LESSON 1

The Male Reproductive System

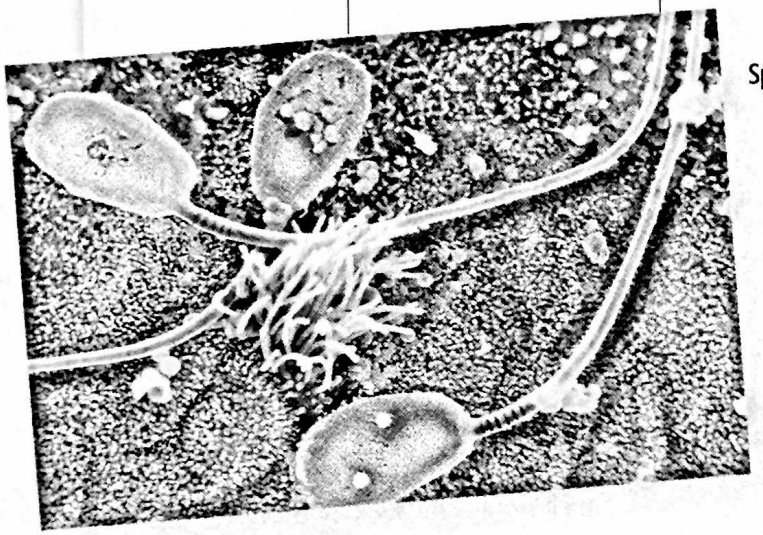
HEALTH TERMS

testosterone
sperm
testes
penis
semen
fertilization
circumcision
sterility

HEALTH CONCEPTS

- The male reproductive system produces sperm, male reproductive cells.
- Regular hygiene and self-examinations are important components of male reproductive system care.

Reproduction is one of the essential functions of living organisms. It is as necessary for the preservation of the species as getting food is for the preservation of the individual. In humans, as in many other animal species, reproduction occurs by means of a system of organs known as the *reproductive system.*



Sperm cells magnified

Functions and Structure of the Male Reproductive System

During the early teen years, the male reproductive system reaches maturity. Hormones released by the pituitary gland stimulate the testes to begin producing the *male sex hormone* **testosterone.** Testosterone initiates physical changes, including broadening of the shoulders, development of muscles, facial and other body hair, and deepening of the voice.

Testosterone also causes the production of **sperm,** *male reproductive cells.* Once a male is physically mature, he is capable of manufacturing sperm for the rest of his life. The production of sperm and the transfer of it to the female's body during sexual intercourse are the two main biological functions of the male reproductive system.

External Male Reproductive Organs

Some of the organs involved in the process of reproduction are internal to the male's body; others are external. The main external organs are the testes and penis.

Also known as the *testicles,* the **testes** are *two small glands that produce sperm* at the rate of 100 million per day. The sperm resemble tadpoles and are so tiny that 500 of them lined up would measure only an inch.

The testes hang outside the body in a sac called the *scrotum.* This sac protects sperm by keeping the testes at a temperature slightly below the normal body temperature of 98.6°F (37°C). If body temperature rises, the muscles of the scrotum relax, lowering the testes away from the body. If body temperature drops, the muscles contract, pulling the testes closer to the body. Any clothing or other restraint that holds the testicles too close to the body can interfere with sperm production. Even wearing pants that are too tight is believed to interfere with the natural cooling of the testicles.

The **penis** is *a tube-shaped organ attached to the trunk of the body just above the testes.* The penis is composed of spongy tissue that contains many blood vessels. As a result of increased blood flow, the penis becomes enlarged and erect. Males of every age experience erections, and these can occur for no reason at all. Sometimes an erection results from friction of the clothing a male is wearing.

