

Endocrine and Reproductive Systems



Lesson 1 The Endocrine System

Lesson 2 The Male Reproductive System

Lesson 3 The Female Reproductive System



Gender Representation in the Media

Is there gender bias in news coverage? Are women reporters seen as frequently on the news as men? Gender biases in the media may be reflected in

- ▶ television news reporting.
- ▶ magazine writing.
- ▶ newspaper writing.

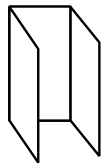
Visit the Eye on the Media section at health.glencoe.com to learn more about gender bias in your city's media.

FOLDABLES™ Study Organizer

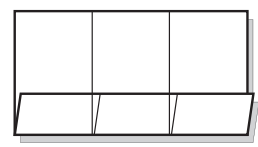
Before You Read

Make this Foldable to help you organize your notes on the structure and function of the endocrine system. Begin with a sheet of 11" x 17" paper.

▶ **Step 1**
Fold a sheet of paper into thirds.



▶ **Step 2**
Fold the bottom edge up 2 inches and crease.



▶ **Step 3**
Glue the outer edges of the fold to create three pockets. Label as shown. Place 3" x 5" notecards or pieces of paper in the pockets.

Endocrine System		
Structure	Function	Problems

As You Read

As you read and discuss the material in the chapter, use notecards to record and define terms, draw diagrams, list main ideas and supporting facts, and give examples of how you might use what you've learned in your daily life. Place the notecards in the appropriate pocket in your Foldable.

SPOTLIGHT ON HEALTH

Using Visuals. Many hormonal changes take place during the teen years. How are the endocrine and the reproductive systems related?

The Endocrine System

Guide to Reading

Building Vocabulary

As you read this lesson, write each new highlighted term and its definition in your notebook.

- ▶ endocrine glands (p. 464)
- ▶ hormones (p. 464)
- ▶ thyroid gland (p. 465)
- ▶ parathyroid glands (p. 465)
- ▶ pancreas (p. 465)
- ▶ pituitary gland (p. 465)
- ▶ gonads (p. 466)
- ▶ adrenal glands (p. 466)

Focusing on the Main Ideas

In this lesson, you will learn how to:

- ▶ **Describe** the glands of the endocrine system and the function of each.
- ▶ **Examine** the effects of health behaviors on the endocrine system.




The endocrine system causes bodies to change during adolescence. Write a short paragraph describing why it is especially important to eat nutritious foods during the teen years.

Reading Strategy

Organize Information

- ▶ **Make a two-column chart.** On the left side of the chart, list facts about the structure of the endocrine system, including the function of the glands. On the right side of the chart, list facts about the problems of the endocrine system.

 When the brain recognizes a stressful situation, the endocrine system reacts by releasing the hormone adrenaline. *How do these changes help prepare the body to react under stress?*



All the cells in your body respond to messages sent by three of your major body systems—the nervous system, the immune system, and the endocrine system. These three systems work closely together to coordinate the functions of the body. The endocrine system is especially important during the teen years because one of its main functions is to regulate growth and development. Health-literate individuals can analyze and describe the relationship between the glands and hormones that control the secondary sex characteristics.

Structure of the Endocrine System

Endocrine glands are ductless—or tubeless—organs or groups of cells that secrete hormones directly into the bloodstream. **Hormones** are chemical substances that are produced in glands and help regulate many of your body's functions. Hormones are secreted by the endocrine glands and then carried to their destinations in the body by the blood. These chemical messengers influence physical and mental responses. Hormones produced during puberty trigger physical changes in the body. **Figure 18.1** describes the major glands of the endocrine system and the body functions they regulate.



FIGURE 18.1

THE ENDOCRINE SYSTEM

The glands of the endocrine system are located throughout the body. Each gland has at least one particular function.

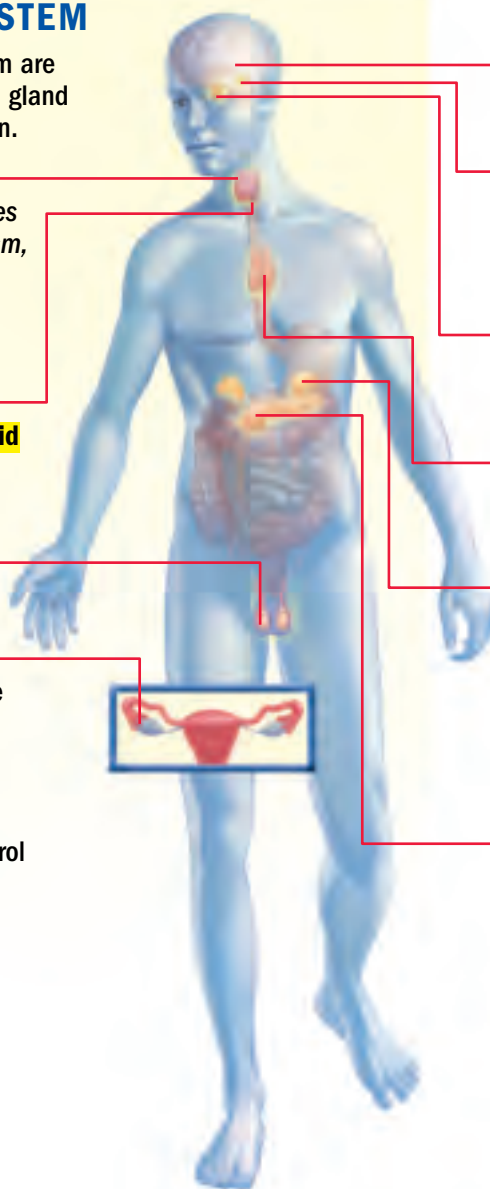
Thyroid The **thyroid gland** produces hormones that regulate metabolism, body heat, and bone growth. The thyroid produces thyroxine, which regulates the way cells release energy from nutrients.

Parathyroid Glands The **parathyroid glands** produce a hormone that regulates the body's calcium and phosphorus balance.

Testes The testes are the male reproductive glands.

Ovaries The ovaries are the female reproductive glands.

Besides playing a role in reproduction (as described in Lessons 2 and 3), the testes and ovaries control the development of secondary sex characteristics during puberty.



Hypothalamus The hypothalamus links the endocrine system with the nervous system and stimulates the pituitary gland to secrete hormones.

Pineal Gland This gland secretes melatonin, which regulates sleep cycles and is thought to affect the onset of puberty.

Pituitary Gland The pituitary regulates and controls activities of other endocrine glands.

Thymus Gland The thymus regulates development of the immune system.

