

Chapter 17 The Female Reproductive System

OVERVIEW

The purpose of this chapter is to teach the anatomy and physiology of the female reproductive system and to present select concepts associated with pathophysiology or disease issues of the female reproductive system. The reproductive system has been divided into two chapters: male and female because this system works to define sexual characteristics even if reproduction does not take place. The functions of the reproductive system concerning male sexual characteristics are covered in Chapter 16. The functions of the reproductive system concerning female sexual characteristics and reproduction of offspring are continued in this chapter along with pregnancy. The Putting the Pieces Together feature combines the male and female reproductive systems and is shown in both chapters.

Reproductive anatomy, hormonal regulation, and gamete production is more straight forward in the male, so the male reproductive system was covered first. Meiosis was explained in Figure 16.12, which showed crossing over and independent assortment. In this chapter the female anatomy is explained, the cyclic nature of hormone regulation of what is happening in the ovary and uterus is explored, and the prior knowledge of meiosis from Chapter 16 is used to explain oogenesis. The functions for the male and female reproductive systems are explained in the context of a couple expecting a child and what they can expect during the pregnancy.

Another way to study the anatomy and physiology of the reproductive system is to study how to prevent the system from working. A Talking Point, Discussion Point, and Group Activity on contraceptives described under Individual Outcome 17.11 below.

Chapter figures can be found in the Online Learning Center (OLC). Discussion points, group activities, and quizzes listed in the summary table below are explained under their individual outcomes following the table. Answer keys to the text chapter review questions, workbook concept maps, and workbook review questions are located at the end of the chapter.

A review guide is also available on the OLC. This guide lists all of the learning outcomes for the chapter and gives space for students to take notes and make sketches. This can be an important tool to encourage students to pay attention to what they are learning and to use to either take initial notes or to organize their existing notes before exams.

Learning Outcome	CAAHEP Competencies	ABHES Competencies
17.1 Use medical terminology related to the female reproductive system.	I.C.1. Describe structural organization of the human body	3.a. Define and use entire basic structure of medical words and be able to accurately identify in the correct context, i.e., root, prefix, suffix, combinations, spelling and definitions

17.2 Explain what is needed for female anatomy to develop.	I.C.5. Describe the normal function of each body system	2.b. Identify and apply the knowledge of all body systems, their structure and functions, and their common diseases, symptoms and etiologies.
17.3 Describe the anatomy of the ovary and its functions.	I.C.5. Describe the normal function of each body system	2.b. Identify and apply the knowledge of all body systems, their structure and functions, and their common diseases, symptoms and etiologies.
17.4 Describe the female secondary reproductive organs and structures and their respective functions.	I.C.5. Describe the normal function of each body system	2.b. Identify and apply the knowledge of all body systems, their structure and functions, and their common diseases, symptoms and etiologies.
17.5 Explain the hormonal control of puberty and the resulting changes in the female.	I.C.5. Describe the normal function of each body system	2.b. Identify and apply the knowledge of all body systems, their structure and functions, and their common diseases, symptoms and etiologies.
17.6 Explain oogenesis in relation to meiosis.	I.C.5. Describe the normal function of each body system	2.b. Identify and apply the knowledge of all body systems, their structure and functions, and their common diseases, symptoms and etiologies.
17.7 Explain the hormonal control of the adult female reproductive system and its effect on follicles in the ovary and the uterine lining.	I.C.5. Describe the normal function of each body system	2.b. Identify and apply the knowledge of all body systems, their structure and functions, and their common diseases, symptoms and etiologies.
17.8 Describe the stages of the female sexual response.	I.C.5. Describe the normal function of each body system	2.b. Identify and apply the knowledge of all body systems, their structure and functions, and their common diseases, symptoms and etiologies.
17.9 Explain the effects of aging on the female reproductive system.	I.C.10. Compare body structure and function of the human body across the life span	2.b. Identify and apply the knowledge of all body systems, their structure and functions, and their common diseases, symptoms and etiologies.
17.10 Describe common diagnostic tests for female reproductive disorders.	I.C.6. Identify common pathology related to each body system	2.b. Identify and apply the knowledge of all body systems, their structure and functions, and their common diseases, symptoms and etiologies.
17.11 Describe female reproductive disorders and relate abnormal function to pathology.	I.C.6. Identify common pathology related to each body system	2.b. Identify and apply the knowledge of all body systems, their structure and functions, and their common diseases, symptoms and etiologies.
17.12 List the four requirements of pregnancy.	I.C.4. List major organs in each body system	2.b. Identify and apply the knowledge of all body systems, their structure and functions, and their common diseases, symptoms and etiologies.
17.13 Trace the pathway for a sperm to fertilize an egg.	I.C.4. List major organs in each body system	2.b. Identify and apply the knowledge of all body systems, their structure and functions, and their common diseases, symptoms and etiologies.

17.14 Describe the events necessary for fertilization and implantation.	I.C.5. Describe the normal function of each body system	2.b. Identify and apply the knowledge of all body systems, their structure and functions, and their common diseases, symptoms and etiologies.
17.15 Explain the hormonal control of pregnancy.	I.C.5. Describe the normal function of each body system	2.b. Identify and apply the knowledge of all body systems, their structure and functions, and their common diseases, symptoms and etiologies.
17.16 Explain the adjustments a woman's body makes to accommodate a pregnancy.	I.C.5. Describe the normal function of each body system	2.b. Identify and apply the knowledge of all body systems, their structure and functions, and their common diseases, symptoms and etiologies.
17.17 Explain the nutritional requirements for a healthy pregnancy.	I.C.5. Describe the normal function of each body system	2.b. Identify and apply the knowledge of all body systems, their structure and functions, and their common diseases, symptoms and etiologies.
17.18 Explain what initiates the birth process.	I.C.5. Describe the normal function of each body system	2.b. Identify and apply the knowledge of all body systems, their structure and functions, and their common diseases, symptoms and etiologies.
17.19 Describe the birth process.	I.C.5. Describe the normal function of each body system	2.b. Identify and apply the knowledge of all body systems, their structure and functions, and their common diseases, symptoms and etiologies.
17.20 Explain the process of lactation.	I.C.5. Describe the normal function of each body system	2.b. Identify and apply the knowledge of all body systems, their structure and functions, and their common diseases, symptoms and etiologies.
17.21 Describe disorders of pregnancy.	I.C.6. Identify common pathology related to each body system	2.b. Identify and apply the knowledge of all body systems, their structure and functions, and their common diseases, symptoms and etiologies.

SUMMARY TABLE 17

LEARNING OUTCOME	LECTURE OUTLINE	ACTIVITIES – TALKING POINTS	ASSESSMENTS
17.1 Use medical terminology related to the female reproductive system.			<i>WkBk Chapter Review Questions:</i> <ul style="list-style-type: none"> Word Deconstruction: 1-5
17.2 Explain what is needed for female anatomy to develop.	I. Overview		<i>WkBk Chapter Review Questions:</i> <ul style="list-style-type: none"> Completion:1

