

# 21

## Female Reproductive System

### I. Introduction to the Female Reproductive System

☞ *Concept:* The female reproductive system produces ova, secretes sex hormones, receives spermatozoa from the male, and provides sites for fertilization of an ovum and implantation of the blastocyst. Parturition follows gestation, and secretion from the mammary glands provides nourishment for the baby.


#### A. Multiple Choice Questions

- \_\_\_ 1. Gonads are  
(a) found only in the male. (c) found only in the female.  
(b) primary sex organs. (d) secondary sex organs.
- \_\_\_ 2. An example of a secondary sex organ is  
(a) the vagina. (c) primordial follicles.  
(b) an ovary. (d) a gonad.
- \_\_\_ 3. Female secondary sex characteristics  
(a) are essential for reproduction.  
(b) are partially due to fat distribution.  
(c) cease functioning after menopause.  
(d) play an important role in lactation.
- \_\_\_ 4. Puberty  
(a) generally occurs earlier in girls than in boys.  
(b) can also be called menopause.  
(c) occurs in girls between the ages of 15 and 16.  
(d) is completely determined by genes.
- \_\_\_ 5. Secondary sex characteristics are  
(a) the only structures that distinguish the sexes.  
(b) not essential for the reproductive process.  
(c) only those structures that develop after puberty.  
(d) only those reproductive structures that are affected by hormones.

#### B. True-False Questions

- \_\_\_ 1. Menstruation is the discharge of menses at the middle of the ovulation cycle.
- \_\_\_ 2. Menopause marks the termination of both menstruation and ovulation.
- \_\_\_ 3. The primary sex organs are located within the pelvic cavity, whereas the secondary sex organs are the external genitalia.
- \_\_\_ 4. Secondary sex characteristics are considered to be sexual attractants.
- \_\_\_ 5. It is not necessary that breasts be large in order to nurse an infant.

## II. Structure and Function of the Ovaries

 **Concept:** The ovary contains a large number of follicles, each of which encloses an ovum. Some of these follicles mature during the ovarian cycle, and the ova they contain progress to the secondary oocyte stage of meiosis. During ovulation, the largest follicle ruptures and releases its secondary oocyte. The ruptured follicle becomes a corpus luteum and regresses to become a corpus albicans. These cyclic changes in follicular development are accompanied by changes in hormone levels.

### A. Multiple Choice Questions

- \_\_\_\_\_ 1. Which of the following statements regarding the ovaries is *false*?
- (a) The ovaries of a sexually mature female can be palpated, either in a vaginal or an abdominal examination.
  - (b) Each ovary is supported by an ovarian ligament, a mesovarium, and a suspensory ligament.
  - (c) The ovaries are innervated by both sympathetic and parasympathetic fibers.
  - (d) The lateral portion of an ovary is positioned near the opening of the uterine tube.
- \_\_\_\_\_ 2. All of the following are layers of the ovary *except*
- (a) the medulla.
  - (b) the tunica albuginea.
  - (c) the cortex.
  - (d) the mesovarium.
  - (e) the superficial epithelium.
- \_\_\_\_\_ 3. The follicles and blood vessels of an ovary are embedded in
- (a) the stroma.
  - (b) the mesovarium.
  - (c) the hilum.
  - (d) the superficial epithelium.
  - (e) the ovarian capsule.
- \_\_\_\_\_ 4. Primary oocytes that are *not* stimulated to complete the first meiotic division are contained within tiny follicles called
- (a) superficial epithelia.
  - (b) stromae.
  - (c) ovarian capsules.
  - (d) primordial follicles.
  - (e) antria.
- \_\_\_\_\_ 5. The follicular epithelium of secondary follicles
- (a) develops in response to gonadotrophin stimulation.
  - (b) phagocytoses underdeveloped polar bodies.
  - (c) secretes FSH to promote the maturation of oocytes.
  - (d) forms the corona radiata.
  - (e) both a and d apply.
- \_\_\_\_\_ 6. Which of the following is the correct sequence for the development and regression of an ovarian follicle?
- (a) the primordial follicle, mature vesicular ovarian follicle, corpus albicans, and corpus luteum
  - (b) the primordial follicle, mature vesicular ovarian follicle, corpus luteum, and corpus albicans
  - (c) the primordial follicle, corpus luteum, corpus albicans, and mature vesicular ovarian follicle
  - (d) the primordial follicle, corpus luteum, mature vesicular ovarian follicle, and corpus albicans
- \_\_\_\_\_ 7. The corpus luteum secretes
- (a) luteinizing hormone.
  - (b) oxytocin.
  - (c) estrogen and progesterone.
  - (d) follicle-stimulating hormone.
- \_\_\_\_\_ 8. Estrogen is secreted by
- (a) the corpus luteum.
  - (b) the secondary oocytes.
  - (c) the pituitary gland.
  - (d) the follicular epithelium of secondary follicles.
  - (e) both a and d.