Adrenal Glands These glands produce hormones that regulate the body's salt and water balance. Secretions from the adrenal cortex and the adrenal medulla control the body's emergency response.

Pancreas The **pancreas** is a gland that serves both the digestive and the endocrine systems. As an endocrine gland, the pancreas secretes two hormones that regulate the level of glucose in the blood—glucagon and insulin.

Pituitary Gland

The **pituitary gland** regulates and controls the activities of all of the other endocrine glands. The pituitary is known as the master gland. It has three sections, or lobes—anterior, intermediate, and posterior.

- ▶ **Anterior lobe.** The anterior, or front, lobe of the pituitary gland produces six hormones. Somatotrophic, or growth, hormone stimulates normal body growth and development by altering chemical activity in body cells. Thyroid-stimulating hormone (TSH) stimulates the thyroid gland to produce hormones. Adrenocorticotropic (uh-DREE-noh-kawr-ti-koh-TROH-pik) hormone (ACTH) stimulates production of hormones in the adrenal glands.



Analyze What are the functions of the thyroid gland and the parathyroid gland (Figure 18.1)?



Hormones produced by the pituitary gland play a role in determining height.

Appraise the significance of other body changes occurring during adolescence.



Apply How can you keep your endocrine system functioning at peak performance?

Two hormones that stimulate production of all other sex hormones are secreted by the pituitary's anterior lobe during adolescence. Follicle-stimulating hormone (FSH) and luteinizing hormone (LH) control the growth, development, and functions of the **gonads**, another name for *the ovaries and testes*.

- In females FSH stimulates cells in the ovaries to produce estrogen, a female sex hormone that triggers the development of ova. LH is responsible for ovulation and stimulates ovarian cells to produce progesterone. The hormone prolactin stimulates milk production in females who have given birth.
 - In males LH stimulates cells in the testes to produce the male hormone testosterone. FSH controls the production of sperm.
- ▶ **Intermediate lobe.** The intermediate, or middle, lobe of the pituitary secretes melanocyte-stimulating hormone (MSH), which controls the darkening of the skin by stimulating skin pigments.
- ▶ **Posterior lobe.** The posterior, or rear, lobe of the pituitary gland secretes antidiuretic hormone (ADH), which regulates the balance of water in the body. ADH also produces oxytocin, which stimulates uterine contractions during the birth of a baby.

Adrenal Glands

The **adrenal glands** are glands that help the body recover from stress and respond to emergencies. They each have two parts.


- ▶ The **adrenal cortex** secretes a hormone that inhibits the amount of sodium excreted in urine and serves to maintain blood volume and pressure. It also secretes hormones that aid the metabolism of fats, proteins, and carbohydrates. These hormones play a role in immunity and the body's response to stress.
- ▶ The **adrenal medulla** is controlled by the hypothalamus and the autonomic nervous system. It secretes the hormones epinephrine (also called adrenaline) and norepinephrine. Epinephrine increases heartbeat and respiration, raises blood pressure, and suppresses the digestive process during periods of high emotion.

Problems of the Endocrine System

Factors such as stress, infection, and changes in the balance of fluid and minerals in the blood can cause hormone levels to vary. Often these situations will correct themselves. More serious problems, including those described here, may require medication.

- ▶ **Diabetes mellitus** is a disorder in which the pancreas produces too little or no insulin, resulting in high blood glucose levels. Symptoms include fatigue, weight loss, thirst, and frequent urination.

- ▶ **Graves' disease**, also called *hyperthyroidism*, is a disorder in which an overactive and enlarged thyroid gland produces excessive amounts of thyroxine. Symptoms include nervousness, weight loss, increased thirst, rapid heartbeat, and intolerance for heat. Low thyroxine production, called *hypothyroidism*, causes fatigue, dry skin, weight gain, constipation, and sensitivity to cold.
- ▶ **Cushing's disease** results from the overproduction of adrenal hormones. Symptoms include round face, humped upper back, thin and easily bruised skin, and fragile bones.
- ▶ **Goiter**, an enlargement of the thyroid gland, is caused mainly by a lack of iodine in the diet. Since the introduction of iodized salt, goiters have become rare in the United States.
- ▶ **Growth disorders** are caused by abnormal amounts of growth hormone. With early diagnosis and proper treatment, a child with a growth disorder can reach a normal height.

 **Staying physically active is one way to reduce stress and to keep your endocrine system healthy. What other healthful behaviors help ensure the health of this system?**



Care of the Endocrine System

To keep your endocrine system functioning at peak performance, take care of all of your body systems. Eat nutritious meals, get enough sleep, and avoid stress. A health care professional can perform medical tests to determine whether your endocrine function is normal.

LESSON

1

REVIEW

Reviewing Facts and Vocabulary

1. What is an *endocrine gland*?
2. What are the two parts of the adrenal glands, and what do they do?
3. What are the functions of FSH and LH?

Thinking Critically

4. **Evaluating.** Do you agree with the statement that the pituitary gland is the “master gland”? Explain your reasoning.
5. **Analyzing.** Which endocrine glands become more active during puberty? Name the hormones these glands produce, and appraise the significance of changes occurring during adolescence that they cause.

Applying Health Skills

Self Management. On a sheet of paper, write the names of two endocrine glands. List one important function of each gland. Then write a statement examining the effects of health behaviors on the endocrine system.

After You Read

Cause and Effect. Create a two-column chart. In one column, list the problems that may affect the endocrine system. In the second column, list some of the symptoms of that disorder.



The Male Reproductive System

Guide to Reading

Building Vocabulary

As you read this lesson, write each new highlighted term and its definition in your notebook.

- ▶ reproductive system (p. 468)
- ▶ sperm (p. 468)
- ▶ testosterone (p. 469)
- ▶ testes (p. 469)
- ▶ scrotum (p. 469)
- ▶ penis (p. 469)
- ▶ semen (p. 469)
- ▶ sterility (p. 472)

Focusing on the Main Ideas

In this lesson, you will learn how to:

- ▶ **Describe** the parts and functions of the male reproductive system.
- ▶ **Examine** care of the male reproductive system and identify situations requiring professional health services.
- ▶ **Describe** abstinence as it relates to the prevention of STDs.