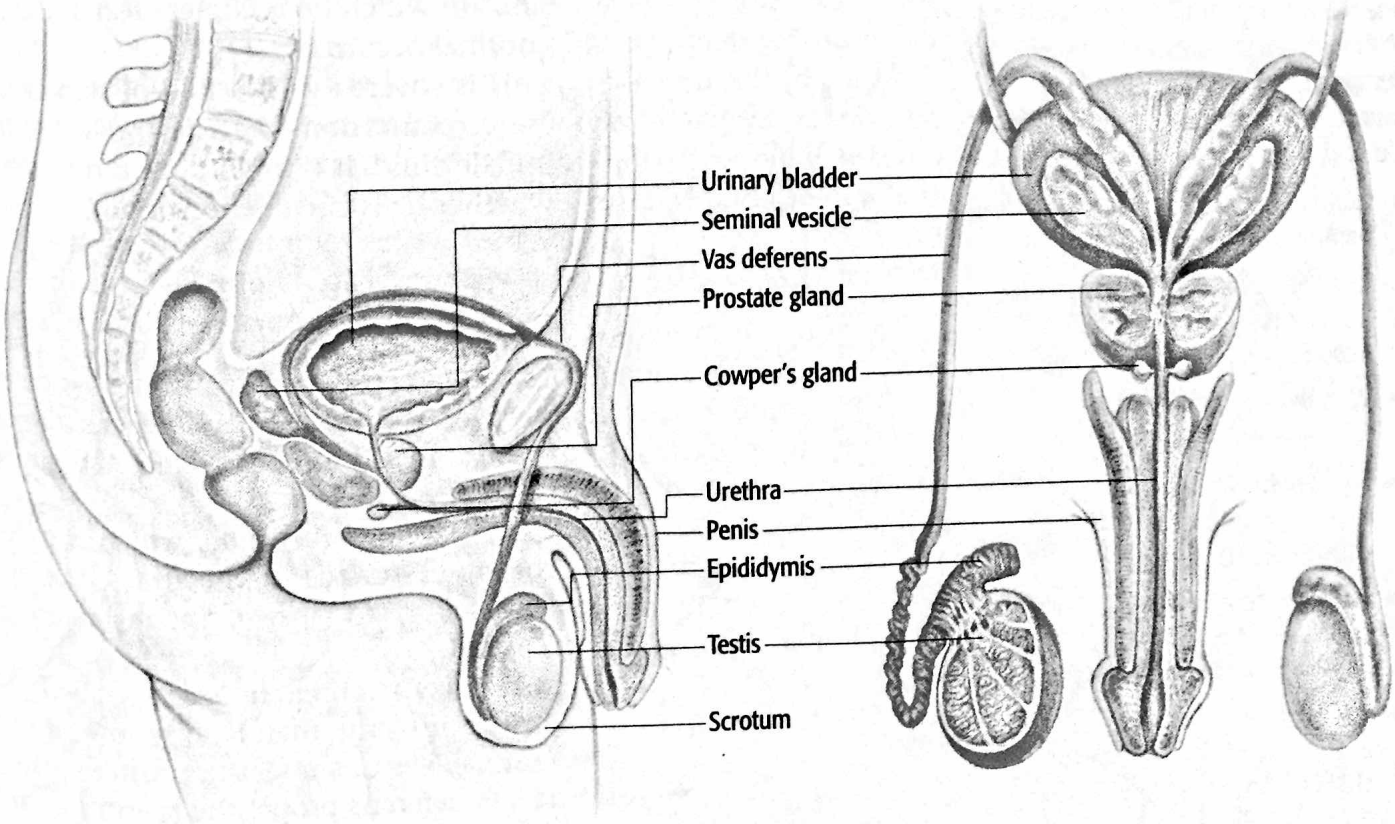
Did You Know?

- One spoonful of semen contains between 100 million and 500 million sperm.
- There are 300 million to 400 million sperm in each ejaculation, but only one can fertilize an ovum.

The male reproductive system produces sperm in the testes.

ACTIVITY ***Name the other main function of the male reproductive system.***

THE MALE REPRODUCTIVE SYSTEM



Making Responsible Decisions

The Voice of Reason

Claude is the star of his school's debating team. The problem is that his voice is changing, causing it to "crack." Although

no one has said anything to him, Claude is very self-conscious—almost to the point of being afraid to speak. A big debate is coming up, and Claude doesn't know what to do. One thing he *does* know is that his team is counting on him!

What Would You Do?

Apply the six steps of the decision-making process to Claude's problem.

1. **State the situation.**
2. **List the options.**
3. **Weigh the possible outcomes.**
4. **Consider your values.**
5. **Make a decision and act.**
6. **Evaluate the decision.**

keeping Fit

Steps to Performing a Testicular Exam

Once a month, males should examine themselves for testicular cancer. Although the majority of testicular lumps do not signify cancer, it is wise to seek a doctor's advice if you do find a lump.

- Examine the testicles after a warm bath or shower, and lying down.
- Cup the scrotum in the palms of both hands. Note any changes from the last examination.
- With thumb and fingers, gently roll each testicle around.
- Squeeze the testicles gently to note the firm, not hard, consistency.
- Examine the epididymis. It feels softer than the testicles and it may be spongy and a little tender.
- A hard, painless pea-sized nodule and any swelling on the testicle should be reported to a doctor.

Erections also occur as the result of becoming sexually aroused. At the height of sexual arousal, a series of muscular contractions known as *ejaculation* may occur. During ejaculation, **semen**—*a thick fluid containing sperm and other secretions from the male reproductive organs*—is propelled from the penis. If this happens during sexual intercourse, fertilization may be initiated. **Fertilization** is *the union of a reproductive cell from a male and one from a female.*

When a male begins to produce sperm, he may experience a nocturnal emission, or "wet dream," in which he becomes erect and ejaculates during sleep. This is a normal occurrence.