17.3 Describe the anatomy of the ovary and its functions.	<p>II. Female reproductive anatomy</p> <p>A. Ovaries</p> <p>Chapter Figures:</p> <p>17.2 (The anatomy of an ovary)</p> <p>17.3 (The internal female reproductive anatomy)</p>	<p>Talking Point: It is important to stress that the fimbriae of a uterine tube are not connected to nor completely surround the ovary. There is no guarantee that an egg released from an ovary will enter a uterine tube.</p> <p>WkBk Coloring Book:</p> <ul style="list-style-type: none"> An ovary <p>Figure 17.1 (Anatomy of an ovary)</p>	<p>Spot Check: 1</p> <p>WkBk Chapter Review Questions:</p> <ul style="list-style-type: none"> Matching: 1-5
17.4 Describe the female secondary reproductive organs and structures and their respective functions.	<p>B. Secondary female reproductive organs and structures</p> <ol style="list-style-type: none"> Uterus <ol style="list-style-type: none"> Perimetrium Myometrium Endometrium Uterine tubes Vagina <ol style="list-style-type: none"> Flow of mensus Semen receptacle Birth canal Vulva <ol style="list-style-type: none"> Mons pubis Labia Clitoris Vestibular bulbs 	<p>WkBk Coloring Book:</p> <ul style="list-style-type: none"> Internal female reproductive anatomy <p>Figure 17.2 (Internal female reproductive anatomy)</p> <ul style="list-style-type: none"> A breast <p>Figure 17.3 (Anatomy of a breast)</p>	<p>Spot Check: 2</p> <p>Quiz: 1 (Covers LO 17.3, 17.4. See Individual Outcome 17.4.)</p> <p>Figure IMQ 17.1</p> <p>WkBk Chapter Review Questions:</p> <ul style="list-style-type: none"> MS: 1

	<p>e. Vestibular glands</p> <p>5. Breasts</p> <p>Chapter Figures:</p> <p>17.3 (The internal female reproductive anatomy)</p> <p>17.4 (The female reproductive system)</p> <p>17.5 (ciliated epithelial lining of the uterine tube)</p> <p>17.6 (The female perineum)</p> <p>17.7 (The female breast)</p>		
17.5 Explain the hormonal control of puberty and the resulting changes in the female.	<p>III. Physiology of the female reproductive system</p> <p>A. Hormonal control at puberty</p> <p>1. Female secondary sex characteristics</p> <p>a. Breast development</p> <p>b. Development of axillary and pubic hair</p> <p>c. Widening of the pelvis</p> <p>d. Fat deposition</p> <p>e. menstruation</p>	<p>WkBk Concept Maps:</p> <ul style="list-style-type: none"> Hormonal control at puberty <p>Figure 17.5 (Hormonal control at puberty concept map)</p>	<p>Spot Check: 3</p> <p>WkBk Chapter Review Questions:</p> <ul style="list-style-type: none"> MS: 2
17.6 Explain oogenesis in relation to meiosis.	<p>B. Oogenesis</p> <p>Chapter Figures:</p> <p>17.8 (Oogenesis and folliculogenesis)</p>	<p>Discussion Point: Gamete production and the immune system. (See Individual Outcome 17.6)</p>	<p>Spot Check: 4, 5</p> <p>WkBk Chapter Review Questions:</p> <ul style="list-style-type: none"> MS: 3

	17.9 (Developing follicles within the ovary)	<p>Talking Point: It is important to stress that an ovary does not contain a conveyor belt to deliver an egg for ovulation to the ideal spot to enter a uterine tube as Figure 17.9 may suggest. All eggs develop in their original location in the ovary.</p> <p>WkBk Lab Exercises and Activities:</p> <ul style="list-style-type: none"> Oogenesis timeline <p>Table 17.1 (Oogenesis timeline)</p> <p>WkBk Concept Maps:</p> <ul style="list-style-type: none"> Oogenesis <p>Figure 17.4 (Oogenesis concept map)</p>	
17.7 Explain the hormonal control of the adult female reproductive system and its effect on follicles in the ovary and the uterine lining.	<p>C. Hormonal control in the adult female</p> <p>Chapter Figures:</p> <p>17.10 (Female sexual cycle)</p> <p>17.11 (Ovulation in a human (endoscopic view))</p> <p>17.12 (Changes in the endometrium throughout the menstrual cycle)</p>	<p>WkBk Concept Maps:</p> <ul style="list-style-type: none"> Hormonal control in an adult female <p>Figure 17.6 (Hormonal control in an adult female concept map)</p>	<p>Spot Check: 6</p> <p>Quiz: 2 (Covers LOs 17.6 and 17.7. See Individual Outcome 17.7.)</p> <p>Figure IMQ17.2</p> <p>WkBk Chapter Review Questions:</p> <ul style="list-style-type: none"> MS: 4
17.8 Describe the stages of the female sexual response.	<p>D. The female sexual response</p> <p>1. Arousal</p>		<p>WkBk Chapter Review Questions:</p> <ul style="list-style-type: none"> MS: 5

	2. Plateau 3. Orgasm 4. Resolution Chapter Figure: 17.13 (The female sexual response)		
17.9 Explain the effects of aging on the female reproductive system.	IV. The effects of aging on the female reproductive system A. Menopause B. Hot flashes C. Tissue atrophy D. Increase in vaginal yeast infections E. Bone mass declines F. Muscle tissue decreases G. Thinner skin H. Cholesterol increase	Talking Point: Discuss how the testosterone and estrogen levels change in the female to the point that the testosterone levels may cause the female to begin to grow a mustache.	Spot Check: 7, 8 WkBk Chapter Review Questions: <ul style="list-style-type: none"> Critical Thinking:1 Case Study: 1, 2, 3
17.10 Describe common diagnostic tests for female reproductive disorders.	V. Diagnostic tests for female reproductive system disorders A. Biopsy B. Blood tests C. Colposcopy D. Hysteroscopy E. Lab tests F. Laparoscopy G. Mammogram H. Pap smear	Talking Point: Have students research the following: Many years ago, to determine pregnancy, rabbits were used. If the rabbit died, it meant the patient was pregnant. What was this all about?	

	<p>I. Pregnancy test J. Ultrasound</p> <p>Table: 17.1 (Common diagnostic tests for female reproductive system disorders)</p>		
17.11 Describe female reproductive disorders and relate abnormal function to pathology.	<p>VI. Disorders of the female reproductive system</p> <p>A. Breast cancer B. Ovarian cancer C. Cervical cancer D. Fibroids E. Endometriosis F. Sexually transmitted diseases</p> <p>Chapter Figures: 17.14 (Breast cancer detection and treatment) 17.15 (Pap smear) 17.16 (removal of uterine fibroid) 17.17 (Endometriosis in the abdominal cavity)</p> <p>Table: 17.2 (Summary of diseases and disorders)</p>		<p><i>Spot Check:</i> 9</p> <p><i>WkBk Chapter Review Questions:</i></p> <ul style="list-style-type: none"> Completion: 5

	of the female reproductive system)		
17.12 List the four requirements of pregnancy.	<p>VII. Pregnancy</p> <p>Chapter Figure: 17.18 (Joan and Rick view an early pregnancy test)</p>	<p>Talking Point: Remind the class of the four requirements of a pregnancy. Do the parents need to be present for all four? This leads into the Discussion Point and Group Activity that follows.</p> <p>Discussion Point: Contraceptives. (See Individual Outcome 17.11.)</p> <p>Group Activity: Contraceptives. The following Workbook activity works very well as a group activity for the entire class. (See Individual Outcome 17.11 .)</p> <p>WkBk Lab Exercises and Activities:</p> <ul style="list-style-type: none"> Contraceptives <p>Table 17.2 (Contraceptives)</p>	<p>WkBk Chapter Review Questions:</p> <ul style="list-style-type: none"> Critical Thinking: 2
17.13 Trace the pathway for a sperm to fertilize an egg.	A. Pathway for sperm to meet an egg	<p>Talking Point: This would be a good time to follow the pathway of sperm all the way from the seminiferous tubules of the testes to the distal 2/3 of the uterine tube where pregnancy takes place.</p>	<p>WkBk Chapter Review Questions:</p> <ul style="list-style-type: none"> MS: 6
17.14 Describe the events necessary for fertilization and implantation.	<p>B. Fertilization to implantation</p> <ol style="list-style-type: none"> Capacitation Sperm fuses with egg membrane 	<p>Talking Point: It is well understood that only 1 sperm cell can typically and successfully fertilize an egg? Discuss</p>	<p>Spot Check: 10</p> <p>WkBk Chapter Review Questions:</p> <ul style="list-style-type: none"> MS: 7