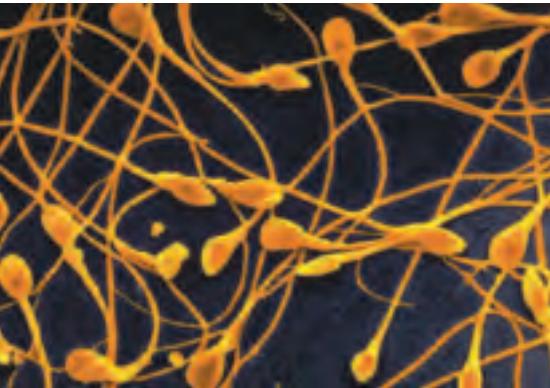
Reading Strategy

Organize Information

- ▶ Create a chart with four boxes. In the top left box, list the functions of the male reproduction system. In the top right box, list the structure of the system. In the lower boxes, list ways to care for the system on the left and problems of the system on the right.

Quick Write

Write a short paragraph explaining what changes occur when the male reproductive system matures.



There are 300 million to 400 million sperm in each ejaculation, but only one can fertilize an ovum.

What is the relationship of testosterone to sperm?

An essential function of all living things is reproduction, the process by which life continues from one generation to the next. In humans, as in many other animal species, reproduction results from the union of two specialized sex cells—one from the male and one from the female. These cells are made by the **reproductive system**, the system of organs involved in producing offspring.

Structure and Function of the Male Reproductive System

The male reproductive system includes both external and internal organs. The two main functions of the male reproductive system are the production and storage of **sperm**, the male reproductive cells, and the transfer of sperm to the female's body during sexual intercourse. During the early teen years, usually

between the ages of 12 and 15, the male reproductive system reaches maturity. At that time hormones produced in the pituitary gland stimulate the production of **testosterone**, the male sex hormone. Testosterone initiates physical changes that signal maturity, including broadening of the shoulders, development of muscles and facial and other body hair, and deepening of the voice. Testosterone also controls the production of sperm. A physically mature male is capable of producing sperm for the rest of his life. Health-literate teens can describe gender differences, expectations, and biases. At this time in a teen's life, it is important to learn to identify ways of resisting persuasive tactics regarding sexual involvement.

External Male Reproductive Organs

The testes, the penis, and the scrotum are external structures involved in the process of reproduction. The **testes** (singular, *testis*), also called testicles, are *two small glands that produce sperm*. These glands secrete testosterone. The testes are located in the **scrotum**, an external skin sac. The **penis** is a tube-shaped organ that extends from the trunk of the body just above the testes. It is composed of spongy tissue that contains many blood vessels. When blood flow to the penis increases, it becomes enlarged and erect. This normal body function is called an *erection*. Males experience erections easily and frequently during puberty. Erections can occur for no reason. Sometimes an erection results when clothing the male is wearing causes friction.

The penis releases semen. **Semen** is a thick fluid containing sperm and other secretions from the male reproductive system. At the height of sexual arousal, a series of muscular contractions known as *ejaculation* may occur. **Fertilization**—the joining of a male sperm cell and a female egg cell—can result if ejaculation occurs during sexual intercourse.

Sperm cannot live in temperatures higher than the normal body temperature of 98.6°F. The scrotum protects sperm by keeping the testes slightly below the normal body temperature. When body temperature rises, muscles attached to the scrotum relax, causing the testes to lower away from the body. If body temperature lowers, the muscles tighten and the testes move closer to the body for warmth. Tight clothing that holds the testes too close to the body may interfere with sperm production.

When a male begins to produce sperm, he may experience nocturnal emissions, or ejaculations that occur when sperm is released during sleep. This is a normal function that relieves the buildup of pressure as sperm begin to be produced during puberty.

During puberty, teens should assess their lifelong health and other goals, and set personal goals for maintaining a healthy body.

Development of facial hair is one of the changes that occur during a male's early teens. Another change is the ability to produce sperm. Which hormone stimulates physical changes in a maturing male?



Reading Check

Cause and Effect What physical changes are the result of the male sex hormone testosterone?

Character Check

Responsibility. Here are some ways a teen can show that he or she is mature and responsible.

- Demonstrate respect for yourself and others.
- Control sexual urges, and never impose them on others.
- Practice abstinence from sexual activity before marriage.

