

# The Male Reproductive System

## HEALTH TERMS

sperm cell  
 testes  
 scrotum  
 epididymis  
 penis  
 vas deferens  
 semen  
 urethra

## HEALTH CONCEPTS

- The male reproductive system functions to produce sperm.
- The male reproductive system has external and internal organs.
- Healthy care of the male reproduction system involves cleanliness, self-examinations, and regular visits to a doctor.

The male reproductive system functions to produce a **sperm cell**, the *male reproductive cell*. A sperm cell unites with a female egg cell, or ovum, to form a fertilized ovum. Males do not begin producing sperm until puberty—between the ages of 12 and 15. The pituitary gland secretes a hormone that causes the testes to begin producing testosterone. Testosterone causes the testes to begin producing sperm. Once a male reaches puberty and begins producing sperm, he is capable of producing sperm for the rest of his life. The process is called spermatogenesis.

## External Male Reproductive Organs

External male reproductive organs include the scrotum, the testes, and the penis. The **testes** are the *male sex glands*. They serve two important functions: they manufacture the male sex hormone, testosterone, and they produce male reproductive cells—sperm. The **scrotum** is a sac that hangs outside the body and holds the testes. One testicle usually hangs slightly lower than the other.

### The Scrotum

The scrotum is a loose pouch of skin that becomes darker as males grow and develop. As puberty progresses, hair will appear on the scrotum. As the testes grow, the skin of the scrotum becomes wrinkled.

The scrotum has an important function. It keeps the testes at the right temperature so they can produce sperm. The temperature of the testes must be about 3° to 4° F (1.5° to 2° C) lower than the normal body temperature of 98.6° F (37° C) to produce sperm. If body temperature rises, muscles in the scrotum relax to lower the testes away from the body. If the body temperature lowers, the muscles of the scrotum contract to pull the testes in close to the body.

### The Testes

Sperm are actually produced in a section of the testes called seminiferous tubules. These are a long series of threadlike tubes packed in the testes. There are about 1,000 of these tubes, each about one to three feet long. The combined length of all the tubules can extend almost one-half mile. These tubules are capable of producing billions and billions of sperm. The testes produce 500 million or more sperm each day.

Once sperm are produced, they move into the epididymis. The **epididymis** (ep-uh-DID-uh-muhs) is a *highly coiled structure located on the back side of each of the testes*. The epididymis stores newly produced sperm. *Epididymis* means “over the testis.” The epididymis is about 20 feet in length.

The maturation of the sperm, which began in the seminiferous tubules, continues in the epididymis. It takes about 64 days from the time sperm are produced until they become fully mature.

## Did You Know?

During fetal development, the male baby's testes are inside his body. About two months before birth, the testes usually descend into the scrotum. In some males, only one testicle descends. The other one may not descend until years later. In some cases, a surgical procedure in early childhood can correct an undescended testicle.

**NOTE.** The highest rate of sperm production and the healthiest, most active sperm cells are present in 15- to 19-year-old males.

**STRESS.** Sometimes a male will wake up with a partial erection caused by having a full bladder. After urinating, the penis returns to its soft state. This is different from a sexual erection.



▲ **Once sperm are produced in the testes, they mature in the epididymis.**

**The Sperm Cell.** A mature sperm is very tiny—about .0024 inch, or  $\frac{60}{10,000}$  millimeter, long. It consists of a head, a neck, a middle piece, and a tail. A normal sperm carries 23 chromosomes in the head. This is half the number of chromosomes in all the other cells of the body. When the sperm unites with an ovum, which also carries 23 chromosomes, the result is one cell of 46 chromosomes and the production of a human offspring.

## The Penis

The **penis** is a tubelike organ that functions in sexual reproduction, sexual pleasure, and elimination of body wastes. The penis is normally soft and hangs downward from the front of the body at the groin area. The penis is made up of three long cylinders of spongy tissue that line up parallel to the urethra. These cylinders are tissues filled with spaces much like a sponge. They contain a very rich supply of blood vessels and nerves. When the penis is soft, these cylinders contain little blood. However, when blood from the circulatory system fills these spaces, the penis becomes enlarged and hard, or erect. This process is called an erection. Contrary to what some people think, the penis is neither a muscle nor a bone. Erections result entirely from blood flow.

### ERECTIONS AND EJACULATION

Erections are a normal part of being a male. Male babies have erections. However, when a male goes through puberty, hormones cause the penis to become more sensitive, and the male will have erections more often. He may have an erection at any time and for no apparent reason. This can be embarrassing, but it is perfectly normal. The penis will return to its soft state.

