

## 1. Male Reproductive System

- a. Label the figure by placing the numbers of the structures by the correct labels.

12 Bulbourethral gland

4 Corpus cavernosum

5 Corpus spongiosum

10 Ejaculatory duct

13 Epididymis

7 Glans penis

6 Penis

8 Prepuce

11 Prostate gland

15 Scrotum

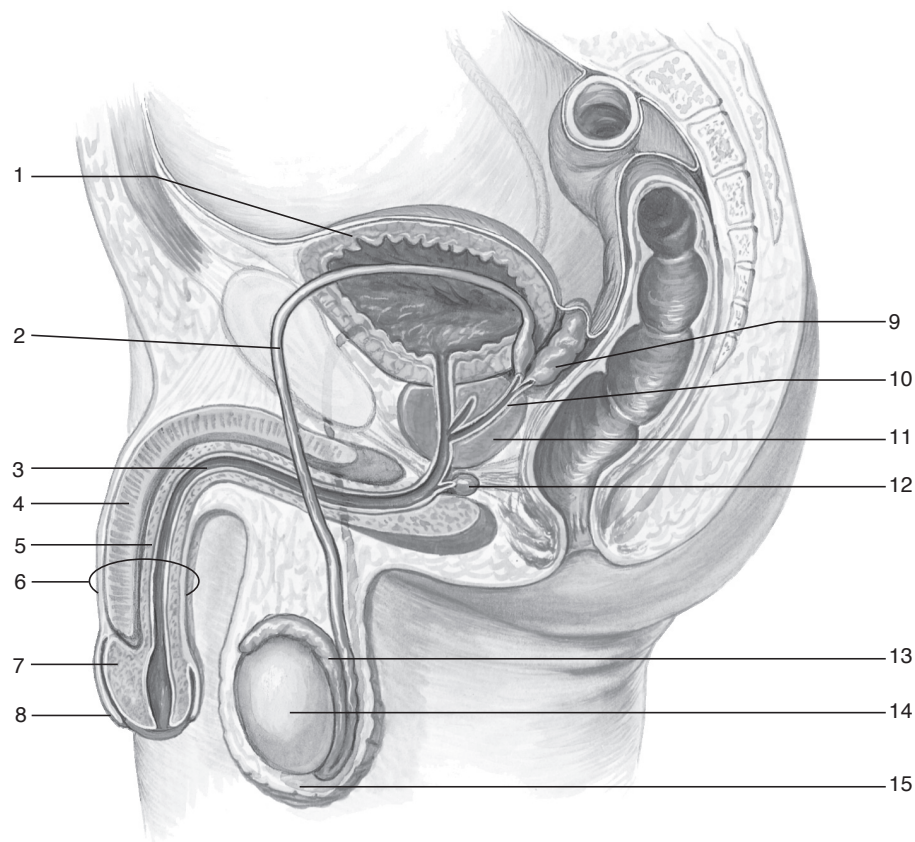
9 Seminal vesicle

14 Testis

3 Urethra

1 Urinary bladder

2 Vas deferens



- b. Trace the path of sperm cells from a testis to the outside by placing the numbers of the ducts in the spaces below.

1) Ejaculatory duct

3) Urethra

2) Epididymis

4) Vas deferens

Testis → 2 → 4 → 1 → 3 → outside.

c. Write the terms that match the statements in the spaces at the right.

1) Male gonads, or sex glands.	<u>Testis</u>
2) Tubules producing sperm cells.	<u>Seminiferous tubules</u>
3) Cells producing testosterone.	<u>Interstitial cells</u>
4) Process of sperm formation.	<u>Spermatogenesis</u>
5) Number of chromosomes in spermatogonia and primary spermatocytes.	<u>46</u>
6) Type of cell division forming primary spermatocytes.	<u>Mitosis</u>
7) Type of cell division forming spermatids from primary spermatocytes.	<u>Meiosis</u>
8) Number of chromosomes in each spermatid.	<u>23</u>
9) Cell formed from each spermatid.	<u>Sperm</u>
10) Location of nucleus in a sperm cell.	<u>In the head</u>
11) Provides motility for a sperm cell.	<u>Flagellum</u>
12) Tubule where sperm cells mature.	<u>Epididymis</u>
13) Secrete fluid, neutralizing acidity of urethra prior to ejaculation.	<u>Bulbourethral glands</u>
14) Secrete fluid containing fructose.	<u>Seminal vesicles</u>
15) Secrete fluid, activating swimming movements of sperm cells.	<u>Prostate gland</u>
16) Mixture of glandular secretions and sperm cells.	<u>Semen</u>
17) Contains testes outside the body.	<u>Scrotum</u>
18) Approximate temperature of testes required for production of viable sperm.	<u>95.6° F</u>
19) Male copulatory organ inserted into vagina during sexual intercourse.	<u>Penis</u>
20) Erectile tissue in penis surrounding urethra.	<u>Corpus spongiosum</u>
21) Two dorsal columns of erectile tissue in penis.	<u>Corpora cavernosa</u>
22) Sheath of skin covering the glans penis.	<u>Prepuce</u>