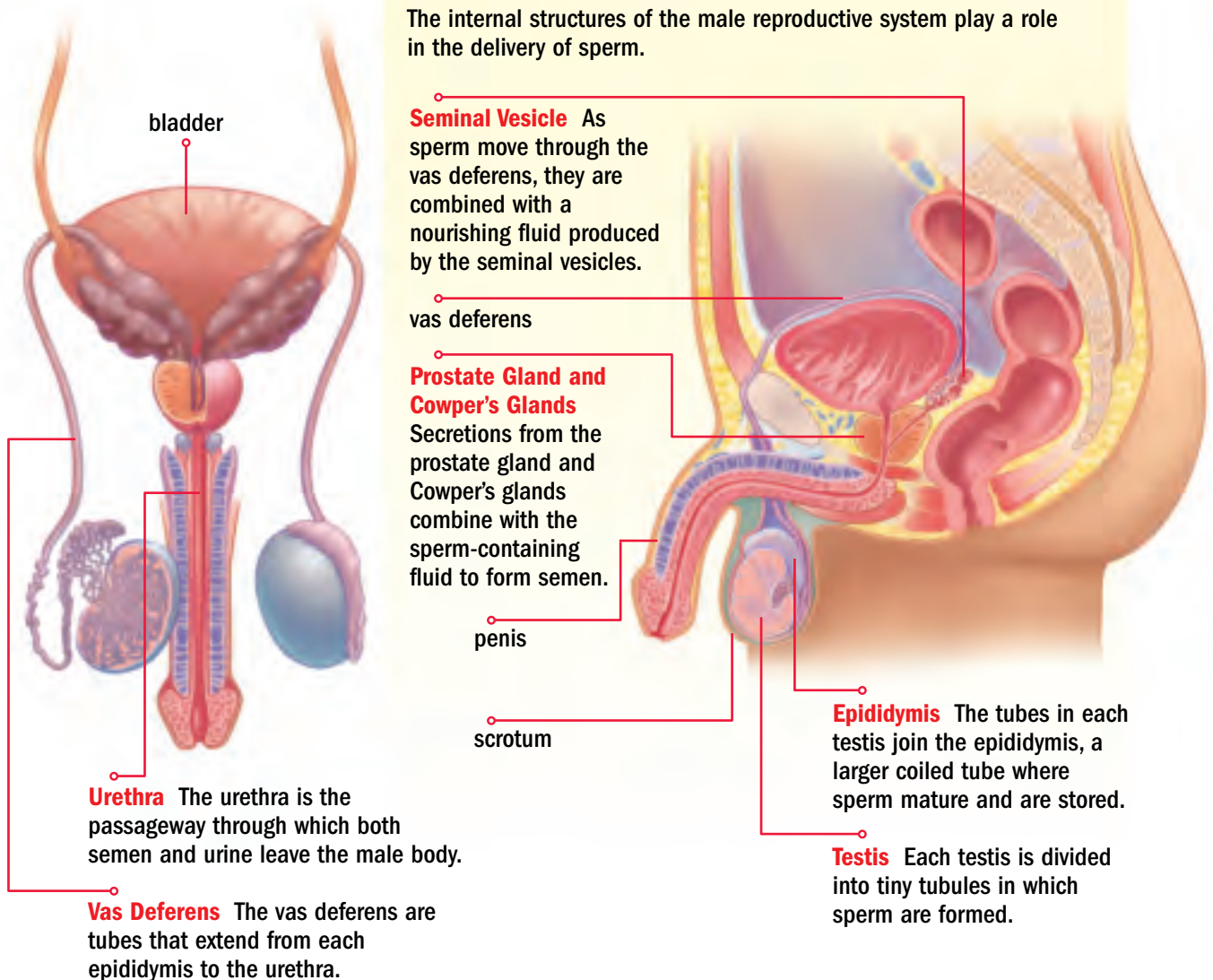
Internal Male Reproductive Organs

Although sperm are produced in the testes, which are suspended outside the body, they must travel through several structures inside the body before they are released. These structures include the vas deferens, the urethra, the seminal vesicles, the prostate gland, and Cowper's glands. **Figure 18.2** shows the path taken by sperm cells from the testes until they are released from the body.

FIGURE 18.2

MALE REPRODUCTIVE SYSTEM

The internal structures of the male reproductive system play a role in the delivery of sperm.



Seminal Vesicle As sperm move through the vas deferens, they are combined with a nourishing fluid produced by the seminal vesicles.

vas deferens

Prostate Gland and Cowper's Glands Secretions from the prostate gland and Cowper's glands combine with the sperm-containing fluid to form semen.

penis

scrotum

Epididymis The tubes in each testis join the epididymis, a larger coiled tube where sperm mature and are stored.

Testis Each testis is divided into tiny tubules in which sperm are formed.

Urethra The urethra is the passageway through which both semen and urine leave the male body.

Vas Deferens The vas deferens are tubes that extend from each epididymis to the urethra.

Hands-On Health ACTIVITY

Monthly TSE Reminder Card

It's important for males to do a testicular self-exam (TSE) every month. However, not all males are accustomed to performing it. In this activity you will create a reminder card for yourself or the males in your family.

What You'll Need

- paper
- colored pens
- lamination supplies (optional)

What You'll Do

1. Cut the paper into a wallet-sized card.
2. On one side of the card, write out the steps in performing a TSE (see page 472).
3. On the other side of the card, create a message that will remind and

persuade you or males in your family to do a monthly exam. The exam could be scheduled for the same time each month, such as the first day of every month.

4. Laminate the card so that it will last.

Apply and Conclude

Keep the reminder card in a location where you (or males in your family) will see it often. Because the best time to examine yourself is after a warm bath or shower, consider placing the card in the bathroom. Explain the importance of taking responsibility for regularly performing a TSE.

Care of the Male Reproductive System

Caring for the male reproductive system involves medical checkups, hygiene, protection, and self-examination. A health-literate individual knows strategies for health enhancement and risk reduction.

- ▶ **Get regular checkups.** Have regular checkups by a physician every 12 to 18 months.
- ▶ **Bathe regularly.** Bathe daily, thoroughly cleansing the penis and scrotum.
- ▶ **Wear protective equipment.** Use a protective cup or supporter during physical activities to shield external organs.
- ▶ **Perform regular self-examinations.** Check the scrotum and testicles for signs of cancer. Report any change to a physician.
- ▶ **Practice abstinence.** Abstain from sexual activity before marriage to avoid contracting **STDs**.



Classify What are some of the STDs that affect the male reproductive system?



Health Minute

Steps for Performing a Testicular Exam

The American Cancer Society recommends that males perform a self-exam for testicular cancer once a month.

Follow this procedure:

- ▶ Stand in front of a mirror. Check for any swelling on the scrotum skin. Examine each testicle with both hands. Roll the testicle gently between the thumbs and fingers.
- ▶ Find the epididymis, the soft, tubelike structure behind the testicle that collects and carries sperm. Become familiar with this structure so that you won't mistake it for a lump.
- ▶ Cancerous lumps usually are found on the sides of the testicle but can also appear on the front.
- ▶ Although lumps do not always indicate the presence of cancer, be sure to consult a health care professional if you do find a lump.

Source: American Cancer Society

Sexually Transmitted Diseases (STDs)

The primary means of transmission of all STDs is sexual activity. An individual who practices abstinence before marriage understands the role of individual responsibility regarding personal risk behaviors and how abstinence from sexual activity prevents STDs. One of the important benefits of abstinence is the prevention of these STDs:

- ▶ **Chlamydia** and **gonorrhea** are bacterial infections that cause discharge from the penis and burning upon urination; both conditions can damage reproductive health. Treatment includes a course of antibiotics.
- ▶ **Syphilis** is another bacterial infection. Initially, a painless, reddish sore appears at the site of infection. If left untreated, syphilis can spread and damage internal organs. It is treated with antibiotics.
- ▶ **Genital herpes** is a virus that causes blisterlike sores in the genital area. Medication relieves symptoms, but the virus remains in the body for life.

Problems of the Male Reproductive System

The organs of the male reproductive system can be affected by functional and structural problems, as well as STDs. These situations require professional health services.

Inguinal Hernia

An inguinal (IN-gwuh-nuhl) hernia is a separation of tissue that allows part of the intestine to push into the abdominal wall near the top of the scrotum. Straining the abdominal muscles or lifting heavy objects can cause a tear in this tissue. Symptoms of inguinal hernia may include a lump in the groin near the thigh, pain in the groin, or in severe cases, partial or complete blockage of the intestine. Surgery is usually necessary to repair the opening in the muscle wall.

Sterility

Sterility is the inability to reproduce. In males it can result from too few sperm or sperm of poor quality. Sterility can result from environmental hazards, including exposure to X rays and other radiation, toxic chemicals, and lead. Hormonal imbalance, certain medications, and use of drugs, including anabolic **steroids**, can damage sperm. Some diseases, including STDs, and mumps contracted as an adult also can result in sterility.