## B. True–False Questions

- \_\_\_ 1. The ovarian fossa is the depression of the ovary that comes in contact with the opening of the uterine tube.
- \_\_\_ 2. Both the right and left ovarian veins empty directly into the inferior vena cava.
- \_\_\_ 3. The only innervation of the ovaries is via parasympathetic fibers from the ovarian plexus.
- \_\_\_ 4. All of the oogonia have been formed in a female fetus by 5 months of development.
- \_\_\_ 5. The follicular epithelium of a developing follicle gives rise to the cumulus oophorus and the corona radiata.
- \_\_\_ 6. The first meiotic division of a primary oocyte forms two secondary oocytes that remain in this stage unless fertilization occurs.
- \_\_\_ 7. The penetration of a sperm cell through the corona radiata and the zona pellucida of an ovulated secondary oocyte is necessary for fertilization to occur.
- \_\_\_ 8. Estrogen is secreted by both the follicular epithelium of the ovarian follicle and the corpus luteum.

## III. Secondary Sex Organs

☞ *Concept:* The uterine tube conducts the zygote to the uterus, where implantation in the endometrium of the uterine wall typically occurs. The muscular layer of the uterine wall, or myometrium, is functional in labor and delivery. Sperm cells enter the female reproductive tract through the vagina, which also serves as the birth canal during parturition.

## A. Multiple Choice Questions

- \_\_\_ 1. The open-ended portion of the uterine tube closest to the ovary is
  - (a) the infundibulum.
  - (b) the fimbria.
  - (c) the ampulla.
  - (d) the oviduct.
  - (e) the uterine fossa.
- \_\_\_ 2. The innermost layer of the wall of a uterine tube is
  - (a) the serous layer.
  - (b) the fibrous layer.
  - (c) the mucosa.
  - (d) the endometrium.
  - (e) the muscularis.
- \_\_\_ 3. All of the following are regions of the uterus *except*
  - (a) the fundus.
  - (b) the body.
  - (c) the uterine cavity.
  - (d) the cervix.
  - (e) the ampulla.
- \_\_\_ 4. The ligaments that do *not* support the uterus are
  - (a) the broad ligaments.
  - (b) the rectouterine folds.
  - (c) the cardinal ligaments.
  - (d) the round ligaments.
  - (e) the suspensory ligaments.

- \_\_\_\_\_ 5. The superficial stratum functionale of the uterus is composed of  
 (a) simple squamous epithelium.  
 (b) simple columnar epithelium.  
 (c) stratified squamous epithelium.  
 (d) simple cuboidal epithelium.  
 (e) simple ciliated columnar epithelium.
- \_\_\_\_\_ 6. The layer that is shed as menses is  
 (a) the perimetrium. (d) the stratum basale.  
 (b) the myometrium. (e) the menstrual layer.  
 (c) the stratum functionale.
- \_\_\_\_\_ 7. The transverse mucosal folds in the vagina are called  
 (a) fimbriae. (d) vaginal rugae.  
 (b) fornices. (e) vaginal villi.  
 (c) vulvae.
- \_\_\_\_\_ 8. The structures of the vulva include all of the following *except*  
 (a) the vagina. (d) the labia minora.  
 (b) the vaginal vestibule. (e) the clitoris.  
 (c) the labia majora.
- \_\_\_\_\_ 9. The vaginal vestibule  
 (a) surrounds the perineum.  
 (b) is the depression between the labia majora.  
 (c) supports pubic hair and sebaceous glands.  
 (d) is the cleft between the labia minora.  
 (e) is a secretory gland.
- \_\_\_\_\_ 10. Which of the following occurs during female sexual arousal?  
 (a) Sympathetic impulses cause vascular engorgement of the clitoris.  
 (b) The vagina expands and elongates.  
 (c) The vestibular bulbs contract.  
 (d) The clitoris secretes mucus.  
 (e) All of the above occur.