Penis size, both in an erect and soft state, varies. Penis size also varies from male to male. It is important to note that size has nothing to do with the male's ability to be effective in the reproduction process.

In order for semen to leave the penis, the penis must be erect. This release of semen is called ejaculation. In the small amount of semen that leaves the body—perhaps less than a teaspoonful—there are about 300 to 400 million sperm.

However, just because the penis becomes erect does not mean semen must be released. The penis can return to its soft state without an ejaculation. A male may experience some discomfort and pain if sexual arousal lasts for a period of time and he does not ejaculate. The erection eventually goes away, but he may have a dull, sensitive, swollen feeling, especially in the testes. As the blood vessels in the penis fill with blood, causing an erection, there is also a swelling of the blood vessels and muscular pressure. The testes, epididymis, vas deferens, prostate, and seminal vesicles are all involved in this reaction. They become swollen and sensitive. If pressure builds up and there is no ejaculation, it can be painful for a time. However, this condition is not harmful in any way and eventually ceases.

### CIRCUMCISION

All male babies are born with a fold of skin that covers the end of the penis. This is called foreskin. Circumcision is the surgical removal of the foreskin. Some circumcision is performed as a religious custom. For

many years, doctors also thought it was necessary for health reasons to have a baby boy circumcised shortly after birth. Now doctors know that circumcision is not necessary for health reasons. Parents now choose whether to have their baby boy circumcised. In recent years, about half of all parents choose not to circumcise their sons.

One difference between the circumcised and uncircumcised penis is the way the penis looks. The ridge that forms the head of the penis may be obvious on a circumcised penis. The foreskin covers this ridge on an uncircumcised penis.

## Internal Male Reproductive Organs

Internal male reproductive structures include the vas deferens, seminal vesicles, prostate gland, Cowper's glands, and urethra.

### The Vas Deferens

After the sperm mature in the epididymis, they travel into the **vas deferens** (vas-DEF-uh-ruh-nz), *a long tube that connects the epididymis with the urethra*. There are two of these tubes, each about 18 inches long. The vas deferens are lined with cilia, fingerlike projections that help move the sperm through the tube. It is thought that while the sperm are in the epididymis and vas deferens, they have little ability to move on their own. Not until they mix with other fluids do they become mobile.

The vas deferens loops over the pubic bone, around the bladder, and through the prostate gland. As it passes through the prostate gland, it narrows and becomes the ejaculatory duct. The ejaculatory duct opens into the urethra.

### The Seminal Vesicles

In the illustration on page 20, you will notice two little pouches just above and on either side of the prostate gland. These are the seminal vesicles (*vesicle* means "fluid-filled pouch"). The seminal vesicles secrete a fluid that mixes with the sperm. This fluid helps make the sperm mobile and provides nourishment to the sperm. The fluid from the seminal vesicles travels down the ejaculatory duct to mix with the sperm.

