ANSWERS: CHAPTER 13

MATCHING

1. m 10. j 19. g 28. y
2. w 11. t 20. q 29. d
3. ee 12. bb 21. aa 30. a
4. l 13. i 22. f 31. n
5. v 14. s 23. b 32. c
6. dd 15. gg 24. p 33. ff
7. k 16. h 25. z
8. u 17. r 26. e
9. cc 18. x 27. o

45. chorionic cavity
46. chorionic plate
47. yolk sac and vitelline vessels
48. connecting stalk
49. primitive umbilical ring
50. chorionic cavity
51. chorion
52. yolk sac and stalk
53. intestinal loop
54. abdominal wall of embryo
55. amnion
56. chorionic cavity
57. A

IMAGE LABELING

1. ovulation
2. fertilization
3. zygote, 24 hours
4. two-cell stage, 30 hours
5. four-cell stage, day 2
6. blastocyst, day 4 to 5
7. blastocyst, day 6
8. blastocyst implantation, day 7
9. trophoblastic lacunae
10. syncytiotrophoblast
11. cytotrophoblast
12. amniotic cavity
13. epiblast
14. hypoblast
15. exocoelomic (Heuser) membrane
16. fibrin coagulum
17. exocoelomic cavity (primitive yolk sac)
18. decidua basalis
19. gestational sac
20. decidua parietalis
21. uterine cavity
22. decidua basalis
23. gestational sac
24. decidua parietalis
25. decidua capsularis
26. uterine cavity
27. decidua basalis
28. placenta
29. gestational sac
30. decidua parietalis
31. decidua capsularis
32. uterine cavity
33. tertiary stem villi
34. intervillous spaces
35. syncytiotrophoblast shell
36. outer cytotrophoblast shell
37. connecting stalk
38. amniotic cavity
39. definitive yolk sac
40. chorionic plate
41. chorionic cavity
42. exocoelomic cyst
43. amniotic cavity
44. amnion

MULTIPLE CHOICE

1. b 6. a 11. c 16. a
2. c 7. b 12. a 17. c
3. b 8. c 13. d 18. a
5. d 10. a 15. c 20. b

FILL-IN-THE-BLANK

1. first trimester
2a. haploid
2b. 23
3. mitochondria
4a. FSH
4b. fluid
5. progesterone
6a. conceptus
6b. zygote
7a. 24 to 30
7b. cleavage
8. four
9a. basal
9b. connective tissue
10a. 6 to 8
10b. 4
11a. zona pellucida
11b. blastocyst
12. thick epiblast
13. secondary yolk sac
14a. umbilical vesicle
14b. vitelline
15a. three
15b. tissue
16a. embryonic
16b. 11
17. decidua basalis
18a. decidua capsularis
18b. decidua parietalis
19a. 2.3
19b. 5.6
19c. 12
20. zona pellucida
SHORT ANSWER

1. The endometrium remains decidualized (altered to accept blastocyst implantation). Trophoblast cells differentiate into an inner cytotrophoblast and an outer mass called the syncytiotrophoblast (producing hCG to extend the corpus luteum life). The extended corpus luteum continues to secrete progesterone, allowing the endometrium to retain the necessary endometrial tissue. The syncytiotrophoblast also excretes enzymes that erode the endometrial surface and allow the blastocyst to bury within. A blood clot or fibrin coagulum seals the opening created by the blastocyst.

2. hCG is a glycoprotein with an α and β subunit, both of which enter the maternal blood and urine. Pregnancy tests rely on identifying the β subunit, commonly called β-hCG. Urine tests are qualitative, meaning they determine a negative or positive β-hCG in comparison with the threshold of men and nonpregnant women. Quantitative pregnancy tests measure the level of β-hCG in maternal serum.

3. At 4 to 5 weeks GA, a gestational sac is seen with the endometrium. Week 5 demonstrates the yolk sac. Late week 5 to early week 6, the embryo may be detected. Week 6 cardiac activity is seen and the embryo should measure 5 mm. The rhombencephalon is seen in week 7. Week 8 demonstrates a 17 mm to 23 mm embryo displaying cranial anatomy. Hands and feet can be seen at weeks 9 to 10.

4. First trimester sonograms should include images of the uterus and adnexa to identify the presence and location of a gestational sac and the presence or absence of abnormal adnexal masses or fluid in the cul-de-sac. After an intrauterine gestational sac is detected, the images and the report should document whether a yolk sac and/or embryo can be seen. If the pregnancy is too early to visualize an embryo, a mean sac diameter should be obtained to estimate the gestational age. Once an embryo is evident, measurement of the crown rump length is preferred. Cardiac activity, or lack of, in the embryo should be stated in the report.

5. Pregnancy typically lasts about 280 days, or 40 weeks from the first day of the last menstrual period, and is divided into 3 trimesters. The first trimester begins at week 1 ending at week 12, the second begins at week 13 ending in week 27, and the third begins at week 28 ending at postterm 42 weeks.

IMAGE EVALUATION/PATHOLOGY

1. Long arrow: decidua; short arrow: gestational sac (chorion); narrow arrowhead: secondary yolk sac.

2. Short arrow: fetal cranium; long arrow: lateral ventricles, largely filled with choroid plexus, appear to occupy most of the hemispheres of the developing brain.

3. This image is revealing an early intrauterine pregnancy. The hyperechoic ring positioned around the hypoechoic gestational sac is decidua. The two measurements are two of three normally obtained to calculate and mean sac diameter (MSD).

4. Thin arrow: amnion; arrowhead: umbilical cord; crooked arrow: yolk sac (with measurement); thick arrow: embryo.

5. This is a 9-week embryo in a sagittal position showing a physiologic herniation of the midgut. The measurement depicts a crown rump length (CRL) measurement, which is obtained by measuring the embryo along its longest axis, preferably in a sagittal view. The CRL is the most accurate single measurement to establish an estimated date of delivery. The crescent-shaped sonolucency in the anterior aspect of the brain is created by the diencephalon and mesencephalon.

CASE STUDY

1. This a healthy appearing young fetus displaying a normal physiologic herniation of embryonic midgut into the base of the umbilical cord on this sagittal image. Image B reveals a transverse image of the abdomen demonstrating the midgut herniation on the 11-week embryo. Image C shows a 3-D surface rendering of gestation with a physiologic herniation (arrow) into the base of the umbilical cord.

2. Images A and B are both midsagittal planes displaying a profile view of the fetal head, neck, and upper chest in the image with amnion seen posteriorly. The images are magnified appropriately. The measurement taken is a nuchal translucency (NT), which is performed from inner margin to inner margin with the nuchal fluid. Care must be taken to see the amnion separately from the fetal skin line. Note: Image B demonstrates an enlarged NT. Review Table 13.3 for NT measurement guidelines.