## 2. Male Sexual Response

Write the words that complete the sentences in the spaces at the right.

Sexual stimulation causes ___1___ nerve impulses to ___2___ the arterioles and ___3___ the venules serving the erectile tissue in the penis. Engorgement of the erectile tissue results in ___4___ of the penis. At the same time, the ___5___ glands secrete an alkaline fluid that neutralizes the ___6___ of the urethra. Continued sexual stimulation results in ___7___, which is characterized by a sensation of sexual pleasure and ___8___, the forcing of ___9___ out the urethra.	1) <u>Parasympathetic</u>
	2) <u>Dilate</u>
	3) <u>Constrict</u>
	4) <u>Erection</u>
	5) <u>Bulbourethral</u>
	6) <u>Acidity</u>
	7) <u>Orgasm</u>
	8) <u>Ejaculation</u>
	9) <u>Semen</u>

### 3. Hormonal Control of Reproduction in Males

- a. Write the terms that match the statements in the spaces at the right.

- 1) The male sex hormone.
- 2) Secretes gonadotropin-releasing hormone.
- 3) Releases FSH and LH.
- 4) Hormone stimulating testosterone secretion by testes.
- 5) Two hormones that act together to stimulate spermatogenesis.
- 6) Stimulates maturation of male sex organs.
- 7) Stimulates development and maintenance of secondary sexual characteristics.
- 8) Produces androgens in male fetus.
- 9) Hormone whose first secretion triggers onset of puberty.
- 10) Hormone stimulating release of FSH and LH.

Testosterone

Hypothalamus

Anterior pituitary

LH (ICSH)

FSH; testosterone

Testosterone

Testosterone

Adrenal cortex

FSH

GnRH

- b. Record the numbers of the male secondary sexual characteristics listed in the space provided.

- |                               |                                  |
|-------------------------------|----------------------------------|
| 1) Maturation of the testes.  | 6) Increased metabolic rate.     |
| 2) Enlargement of the larynx. | 7) Increased muscle development. |
| 3) Broad shoulders.           | 8) Increased RBC production.     |
| 4) Growth of body hair.       | 9) Maturation of the penis.      |
| 5) Production of sperm cells. | 10) Deepening of the voice.      |

2, 3, 4, 6, 7, 8, 10

- c. Write the words that complete the sentences in the spaces at the right.

The production of testosterone by \_\_\_\_1\_\_\_\_ in the testes is regulated by a \_\_\_\_2\_\_\_\_ feedback system. When the level of testosterone in the blood declines, secretion of \_\_\_\_3\_\_\_\_ by the hypothalamus is \_\_\_\_4\_\_\_\_, causing an \_\_\_\_5\_\_\_\_ in the release of \_\_\_\_6\_\_\_\_ from the anterior pituitary, which, in turn, \_\_\_\_7\_\_\_\_ testosterone production. As the level of testosterone increases, it inhibits \_\_\_\_8\_\_\_\_ production, which decreases the release of \_\_\_\_9\_\_\_\_, resulting in a \_\_\_\_10\_\_\_\_ in testosterone production.

1) Seminiferous tubules

2) Negative

3) GnRH

4) Increased

5) Increase

6) LH (ICSH)

