

# 17 The Reproductive System

## *Chapter Summary*

The human life cycle includes a form of cell division called meiosis which produces sperm in males (spermatogenesis) and eggs in females (oogenesis). The male reproductive system serves to produce sperm via meiotic cell division within the seminiferous tubules of the testes. These sperm cells are stored in the epididymides, where they also mature. Sperm are conducted to the outside of the body by the vasa deferentia, and, within the penis, the urethra. The sperm are carried within seminal fluid, which is the product of secretions from the seminal vesicles, prostate gland, and bulbourethral glands. Orgasm in males follows erection and sexual stimulation, and involves ejaculation. Two hypothalamic hormones, follicle-stimulating hormone (FSH) and luteinizing hormone (LH), regulate the functioning of the testes (LH is also called interstitial cell stimulating hormone or ICSH in males). FSH promotes the formation of sperm (spermatogenesis), and LH causes the testes to produce and release testosterone. Testosterone is necessary for the production of sperm, and maintains the male secondary sexual characteristics. The female reproductive system serves to produce eggs, and house developing offspring. Eggs are produced in follicles within ovaries and egg production is called oogenesis. Ovulation involves the release of an egg from an ovary, typically occurs once a month, and produces an empty follicle called a corpus luteum. The corpus luteum will persist for 3–6 months if pregnancy occurs. The egg released from the ovary travels down the uterine tube where fertilization may occur. Eventually the egg (or developing embryo if fertilization has occurred) will implant in the lining of the uterus (endometrium). The vagina is inferior to the uterus and serves as both the birth canal and the organ for sexual intercourse. The menstrual cycle, which consists of changes that effect both the ovaries and the uterus, last an average of 28 days and is regulated by various sex hormones. The anterior pituitary secretes the hormones FSH and LH. FSH promotes the development of a follicle in the ovary and the secretion of estrogen by the follicle. LH promotes the development of the corpus luteum, which secretes progesterone. Estrogen and progesterone regulate the changes to the uterus that occur during the menstrual cycle. First, the uterine lining, or endometrium, builds up and then is shed during menstruation. Menstruation does not occur during pregnancy because of hormones produced by the placenta. Following pregnancy and the birth of the baby, the pituitary gland begins to secrete prolactin. Prolactin stimulates the breasts to produce milk. Suckling at the breast causes the pituitary to release oxytocin, which causes milk to be released from the breast. The text explains various methods of birth control and describes their effectiveness. Infertility is also discussed, as are a variety of sexually transmitted diseases.

## *Chapter Outline*

- I. Human Life Cycle
  - A. Meiosis
- II. Male Reproductive System
  - A. The Testes
    1. Anatomy of a Testis
    2. Spermatogenesis
  - B. Male Internal Accessory Organs
    1. Epididymides
    2. Vas Deferens
    3. Seminal Vesicles
    4. Prostate
    5. Bulbourethral Glands
  - C. Male Sexual Response

- D. Regulation of Male Hormone Levels
  - 1. Negative Feedback Mechanisms
  - 2. Testosterone
- III. Female Reproductive System
  - A. The Ovary
    - 1. Oogenesis
  - B. Female Internal Accessory Organs
    - 1. Uterine Tubes
    - 2. Uterus
    - 3. Vagina
  - C. External Genitals
  - D. Female Sexual Response
  - E. Regulation of Female Hormone Levels
    - 1. Estrogen and Progesterone
  - F. Menstrual Cycle
    - 1. Pre-ovulation Events
    - 2. Post-ovulation Events
    - 3. Menopause
  - G. Female Breast and Lactation
- IV. Control of Reproduction and Sexually Transmitted Diseases
  - A. Birth Control Methods
    - 1. Morning After Pills
  - B. Infertility
    - 1. Causes of Infertility
    - 2. Assisted Reproductive Technologies
      - a. Artificial Insemination
      - b. In Vitro Fertilization
      - c. Intracytoplasmic Sperm Injection
  - C. Sexually Transmitted Diseases
    - 1. Genital Warts
    - 2. Genital Herpes
    - 3. Hepatitis
    - 4. Chlamydia
    - 5. Gonorrhea
    - 6. Syphilis
- V. Effects of Aging
- VI. Homeostasis

*Suggested Student Activities*

1. Discuss puberty and the changes that occur in both males and females.
2. Locate the organs of the male and female reproductive systems on a model.
3. Discuss modes of birth control.

*Answers to Objective Questions*

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|---------------------|------------------------------------|-----------------------|
| 1. vas deferens     | 6. estrogen, progesterone          | 11. corpus luteum     |
| 2. seminal vesicles | 7. follicle, endometrium           | 12. ovulation         |
| 3. blood            | 8. low sperm count, abnormal sperm | 13. viruses, bacteria |
| 4. testosterone     | 9. seminiferous tubules            |                       |
| 5. vagina           | 10. interstitial                   |                       |

*Answers to Medical Terminology Reinforcement Exercise*

1. orchido/pexy - surgical fixation of a testicle—a surgical procedure whereby the undescended testicle is brought down into the scrotum and secured
2. trans/urethr/al re/sect/ion of prostate - surgical removal of a portion of the prostate gland through a resectoscope inserted into the urethra
3. gonado/trop/ic - an agent that stimulates the gonads (gamete/seed producing glands—testes and ovaries)
4. contra/cept/ive - an agent used against conception (pregnancy)
5. gyneco/mast/ia - female breast—excessive development of male mammary glands
6. hyster/salpingo/oophor/ectomy - surgical removal of uterus, tube, and ovary
7. colpo/rrhaphy - suturing the vagina
8. meno/metro/rrhagia - hemorrhage from the uterus monthly—excessive uterine bleeding during menses and at irregular intervals
9. multi/para - many children—a woman who has borne two or more viable children
10. balan/itis - inflammation of the glans penis
11. semin/oma - tumor arising from germ cells in seminiferous tubules
12. genito/urinary - relating to organs of both reproduction and urination
13. prostatic hyper/trophy - increase in size of the prostate gland
14. a/zoo spermia - absence of living sperm in semen

*Audiovisual Materials*

1. Model - Pelvic Organs - Male (S17144)(Fisher Scientific)
2. Model - Pelvic Organs - Female (S17143)(Fisher Scientific)
3. Filmstrip - Reproductive System in the Human Body (HD-0481-NU)(Career Aids)
4. Transparencies - Human Reproduction (HB-1700SNU)(Career Aids)
5. Filmstrip - Methods of Contraception (A-77059)(Concept Media)