

## **Chapter 03: Fetal Development**

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### **MULTIPLE CHOICE**

1. What is the total number of chromosomes contained in a mature sperm or ovum?
  - a. 22
  - b. 23
  - c. 44
  - d. 46

ANS: B

Gametes (sex chromosomes) contain 23 chromosomes.

DIF: Cognitive Level: Knowledge      REF: Page 31      OBJ: 2  
TOP: Gametogenesis      KEY: Nursing Process Step: N/A  
MSC: NCLEX: Health Promotion and Maintenance: Growth and Development

2. A pregnant woman states, "My husband hopes I will give him a boy because we have three girls." What will the nurse explain to this woman?
  - a. The sex chromosome of the fertilized ovum determines the gender of the child.
  - b. When the sperm and ovum are united, there is a 75% chance the child will be a girl.
  - c. When the pH of the female reproductive tract is acidic, the child will be a girl.
  - d. If a sperm carrying a Y chromosome fertilizes an ovum, then a boy is produced.

ANS: D

When a Y-bearing sperm fertilizes an ovum, a male child is produced.

DIF: Cognitive Level: Comprehension      REF: Page 33      OBJ: 3  
TOP: Sex Determination      KEY: Nursing Process Step: Implementation  
MSC: NCLEX: Health Promotion and Maintenance: Growth and Development

3. What is the most common site for fertilization?
  - a. Lower segment of the uterus
  - b. Outer third of the fallopian tube near the ovary
  - c. Upper portion of the uterus
  - d. Area of the fallopian tube farthest from the ovary

ANS: B

Fertilization takes place in the outer third of the fallopian tube, which is closest to the ovary.

DIF: Cognitive Level: Knowledge      REF: Page 33      OBJ: 3  
TOP: Fertilization      KEY: Nursing Process Step: Implementation  
MSC: NCLEX: Health Promotion and Maintenance: Growth and Development

4. The embryo is termed a fetus at which stage of prenatal development?
  - a. 2 weeks
  - b. 4 weeks
  - c. 9 weeks
  - d. 16 weeks

ANS: C

The fetus (third stage of prenatal development) begins at the ninth week and continues until the 40th week of gestation or until birth.

DIF: Cognitive Level: Knowledge REF: Page 36 OBJ: 4  
TOP: Prenatal Developmental Milestones  
KEY: Nursing Process Step: Implementation  
MSC: NCLEX: Health Promotion and Maintenance: Growth and Development

5. The nurse is reviewing fetal circulation with a pregnant patient and explains that blood circulates through the placenta to the fetus. What vessel(s) carry blood to the fetus?
- One umbilical vein
  - Two umbilical veins
  - One umbilical artery
  - Two umbilical arteries

ANS: A

The umbilical vein transports richly oxygenated blood from the placenta to the fetus.

DIF: Cognitive Level: Knowledge REF: Page 39-40 OBJ: 7  
TOP: Fetal Circulation KEY: Nursing Process Step: Implementation  
MSC: NCLEX: Health Promotion and Maintenance: Growth and Development

6. Where is the usual location for implantation of the zygote?
- Upper section of the posterior uterine wall
  - Lower portion of the uterus near the cervical os
  - Inner third of the fallopian tube near the uterus
  - Lateral aspect of the uterine wall

ANS: A

The zygote usually implants in the upper section of the posterior uterine wall.

DIF: Cognitive Level: Knowledge REF: Page 35 OBJ: 3  
TOP: Implantation KEY: Nursing Process Step: N/A  
MSC: NCLEX: Health Promotion and Maintenance: Growth and Development

7. What is the embryonic membrane that contains fingerlike projections on its surface, which attach to the uterine wall?
- Amnion
  - Yolk sac
  - Chorion
  - Decidua basalis

ANS: C

The chorion is a thick membrane with fingerlike projections (villi) on its outermost surface.

DIF: Cognitive Level: Knowledge REF: Page 35 OBJ: 4  
TOP: Accessory Structures of Pregnancy KEY: Nursing Process Step: N/A  
MSC: NCLEX: Health Promotion and Maintenance: Growth and Development

8. Which hormone is responsible for converting the endometrium into decidual cells for implantation?

- a. Estrogen
- b. Human chorionic gonadotropin
- c. Human placental lactogen
- d. Progesterone

ANS: D

At high levels, progesterone maintains the endometrial lining for implantation of the zygote.