## **B. True–False Questions**

- \_\_\_\_\_ 1. *Uterine tube*, *fallopian tube*, and *oviduct* are terms used to refer to the same organ.
- \_\_\_\_\_ 2. The term *salpinx* is occasionally used in reference to the uterine tubes.
- \_\_\_\_\_ 3. An ectopic pregnancy is an implantation of the blastocyst in a site other than the uterus.
- \_\_\_\_\_ 4. The uterine ostium is the opening of the cervical canal into the vagina.
- \_\_\_\_\_ 5. The uterus is supported by four paired ligaments.
- \_\_\_\_\_ 6. The uterine tubes, the uterus, and the vagina are each innervated by sympathetic and parasympathetic fibers.
- \_\_\_\_\_ 7. The entire endometrium is shed as menses during menstruation and is built up again under the stimulation of ovarian hormones.

- \_\_\_ 8. The pudendal cleft is the longitudinal cleft of the vulva between the labia minora.
- \_\_\_ 9. The clitoris is similar to the penis in that it has an exposed glans, a prepuce, a crura, and corpora cavernosa erectile tissue.
- \_\_\_ 10. Following a female orgasm or completion of coitus, parasympathetic impulses cause a reduction of arterial flow to the erectile tissues, and their size returns to what it was prior to sexual stimulation.

#### IV. Mammary Glands

☞ *Concept:* Mammary glands are modified sweat glands composed of secretory alveoli and ducts. The glands develop in the female breasts at puberty and function in lactation.

##### A. Multiple Choice Questions

- \_\_\_ 1. The mammary glands are modified
  - (a) endocrine glands.
  - (b) sebaceous glands.
  - (c) lymphatic ductules.
  - (d) sweat glands.
- \_\_\_ 2. The enlargement of the breasts at puberty is due to elevated levels of
  - (a) estrogen.
  - (b) growth hormone.
  - (c) prolactin.
  - (d) oxytocin.
  - (e) androgens.
- \_\_\_ 3. Which of the following statements concerning the anatomy of the breast is *false*?
  - (a) It is positioned over ribs 2 through 6.
  - (b) It is extensively innervated with sympathetic and parasympathetic fibers.
  - (c) It is supported by the suspensory ligaments.
  - (d) Each mammary gland is composed of 15 to 20 lobes.

##### B. True–False Questions

- \_\_\_ 1. Glandular mammary alveoli within the lobules of the breasts secrete the milk in a lactating female.
- \_\_\_ 2. The cylindrical nipple of the breast contains erectile tissue.
- \_\_\_ 3. The secretions of the areolar glands are responsible for the pigmentation of the areola and the nipple.

#### V. Ovulation and Menstruation

☞ *Concept:* Ovulation and menstruation are reproductive cyclic events that are regulated by follicle-stimulating hormone (FSH) and luteinizing hormone (LH), secreted by the anterior pituitary, and by estrogen and progesterone, secreted by structures of the ovaries.

##### A. Multiple Choice Questions

- \_\_\_ 1. Which of the following is *not* a phase of the menstrual cycle?
  - (a) proliferative phase
  - (b) menstrual phase
  - (c) secretory phase
  - (d) ovulatory phase
- \_\_\_ 2. Menstrual bleeding is the result of
  - (a) low levels of ovarian hormones.
  - (b) high levels of ovarian hormones.
  - (c) high levels of LH.
  - (d) high levels of FSH.
  - (e) low levels of LH.

- \_\_\_ 3. The corpus luteum secretes  
 (a) estrogen. (d) progesterone.  
 (b) FSH. (e) both a and d.  
 (c) LH.
- \_\_\_ 4. Ovulation is triggered by a surge of  
 (a) LH. (d) progesterone.  
 (b) FSH. (e) both a and b.  
 (c) estrogen.
- \_\_\_ 5. Which of the following is secreted only during the luteal phase of a menstrual cycle?  
 (a) LH (c) estrogen  
 (b) FSH (d) progesterone

## B. True-False Questions

- \_\_\_ 1. The follicular phase of the ovaries corresponds to the menstrual phase of the uterus.
- \_\_\_ 2. Ovulation occurs as a result of the sequential effects of FSH and LH on the ovarian follicles.
- \_\_\_ 3. Ovulation is completed as the oocyte and its follicular fluid are discharged toward the uterine tube.
- \_\_\_ 4. Both estrogen and progesterone maintain the endometrium by inhibiting the secretion of FSH and LH from the anterior pituitary.
- \_\_\_ 5. Withdrawal of ovarian hormones causes menstrual bleeding.

