**Peter Benjamin**

**18/mhs07/048( Pharmacology)**

**PHS 212**

**Renal Physiology**

**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 produces mature male gametes, commonly called sperm but more specifically known as spermatozoa, which are able to fertilize the counterpart female gamete, the oocyte, during conception to produce a single-celled individual known as a zygote. This is the cornerstone of sexual reproduction and involves the two gametes both contributing half the normal set of chromosomes (haploid) to result in a chromosomally normal (diploid) zygote.**

***Testosterone* is the primary male sex hormone and anabolic steroid.In male humans, testosterone plays a key role in the development of male reproductive tissues such as testes and prostate, as well as promoting secondary sexual characteristics such as increased muscle and bone mass, and the growth of body hair.In addition, testosterone is involved in health and well-being,and the prevention of osteoporosis.Insufficient levels of testosterone in men may lead to abnormalities including frailty and bone loss.**

**Testosterone can be described as having virilising and anabolic effects (though these categorical descriptions are somewhat arbitrary, as there is a great deal of mutual overlap between them).**

**\* Anabolic effects include growth of muscle mass and strength, increased bone density and strength, and stimulation of linear growth and bone maturation.**

**\* Androgenic effects include maturation of the sex organs, particularly the penis and the formation of the scrotum in the fetus, and after birth (usually at puberty) a deepening of the voice, growth of facial hair (such as the beard) and axillary (underarm) hair. Many of these fall into the category of male secondary sex characteristics.**

**\* Testosterone is used as a medication for the treatment of males with too little or no natural testosterone production, certain forms of breast cancer,and gender dysphoria in transgender men and non-binary individuals.**

***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.**

**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.**

**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.**

**Disease Transmission—Semen can transmit many sexually transmitted diseases and pathogens, including viruses like HIV and Ebola.Swallowing semen carries no additional risk other than those inherent in fellatio. This includes transmission risk for sexually transmitted diseases such as human papillomavirus (HPV) or herpes, especially for people with bleeding gums, gingivitis or open sores.Viruses in semen survive for a long time once outside the body.**

***Male infertility* refers to a male's 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.**

**CAUSES:**

**Genetics: Chromosomal anomalies and genetic mutations account for nearly 10–15% of all male infertility cases.**

**Y chromosome deletions**

**Y chromosomal infertility is a direct cause of male infertility due to its effects on sperm production, occurring in 1 out of every 2000 males. Usually affected men show no sign of symptoms other than at times can exhibit smaller teste size. Men with this condition can exhibit azoospermia (no sperm production), oligozoospermia (small number of sperm production), or they will produce abnormally shaped sperm (teratozoospermia).**

**PRE-TESTICULAR FACTORS**

**Pre-testicular factors refer to conditions that impede adequate support of the testes and include situations of poor hormonal support and poor general health including:**

**Varicocele, is a condition of swollen testicle veins.**

**It is present in 15% of normal men and in about 40% of infertile men.**

**It is present in up to 35% of cases of primary infertility and 69–81% of secondary infertility.**

**POST TESTICULAR FACTORS**

**Post-testicular factors decrease male fertility due to conditions that affect the male genital system after testicular sperm production and include defects of the genital tract as well as problems in ejaculation:**

**\* Vas deferens obstruction**

**\* Lack of Vas deferens, often related to genetic markers for cystic fibrosis**

**\***

**PREVENTION**

**\* Avoiding smokingas it damages sperm DNA**

**\* Avoiding heavy marijuana and alcohol use.**

**\* Avoiding excessive heat to the testes**

**TREATMENT:**

**Application of Hormonal Therapy**

***Male orgasm*: Men achieve orgasm through a series of steps involving a number of organs, hormones, blood vessels, and nerves working together. The typical result is ejaculation of fluid that may contain sperm through strong muscle contractions.**