	3. Sperm nucleus enters the egg 4. Zygote forms Chapter Figures: 17.19 (The process of fertilization) 17.20 (Migration from fertilization to implantation)	why a male needs to ejaculate more than 20 million sperm cells / Ml of ejaculate. Less than 20 million is considered sterile.	
17.15 Explain the hormonal control of pregnancy.	C. Hormonal control of pregnancy	WkBk Concept Maps: <ul style="list-style-type: none"> Hormonal control of pregnancy Figure 17.7 (Hormonal control of pregnancy concept map)	WkBk Chapter Review Questions: <ul style="list-style-type: none"> Matching: 6-10
17.16 Explain the adjustments a woman's body makes to accommodate a pregnancy.	D. A woman's adjustment to pregnancy Chapter Figure: 17.21 (A full-term fetus in the uterus)	Group Activity: Interview. (See Individual Outcome 17.15 .)	WkBk Chapter Review Questions: <ul style="list-style-type: none"> MS: 8
17.17 Explain the nutritional requirements for a healthy pregnancy.	E. Nutritional requirements for a pregnancy <ol style="list-style-type: none"> Folic acid Calcium Protein Iron 		Spot Check: 11 WkBk Chapter Review Questions: <ul style="list-style-type: none"> Completion: 3
17.18 Explain what initiates the birth process.	F. Initiating the birth process <ol style="list-style-type: none"> Hypothalamus in the fetus releases CRH <ol style="list-style-type: none"> Causes anterior pituitary to 		WkBk Chapter Review Questions: <ul style="list-style-type: none"> MS: 9

	<p>release ACTH</p> <ol style="list-style-type: none"> 2. Causes fetal adrenal glands to release glucocorticoids 3. Glucocorticoids target placenta 4. Placenta decreases progesterone production but increases estrogen production 5. Myometrium of uterus stretches 6. Stretching myometrium signals the posterior pituitary to release oxytocin 7. Uterus contracts <p>Chapter Figure: 17.22 (Initiating the birth process)</p>		
17.19 Describe the birth process.	<p>G. The birth process</p> <ol style="list-style-type: none"> 1. Dilation and effacement 2. Crowning 3. Placenta detaches <p>Chapter Figures: 17.23 (The birth process) 17.24 (Childbirth)</p>	<p>WkBk Concept Maps:</p> <ul style="list-style-type: none"> • The birth process <p>Figure 17.8 (The birth process concept map)</p>	<p>WkBk Chapter Review Questions:</p> <ul style="list-style-type: none"> • MS: 10
17.20 Explain the process of lactation.	<p>H. Lactation</p> <p>Chapter Figure: 17.25 (Prolactin secretion in a nursing</p>	<p>Talking Point: Prolactin is necessary for milk production whereas oxytocin is necessary for milk ejection. This explains why, after the birth of the child, when the</p>	<p>Quiz: 3 (Covers LOs 17.4 17.19. See Individual Outcome 17.19 .) Figure IMQ17.3</p>

	mother)	mother is nursing her child, sometimes she will feel uterine contractions. It's because in order for the child to get the milk from the breast, the child has to apply pressure to the nipple. This pressure ultimately causes the release of OT from the pituitary gland, thus causing the release of milk. At the same time, this OT will target the myometrium of the uterus resulting in small, uterine contractions.	WkBk Chapter Review Questions: <ul style="list-style-type: none"> • Completion: 2 • Critical Thinking: 3
17.21 Describe disorders of pregnancy and relate to abnormal function to pathology	<p>I. Disorders of pregnancy</p> <ol style="list-style-type: none"> 1. Spontaneous abortion (miscarriage) 2. Ectopic pregnancy 3. Preeclampsia 4. Preeclampsia 5. Placental abruption 6. Placenta previa <p>Chapter Figures:</p> <p>17.26 (Ectopic pregnancy)</p> <p>17.27 (Placenta previa)</p> <p>Table:</p> <p>17.2 (Summary of diseases and disorders of the female reproductive system)</p>	<p>Talking Point: Not all ectopic pregnancies occur in the uterine tube (tubal pregnancy). Some actually end up on the abdominal wall or the fundus of the uterus. Stress that ectopic means any pregnancy out of the uterus.</p>	<p>Spot Check: 12</p> <p>WkBk Chapter Review Questions:</p> <ul style="list-style-type: none"> • Completion: 4

INDIVIDUAL OUTCOMES

OUTCOME 17.3

Spot Check 1: Like the testes, the ovaries belong to the endocrine and reproductive systems. Why do ovaries belong to both systems?

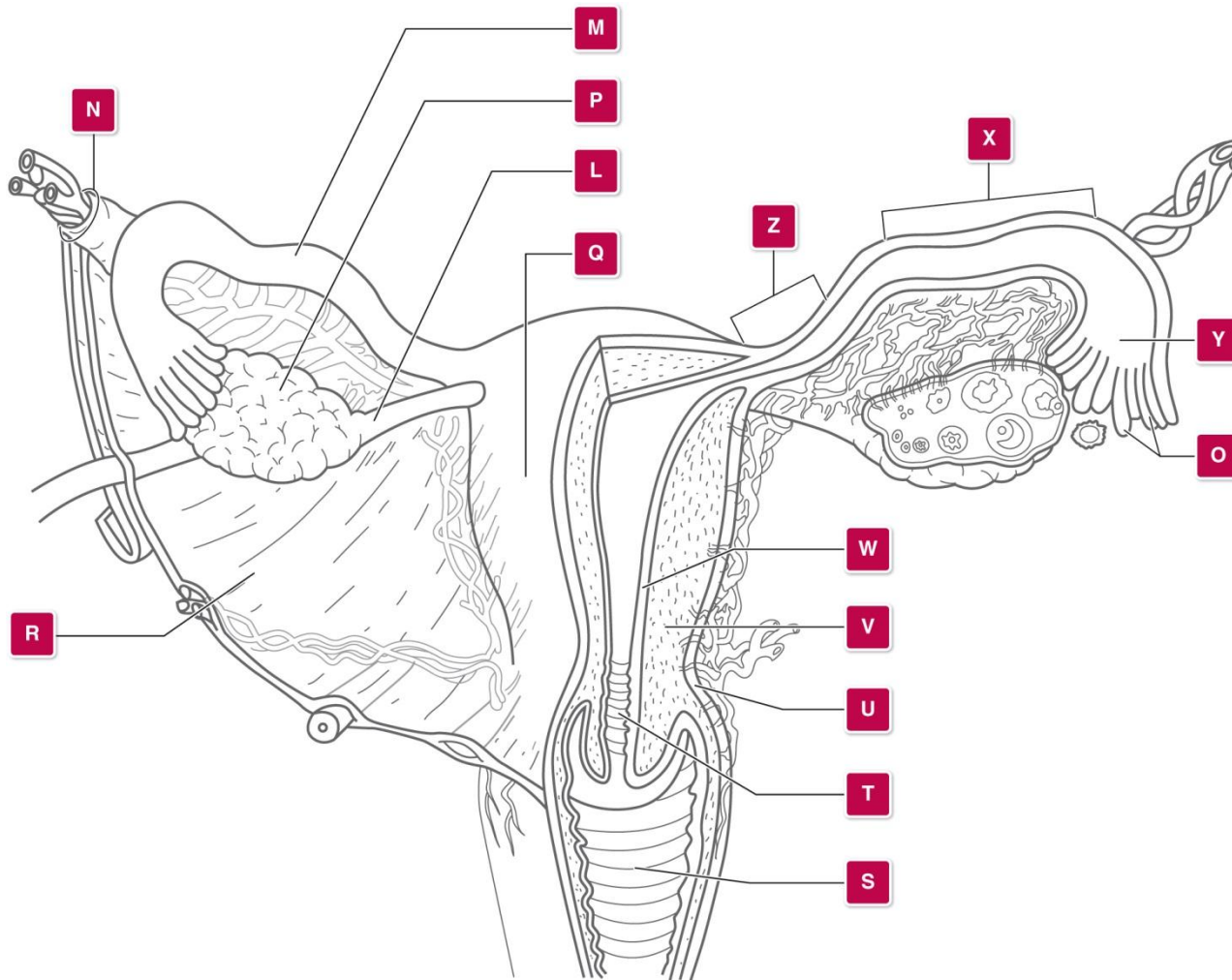
Answer: Ovaries produce gametes (ova) and hormones.