7) Increases

8) GnRH

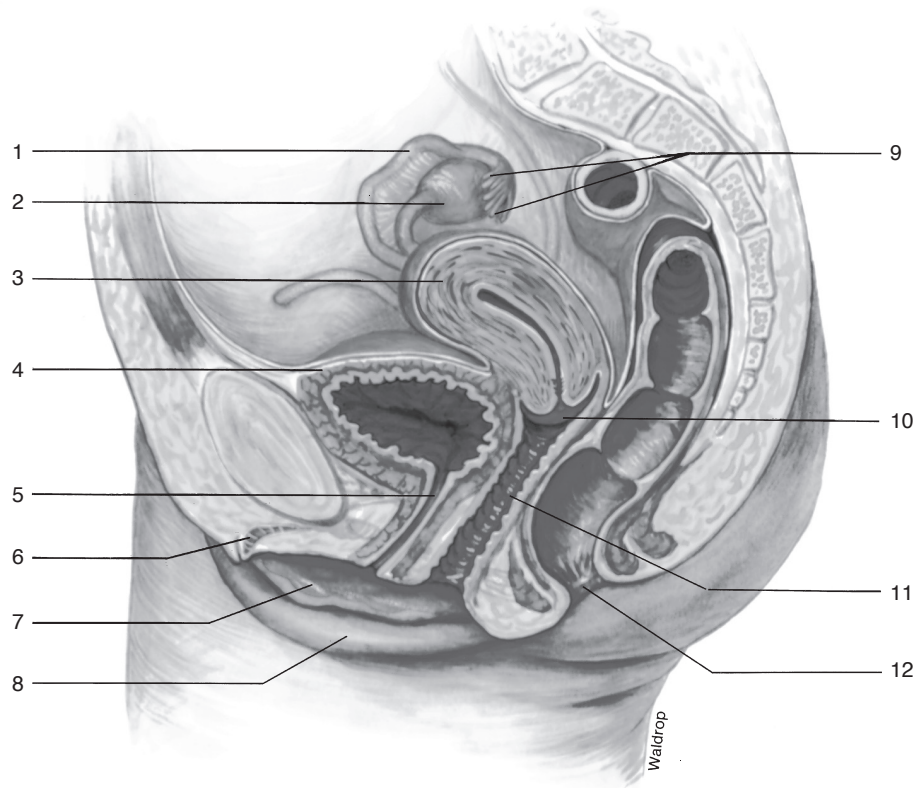
9) LH (ICSH)

10) Decrease

## 4. Female Reproductive System

a. Label the figure by placing the numbers of the structures by the correct labels.

<u>12</u> Anus	<u>8</u> Labium major	<u>4</u> Urinary bladder
<u>10</u> Cervix	<u>7</u> Labium minor	<u>1</u> Uterine tube
<u>6</u> Clitoris	<u>2</u> Ovary	<u>3</u> Uterus
<u>9</u> Fimbriae	<u>5</u> Urethra	<u>11</u> Vagina



b. Write the terms that match the statements in the spaces at the right.

- 1) Produces female sex cells.
- 2) Receives penis in sexual intercourse.
- 3) Holds embryo/fetus during pregnancy.
- 4) Carries secondary oocyte toward uterus.
- 5) Narrow space between labia minora.
- 6) Birth canal during childbirth.

Ovaries

Vagina

Uterus

Uterine tube

Vestibule

Vagina

- c. Write the words that complete the sentences in the spaces at the right.

During fetal development, \_\_\_\_1\_\_\_\_ cell division of germinal epithelial cells forms millions of \_\_\_\_2\_\_\_\_, but most of them degenerate. Survivors become \_\_\_\_3\_\_\_\_ oocytes containing \_\_\_\_4\_\_\_\_ chromosomes. Single layers of follicular cells envelop each oocyte forming \_\_\_\_5\_\_\_\_ follicles, but most of them degenerate; the survivors become \_\_\_\_6\_\_\_\_ follicles. After puberty, usually \_\_\_\_7\_\_\_\_ dominant follicle develops each month, and its oocyte undergoes the first \_\_\_\_8\_\_\_\_ division, producing a \_\_\_\_9\_\_\_\_ oocyte and a first \_\_\_\_10\_\_\_\_. Both of these cells contain \_\_\_\_11\_\_\_\_ chromosomes. Continued growth results in rupture of the follicle at \_\_\_\_12\_\_\_\_, and the released oocyte enters a \_\_\_\_13\_\_\_\_ tube. If the secondary oocyte is penetrated by a \_\_\_\_14\_\_\_\_, the second \_\_\_\_15\_\_\_\_ division forms an \_\_\_\_16\_\_\_\_ and a second \_\_\_\_17\_\_\_\_, each with \_\_\_\_18\_\_\_\_ chromosomes.