DIF: Cognitive Level: Knowledge REF: Page 39 OBJ: 6  
TOP: Placenta KEY: Nursing Process Step: N/A  
MSC: NCLEX: Health Promotion and Maintenance: Growth and Development

9. A patient asks the nurse when her infant's heart will begin to pump blood. What will the nurse reply?
- a. By the end of week 3
  - b. Beginning in week 8
  - c. At the end of week 16
  - d. Beginning in week 24

ANS: A

The fetal heart begins to pump by week 3 of gestation.

DIF: Cognitive Level: Knowledge REF: Page 36 OBJ: 5  
TOP: Prenatal Development KEY: Nursing Process Step: N/A  
MSC: NCLEX: Health Promotion and Maintenance: Growth and Development

10. What organ does the ductus venosus shunt blood away from in fetal circulation?
- a. Liver
  - b. Heart
  - c. Lungs
  - d. Kidneys

ANS: A

Fetal blood bypasses the liver through the ductus venosus by carrying blood directly to the inferior vena cava.

DIF: Cognitive Level: Knowledge REF: Page 39 OBJ: 7  
TOP: Prenatal Development KEY: Nursing Process Step: N/A  
MSC: NCLEX: Health Promotion and Maintenance: Growth and Development

11. What complication can result from untreated respiratory distress in the newborn?
- a. Esophageal atresia
  - b. Gastric dilation
  - c. Cold stress
  - d. Reopening of the foramen ovale

ANS: D

Respiratory distress can cause increased pressure in the right ventricle, causing reopening of the foramen ovale.

DIF: Cognitive Level: Comprehension REF: Page 40 OBJ: 7  
TOP: Fetal Circulation KEY: Nursing Process Step: Implementation  
MSC: NCLEX: Health Promotion and Maintenance: Growth and Development

12. During an ultrasound, two amnions and two placentas are observed. What will be the most likely result of this pregnancy?
- Dizygotic twins
  - Monozygotic twins
  - Conjoined twins
  - High birth-weight twins

ANS: A

Dizygotic twins always have two amnions and two chorions (placentas).

DIF: Cognitive Level: Comprehension REF: Page 42 OBJ: 8  
TOP: Multifetal Pregnancy KEY: Nursing Process Step: Data Collection  
MSC: NCLEX: Health Promotion and Maintenance: Growth and Development

13. A woman who is 25 weeks pregnant asks the nurse what her fetus looks like. What does the nurse explain is one physical characteristic present in a 25-week-old fetus?
- Lanugo covering the body
  - Constant motion
  - Skin that is pink and smooth
  - Eyes that are closed

ANS: A

By 25 weeks, the body of the fetus is covered with lanugo, the eyes are open, the skin is wrinkled, and the fetus has definite periods of movement and sleeping.

DIF: Cognitive Level: Comprehension REF: Page 37-38, Table 3-1  
OBJ: 5 TOP: Prenatal Development  
KEY: Nursing Process Step: Implementation  
MSC: NCLEX: Health Promotion and Maintenance: Growth and Development

14. At what point in prenatal development do the lungs begin to produce surfactant?
- 17 weeks
  - 20 weeks
  - 25 weeks
  - 30 weeks

ANS: C

During week 25, the alveoli begin to produce surfactant, which enables the alveoli to stay open for adequate lung oxygenation to occur.

DIF: Cognitive Level: Knowledge REF: Page 37, Table 3-1  
OBJ: 5 TOP: Prenatal Development KEY: Nursing Process Step: N/A  
MSC: NCLEX: Health Promotion and Maintenance: Growth and Development

15. A woman missed her menstrual period 1 week ago and has come to the doctor's office for a pregnancy test. Which placental hormone is measured in pregnancy tests?
- Progesterone
  - Estrogen
  - Human chorionic gonadotropin
  - Human placental lactogen

ANS: C

Human chorionic gonadotropin is the basis for most pregnancy tests. It is detectable in maternal blood as soon as implantation occurs, usually 7 to 9 days after fertilization.

DIF: Cognitive Level: Knowledge REF: Page 39 OBJ: 6  
TOP: Accessory Structures of Pregnancy KEY: Nursing Process Step: Data Collection  
MSC: NCLEX: Health Promotion and Maintenance: Growth and Development

16. When preparing to teach a class about prenatal development, the nurse would include information about folic acid supplementation. What is folic acid known to prevent?
- Congenital heart defects
  - Neural tube defects
  - Mental retardation
  - Premature birth

ANS: B

It is now known that folic acid supplements can prevent neural tube defects such as spina bifida.