OUTCOME 17.4

Spot Check 2: What else prevents harmful bacteria in the vagina from infecting the pelvic cavity?

Answer: Mucous glands in the cervix produce thick mucus to block the entrance to the uterus.

Quiz: 1



IM Ch 17

Use this figure to answer the following questions.

1. Identify Q.

Uterus

2. Identify P.

Ovary

3. Identify O.

Fimbriae

4. Identify S.

Vagina

5. Identify W.

Endometrium

6. Identify R.

Broad ligament

7. Identify M.

Uterine tube

8. Identify L.

Ovarian ligament

9. Identify N.

Suspensory ligament

10. Of what type of tissue is V composed?

Smooth muscle tissue

OUTCOME 17.5

Spot Check 3: Female athletes who excessively train and rid their diet of fat often stop menstruating. What might be the reason for this?

Answer: Their body fat is too low and they have insufficient cholesterol to produce estrogen.

OUTCOME 17.6

Spot Check 4: What are the functions of a follicle during oogenesis?

Answer: A follicle cares for the primary and secondary oocyte by providing nutrients, removing wastes, and protecting it from the woman's immune system.

Spot Check 5: Why would a woman's age affect the condition of her eggs more so than a man's age would affect the condition of his sperm?

Answer: A woman's eggs are as old as she is, where a man's sperm are at most 40 to 60 days old once they are mature.

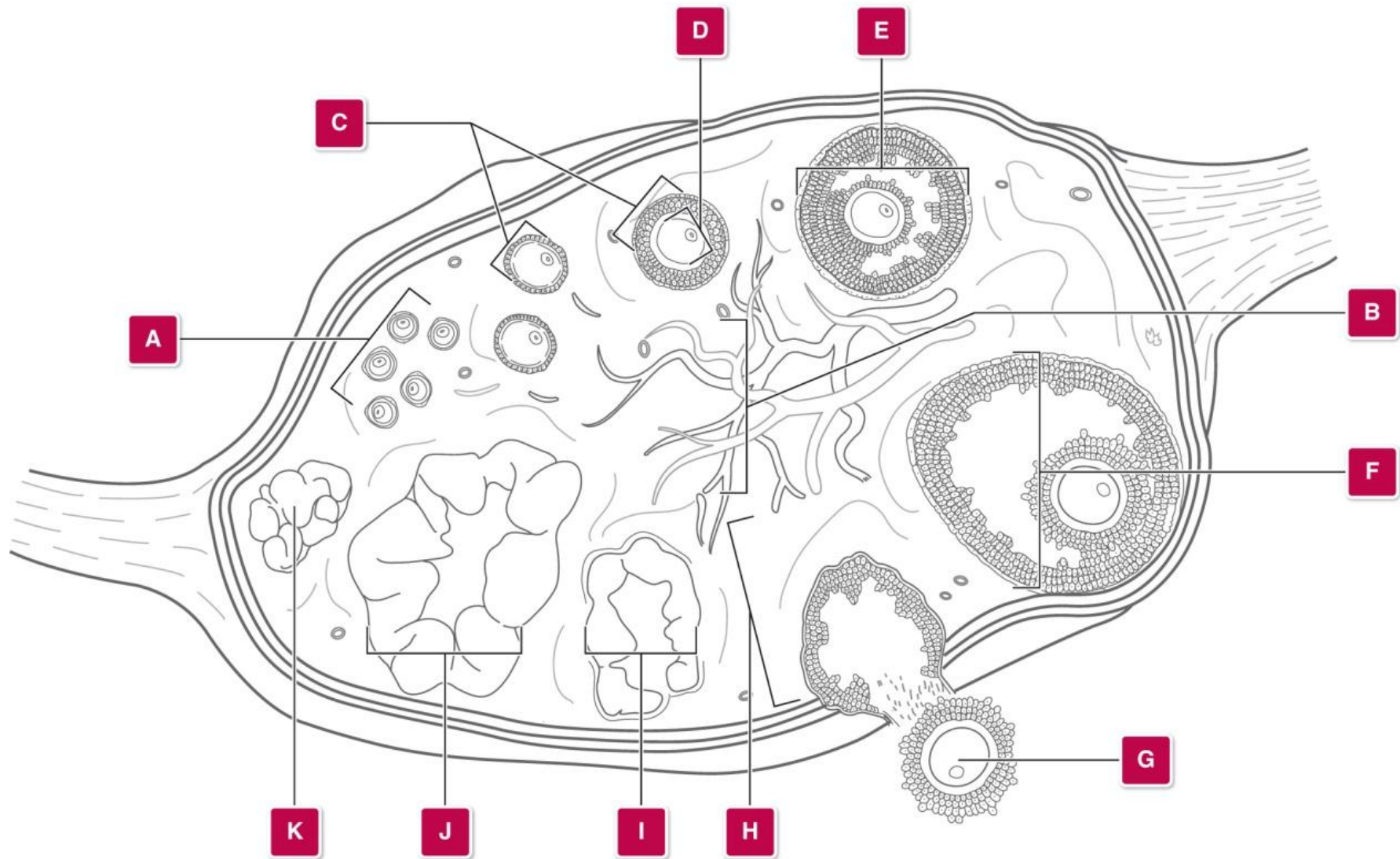
Discussion Point: Gamete production and the immune system. Gametes (sperm and eggs) have just 23 chromosomes. Therefore cellular proteins on these cells may reflect recessive genes not seen in any other body cells. How would the cells of the lymphatic system react to these gametes? What is the protection for this?

T_{helper} cells would likely recognize the gametes as foreign and initiate an immune response. Sustainacular cells protect developing sperm by forming a blood-testes barrier and follicular cells protect the developing egg.

OUTCOME 17.7

Spot Check 6: If an early pregnancy test can detect a pregnancy within eight or nine days, why does this correlate to a three day window in the sexual cycle (day 22, day 23, or day 24)?

Answer: The egg is ovulated on day 14. If the egg is fertilized on that day, eight or nine days from then is day 22 or day 23. However, the egg can remain viable for 24 hours and still be fertilized. So, it could also be fertilized on day 15. Then, early detection would occur as soon as day 23 or day 24.



Use this figure to answer the following questions.

- | | |
|---|----------------------------------|
| 1. Identify A. | <i>Primordial follicles</i> |
| 2. Identify E. | <i>Secondary follicle</i> |
| 3. What hormone is produced by E? | <i>Estrogen</i> |
| 4. Identify G. | <i>Ovulated secondary oocyte</i> |
| 5. What is this release of G called? | <i>Ovulation</i> |
| 6. At what stage of meiosis is G? | <i>Midmeiosis II</i> |
| 7. Identify J. | <i>Corpus luteum</i> |
| 8. What hormone(s) does J produce? | <i>Estrogen and progesterone</i> |
| 9. For how long will J remain viable if there is a pregnancy? | <i>90 days</i> |
| 10. Identify K. | <i>Corpus albicans</i> |

OUTCOME 17.9

Spot Check 7: Why has the number of her follicles decreased?