- 1) Mitotic
- 2) Oogonia
- 3) Primary
- 4) 46
- 5) Primordial
- 6) Primary
- 7) One
- 8) Meiotic
- 9) Secondary
- 10) Polar body
- 11) 23
- 12) Ovulation
- 13) Uterine tube
- 14) Sperm
- 15) Meiotic
- 16) Ovum
- 17) Polar body
- 18) 23

- d. Write the terms that match the statements in the spaces at the right.

- 1) Inner lining of the uterus.
- 2) Moves an oocyte through a uterine tube.
- 3) Type of muscle in uterine wall.
- 4) Collective term for the external female reproductive organs.
- 5) Nodule of erectile tissue corresponding to the penis in males.
- 6) Portion of uterus projecting into vagina.

- Endometrium
- Cilia
- Smooth
- Vulva
- Clitoris
- Cervix

- e. Female Sexual Response

Write the words that complete the sentences in the spaces at the right.

Sexual stimulation results in enlargement of the \_\_1\_\_ and erection of the \_\_2\_\_ and nipples due to increased blood flow. Increased secretion of the \_\_3\_\_ glands lubricates the vestibule. Sexual response culminates in \_\_4\_\_, which produces rhythmic contractions of the pelvic floor, \_\_5\_\_, and \_\_6\_\_ tubes plus intense pleasure.

- 1) Vaginal mucosa and breasts
- 2) Clitoris
- 3) Vestibular
- 4) Orgasm
- 5) Uterus
- 6) Uterine

## 5. Hormonal Control of Reproduction in Females

- a. Match the hormones listed with the following statements.

Estrogen

GnRH

Progesterone

FSH

LH

- 1) Secreted by the follicular cells.
- 2) Stimulates maturation of female sex organs.
- 3) Maintains uterine lining in pregnancy.
- 4) Develops female secondary sexual characteristics.
- 5) Secreted by corpus luteum.
- 6) Secreted by the hypothalamus.
- 7) Stimulates development and function of corpus luteum.
- 8) First secretion starts onset of puberty.
- 9) Stimulates development of ovarian follicles.
- 10) Prepare endometrium for pregnancy.
- 11) High concentrations inhibit GnRH secretion.
- 12) Promotes thickening of endometrium.
- 13) Promotes formation of blood vessels in endometrium.

Estrogen, progesterone

Estrogen

Progesterone

Estrogen

Estrogen, progesterone

GnRH

LH

GnRH and FSH

FSH

Progesterone

Progesterone

Estrogen

Progesterone

- b. Write the words that complete the sentences in the spaces at the right.

Between puberty and \_\_\_\_1\_\_\_\_, a woman experiences one reproductive cycle per month consisting of an ovarian cycle and a \_\_\_\_2\_\_\_\_ cycle. These cycles are controlled by \_\_\_\_3\_\_\_\_ and average about \_\_\_\_4\_\_\_\_ days in length. A cycle is started by the secretion of \_\_\_\_5\_\_\_\_ by the hypothalamus, which activates the release of \_\_\_\_6\_\_\_\_ and \_\_\_\_7\_\_\_\_ by the anterior pituitary. FSH stimulates the development of a primary \_\_\_\_8\_\_\_\_ and the secretion of \_\_\_\_9\_\_\_\_ by the follicular cells. \_\_\_\_10\_\_\_\_ promotes the thickening of the endometrium. The increasing estrogen production triggers a sharp increase in \_\_\_\_11\_\_\_\_ secretion and a lesser increase in FSH production, leading to \_\_\_\_12\_\_\_\_ on day 14. Under stimulation by LH, the follicle remnants become a \_\_\_\_13\_\_\_\_ that secretes a high level of \_\_\_\_14\_\_\_\_ and estrogen, which together prepare the \_\_\_\_15\_\_\_\_ of the uterus to receive an early embryo. The high level of \_\_\_\_16\_\_\_\_ inhibits secretion of GnRH, preventing development of additional ovarian follicles. If pregnancy does not occur, the corpus luteum degenerates and the levels of estrogen and \_\_\_\_17\_\_\_\_ rapidly decline, resulting in breakdown of the endometrium leading to \_\_\_\_18\_\_\_\_ and secretion of GnRH starting a new reproductive cycle.

1) Menopause

2) Menstrual

3) Hormones

4) 28

5) GnRH

6) FSH

7) LH

8) Follicle

9) Estrogen

10) Estrogen

11) LH

12) Ovulation

13) Corpus luteum

14) Progesterone

15) Endometrium

16) Progesterone

17) Progesterone

18) Menstruation

## 6. Mammary Glands

Indicate whether each statement is true (T) or false (F).

