

## CHAPTER TWENTY-EIGHT

### Answers to WHAT DID YOU LEARN?

1. Sex hormones control maturation, development, and changes in the activity of reproductive system organs.
2. Puberty is the time in an adolescent's life when external sex characteristics become more prominent and the reproductive organs become fully functional.
3. The perineum is a diamond-shaped area circumscribed by the pubic symphysis anteriorly, the ischial tuberosities laterally, and the coccyx posteriorly. It is the inferior trunk area between the origin of the thighs where the external genitalia and the anus for both sexes are located.
4. A primordial follicle is the most primitive type of ovarian follicle, and each contains a primary oocyte. A primary follicle matures from a primordial follicle and contains a primary oocyte. A secondary follicle matures from a primary follicle and contains a primary oocyte. A vesicular follicle matures from a secondary follicle and is the only follicle that contains a secondary oocyte.
5. The ovary contains primordial germ cells called oogonia, which are diploid cells (containing 23 pairs of chromosomes). Oogonia divide by meiosis to produce oocytes.
6. Ovulation is the release of the secondary oocyte from a vesicular follicle.
7. Menarche, the first menstrual cycle, is the culmination female sexual development during puberty. On average, the onset of menarche occurs at age 11–12.
8. The wall of the uterine tube consists of a mucosa, a muscularis, and a serosa. The mucosa is formed from ciliated columnar epithelium and a layer of connective tissue.
9. The regions of the uterus are: the fundus, body, isthmus, and cervix.
10. Round ligaments of the uterus run from the lateral sides of the uterus, and help keep the uterus in an anteverted position. Transverse cervical ligaments run from the sides of the cervix and superior vagina laterally to the pelvic wall, and restrict inferior movements of the uterus. The uterosacral ligaments connect the inferior portion of the uterus posteriorly to the sacrum.
11. The innermost uterine tunic is the endometrium, an intricate mucosal membrane composed of a simple columnar epithelium and an underlying lamina propria. The endometrium contains a basal layer, which lies next to the myometrium, and a functional layer, which is shed each month as menses.
12. The mammary glands contain secretory units termed alveoli that produce milk in the lactating female. Tiny ducts drain milk from the alveoli and lobules. The tiny ducts of the lobules merge and form 10–20 larger channels called lactiferous ducts. As each lactiferous duct approaches the nipple, its lumen expands to form a lactiferous sinus where milk is stored prior to release from the nipple.
13. The male gonads and first portion of the duct system, which is the site of early maturation and development, reside outside the body proper within a skin-covered sac called the scrotum. The scrotum is homologous to the labia majora in the female.

14. Within the spaces surrounding the seminiferous tubules reside the interstitial cells, which produce androgens. There are several types of androgens, the most common one being testosterone.
15. The cremaster muscle and cremasteric fascia surround the testes and the spermatic cord. When the testes are exposed to elevated temperatures, the skin of the scrotal sac becomes thin as a result of dartos relaxation. At the same time, the cremaster muscle relaxes to permit the testes to move inferiorly away from the body.
16. Spermatogenesis is the process of sperm development that occurs within the seminiferous tubule of the testis. Spermatogenesis does not occur until puberty, when significant levels of FSH (follicle-stimulating hormone) and LH (luteinizing hormone) are secreted and stimulate the testis to begin developing gametes.
17. The ejaculatory duct is formed from the union of the ampulla of the ductus deferens and the proximal region of the seminal vesicle.
18. The seminal vesicles secrete viscous, whitish-yellow alkaline fluid containing fructose and prostaglandins. The fructose is a sugar that nourishes the sperm as they travel through the female reproductive tract, while the prostaglandins promote the widening and slight dilation of the external os of the cervix.
19. Semen is a combination of sperm (produced by the testis) and seminal fluid secreted by the seminal vesicles, prostate gland, and bulbourethral glands.
20. Within the shaft of the penis are three cylinders of erectile tissue—the paired corpora cavernosa and the single corpus spongiosum.
21. Parasympathetic and sympathetic innervation work together to create an erection and ejaculation, respectively.
22. Females stop gamete maturation in their 40s or 50s, and menopause occurs. A reduction in hormone production results in some atrophy of the reproductive organs and the breasts. The vaginal wall thickness decreases, as do glandular secretions for maintaining a lubricated lining. The uterus shrinks and atrophies at menopause, becoming much smaller than it was before puberty. Women also may experience hot flashes and changes in hair patterns, and they have an increased risk of osteoporosis.
23. The genetic sex of an individual is based on the sex chromosomes. An individual with two X chromosomes is a genetic female, while an individual with one X and one Y chromosome is a genetic male. In contrast, the phenotypic sex of an individual refers to the appearance of the internal and external genitalia. A person who has testes and male external genitalia is a phenotypic male, whereas a person who has ovaries and female external genitalia is a phenotypic female.