DIF: Cognitive Level: Comprehension REF: Page 37 OBJ: 5  
TOP: Prenatal Development KEY: Nursing Process Step: Planning  
MSC: NCLEX: Health Promotion and Maintenance: Growth and Development

17. The nurse is educating a class of expectant parents about fetal development. What is considered fetal age of viability?
- 14 weeks
  - 20 weeks
  - 25 weeks
  - 30 weeks

ANS: B

By 20 weeks of gestation, the lungs have matured enough for the fetus to survive outside the uterus (age of viability).

DIF: Cognitive Level: Knowledge REF: Page 37 OBJ: 5  
TOP: Prenatal Developmental Milestones KEY: Nursing Process Step: N/A  
MSC: NCLEX: Health Promotion and Maintenance: Growth and Development

18. The nurse is presenting a conference on gene dominance. What does the nurse report as the percentage of children carrying the dominant gene if one parent has a dominant gene and the other parent does not?
- 10%
  - 25%
  - 50%
  - 100%

ANS: C

If one parent has a dominant trait and the other does not, then 50% of the children will inherit the trait.

DIF: Cognitive Level: Comprehension REF: Page 34 OBJ: 4  
TOP: Dominant Traits KEY: Nursing Process Step: Implementation

19. The nurse explains that the birth weight of monozygotic twins is frequently below average. What is the most likely cause?
- Inadequate space in the uterus
  - Inadequate blood supply
  - Inadequate maternal health
  - Inadequate placental nutrition

ANS: D

The single placenta may not be able to provide adequate nutrition to two fetuses.

DIF: Cognitive Level: Comprehension REF: Page 42 OBJ: 8  
TOP: Low Birth-weight Twins KEY: Nursing Process Step: Implementation  
MSC: NCLEX: Health Promotion and Maintenance: Growth and Development

20. The school nurse is counseling a group of adolescent girls. What does the nurse explain about sperm ejaculated near the cervix?
- They are destroyed by the acidic pH of the vagina.
  - They survive up to 5 days and can cause pregnancy.
  - They lose their motility in about 12 hours after intercourse.
  - They are usually pushed out of the vagina by the muscular action of the vaginal wall.

ANS: B

Sperm ejaculated near the cervix can survive up to 5 days and cause pregnancy even before ovulation.

DIF: Cognitive Level: Comprehension REF: Page 33 OBJ: 3  
TOP: Fertilization KEY: Nursing Process Step: Implementation  
MSC: NCLEX: Health Promotion and Maintenance: Growth and Development

21. What does the nurse explain can affect the survival of the X- and Y-bearing sperm after intercourse?
- Age
  - Estrogen level
  - Body temperature
  - Level of feminine hygiene

ANS: B

Estrogen levels and the pH of the female reproductive tract can affect the survival of the X- and Y-bearing sperm as well as their motility.

DIF: Cognitive Level: Knowledge REF: Page 33 OBJ: 3  
TOP: Fertilization KEY: Nursing Process Step: Implementation  
MSC: NCLEX: Health Promotion and Maintenance: Growth and Development

22. Of what is the normal umbilical cord comprised?
- 1 artery carrying blood to the fetus and 1 vein carrying blood away from the fetus
  - 1 artery carrying blood to the fetus and 2 veins carrying blood away from the fetus
  - 2 arteries carrying blood away from the fetus and 1 vein carrying blood to the fetus
  - 2 arteries carrying blood to the fetus and 2 veins carrying blood away from the

fetus

ANS: C

The umbilical cord is comprised of 2 arteries carrying blood away from the fetus and 1 vein carrying blood to the fetus.

DIF: Cognitive Level: Knowledge

REF: Page 39

OBJ: 6

TOP: Fetal Circulation

KEY: Nursing Process Step: N/A

MSC: NCLEX: Health Promotion and Maintenance: Growth and Development

23. What part of the fetal body derives from the mesoderm?

- a. Nails
- b. Oil glands
- c. Muscles
- d. Lining of the bladder

ANS: C

The mesoderm is responsible for the development of muscles. Nails and oil glands derive from the ectoderm. The lining of the bladder derives from the endoderm.

DIF: Cognitive Level: Knowledge

REF: Page 35, Box 3-1

OBJ: 4

TOP: Embryonic development

KEY: Nursing Process Step: N/A

MSC: NCLEX: Health Promotion and Maintenance: Growth and Development

24. A couple just learned they are expecting their first child and are curious if they are having a boy or a girl. At what point of development can the couple first expect to see the sex of their child on ultrasound?