Answer: All of her follicles and oocytes were produced before she was born. Many have died through atresia, and many others have been developed, ovulated, and been discharged from her body with menstruation. Still others began development each month and underwent atresia before being ovulated. She does not continue to develop any more follicles after birth.

Spot Check 8: Vaginal yeast infections often occur due to a lack of beneficial bacteria in the vagina. How does aging affect the presence of these bacteria?

Answer: Beneficial bacteria feed off glycogen, provided by the stratified squamous epithelial lining of the vagina. This results in a low pH in the vagina that discourages the growth of microorganisms, including yeast. Atrophy of the lining decreases the support for the beneficial bacteria.

Case Study 1: What is the name for this stage in Karen's life?

Answer: Menopause

Case Study 2: What are the changes related to aging Karen is likely experiencing?

Answer: Decrease in estrogen and an increase in FSH

Experiencing hot flashes

Reproductive structures are starting to atrophy

Increased vaginal infections

Decrease in bone mass

Thinner skin

Muscle tissue decreases (sagging breasts, decrease urinary bladder and uterus support)

Case Study 3: Specifically, what will result in Karen's inability to have more children? Explain

Answer: Karen has entered into menopause. She no longer matures eggs and no longer ovulates either. Without egg maturation or ovulation, Karen will not be able to have any more children.

OUTCOME 17.11

Spot Check 9: What would happen to the signs and symptoms of endometriosis after menopause? Explain.

Answer: They would cease due to the lack of estrogen and progesterone.

OUTCOME 17.11

Discussion Point: Contraceptives.

Develop a class list of possible contraceptive measures to avoid a pregnancy. The list should contain 15 to 20 methods.

Group Activity: Contraceptives.

Divide the class into groups of four to five. Each group divides the contraceptives list (derived from the Discussion Point above) among the members of the group to research:

- the contraceptive method by describing who uses it (the man or the woman) and how each method uses the anatomy and physiology of the reproductive system to avoid a pregnancy.
- which of the four requirements of pregnancy are thwarted by the method.
- the effectiveness percentages (theoretical versus actual).

Each member should provide each other member of the group and the instructor a written copy including citations for the credible sources used to find the information. Therefore each member of the group has a combined document of all the contraceptive information at the end of the activity.

OUTCOME 17.14

Spot Check 10: At what point in a sperm's journey does capacitation begin?

Answer: The vagina.

OUTCOME 17.16

Group Activity: Interview.

Divide the class into groups of four. Given what the students have learned about a woman's adaptation to pregnancy, each group is to develop a list of questions it thinks would help in the understanding of what a woman experiences during a pregnancy. Each member then interviews someone who has gone through a pregnancy and reports his/her findings to the group. A discussion as to what is appropriate to ask, confidentiality, and the proper way to handle an interview should be discussed before the interviews begin.

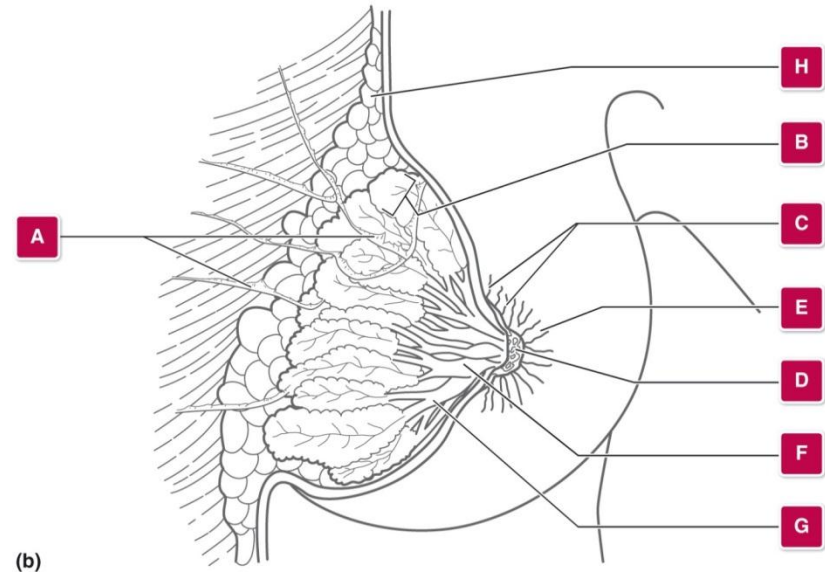
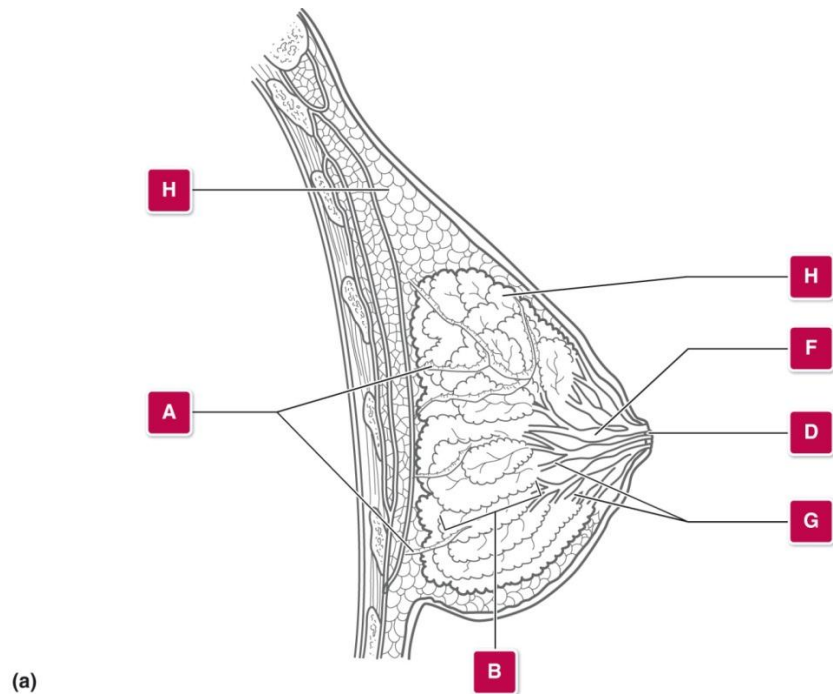
OUTCOME 17.17

Spot Check 11: What would be a good menu for a day while pregnant? Explain.

Answer: Answers will vary, but the menu should be balanced and include all of the essential nutrients to support a pregnancy—folic acid, calcium, protein, and iron—without a high caloric intake.

OUTCOME 17.20

Quiz: 3



Use this figure to answer the following questions.

1. Identify D.
2. Identify E.
3. Identify bumps marked C.
4. What is the function of C.
5. Identify F.
6. Identify G.
7. Identify B.
8. When does B fully develop?
9. What hormone causes B to produce milk?
10. What does a breast produce right after birth?

Nipple

Areola

Areolar glands

Secrete a substance to prevent chafing while nursing

Lactiferous sinus

Lactiferous duct

Lobe

During pregnancy

Prolactin

Colostrum

OUTCOME 17.21

Spot Check 12: A uterine tube is usually removed in an ectopic pregnancy. Does this affect the woman's fertility?

Answer: This would only affect a woman's fertility each time an egg is released from the ovary on the same side the tube was removed. She would still be able to conceive if the egg was released from the ovary on the same side as the remaining tube.

