

Name _____ Date _____

Human Reproduction - The Male Reproductive System

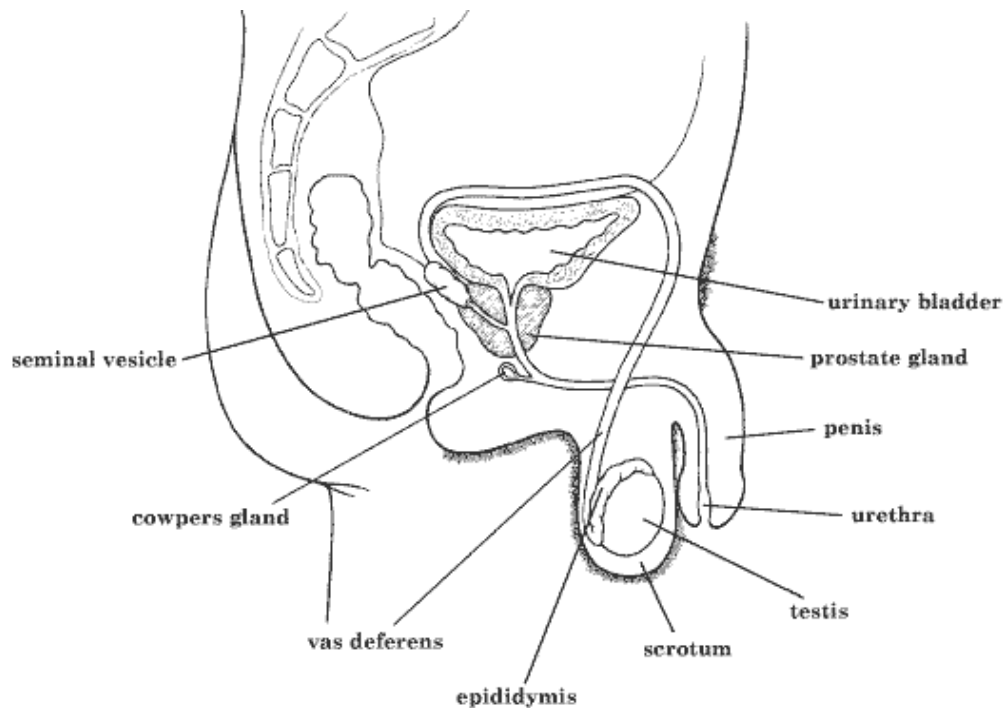
The male of the species contributes half of the genetic material to the offspring in the form of sperm. After puberty, males constantly produce millions of sperm. The strategy is to produce as many sperm as possible in the reproductive hope that one will be successful in fertilizing an egg.

Recently a lot has been learned about factors that affect male fertility including the kind of shorts you wear, smoking, alcohol and drug use. In this lesson we are going to study the structure and function of the male reproductive system.

The male reproductive system functions as a producer of sperm. You will recall that sexual reproduction requires gametes from both parents. The male gamete is called sperm. In order for fertilization to occur, sperm must unite with the female gamete called the egg.

The male reproductive system must both

- produce sperm and
- pass the sperm on to the female.



The diagram shown above illustrates the male reproductive system in humans. Each labelled part has an important function in the process of reproduction.

- **Scrotum**

The scrotum is a sac of tissue that holds the testes. The scrotum is external to the body, providing a cooler environment that allows development of healthy sperm.

- **Seminiferous tubules**

Tiny tubes in the testes that produce 300 to 500 million sperm per day.

- **Epididymis**

The epididymis is a storage place where sperm are kept until they leave the body.

- **Vas deferens**

The vas deferens carries sperm from the epididymis past the seminal vesicles and the prostate gland to the urethra.