At birth, the tip of the penis is covered with a fold of skin called *foreskin.* Some parents choose **circumcision**—*surgical removal of the foreskin of the penis*—for their male child. It is important to remember that a male child is normal whether he is circumcised or not.

Internal Male Reproductive Organs

The internal structures of the male reproductive system play a role in the delivery of sperm. These include the epididymis, the vas deferens, the seminal vesicles, the prostate gland, the Cowper's glands, and the urethra. The urethra is also involved in the removal of liquid wastes from the body.

The tubes in each testis join a larger coiled tube, which is called the *epididymis.* Located at the outer surface of the testes, the epididymis is a temporary storage facility for sperm. Sperm mature in the epididymis.

The vas deferens are a pair of connecting tubes, each about 18 inches (46 cm) long, that lead up into the male's body toward two other internal organs, the seminal vesicles and the prostate gland. The thick muscle walls of the vas deferens propel the sperm forward in powerful spurts just before ejaculation.

As sperm move through the vas deferens, they are combined with a fluid produced by the seminal vesicles. These are glands that are about 2 inches (5 cm) long and attached to the vas deferens near the base of the bladder. The fluid contains nutrients and mixes with sperm to make them more mobile and to provide nourishment. The seminal vesicles and vas deferens meet to form the ejaculatory duct.

As sperm continue on their journey through the ejaculatory duct, they are next mixed with fluids secreted from the prostate gland—a small gland that surrounds the urethra—and from Cowper's glands, which are located below the prostate gland. Semen, or seminal fluid, is now fully formed. The secretion from the Cowper's glands also neutralizes the acid content before semen is ejaculated.

The urethra is the passageway through which both semen and urine leave the body. Semen and urine do not pass through the body at the same time. A muscle near the bladder contracts, preventing urine from entering the urethra when semen is present.

The groin area should be protected from possible injury when playing sports.

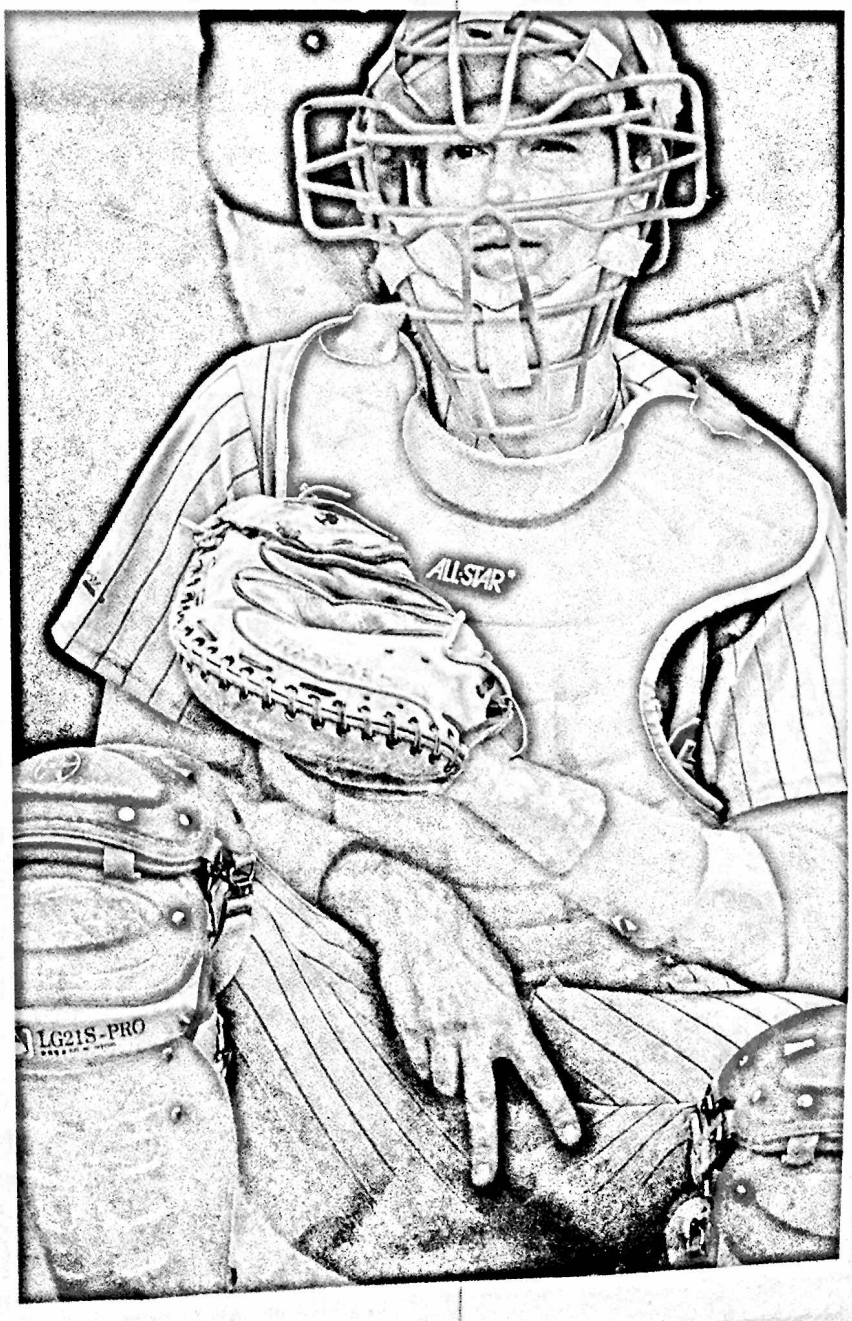
ACTIVITY ***List sports that you play and name the protective equipment you wear during these sports.***

