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How do the male and female reproductive systems work?

In this unit, we focus on the anatomy, or the structure, of the reproductive organs. For many of us, the genitalia are not “neutral” like other parts of the body, and it is often difficult to discuss them without paying attention to how we feel about them. You should be aware of your own thoughts and feelings as you read the text and look at the illustrations. Remember that your attitudes and how you express them affect others in the class.

The Male Sex Organs

The reproductive system consists of one integrated unit. The parts located outside the body are called external sex organs or genitals. The parts inside the lower abdomen are called internal sex organs. The genitals of the male include the penis, which is the male organ of sexual intercourse that the semen and urine pass through, and the scrotum, the pouch containing the testes, which are the male reproductive glands.

What are some of the reasons people in most cultures cover their genitalia even if they don’t wear much other clothing?

What Do You Think?

People often associate internal sex organs with reproduction and genitals with sexual activities. This is the reason that for some people external genitals bring out many uncomfortable feelings, such as shame and embarrassment. Societies have different laws and customs about the public display of genitalia or pictures of genitalia.

Figures 2.1 and 2.2 show the parts of the male reproductive system from both the side and front.
Activity 2-1: Male Anatomy

Introduction
Have you ever noticed how some people turn red in the face when parts of the male reproductive system are referred to by “street” slang? This can be confusing and embarrassing. In this activity you identify and label parts of the male reproductive system, using the correct scientific terminology.

**Materials**

- Activity Report

**Procedure**

*Step 1* You will be given an outlined illustration of the male reproductive system.

*Step 2* See how many parts of the male reproductive system you can name and locate correctly.

*Step 3* Then read the text, review your choices, and correct them if necessary.

To understand the general plan of the reproductive system, it helps to think of it as having three parts. There is the part that produces and stores the sperm. There is the part that transports the sperm. And there is the part that delivers the sperm. The ultimate biological goal of these related parts is reproduction, which is getting a sperm to combine with an egg. Everything is designed to accomplish that purpose.

The first part of the system produces sperm. Sperm are produced in the two testes. Each testis (the singular of testes) is packed full of tiny, threadlike tubes, or tubules. Sperm cells are produced in the walls of these hollow tubules. As the sperm cells mature, they move toward the open center of the tubule. These tubules are tightly coiled to save space. If all the tubules were stretched out and connected end to end, they would measure a quarter of a mile! The testes can produce 300 million sperm each day, from puberty on.

The testes also function as **endocrine glands** that produce the male hormone **testosterone**. Testosterone is produced by cells that are located between sperm-bearing tubules. The glands are not in direct contact with sperm, but the testosterone they produce reaches sperm through the bloodstream. Testosterone is essential for the development of sperm.
All boys are born with a flap of skin, called the **foreskin**, covering the head, or **glans**, of the penis. The foreskin can be easily pulled back to fully expose the glans. This is important to do when washing the penis, so secretions that accumulate under the foreskin are washed away.

**Circumcision** is a surgical procedure in which part of the foreskin is cut off. In the circumcised penis, the glans is permanently exposed.

Circumcision is an ancient practice. It existed in Egypt over 4,000 years ago. It continues to be part of the religious rituals of the Jewish faith, the Muslim faith, and other groups. In many African societies, circumcision has been part of a ceremony through which the community recognizes boys as adults.

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**Figure 2.3** Cross section of a testis.
In the United States, many boys are circumcised in infancy, some for religious reasons, but most for health considerations. It is easier to keep the tip of the penis clean if the foreskin has been removed. However, many doctors consider this procedure unnecessary today. Circumcision does not affect the sensitivity or function of the penis. Nor does it affect the size of the penis.

Countless magazines, videos, advertisements, and art forms display and focus on the female body and sexual characteristics. There is not nearly the same interest shown in the male body. Why do you think this is true?

What Do You Think?

The second part of the male reproductive system stores and transports sperm. Sperm cells in the tubules of each testis gradually move into a coiled storage area called the epididymis. The epididymis then becomes a single tube called the vas deferens. The vas deferens carries the sperm from the testis. The vas deferens moves away from each testis (there are two vas deferens), out of the scrotum, and into the abdomen. Each vas deferens curves over the urinary bladder and enters the prostate gland. The prostate gland is the organ at the back of the bladder that contributes the fluid to semen. Inside the prostate gland, the vas deferens joins the urethra, the tube that carries urine or semen. The urethra goes through the penis and opens to the outside. As sperm travel through the system, they combine with nutrient fluids to make up semen. These fluids come from the prostate gland and two small sacs called seminal vesicles. Semen is ejaculated from the penis during the pleasurable culmination of sexual arousal called orgasm.

In the male, the urethra carries urine from the urinary bladder (where urine is stored) to the outside of the body during urination. However, urine and semen do not mix together. The opening of the bladder closes tightly during ejaculation.
The third part of the male reproductive system is the penis, which delivers sperm to the vagina in the female. The penis is made of spongy tissue that becomes filled with blood during sexual excitement. This results in an **erection** when the penis becomes larger and harder and “rises” to a different angle. The erect penis enters the vagina, where it ejaculates, or discharges semen (containing sperm). An erection and ejaculation can also occur without sexual intercourse.

The fluid part of semen consists of fluid from the prostate and other glands. These secretions contain nutrients for sperm cells, and activate sperm tails so that sperm can move on their own after ejaculation in the vagina.

**Why do you think an egg doesn’t have a tail?**

“I think what is happening to me is so wonderful, and not only what can be seen on my body, but all that is taking place inside. I never discuss myself or any of these things with anybody; that is why I have to talk to myself about them.”