Testicular Cancer and Problems of the Prostate

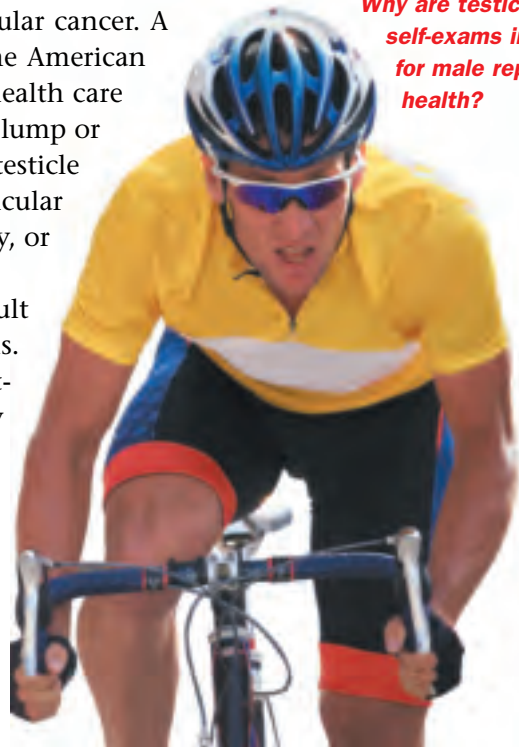
Testicular cancer can affect males of any age but occurs most often in males between the ages of 14 and 40. These factors increase the risk of developing the disease: undescended testicle, abnormal testicular development, and family history of testicular cancer. A monthly testicular self-exam is recommended by the American Cancer Society. Males should be prompted to seek health care if they notice any warning signs, such as a painless lump or swelling in either testicle or pain or discomfort in a testicle or in the scrotum. With early detection most testicular cancer is treatable through surgery, radiation therapy, or chemotherapy.

The prostate gland can become enlarged as a result of an infection, a tumor, and age-related problems. An enlarged gland presses against the urethra, resulting in frequent or difficult urination. Symptoms may also indicate more serious conditions, including prostate cancer. Prostate cancer screening is usually done during routine physical exams for males over age 50. Early detection increases the chance of survival. Treatment includes surgery, radiation, and hormone therapy.



National and world champion cyclist Lance Armstrong is a survivor of testicular cancer.

Why are testicular self-exams important for male reproductive health?



LESSON

2

REVIEW

Reviewing Facts and Vocabulary

1. What is the function of the testes?
2. Describe the path that sperm follow from the time they form until they leave the body.
3. What are the symptoms of testicular cancer? Identify situations requiring professional health services for preventive care.

Thinking Critically

4. **Analyzing.** Why would knowing the correct way to lift a heavy object be an important behavior to protect the health of the male reproductive system?
5. **Synthesizing.** Analyze the importance and benefits of abstinence as it relates to the prevention of STDs. How can problems related to STDs affect the male reproductive system?

Applying Health Skills

Practicing Healthful Behaviors. Analyze the relationship between unsafe behaviors related to drug use and the harmful effects of these substances on the male reproductive system. Write a paragraph stating how avoiding drugs, including steroids, can ensure the health of your reproductive system.

After You Read

Identify Problems and Solutions. List at least three problems that may affect the male reproductive system. After each problem, list some of the symptoms.



The Female Reproductive System

Guide to Reading

Building Vocabulary

As you read this lesson, write each new highlighted term and its definition in your notebook.

- ▶ ova (p. 474)
- ▶ uterus (p. 474)
- ▶ ovaries (p. 474)
- ▶ ovulation (p. 474)
- ▶ fallopian tube (p. 475)
- ▶ vagina (p. 475)
- ▶ cervix (p. 476)
- ▶ menstruation (p. 476)

Focusing on the Main Ideas

In this lesson, you will learn how to:

- ▶ **Describe** the parts and functions of the female reproductive system.
- ▶ **Examine** the care of the female reproduction system and identify situations requiring professional health services.
- ▶ **Explain** the importance of abstinence as it relates to the prevention of STDs.

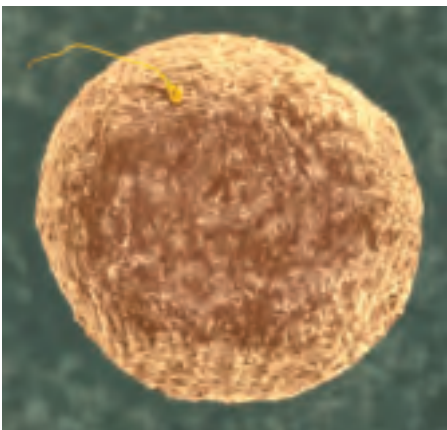
Reading Strategy

Organize Information

- ▶ **Make a three-column chart.** In the first column, list facts about the structure and function of the female reproductive system. In the second column, list facts about the care of the system. In the third column, list facts about the problems of the system.

Quick Write

Write a short paragraph explaining how the endocrine and reproductive systems relate to one another.



- ▶ The female reproductive system stores ova that unite with sperm in the process of reproduction. **Name another function of the female reproductive system.**

The female reproductive system has several functions. It produces female sex hormones and stores *female reproductive cells*, called **Ova** (singular, *ovum*). The **uterus**, a hollow, muscular, pear-shaped organ inside a female's body, nourishes and protects the fertilized ovum from conception until birth.

Structure and Function of the Female Reproductive System

The female reproductive system includes several organs and glands. **Ovaries** are the female sex glands that store the ova and produce female sex hormones. At birth a female's ovaries contain more than 400,000 immature ova, or eggs. One ovum matures each month, beginning at puberty when the pituitary gland produces hormones. **Ovulation** is the process of releasing a mature ovum into the fallopian tube each month. The right ovary will release a mature ovum one month, and the left ovary will release one the next month.

Female Reproductive Organs

Figure 18.3 shows the structures of the female reproductive system. Notice the tube that lies next to each ovary. When a mature ovum is released from the ovary, it moves to one of the **fallopian tubes**, a pair of tubes with fingerlike projections that draw in the ovum.

Tiny hairlike structures called cilia work, along with muscular contractions in the fallopian tubes, to move the ovum along. Sperm from the male enter the female reproductive system through the **vagina**, a muscular, elastic passageway that extends from the uterus to the outside of the body.

If sperm are present in the fallopian tubes, a sperm cell may unite with an ovum, resulting in fertilization. The fertilization of an egg by a sperm produces a cell called a *zygote*. When the zygote leaves the fallopian tube, it enters the uterus. There, the zygote attaches itself to the uterine wall and begins to grow. In preparation for receiving the zygote, the uterine wall has thickened and is rich in blood, which enables the uterus to nourish the zygote. The developing fetus will remain attached to the uterine wall until **birth**.