Care of the Male Reproductive System

Caring for the male reproductive system involves cleanliness, protection, and self-examination. To stay healthy, males should shower daily, completely cleansing the penis and scrotum. A male who is uncircumcised must practice extra hygiene, taking care to wash underneath the foreskin.

Another aspect of male reproductive care is avoiding clothing that is too tight and wearing a protector or supporter during strenuous activity to help shield the groin area and the external reproductive organs.

In addition, once a male is physically mature, he should perform a monthly self-examination of his testes for signs of cancer. Any lumps, thickenings, or change in texture or size of the testes should be reported to a doctor, even though such signs do not always mean cancer has developed. If cancer is present, however, early detection usually leads to successful treatment.



➤ ***Talk to a school nurse, doctor, or other health professional to get accurate health information.***

ACTIVITY ***List questions you may have that can be answered by a health professional.***

Problems of the Male Reproductive System

The organs of the male reproductive system can be affected by both functional and structural problems. The effect of **sexually transmitted diseases (STDs)** on these organs will be discussed in Chapter 29.

Hernia

A hernia occurs when part of an organ pushes through an opening of a membrane or muscle that usually contains the organ. Hernias occur in various parts of the body. A common hernia of the male reproductive system is an inguinal hernia. This is a weak spot in the abdominal wall in the lowest lateral regions of the abdomen 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 abdominal area. Surgery is usually necessary to correct such a hernia.

Sterility

Sterility is *a condition in which a person is unable to reproduce.* In a male, this can be the result of producing too few sperm—less than 20 million sperm per milliliter (ml) of seminal fluid—or sperm of poor quality. Environmental hazards that damage the sperm-making process include exposure to X rays, radiation, and lead from motor exhaust. Sterility can arise as a result of temperature change, exposure to certain chemicals, smoking, contracting mumps as an adult,

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sexually transmitted diseases (STDs) For more information on sexually transmitted diseases (STDs) and ways to avoid them, see Chapter 29, page 640.

keeping Fit

Steps to Becoming a Responsible Young Male

The ability to produce sperm is a major responsibility. Yet, in truth, it has nothing to do with becoming a responsible man. Here are some ways to show you are responsible:

- Respect yourself and other people.
- Control your sexual feelings and never impose them on others.
- Distinguish between sexual information that is designed to excite and "sell" and sexual information that is designed to inform.

complications of an STD, or malfunction of one of the internal male reproductive organs.

Enlarged Prostate Gland

The prostate gland can enlarge for reasons such as infection, a tumor, or old age. When the gland enlarges, it tends to squeeze the urethra, resulting in frequent or difficult urination. Treatments for enlarged prostate include special exercises to improve bladder control, medications that shrink an enlarged prostate or relax the prostatic muscle, and surgery to remove excess tissue.

Cancer of the Prostate Gland

Cancer is an uncontrolled growth of cells. The prostate gland is often a cancer site in older males. Prostate cancer is the second highest incidence of cancer in males. Only a doctor can diagnose prostate cancer. Early detection is important because prostate cancer can be treated if it is localized in the gland. Surgical removal of the prostate or radiation therapy and hormone therapy are current treatments.

Cancer of the Testes

Cancer of the testes occurs most frequently in males between the ages of 15 and 35 in the United States. The first sign of testicular cancer is usually a slight enlargement of one of the testes. The male may not experience any pain at all, or he might have a dull ache in the lower abdomen and groin. Hard lumps, or nodules, on the testes may be a sign of cancer. Testicular cancer can be cured in 90 percent of cases if it is caught early.