### The Prostate Gland

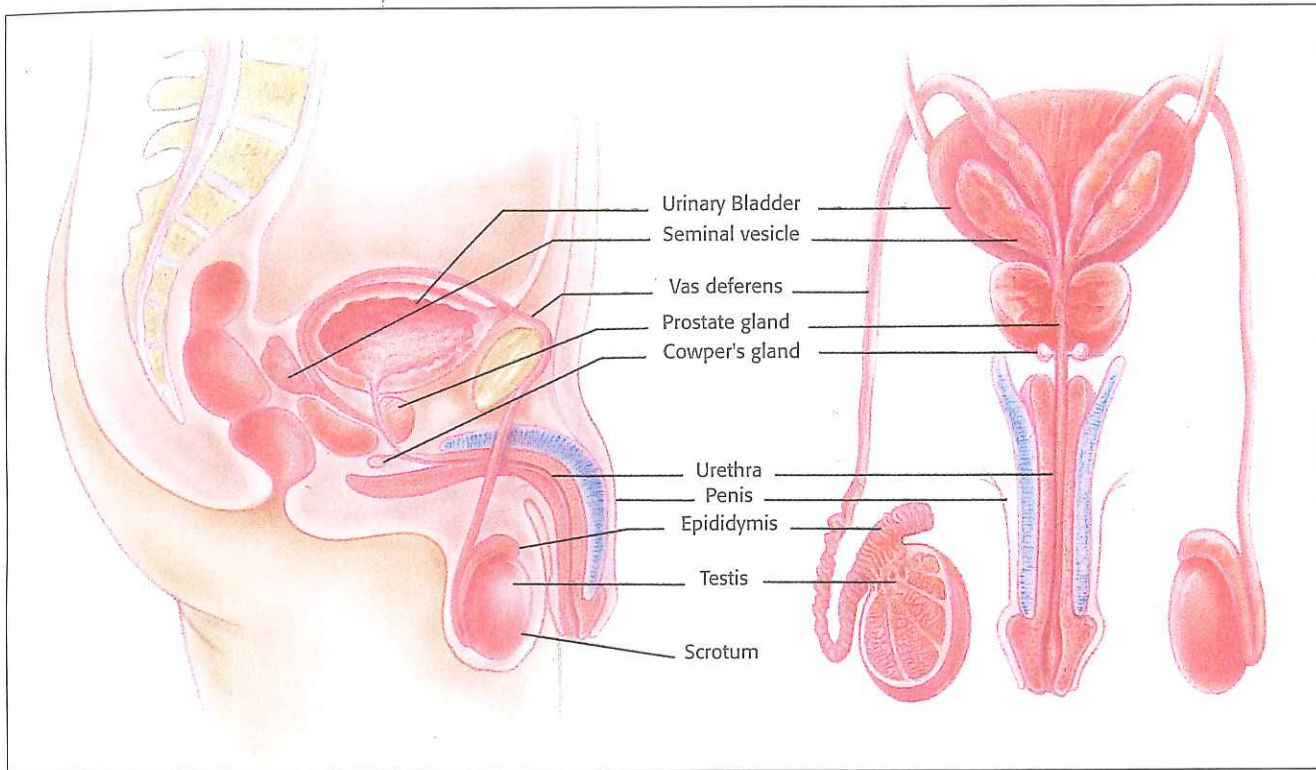
The prostate gland lies just below the bladder and surrounds the urethra. It is about the size of a chestnut. It is made up of both muscular and glandular tissue. The prostate secretes a milky, alkaline fluid that mixes with sperm and makes up the major portion of semen. It is this solution that helps protect sperm by neutralizing the acidity of the urethra and vagina in the female.

### The Cowper's Glands

Just below the prostate are two pea-sized glands that open into the urethra. These glands, the Cowper's glands, secrete a clear, sticky fluid that is thought to cleanse the urethra of acid from urine, thus allowing the safe passage of sperm. *The mixture of sperm and fluids from the seminal vesicles, prostate gland, and Cowper's glands* is called **semen**. Some of the clear fluid from the Cowper's gland is released before the semen is

**NOTE.** A male who does not want to father any children can have a vasectomy. The vas deferens is cut and tied, preventing sperm from getting out of the body. This has no effect on the male's masculinity or sex drive. He still has ejaculations.

**NOTE.** The seminal vesicles store approximately six weeks' worth of sperm.



**The male reproductive system**

released. This secretion causes droplets of fluid to form on the end of the penis before ejaculation. These droplets of fluid can contain sperm. That means pregnancy can occur from the secretions of the Cowper's glands, even if semen never leaves the penis.

**The Urethra**

The **urethra** is a tubelike organ that travels through the penis. It leads from the ejaculatory ducts. The urethra serves as a passageway for sperm and urine. However, it is impossible for sperm and urine to leave the body at the same time. Special muscles surround the urethra at the base of the bladder. When semen is preparing to leave the body, these muscles contract to close off the bladder. Urine cannot leave through the urethra when semen is leaving the body.

**Concerns About the Male Reproductive System**

Nocturnal emissions, hernia, sterility, and cancer of the testes or prostate are some factors males should be aware of in promoting their health.

**Nocturnal Emission**

As a male goes through puberty, hormones cause the glands in the reproductive system to begin producing the fluids that constitute sperm. All this new fluid causes pressure to build in the reproductive system. However, the male body has a way of relieving this pressure. While the male is asleep, the penis becomes erect, and he will have an ejaculation. This is called a nocturnal emission. There is no warning when it occurs, and the male cannot prevent it from happening.

A nocturnal emission may or may not be accompanied by a dream. Most males experience wet dreams, or dreams dealing with sexual content that result in ejaculation, as they go through puberty. It is perfectly normal if males do experience these dreams, and it is just as normal if they do not.

## Hernia

A hernia is the pushing of a part of the body through the muscle wall normally keeping it in. Hernias, therefore, may occur in various parts of the body. A common hernia of the male reproductive system is called the inguinal hernia. This is a weak spot in the abdominal wall near the top of the scrotum. Sometimes, straining the abdominal muscles can cause a tear in this spot. A part of the intestine can then push through into the scrotum. Surgery can correct this. A male can help avoid such hernia by using care when lifting or pushing heavy objects. When lifting must be done, the male should lift with his legs rather than his back.