- T   Mammary glands are specialized for milk production.
- F   Breasts contain connective tissue but little fat.
- T   Alveolar glands occur in lobes of mammary glands.
- T   Estrogen stimulates the development of mammary glands.
- T   A pigmented areola surrounds a protruding nipple.
- T   Mammary glands are present, but nonfunctional, in males.
- F   Breasts are formed internal to the pectoralis muscles.

## 7. Birth Control

Indicate whether each statement is true (T) or false (F).

- T   Contraceptives are designed to prevent union of sperm and egg.
- F   Contraceptives and birth control are synonymous.
- T   Spermicides act by killing the sperm cells.
- T   Progesterone in the “pill” inhibits GnRH secretion.
- T   Spermicides are usually used with barrier methods.
- F   It is impossible to catch STDs when using a condom.
- T   Diaphragms and cervical caps are about equally effective.
- T   The rhythm method relies on knowing when ovulation occurs.
- T   A condom is a barrier contraceptive.
- F   Pregnancy is not possible when using a condom.
- F   The “pill” is the most effective contraceptive.
- F   There are no undesirable side effects of the “pill.”
- T   An IUD prevents implantation of an embryo.
- F   Induced abortion is a contraceptive procedure.
- F   A tubal ligation prevents ovulation.
- T   Diaphragms and cervical caps are barrier contraceptives.
- T   A vasectomy prevents the ejaculation of sperm.
- T   Use of an IUD may cause pelvic inflammatory disease.
- T   Withdrawal is less effective than a condom.
- T   Undesirable side effects may result from induced abortion.

## 8. Disorders of the Reproductive Systems

Write the disorders that match the statements in the spaces provided.

*Male Disorders*

- |  |                              |
|--|------------------------------|
| 1) Inability to maintain an erection.                                | <u>  Impotence  </u>         |
| 2) Common reproductive cancer in males.                              | <u>  Prostate  </u>          |
| 3) Inflammation of the prostate glands.                              | <u>  Prostatitis  </u>       |
| 4) Inability to produce sufficient viable sperm.                     | <u>  Infertility  </u>       |
| 5) Causes constriction of urethra in about one-third of older males. | <u>  Enlarged prostate  </u> |



### Female Disorders

- 1) Physical pain during menstruation.
- 2) Growth of endometrial tissue outside the uterus.
- 3) Absence of menstruation without pregnancy.
- 4) Associated with highly absorbent tampons.
- 5) Inability to become pregnant.
- 6) Infection in reproductive organs and/or pelvic cavity.
- 7) Physical and emotional distress just prior to menstruation.
- 8) Caused by toxin formed by *S. aureus*.

### Sexually Transmitted Diseases

- 1) Results from infection with herpes simplex virus type 2.
- 2) Fatal disease resulting from HIV infection.
- 3) Two bacterial diseases that may lead to sterility in females.
- 4) Characterized by chancre in first stage.
- 5) Caused by human papillomavirus (HPV).
- 6) Bacterial diseases curable with antibiotics.
- 7) Viral diseases for which there are no cures.

Dysmenorrhea

Endometriosis

Amenorrhea

Toxic shock syndrome

Infertility

Pelvic inflammatory disease

Premenstrual syndrome

Toxic shock syndrome

Genital herpes

AIDS

Gonorrhea

Chlamydia

Syphilis

Genital warts

Syphilis

Gonorrhea

Chlamydia

AIDS

Genital herpes

Genital warts

## 9. Clinical Applications



- a. Failure of the testes to descend into the scrotum (cryptorchidism) causes sterility in males. Explain why. Normal body temperature prevents the development of viable sperm. A lower temperature, about 95.6°F., is required for production of viable sperm.
- b. Secondary amenorrhea in female athletes results from strenuous activity, which blocks the hypothalamic regulation of reproduction. How does this stop the reproductive cycles? When the production of GnRH by the hypothalamus is curtailed, ovarian and menstrual cycles cease.

Women with amenorrhea produce little, if any, estrogen, which causes osteoporosis (bone loss). Why are such women deficient in estrogen? When GnRH is not produced by the hypothalamus, FSH is not secreted by the anterior pituitary. Without stimulation by FSH, follicular cells do not secrete estrogen.

- c. Without effective treatment, a bacterial sexually transmitted disease usually leads to pelvic inflammatory disease (PID) in females. How does this happen? Bacteria migrate up the uterine tubes and infect pelvic tissues.