## VI. Developmental Exposition of the Female Reproductive System

### A. Multiple Choice Questions

- \_\_\_ 1. Which of the following is an organ of the genital tract?  
 (a) vestibule (d) hymen  
 (b) clitoris (e) none of the above  
 (c) uterus
- \_\_\_ 2. Concerning the hymen, which of the following is a *false* statement?  
 (a) It develops from the genital ducts.  
 (b) Its presence is a reliable indicator of virginity.  
 (c) It may be extremely elastic.  
 (d) It never completely covers the vaginal orifice.
- \_\_\_ 3. Which of the following developmental sequences of female genital structures is *correct*?  
 (a) genital tract, urethral folds, labia minora  
 (b) urethral folds, genital tubercle, labia majora  
 (c) primordial follicles, genital swelling, vestibular glands  
 (d) genital tubercle, phallus, clitoris  
 (e) both c and d
- \_\_\_ 4. In the female, the \_\_\_\_\_ is (are) homologous to the glans penis of the male.  
 (a) labia minora (c) vestibular gland  
 (b) labia majora (d) clitoris
- \_\_\_ 5. In the female, the \_\_\_\_\_ is (are) homologous to the spongy urethra of the male.  
 (a) labia majora (d) labia minora  
 (b) clitoris (e) vestibule  
 (c) mons pubis

## B. True–False Questions

- \_\_\_ 1. The external genitalia of the male and the female are derived from similar embryonic structures.
- \_\_\_ 2. All oogonia are formed prenatally.
- \_\_\_ 3. In the female embryo, high levels of testosterone cause feminization.
- \_\_\_ 4. The external genitalia of a female are completely formed at the end of the twelfth week.
- \_\_\_ 5. The presence of a hymen that is not broken or stretched is a reliable indicator of virginity.

## VII. Clinical Considerations

### A. Multiple Choice Questions

- \_\_\_ 1. Females are more prone to dysfunctions of the reproductive organs than are males because
  - (a) reproductive events in the female are characterized by cyclic changes.
  - (b) their reproductive organs are structurally more complex.
  - (c) they pass through puberty at an earlier age.
  - (d) they have a higher overall body fat level.
  
- \_\_\_ 2. A hysterosalpingogram
  - (a) permits in vivo visualization of the internal reproductive organs.
  - (b) is the same as a laparoscopy.
  - (c) may determine whether the uterine tubes are patent.
  - (d) is always used when performing a tubal ligation.
  
- \_\_\_ 3. The most frequent ectopic pregnancy site is in
  - (a) the uterine tube.
  - (b) the cervix.
  - (c) the myometrium.
  - (d) the vaginal fornix.
  - (e) the endometrium.
  
- \_\_\_ 4. Amenorrhea
  - (a) will cause overdevelopment of the secondary sex characteristics.
  - (b) is never normal.
  - (c) is rare in woman athletes due to their good physical conditioning.
  - (d) is the absence of menstruation.
  
- \_\_\_ 5. Which of the following could cause female infertility?
  - (a) endometriosis
  - (b) uterine displacement
  - (c) abnormal ovulation
  - (d) obstruction of the uterine tubes
  - (e) all of the above
  
- \_\_\_ 6. An abortion is
  - (a) usually induced by prolapsing the uterus.
  - (b) defined as the termination of pregnancy after the twenty-eighth week.
  - (c) the common term for an endometriosis.
  - (d) classified as either spontaneous or induced.
  
- \_\_\_ 7. The contraceptive pill works by directly preventing
  - (a) ovulation.
  - (b) menstruation.
  - (c) fertilization.
  - (d) implantation.
  - (e) gestation.

- \_\_\_\_\_ 8. When a woman is taking the contraceptive pill, or when she is pregnant, the levels of ovarian steroids and pituitary gonadotropins are most similar to those that normally occur during
- (a) the menstrual phase.                      (c) the ovulatory phase.  
(b) the follicular phase.                      (d) the luteal phase.