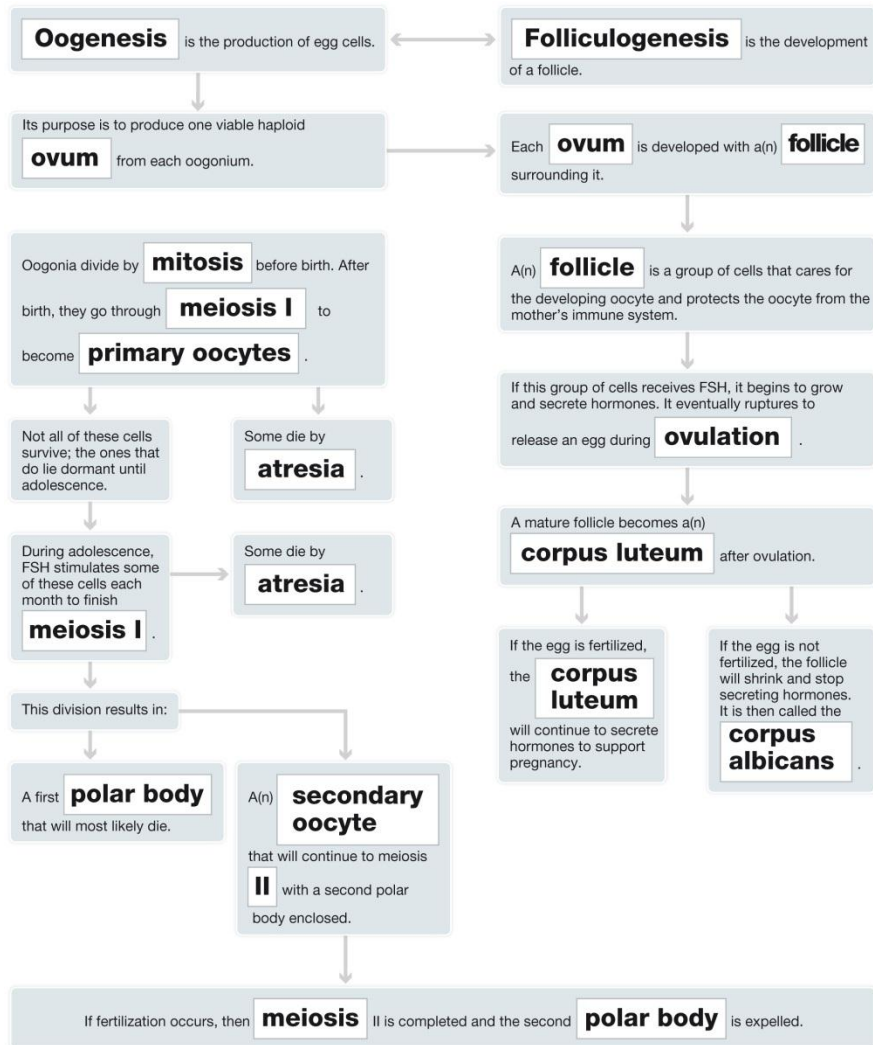
ANSWER KEYS

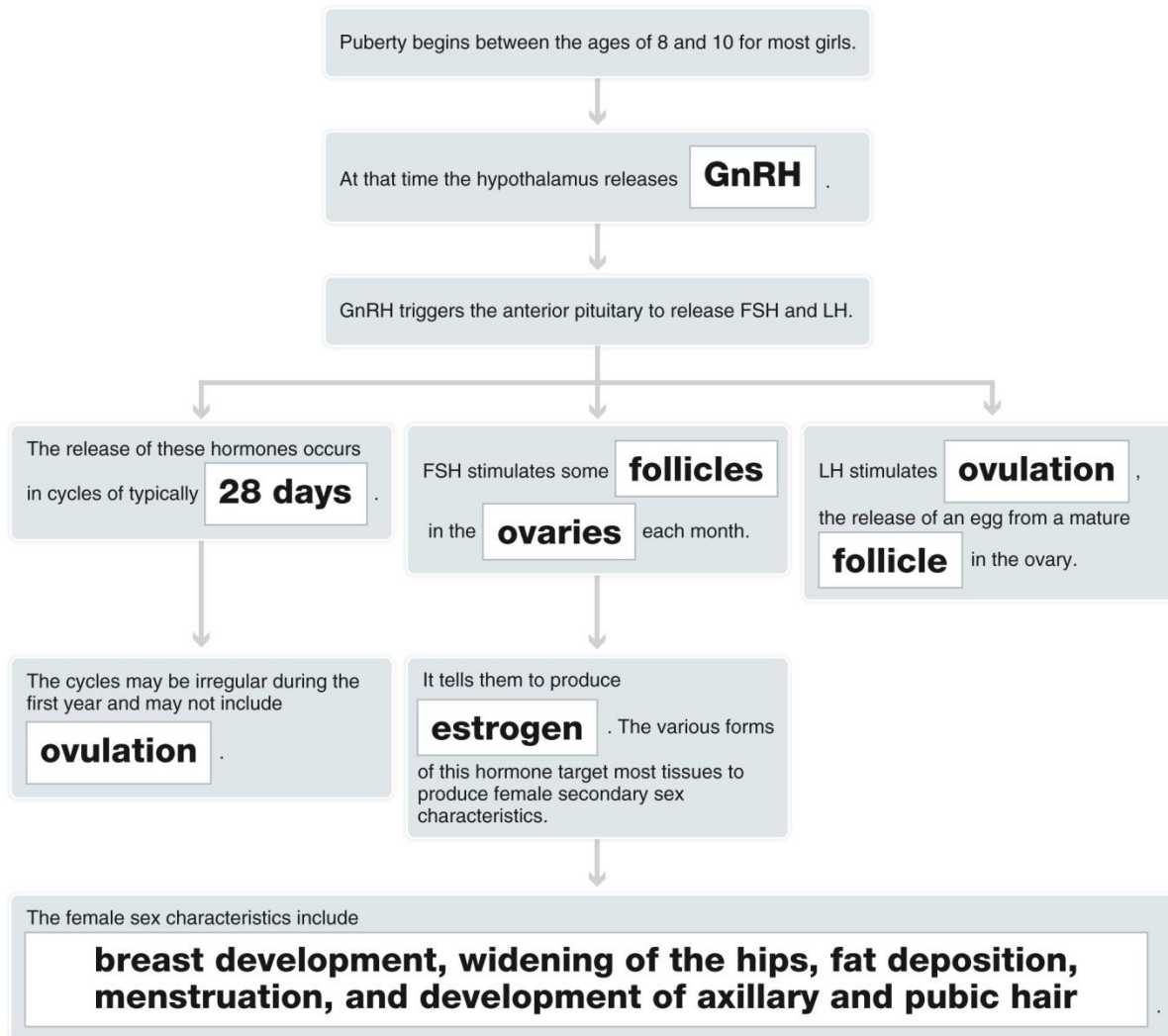
Chapter Review Questions

1. A
2. D
3. B
4. B
5. A
6. B
7. B
8. C
9. B
10. D
11. C
12. B
13. C
14. B
15. D
16. A
17. C
18. B
19. A
20. C
21. C

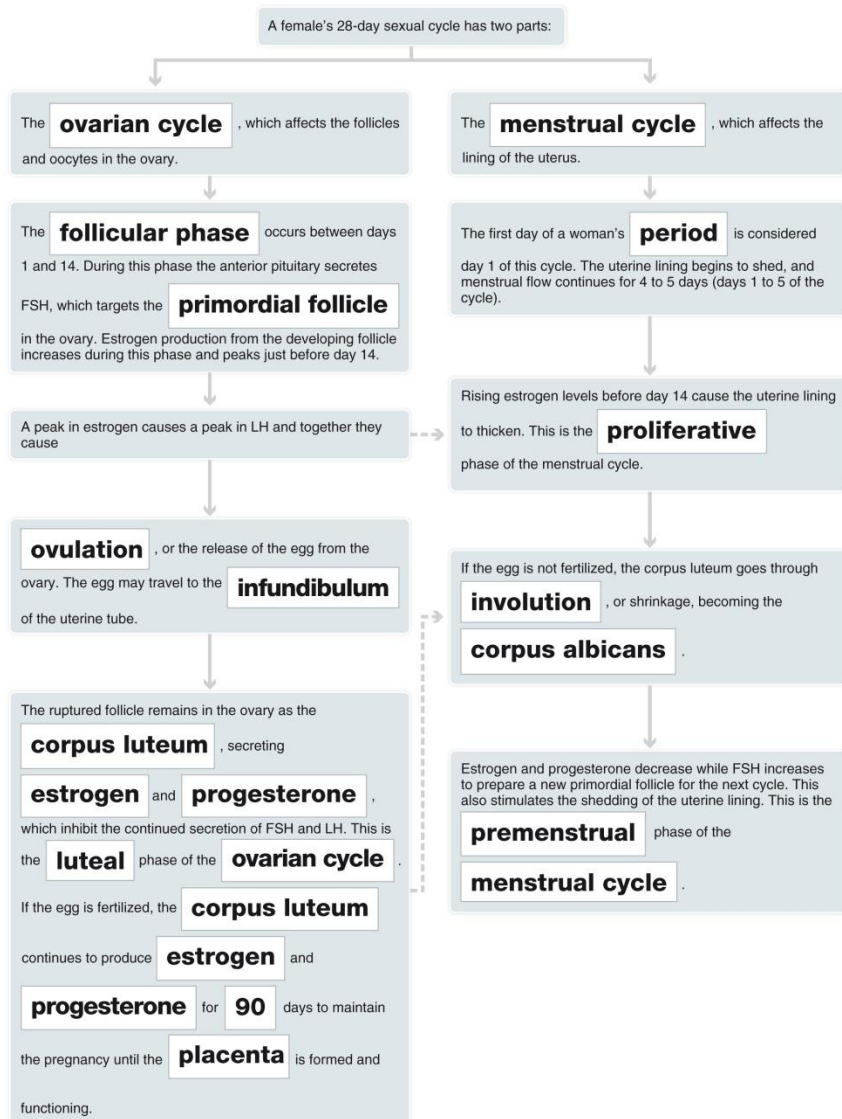
WORKBOOK CONCEPT MAPS:

Oogenesis

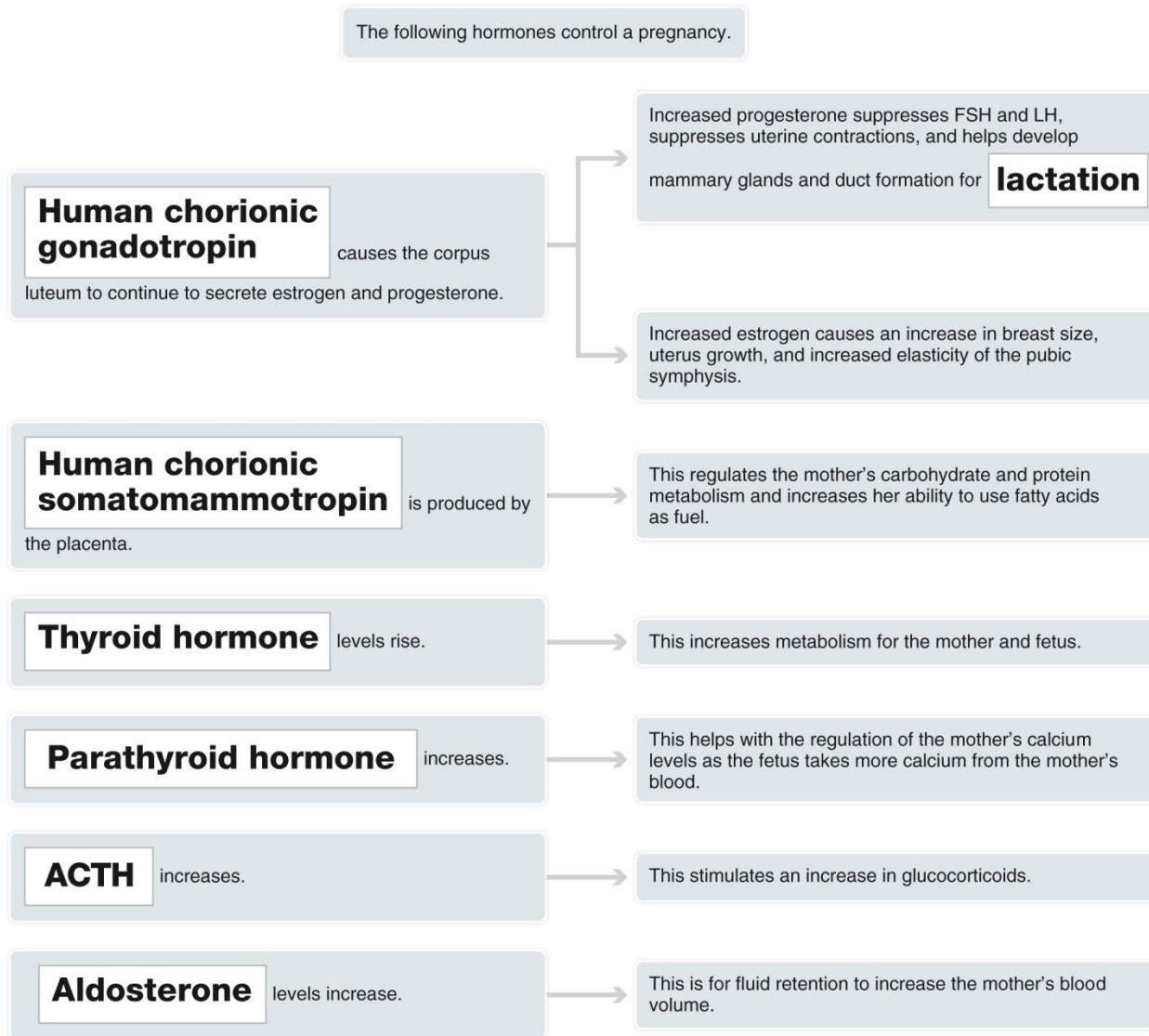


Hormonal control at puberty

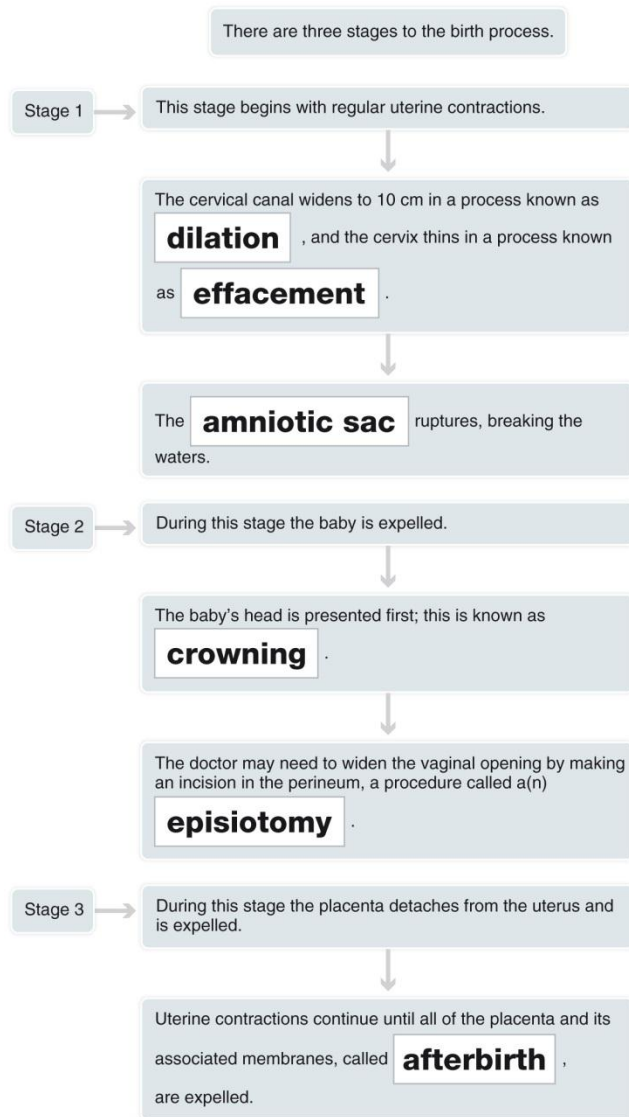
Hormonal control in the adult female



Hormonal control of pregnancy



The birth process



WORKBOOK CHAPTER REVIEW QUESTIONS:

Word Deconstruction:

In the textbook, you built words to fit a definition using the combining forms, prefixes, and suffixes. Here you are to break down the term into its parts (prefixes, roots, and suffixes) and give a definition. Prefixes and suffixes can be found inside the back cover of the textbook.

