterone or related hormones to increase muscle mass and athletic performance.

**Problems associated with abnormally high testosterone levels in men include:**

* Low sperm counts, shrinking of the testicles and impotence (seems odd, doesn't it?)
* Heart muscle damage and increased risk of heart attack
* Prostate enlargement with difficulty urinating
* Liver disease
* Acne
* Fluid retention with swelling of the legs and feet
* Weight gain, perhaps related in part to increased appetite
* High blood pressure and cholesterol
* Insomnia
* Headaches
* Increased muscle mass
* Increased risk of blood clots
* Stunted growth in adolescents
* Uncharacteristically aggressive behavior (although not well studied or clearly proven)
* Mood swings, euphoria, irritability, impaired judgment, delusions

**Problems associated with abnormally high testosterone levels in men include:**

* Low sperm counts, shrinking of the testicles and impotence (seems odd, doesn't it?)
* Heart muscle damage and increased risk of heart attack
* Prostate enlargement with difficulty urinating
* Liver disease
* Acne
* Fluid retention with swelling of the legs and feet
* Weight gain, perhaps related in part to increased appetite
* High blood pressure and cholesterol
* Insomnia
* Headaches
* Increased muscle mass
* Increased risk of blood clots
* Stunted growth in adolescents
* Uncharacteristically aggressive behavior (although not well studied or clearly proven)
* Mood swings, euphoria, irritability, impaired judgment, delusions

**TOO LITTLE TESTOSTERONE**

In recent years, researchers (and pharmaceutical companies) have focused on the effects of testosterone deficiency, especially among men. In fact, as men age, testosterone levels drop very gradually, about 1% to 2% each year — unlike the relatively rapid drop in estrogen that causes menopause. The testes produces less testosterone, there are fewer signals from the pituitary telling the testes to make testosterone, and a protein (called sex hormone binding globulin (SHBG) increases with age. All of this reduces the active (free) form of testosterone in the body. More than a third of men over age 45 may have reduced levels of testosterone than might be considered normal (though, as mentioned, defining optimal levels of testosterone is tricky and somewhat controversial).

**Problems associated with abnormally low testosterone levels in men include:**

* increased body fat.
* decreased strength/mass of muscles.
* fragile bones.
* decreased body hair.
* swelling/tenderness in the breast tissue.
* hot flashes.
* increased fatigue.
* effects on cholesterol metabolism.

**DISEASE AND CONDITIONS THAT AFFECT TESTOSTERONE LEVEL**

Men can experience a drop in testosterone due to conditions or diseases affecting the:

* Testes – direct injury, castration, infection, radiation treatment, chemotherapy, tumors
* Pituitary and hypothalamus glands – tumors, medications (especially steroids, morphine or related drugs and major tranquilizers, such as haloperidol), HIV/AIDS, certain infections and autoimmune conditions

Genetic diseases, such as [Klinefelter syndrome](https://www.health.harvard.edu/mens-health/breast_disorders_in_men) (in which a man has an extra x-chromosome) and hemochromatosis (in which an abnormal gene causes excessive iron to accumulate throughout the body, including the pituitary gland) can also affect testosterone.

REFERENCES

Testosterone- what it does and doesn’t do. Harvard Health Publishing HARVARD MEDICAL SCHOOL July, 2015. Retrieved from: <https://www.health.harvard.edu/drugs-and-medications/testosterone-what-it-does-and-doesnt-do>

Spermatogenesis physiology encyclopedia Britannica. Retrieved from: <https://www.britannica.com/science/spermatogeneis>