## Sterility

Sterility in the male is a condition wherein the sperm of the male is weak, malformed, sparse or nonexistent, or unable to join an ovum. Therefore, fertilization does not take place. Temperature changes, exposure to certain chemicals, smoking, contracting mumps as an adult, an untreated STD, and faulty operation of the epididymis, vas deferens, or urethra can all result in sterility.

## Testicular Cancer

While cancer of the testes accounts for only one percent of all cancers in men, it is the most common cancer in men ages 15 to 34 years old. It accounts for 12 percent of all cancer deaths in this group. If discovered in the early stages, testicular cancer can be treated properly and effectively. It is important for you to take time to learn the basic facts about this type of cancer—and what you can do to get the help you or someone you know needs if it occurs.

The first sign of testicular cancer is usually a slight enlargement of one of the testes and a change in its consistency. There may be a small, hard lump in the testicle or a collection of fluid or blood in the scrotum. Pain may be absent, but often there is a dull ache in the lower abdomen and groin, together with a sensation of dragging and heaviness. Men who have an undescended or partially descended testicle are at a much higher risk of developing testicular cancer than others. Surgery should be done at an early age to correct this problem.

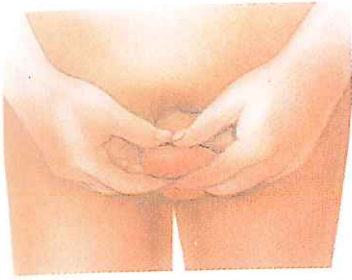
## Problems of the Prostate

Problems with the prostate, including cancer, occur mainly in older men. One problem occurs because, as males get older, the prostate may get bigger and block the urethra or bladder. This blockage may cause difficulty in urinating or with sexual functions. To correct this condition, the man may need surgery. This type of blockage has symptoms similar to prostate cancer.

After lung cancer, prostate cancer is the most common cancer in men. The symptoms of possible prostate cancer include: frequent urination, difficulty urinating, pain or burning when urinating, blood in the urine,

**NOTE.** Testicular torsion is another male health concern. It is the result of abnormal twisting of one of the testicles, which can cut off its blood supply. Torsion causes severe testicular pain and noticeable swelling. If not treated, permanent damage can result. It can be the result of physical overactivity.

**NOTE.** Over 80 percent of all prostate cancers are diagnosed in men over the age of 65. Prostate cancer is more common among African-American men than it is among white American men. Several studies suggest that men who eat a high-fat diet have a greater chance of getting prostate cancer. Prostate cancer also seems to run in some families, suggesting a hereditary factor.



▲ **Each month the testes should be examined separately for changes or lumps.**

**STRESS.** Males who participate in athletics—especially contact sports—should wear a protective cup to prevent injury to the scrotum and testes.

or lingering pain in the back, hips, or pelvis. Unfortunately, there are often no early symptoms of prostate cancer. The only prevention is regular examinations by a doctor.

## Male Reproductive Health

Care of the male reproductive system becomes important as a person goes through puberty. Cleanliness is important to prevent body odor.

### Cleanliness of the Uncircumcised Penis

It is very important for a male who is uncircumcised to wash very thoroughly every time he bathes or showers. He should pull the fold of the foreskin back and wash under it. A substance called smegma, which is made up of dead cells and glandular secretions, can get trapped under the foreskin. Without proper health care, pathogens can grow and multiply in smegma and cause irritation and infection. Circumcised males also must wash this area.

### Testicular Self-Examination

Early detection of testicular cancer can be accomplished with a simple three-minute monthly self-examination. The best time is during or after a warm bath or shower, when the scrotal skin is relaxed. The male rolls each testicle gently between the thumb and fingers of both hands. If there are any hard lumps or nodules on a testicle, he should see his doctor promptly. The testicle may not be cancerous, but only a doctor can make such a diagnosis. Following a thorough physical examination, the doctor may perform certain tests to make the most accurate diagnosis possible. Self-examination for testicular cancer should be done by all males from puberty to 50 years old.

## LESSON

# 1

## Review

### Reviewing Facts and Vocabulary

1. What is the main function of the male reproduction system?
2. List the external and internal male reproductive organs.
3. Name one male reproductive disorder and define it.
4. Name two ways to care for the male reproductive system.

### Thinking Critically

5. **Evaluating.** Compare testicular cancer and prostate cancer.

LESSON 1 REVIEW ANSWERS ARE FOUND ON PAGE TM18.

6. **Synthesizing.** How might the male reproductive system be affected if the vas deferens did not function properly?

### Applying Health Skills

7. **In Your School.** Choose one disorder of the male reproductive system not mentioned in this lesson. Research it and prepare a written report that defines the disorder and suggests ways to prevent and treat it.