FIGURE 18.3

FEMALE REPRODUCTIVE SYSTEM

The female reproductive system produces sex cells called ova and provides a place for a fertilized ovum to grow.

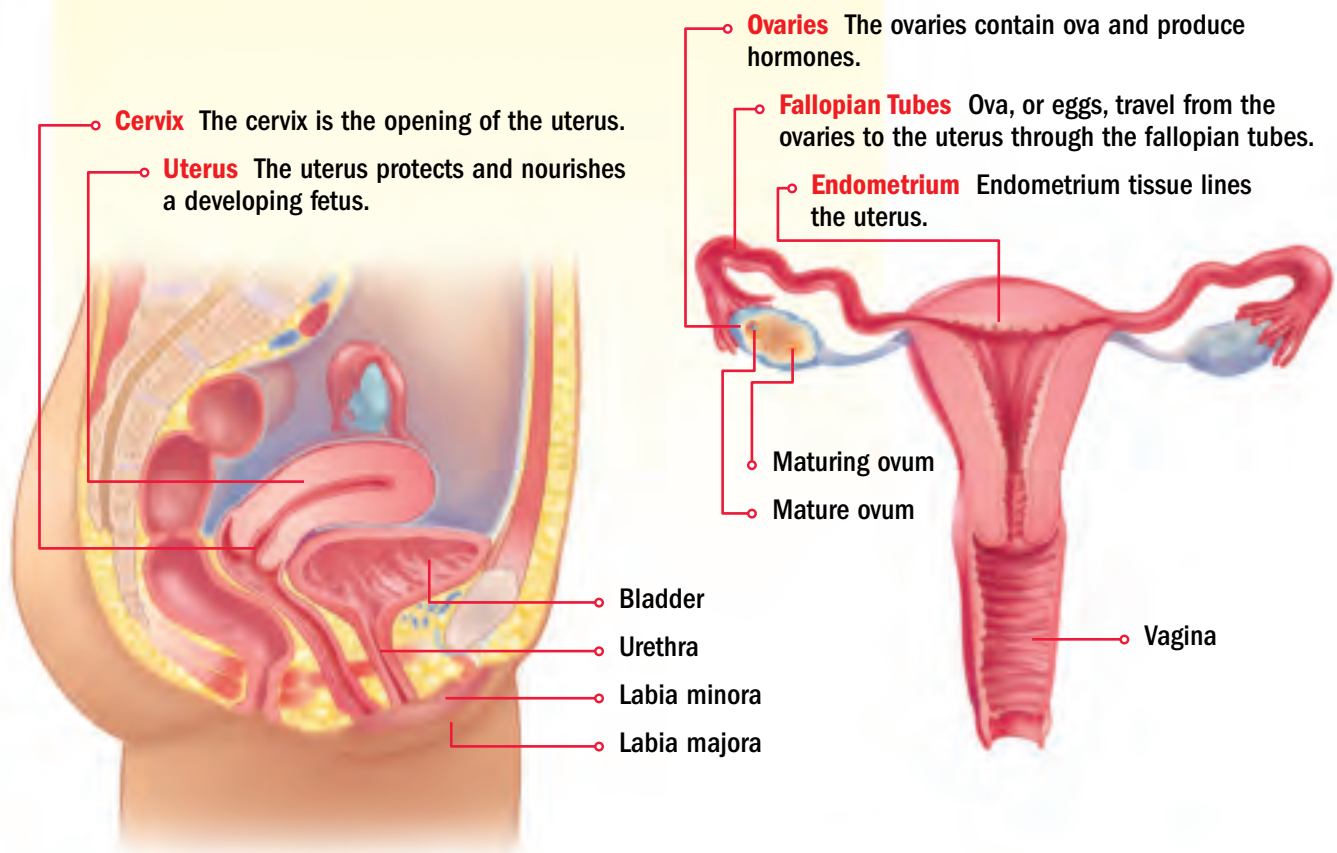






FIGURE 18.4

THE MENSTRUAL CYCLE

Days 1-13	Day 14	Days 15-20	Days 21-28
A new egg is maturing inside the ovary.	The mature egg is released into one of the fallopian tubes.	The egg travels through the fallopian tube to the uterus.	After seven days, if the egg is not fertilized, menstruation begins.
			



Menstruation


In a mature female, each month the uterus prepares for possible pregnancy. If pregnancy doesn't occur, the thickened lining of the uterus, called the *endometrium*, isn't needed, and it breaks down into blood, tissue, and fluids. These materials pass through the **cervix**, the opening to the uterus, and into the vagina. This *shedding of the uterine lining* is called **menstruation** and is part of the menstrual cycle, which is summarized in **Figure 18.4**. Females wear either sanitary pads or tampons to absorb the blood flow. After the menstrual period ends, usually within five to seven days, the entire cycle begins again in preparation for receiving a fertilized ovum the next month.

Most females begin their first menstrual cycle between the ages of 10 and 15. The cycle may be irregular at first. As a female grows and matures, her menstrual cycle usually becomes more predictable. Endocrine hormones control the cycle, but poor nutrition, stress, and illness can influence it.

Care of the Female Reproductive System

Good hygiene is important for maintaining the health of the female reproductive system. In a mature female, cells in the lining of the vagina are constantly being shed, causing a slight vaginal discharge. Cleanliness will help eliminate odors.

- ▶ **Bathe regularly.** It is especially important to shower or bathe daily during the menstrual period. During menstruation, change tampons or sanitary pads every few hours. Feminine deodorant sprays and douches are not necessary and may cause irritation or infection in the sensitive tissues around the vagina.
- ▶ **Practice abstinence from sexual activity.** This is the only 100 percent effective method in preventing pregnancy and STDs.

 **Eating nutritious foods and avoiding caffeine can often reduce discomfort related to menstruation.**

What other health behaviors will keep your reproductive system healthy?



BREAST SELF-EXAM

Breast cancer is the most common cancer and the second leading cause of death, after lung cancer, for women in the United States. The American Cancer Society recommends that females examine their breasts once a month, right after the menstrual period, when breasts are not tender or swollen. Early detection is an important factor in the successful treatment of breast cancer.