FOR EXAMPLE: Dermatitis: dermat/itis—inflammation of the skin

1. Vaginitis: *Vagin/itis, inflammation of the vagina*
2. Gynecomastia: *Gyneco/mast/ia, condition of the female breast*
3. Mammography: *Mammo/graphy, process of recording the breast*
4. Dysmenorrhea: *Dys/meno/rrhea, painful flow of menses*
5. Ovarian: *Ovari/an, pertaining to the ovaries*

Multiple Select:

Select the correct choices for each statement. The choices may be all correct, all incorrect, or any combination of correct and incorrect.

1. What are the functions of the secondary sex organs and structures in the female?
 - a. The vestibular glands tighten around the penis during sexual intercourse.
 - b. Cilia in the lining of the uterine tube move an egg toward the uterus.*
 - c. The clitoris has nerve endings for sexual stimulation.*
 - d. The vestibular bulb produces a lubricant.
 - e. The prepuce stimulates the clitoris during sexual intercourse.*

2. What happens to a girl's body at puberty?

- a. Her hips widen.*
- b. She deposits more fat.*
- c. Her follicles begin to develop and secrete hormones.*
- d. Menstruation begins.*
- e. Menstruation typically begins before ovulation.*

3. What happens in meiosis during oogenesis?

- a. There is uneven distribution of cytoplasm and organelles in the daughter cells during meiosis I.*
- b. A polar body is formed during meiosis I.*
- c. A polar body continues to meiosis II.
- d. A second polar body is formed in mid-meiosis II.*
- e. Meiosis II is complete at ovulation.

4. What happens to the uterine lining during the menstrual cycle?

- a. Estrogen causes the uterine lining to thicken in the proliferative phase.*
- b. Progesterone and estrogen cause the uterine lining to become rich with glycogen during the secretory phase.*
- c. A drop in estrogen and progesterone causes arterioles in the stratum functionalis to spasm during the premenstrual phase.*
- d. The stratum basalis is shed during the menstrual phase.

e. The uterine lining is shed on days 26 to 28 of the menstrual cycle.

5. What happens during the female sexual response?

a. Erectile tissue in the clitoris becomes engorged with blood during arousal.

b. Erectile tissue in the clitoris becomes engorged with blood during plateau.

c. The inner end of the vagina dilates during arousal.

d. The inner end of the vagina constricts during resolution.

e. The vagina contracts rhythmically during orgasm.

6. Where does a sperm fertilize an egg?

a. In the ampulla of the uterine tube

b. In the pelvic cavity

c. In the cervical canal

d. In the lumen of the uterus

e. In the isthmus of the vagina

7. What needs to happen for fertilization to occur?

a. The sperm must meet the egg within 24 hours of ovulation.

b. The acrosome caps must release their enzymes so that sperm can make their way through the cells surrounding the egg.

c. A single sperm must penetrate the egg.

d. The nuclei of the sperm and the egg must rupture so that the chromosome from each may mix.

e. A new nucleus having 46 chromosomes is formed.

8. How does a female body adjust to a pregnancy?

a. Her bone mass may decrease due to PTH.

b. Her cardiac output decreases.

c. She becomes more sensitive to carbon dioxide because of increased estrogen.

d. Her skin may darken.

e. Her breasts may double in size due to increased FSH and LH.

9. What initiates a birth?

a. The fetus produces glucocorticoids that target the placenta.

b. The fetal glucocorticoids cause the placenta to level off its production of progesterone and start secreting prostaglandins.

c. Uterine stretch receptors target the fetal hypothalamus so that more hormones are released.

d. Oxytocin is released from the mother's posterior pituitary.

e. Together, oxytocin and progesterone stimulate uterine contractions.

10. What happens during a normal birth process?

a. The afterbirth goes through involution.

b. The cervix widens, a process called *effacement*.

c. The head is seen first because the fetus usually assumes a head-down position in the seventh month.

d. The cervix dilates to 10 cm during stage I.

e. About 3.5 L of blood is usually lost when the placenta detaches.

Matching:

Match the follicle to its description. Some choices may be used more than once.

- | | |
|--|------------------------|
| <u>c</u> 1. Type of follicle found in a two-year-old | a. Corpus luteum |
| <u>b</u> 2. Follicle that has completed involution | b. Corpus albicans |
| <u>b</u> 3. Type of follicle found in an 80-year-old | c. Primordial follicle |
| <u>e</u> 4. Follicle that ruptures to release an egg | d. Primary follicle |
| <u>d</u> 5. Follicle containing a secondary oocyte | e. Mature follicle |

Matching:

Match the pregnancy hormone to its description. Some choices may be used more than once.

- | | |
|--|-----------------|
| <u>e</u> 6. Targets the corpus luteum to keep it functioning | a. Estrogen |
| <u>d</u> 7. Increases fat metabolism for the mother | b. Progesterone |
| <u>b</u> 8. Suppresses uterine contractions | c. Oxytocin |
| <u>c</u> 9. Causes the uterus to contract | d. HCS |
| <u>a</u> 10. Makes the uterus more likely to contract | e. HCG |

Completion:

Fill in the blanks to complete the following statements.

1. The sex chromosomes (23rd pair) in a female zygote are XX.
2. Surges in prolactin each time an infant nurses ensure that ample milk will be produced.
3. A healthy pregnancy requires a balanced diet with emphasis on four nutrients: folic acid, calcium, protein, and iron.
4. Preeclampsia is pregnancy-induced hypertension accompanied by protein in the urine.
5. Endometriosis is an overgrowth of the uterine lining in places other than in the uterus.

Critical Thinking:

1. What can a woman do to reduce the effects of aging on her reproductive system?

A woman can build strong bones while young with a diet rich in calcium and Vitamin D, and exercise for appositional bone growth. A woman can also exercise the muscles of the pelvic floor to support the urinary bladder, uterus, vagina and rectum. A woman can also talk with her physician about HRT.

2. Which is the only requirement of pregnancy that cannot be directly blocked by a method of contraception?

The sperm fertilizing the egg.

3. What would a working mother need to do to make sure her milk production provided enough milk for her infant? Explain.

Use a breast pump between feedings.

Case Study

1. Menopause

2. Ovaries stop releasing eggs and her menstrual periods eventually stop. Periods may become more irregular before they stop altogether. Hot flashes are common as blood vessels constrict and then dilate due to the changing hormone levels. The tissues of the vagina, labia minora, clitoris, uterus, uterine tubes, and breast atrophy. The thinning of the vagina and decreased secretions from it may cause dryness and make intercourse uncomfortable. Vaginal yeast infections become more common. Bone mass declines and muscle and connective tissue decrease. The skin becomes thinner and cholesterol levels rise, increasing the risk for cardiovascular disease.

3. Karen's diminished levels of estrogen and progesterone will cause her ovaries to stop releasing eggs and her menstrual periods eventually stop. This will result in her inability to have children.