## **B. True–False Questions**

- \_\_\_\_\_ 1. One diagnostic procedure that should be routinely performed by a woman is a BSE.
- \_\_\_\_\_ 2. Most ovarian neoplasms are malignant.
- \_\_\_\_\_ 3. Secondary amenorrhea is the cessation of menstruation in women who previously have had normal menstrual periods, who are not pregnant, and who have not gone through menopause.
- \_\_\_\_\_ 4. Uterine neoplasms are a common problem of the female reproductive tract.
- \_\_\_\_\_ 5. Endometriosis is a condition characterized by the presence of endometrial tissues at sites other than the inner lining of the uterus.
- \_\_\_\_\_ 6. Dysplasia is a broad condition involving several related nonmalignant diseases of the breast.

## **VIII. Chapter Review**

### **A. Completion Questions**

1. The natural termination of pregnancy is labor and delivery, known as \_\_\_\_\_.
2. The genital tract, including the uterus and uterine tubes, develops from a pair of embryonic tubes called the \_\_\_\_\_ ducts.
3. The \_\_\_\_\_ of the female reproductive system is homologous to the glans penis of the male.
4. Each ovary is situated in a shallow depression of the posterior body wall called the \_\_\_\_\_.
5. The \_\_\_\_\_ is the principal supporting membrane of the female reproductive tract.
6. During meiosis, the \_\_\_\_\_ gets all the cytoplasm; the other cell formed becomes a small polar body, which eventually fragments and is absorbed.
7. A ruptured \_\_\_\_\_ on the ovary releases an oocyte in the process of ovulation.
8. The Greek word \_\_\_\_\_ is occasionally used in reference to the uterine tubes.
9. The opening of the uterine cavity into the cavity of the vagina is called the \_\_\_\_\_.
10. The \_\_\_\_\_ pouch is the lowest point in the pelvic cavity and provides a site for surgical entry into the peritoneal cavity.



11. It is the stratum \_\_\_\_\_ of the endometrium that is shed as menses during menstruation.
12. The external genitalia of the female are collectively referred to as the \_\_\_\_\_, or pudendum.
13. During sexual excitement, the vaginal orifice is lubricated by secretions from the paired \_\_\_\_\_ glands.
14. Each mammary gland is composed of 15 to 20 \_\_\_\_\_, which in turn contain lobules composed of the secretory \_\_\_\_\_.
15. The hormones LH and FSH are at their peak at the end of the \_\_\_\_\_ phase in the menstrual cycle and during the \_\_\_\_\_ phase of the ovarian cycle.
16. The developing mature vesicular ovarian follicle secretes only \_\_\_\_\_, whereas the corpus luteum secretes both \_\_\_\_\_ and \_\_\_\_\_.
17. \_\_\_\_\_ is the specialty of medicine concerned with dysfunction and diseases of the female reproductive system, whereas \_\_\_\_\_ is the specialty dealing with pregnancy and childbirth.
18. In order to ensure an early detection of cancer, a woman should do a monthly \_\_\_\_\_, \_\_\_\_\_, and have a yearly \_\_\_\_\_ of her cervix.
19. \_\_\_\_\_ results from the implantation of the blastocyst in a location other than the body or fundus of the uterus.
20. \_\_\_\_\_ is a condition characterized by the presence of endometrial tissues at sites other than the inner lining of the uterus.
21. During the \_\_\_\_\_ stage of reproductive development, the sex organs are apparent but cannot be distinguished as male or female.

## B. Matching Questions

Match the structure with its description.

- |                     |  |
|---------------------|--|
| ___ 1. hymen        | (a) open-ended portion of a uterine tube near the ovary          |
| ___ 2. fimbriae     | (b) site of fertilization  |
| ___ 3. infundibulum | (c) exposed portion of the clitoris                              |
| ___ 4. uterine tube | (d) processes extending over the ovary                           |
| ___ 5. fundus       | (e) portion of the uterus above the entrance of the uterine tube |
| ___ 6. cervix       | (f) external genitalia   |
| ___ 7. glans        | (g) uterine projection into the vagina                           |
| ___ 8. perineum     | (h) region between the vaginal orifice and the anus              |
| ___ 9. vestibule    | (i) membrane covering the vaginal orifice                        |
| ___ 10. pudendum    | (j) cleft between the labia minora                               |