- ▶ Lie down and place a pillow under the right shoulder. Place the right arm behind the head. Use the fingers of the left hand to feel for lumps or thickening in the right breast. Move around the breast first in a circle, then up and down, and be sure to go over the entire breast area. Repeat the procedure the same way each month. Examine the left breast with the right hand.
- ▶ Repeat the examination of both breasts while standing, with one arm behind the head. In the upright position, check the upper and outer parts of the breasts, toward the armpit. Standing in front of a mirror, inspect the breasts for any dimpling of the skin, changes in the nipple, redness, or swelling.

Problems of the Female Reproductive System

Several disorders can affect the female reproductive system. Problems related to menstruation can range from minor discomfort to life-threatening illness.

- ▶ **Menstrual cramps** sometimes occur at the beginning of a menstrual period. Light exercise or applying a heating pad to the abdominal area may help relieve symptoms. A health care professional may recommend medication for pain relief. Severe or persistent cramping, called dysmenorrhea, may be an indication that professional health services are required.
- ▶ **Premenstrual syndrome (PMS)** is a disorder caused by hormonal changes. Its symptoms, which may be experienced one to two weeks before menstruation, include nervous tension, anxiety, irritability, bloating, weight gain, depression, mood swings, and fatigue. Regular physical activity and good nutrition may reduce the severity of symptoms.
- ▶ **Toxic shock syndrome (TSS)** is a rare but serious bacterial infection that affects the immune system and the liver, and can be fatal. To reduce the risk of TSS, use tampons with the lowest possible absorbency and change tampons often. Warning signs of TSS include fever, vomiting, diarrhea, a sunburnlike rash, red eyes, dizziness, and muscle aches. Any female with these symptoms should seek health care immediately.



Identify What are the stages of the menstrual cycle (Figure 18.4)?



The American Cancer Society recommends that females have pelvic exams by age 18 or when recommended by their physician. A pelvic exam is not painful.

- During a pelvic exam, a health care professional checks the shape, size, and position of pelvic organs and checks for any tumors or cysts.
- An examination of cells collected from the cervix, called a *Pap test*, can detect early changes in cells that may indicate a risk of cervical cancer.
- The health care professional also may test for certain sexually transmitted diseases.

Health Skills Activity

Communication: Asking Difficult Questions

“Hello, Brooke,” says Dr. Morgan. “How are you? I see we’re doing a basic summer camp physical.”

Brooke smiles and nods. She has been coming to Dr. Morgan for years and feels comfortable with her.

“Before we begin,” Dr. Morgan continues, “do you have any questions for me? Everything okay?”

“Well,” Brooke begins, “about a week before my period, I get depressed. It seems much worse than the everyday blues. Once my period starts, I’m okay.”

“It’s important to ask about your concerns,” Dr. Morgan replies. “Many girls and women feel a little blue before their periods, but if your depression is severe, there are treatments we can try. Let’s talk more about your symptoms.”



What Would You Do?

How would you bring up a reproductive health topic with your parents or guardian or a health care professional? Use the following guidelines for effective communication to help you develop a dialogue.

1. Use “I” messages.
2. Speak in a respectful tone.
3. Make eye contact.
4. Show appropriate body language.
5. Express clear, organized ideas.

Problems Related to Infertility

Infertility, the inability to conceive a child, can have several causes.

- ▶ **Endometriosis.** This painful, chronic disease occurs when tissue that lines the uterus migrates and grows in the ovaries, fallopian tubes, the uterus, or the lining of the pelvic cavity.
- ▶ **Pelvic inflammatory disease (PID).** PID is an infection of the fallopian tubes, ovaries, and the surrounding areas of the pelvis. It can damage a female’s reproductive organs. PID usually is caused by **sexually transmitted diseases (STDs)**.
- ▶ **Sexually transmitted diseases** are the most common causes of infertility and other disorders of the reproductive system. Often symptoms of STDs are not evident in females unless a medical examination is performed. Avoiding sexual contact until marriage shows you understand the role of individual responsibility regarding personal risk behaviors.

Reading Check

Describe What are the most common causes of infertility and other disorders of the reproductive system?

Other Female Reproductive Disorders

Other reproductive disorders include the following:

- ▶ **Vaginitis**, caused by bacterial vaginosis, is the most common vaginal infection in women of childbearing age, and it is often accompanied by discharge, odor, pain, itching, or burning. If not treated with antibiotics, vaginitis can sometimes lead to PID.
- ▶ **Blocked fallopian tubes**, the leading cause of infertility, may result from PID, abdominal surgery, STDs, or endometriosis.
- ▶ **Ovarian cysts** are fluid-filled sacs on the ovary. Small, noncancerous cysts usually disappear on their own. Larger cysts may require surgery.
- ▶ **Cervical, uterine, and ovarian cancer** occur in the female reproductive system. Early sexual activity and STDs such as human papillomavirus (HPV) are related to an increased incidence of cervical cancer. Regular checkups and pelvic exams are important for early detection and treatment.

Did You Know?

Untreated STDs put women at risk for infertility, chronic pelvic pain, and cancer.

- Chlamydia is the most common bacterial STD in the United States. Symptoms, when present, include vaginal discharge or unexpected bleeding, burning upon urination, and abdominal pain.
- HPV is probably the most common viral STD among sexually active young people. Infection with certain types of HPV can lead to cervical cancer. HPV has no known cure.

LESSON

3

REVIEW

Reviewing Facts and Vocabulary

1. How do the structures in the fallopian tubes help move the ovum from the ovaries to the uterus?
2. Explain *ovulation*, *fertilization*, and *menstruation*.
3. List three causes of infertility in females.

Thinking Critically

4. **Synthesizing.** Analyze the importance of abstinence as it relates to the prevention of STDs. What behaviors can female teens practice to protect the health of their reproductive systems?
5. **Analyzing.** Relate the importance of early detection and warning signs for problems of the female reproductive system. Why is it important for every female to have regular pelvic exams starting at age 18 or when recommended by her physician?

Applying Health Skills

Advocacy. Make a card reminding yourself or the females in your family to perform a monthly breast self-exam. Provide step-by-step instructions. Add a catchy phrase that will remind users of the importance of early detection, and include warning signs that should prompt females to seek professional health services.

After You Read

Identify Problems and Solutions. List at least three problems that may affect the female reproductive system. After each problem, list some of the symptoms.



Bodies on the Move

The teenage body is constantly changing. Just remember: It's all perfectly natural!



Hair Loss

If you notice that you're losing more hair than usual, don't panic. "People are constantly shedding hair, and you can lose a lot in a single day," says Dr. Patricia Simmons, M.D., a specialist in pediatric and adolescent medicine. She adds that it's normal to lose as many as 100 hairs a day. Boys generally have shorter hair, so the lost strands are less noticeable to them than to girls.