-Diary of a Young Girl, Anne Frank

**Female Sex Organs**

The genital organs clearly distinguish male from female. But we must not exaggerate the differences between the female and male reproductive systems. Actually, the two follow the same basic plan. Every part in the male reproductive system corresponds to a part in the female reproductive system in structure and function.

The most obvious differences between the male and female reproductive systems are the external genitalia. Unlike the male, the female sex organs lie mostly inside the abdomen. This provides protection for childbearing. The external female genitalia are less prominent and are covered by **pubic hair** (genital hair) following puberty.

Figure 2.6 shows the female genitalia. Two folds of skin protect the vaginal opening and the structures near it. The outer folds of skin are larger and are called the **major lips** (labia majora). The inner folds are narrower, free of pubic hair, and are called **minor lips** (labia minora).
In contrast to the male reproductive system, the female reproductive system lies almost entirely inside the abdomen. Three structures lie in the space between the labia—the clitoris, the urethral opening (opening to the urethra), and the vagina (the passage in which intercourse takes place, leading from the uterus to the outside of the body). The clitoris is a small organ that is highly sensitive and enlarges during sexual arousal. In females, the urethra carries only urine and is independent of the reproductive system. Close to the urethral opening is the opening of the vagina that leads to the internal sex organs.

How do some people compare the importance of virginity in boys and girls?

What Do You Think?

A thin ring of tissue, called the hymen, partially covers the vaginal opening. The hymen is not found in females of other species and serves no known physiological function. Because it often tears during a woman’s first act of intercourse, it has long been considered a sign of virginity—of never having had sexual intercourse. But it is possible for the hymen to become torn some other way before the first act of intercourse, and sometimes intercourse leaves it intact. Menstrual tampons do not tear the hymen.

Compared to sperm, eggs are huge. Yet, the number of eggs needed to repopulate the world would equal only two gallons. A corresponding number of sperm would fit into a container the size of an aspirin tablet.

Did You Know?

Look at Figure 2.6 to familiarize yourself with the parts and their names of the female reproductive system.

The first part of the female system stores and produces mature eggs, or ova (ovum is singular or one egg), in the ovaries. A woman is born with all the eggs she will ever have, about 400,000 in each ovary. By the time she reaches puberty, about 200,000 eggs remain. During her reproductive years, about 450 eggs mature, and only a few will ever be fertilized by (united with) a sperm.
Fallopian tubes are about 4 inches long. They were named in the 16th century by Gabriello Fallopio who was an Italian anatomist (someone who studies bodies). He thought the Fallopian tubes were ventilators for the uterus.

Did You Know?

Figure 2.7 shows the maturation process of an egg. An immature follicle develops into a mature follicle. The mature follicle consists of a group of cells that contain an egg surrounded by fluid. When the mature follicle ruptures, typically on day 14 of a woman’s ovarian cycle, the egg is released through the ovary wall. This release of an egg is called ovulation. The now “empty” follicle is called a corpus luteum (“yellow body”). The maturing follicle produces the hormone estrogen. The corpus luteum produces progesterone. In addition, estrogen and progesterone are the hormones that help develop and maintain the female reproductive system. These hormones make pregnancy possible.

The second part of the system concerns transport of the ovum. For this function, the system of tubes in the female is much shorter than in the male. Every month at ovulation, when an ovum breaks through the ovary wall, the ovum is trapped by the fingerlike projections of the Fallopian tubes. There is one fallopian tube for each ovary. The Fallopian tube takes in the ovum and sends it towards the uterus, which is the organ in the female abdomen in which a baby develops. If the woman has had sexual intercourse within a day or so of ovulation, the egg may encounter a sperm in the Fallopian tube, and fertilization may occur. If fertilization occurs, the fertilized egg passes into the uterus where it becomes embedded. If no sperm are present so fertilization cannot occur, the egg disintegrates and is discarded during menstruation.

An opening in the lower part of the uterus called the cervix leads to the third part of the female reproductive system—the vagina. The vagina is where the penis delivers sperm. The vagina is also the canal through which a baby passes during birth. The vagina has soft-tissue walls and can expand to accommodate the penis during intercourse or a baby during birth.

As you can see, the female and male organs complement each other for the purpose of reproduction. It is a wonderfully designed system.
Activity 2-2: Female Anatomy

Introduction
In discussions of the human reproductive system, people often use “street” slang rather than scientific terms when talking about anatomy. To avoid possible embarrassment or confusion during classroom discussions, this activity introduces, or re-introduces, the accurate terms.

Can you name and locate the important parts of the female reproductive system correctly? This activity gives you an opportunity for you to check your knowledge.

Materials

- Activity Report

Procedure

Step 1 You will be given an outlined illustration of the female reproductive system.

Step 2 See how many parts of the female reproductive system you can correctly name and locate.

Step 3 Then read the text, review your choices, and correct them if necessary.

Why do you think you are being taught about both male and female reproductive systems? How do you think the opposite sex feels learning about the changes that are happening to you? What did you learn that was new to you or that surprised you? Are there any questions that still haven’t been answered?

Journal Writing

Review Questions

1. Describe three similarities and three differences between the female and male reproductive systems.
2. How do sperm get from the testes to the penis? Describe the route and define the parts.
3. What is semen? How is it produced?
4. Why is the female reproductive system primarily internal?
5. Explain the ovarian cycle using the correct terms.
6. How does the egg get to the uterus?