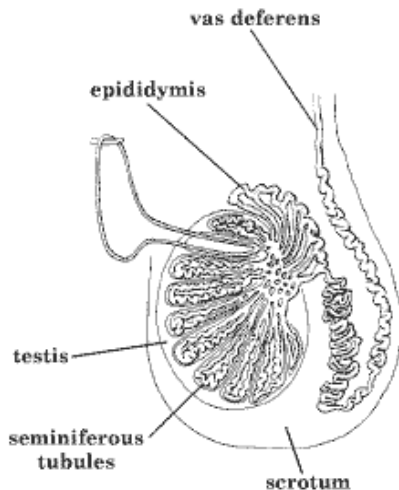
- **Prostate gland and seminal vesicles**

These glands provide the sperm with a fluid called **semen**. Semen is rich in sugar that provides the sperm with energy so they can swim from the male and unite with an egg in the female.

- **Urethra**

The vas deferens joins the same tube that carries urine from the bladder. The urethra has two functions - to carry sperm and to carry urine. A small valve in the bladder prevents both urine and sperm from travelling through the urethra at the same time.

Developing the Male Sex Cell



Sperm is produced in the **seminiferous tubules**. Seminiferous tubules are folded on each other to form a long tube approximately 70 cm in length. These tubules are responsible for producing huge amounts of sperm, up to 500 million in a day. Each human sperm is a single cell containing 23 chromosomes (haploid number). Only one sperm is needed to unite with an egg cell in the female to cause fertilization.

Why are so many sperm produced? One reason arises from the need for the sperm to travel from the male to the female sex organs. The journey is hazardous for the sperm, so the large numbers help make certain some will survive and fertilize the egg in the female.

A sperm has two parts—a head and a tail.



The **head** contains the chromosomes that are to be transferred to the egg. The head also contains an entry capsule made of chemicals that are capable of allowing the sperm to enter the egg.

The **tail** provides mobility the sperm needs to travel to the egg. The tail moves back and forth, propelling the cell to its destination.

Once the sperm leave the seminiferous tubules, they are stored in the epididymis until they leave the body. The seminiferous tubules and the epididymis are located in the scrotum. The scrotum is maintained at a constant temperature to provide the sperm with optimum conditions for production and storage.

To help the sperm move from the male to the female, three glands produce a fluid. The glands are called the **prostate gland**, the **cowpers gland** and the **seminal vesicles**. The fluid, called semen is placed in the vas deferens. The vas deferens leads to the urethra where sperm can travel through the penis into the female. The urethra has a dual function; it can either eliminate urine or semen. A small muscle at the bottom of the bladder allows only semen or urine to pass through the urethra at one time.

Male Hormones in Reproduction

Male sex hormones are essential for proper functioning of the reproductive system. The male and female embryos are identical until the seventh week following fertilization. At the seventh week a hormone is released in the embryo instructing it to produce male (or female) sexual structures.

Once the offspring is born, there are only small amounts of sex hormones released. These sex hormones help regulate the male sex organs but they remain non-functioning until the offspring reach **puberty**. At puberty, the brain instructs the body to begin rapid growth and to reach sexual maturity. At this time, the brain also begins the production of male sex hormones called **androgens**.

The part of the brain responsible for androgens is called the **hypothalamus**. The hypothalamus releases a hormone to the pituitary gland. The pituitary gland, in turn, releases two hormones abbreviated **LH** and **FSH**.

- LH travels to the testes and stimulates cells to produce **testosterone**. Testosterone is the most abundant male sex hormone and is responsible for male characteristics listed below. These characteristics begin to show at puberty.
 1. Onset of sperm production
 2. Sexual organs grow and develop.
 3. Voice changes; muscle and bone grow

- FSH combines with testosterone to stimulate the production of sperm.

Summary

The male reproductive system provides for the production and storage of sperm. The structure of the male reproductive system is established at the seventh week of embryo development. The male reproductive system is non-functioning until puberty. At this time, the hypothalamus signals the pituitary gland to release LH and FSH to the testes where, with testosterone, the production of sperm takes place.