Stretch Marks

Have you spotted any little pinkish lines on your body? "These marks are usually a very normal part of your body's growth and change," says Dr. Simmons. For girls, stretch marks—which start out as raised red areas, become purple, and finally flatten and fade to shiny or barely visible thin streaks—usually appear on areas like the hips, thighs, or breasts. They are not as common for boys, but they occasionally turn up on the upper arms and the shoulders. There is no way to prevent or treat the marks (and you can forget about stretch-mark creams, which just don't work). "Although they never completely go away, they do become far, far less obvious," assures Dr. Simmons.

Body Odor

"Another change that becomes apparent during the teen years is your body odor," says Dr. Simmons. "Hormones work on some of the cells that cause you to sweat, and they also stimulate some of the oil-producing cells. That combination leads to more intense body odor." Shower daily using any kind of soap to banish smelly sweat and bacteria. Just be sure to wash everywhere. Then apply an antiperspirant/deodorant to keep your underarms dry. ■

TIME
to **THINK...**

About Changes During Adolescence

The article lists three changes a person might experience during puberty. Investigate what hormones are responsible for these changes. With a group, create a flow chart that details when and how one of these hormones is triggered, where it is produced, and how it causes the changes during adolescence.

Health Skills Application



1. Practicing Healthful Behaviors. Excessive weight has been shown to be a contributing factor for developing diabetes mellitus. Identify three things you can do each day to help maintain a healthy weight for life. (LESSON 1)



2. Accessing Information. Some athletes use anabolic-androgenic steroids—chemicals similar to testosterone—to increase muscle size and improve overall performance. Research and list the harmful effects of steroids on the body. Then create a visual presentation that informs others of the dangers of steroid use. (LESSON 2)



3. Advocacy. Annual Pap tests are important for all women over the age of 18. Relate the importance of early detection and warning signs that prompt females to seek health care. Prepare an informative, accurate, and persuasive pamphlet to encourage women to have an annual Pap test. (LESSON 3)

CAREER Corner

School Nurse

Are you caring and sympathetic, and are you concerned with the physical and mental/emotional needs of others?



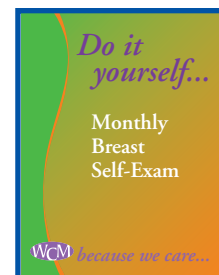
If so, a career as a school nurse may be right for you. School nurses perform screenings, provide emergency first aid, monitor state immunization laws, develop health-related curricula to meet the needs of students and teachers, and counsel students on personal health issues.

Nursing students need a strong background in science and mathematics. To become a registered nurse, a student must graduate from an accredited nursing school and pass a national licensing exam. For more information, click on health.glencoe.com.

BEYOND the Classroom

Parent Involvement

Advocacy. Share the information about breast and testicular self-exams with a parent. Work together to find a place to display the reminder cards you made. Then discuss with all family members the importance of these exams for early detection of cancers. In addition, discuss the warning signs that should prompt persons of any age to seek medical attention.



School and Community

School Health Services. Ask the school nurse to talk to your class about the importance of proper hygiene and care of the reproductive systems. Also, have the nurse describe the health services available through his or her office. How can students access these services? Which services require the approval of a parent?

After You Read

Use your Foldable notecards to review what you have learned about the endocrine system.



► **EXPLORING HEALTH TERMS** Answer the following questions on a sheet of paper.

Lesson 1 Match each definition with the correct term.

adrenal glands	pituitary gland
endocrine glands	parathyroid glands
hormones	thyroid gland
pancreas	gonads

1. The gland that regulates activities of all the other endocrine glands.
2. The gland that produces hormones that regulate metabolism and bone growth.
3. Glands that produce a hormone that regulates the body's calcium and phosphorus balance.
4. Glands that help the body recover from stress and respond to emergencies.

Lesson 2 Identify each statement as True or False. If false, replace the underlined term with the correct term.

penis	sperm
reproductive system	semen
scrotum	testes
sterility	testosterone

5. Semen is the male reproductive cell.
6. The testes are contained in the penis.
7. Testosterone is the male sex hormone.

Lesson 3 Fill in the blanks with the correct term.

cervix	ovulation
fallopian tubes	ovum
menstruation	uterus
ovaries	vagina

8. Ova mature in the _____.
9. The _____ is a muscular, elastic passage-way that extends from the uterus to the outside of the body.
10. The hollow, pear-shaped organ inside a female's body where a fetus is nourished is the _____.

► **RECALLING THE FACTS** Use complete sentences to answer the following questions.

1. What is the function of hormones?
2. Why are the ovaries and testes considered endocrine glands?
3. What is epinephrine, and what function does it have?
4. Why is a goiter an uncommon problem in the United States?
5. What are three physical changes initiated by testosterone in the male?
6. What are three ways to care for the male reproductive system?
7. What is an inguinal hernia?
8. Relate the importance of early detection and warning signs of prostate cancer that prompt males of all ages to seek health care.



9. Name and describe the two processes that are part of the menstrual cycle.
10. How can menstrual cramps be relieved?
11. Relate the importance of early warning signs for seeking health care. Why should a female with symptoms of TSS contact a health care professional immediately?
12. Identify situations requiring professional health services for preventive care. What is PID, and what usually causes it?

▶ WRITING CRITICALLY

1. **Personal.** Write a one-page letter to yourself describing how puberty has affected you. Include information on how your body and emotions have changed and how you feel about yourself now that you're becoming an adult. Save the letter to read to yourself again when you're older.
2. **Personal.** Write a letter to your doctor or school nurse asking questions you might have about the structure and function of your reproductive system and how to care for your reproductive health.

Standardized Test Practice



Read the paragraph below, examine the table, and then answer the questions.

The time between fertilization of an egg by a sperm and birth is known as a *gestation period*. This amount of time varies from organism to organism. The table gives the average gestation periods (in days) for several different types of animals.

Animal	Gestation Period
Hamster	16.5 days
Ferret	42 days
Coyote	63 days
Lion	108 days
Human	267 days
Horse	337 days
Camel	406 days

1. What is the median of the gestation periods in the table?
 - A 108 days
 - B 177 days
 - C 389.5 days
 - D There is no median because all the numbers are different.
2. The actual gestation period can be stated as a range of days. For a human that range is from 250 to 285 days. If the value in the table is the average gestation period, the value is the
 - F median.
 - G mode.
 - H mean.
 - I first quartile.
3. Compare the size of each animal listed to its gestation period. Predict the relative gestation period of a rhinoceros. Explain your prediction.