- a. 4 weeks' gestational age
- b. 6 weeks' gestational age
- c. 10 weeks' gestational age
- d. 16 weeks' gestational age

ANS: C

The fetal period begins at the ninth week, and by the tenth week the external genitalia are visible to ultrasound examination.

DIF: Cognitive Level: Knowledge

REF: Page 37

OBJ: 5

TOP: Fetal Development

KEY: Nursing Process Step: Data Collection

MSC: NCLEX: Health Promotion and Maintenance: Growth and Development

## **MULTIPLE RESPONSE**

25. A nurse is teaching a lesson on fetal development to a class of high school students and explains the primary germ layers. What are the germ layers? *(Select all that apply.)*

- a. Ectoderm
- b. Endoderm
- c. Mesoderm
- d. Plastoderm
- e. Blastoderm

ANS: A, B, C

The zygote transforms its embryonic disc into three layers: the ectoderm, the mesoderm, and the endoderm.

DIF: Cognitive Level: Knowledge REF: Page 35, Box 3-1  
OBJ: 4 TOP: Primary Germ Layers  
KEY: Nursing Process Step: Implementation  
MSC: NCLEX: Health Promotion and Maintenance: Growth and Development

26. What are the functions of amniotic fluid? (*Select all that apply.*)
- Maintaining an even temperature
  - Impeding excessive fetal movement
  - Lubricating fetal skin
  - Acting as a reservoir for nutrients
  - Acting as a cushion for the fetus

ANS: A, E

The amniotic fluid provides maintenance of even temperature; prevents amnion from adhering to fetal skin; allows buoyancy, symmetrical growth, and fetal movement; and acts as a cushion for the fetus. Although the fetus does swallow amniotic fluid, it has no nutritional value.

DIF: Cognitive Level: Knowledge REF: Page 35, Box 3-1  
OBJ: 6 TOP: Amniotic Fluid  
KEY: Nursing Process Step: Implementation  
MSC: NCLEX: Health Promotion and Maintenance: Growth and Development

27. A patient at the obstetric office has just learned she is pregnant with dizygotic twins. What facts will the nurse include when educating this patient? (*Select all that apply.*)
- Dizygotic twins are the same sex.
  - Dizygotic twins share a placenta.
  - Dizygotic pregnancies tend to repeat in families.
  - Dizygotic twins have separate chorions.
  - Dizygotic twin incidence decreases with maternal age.

ANS: C, D

Dizygotic twins tend to repeat in families and have separate chorions. They can be the same sex or different sexes and have their own placenta. Incidence increases with maternal age.

DIF: Cognitive Level: Comprehension REF: Page 42 OBJ: 8  
TOP: Dizygotic Twins KEY: Nursing Process Step: Data Collection  
MSC: NCLEX: Health Promotion and Maintenance: Growth and Development

## COMPLETION

28. The nurse explains that prior to fertilization each cell is reduced from 46 chromosomes to 23 chromosomes. This is referred to as the \_\_\_\_\_ number.

ANS:  
haploid

When each cell reduces its chromosomes from 46 to 23, it is called the haploid number.

DIF: Cognitive Level: Knowledge REF: Page 32 OBJ: 2  
TOP: Haploid Number KEY: Nursing Process Step: Implementation  
MSC: NCLEX: Health Promotion and Maintenance: Growth and Development

29. The component of development that programs the genetic code into the nucleus of the cell is \_\_\_\_\_.

ANS:  
DNA

The DNA programs the genetic code to the nucleus of the cell to be replicated.

DIF: Cognitive Level: Knowledge REF: Page 31 | Page 34  
OBJ: 4 TOP: DNA KEY: Nursing Process Step: N/A  
MSC: NCLEX: Health Promotion and Maintenance: Growth and Development

30. The vessels comprising the umbilical cord are cushioned and protected by a substance called \_\_\_\_\_.

ANS:  
Wharton's jelly

Wharton's jelly is a substance in the umbilical cord that cushions and protects the vessels.

DIF: Cognitive Level: Knowledge REF: Page 39 OBJ: 1  
TOP: Fetal Circulation KEY: Nursing Process Step: N/A  
MSC: NCLEX: Health Promotion and Maintenance: Growth and Development

31. The normal volume of amniotic fluid is approximately \_\_\_\_\_ mL at 37 weeks' gestation.

ANS:  
1000

The volume of amniotic fluid steadily increases from about 30 mL at 10 weeks of pregnancy to 350 mL at 20 weeks. The volume of fluid is about 1000 mL at 37 weeks. In the latter part of pregnancy the fetus may swallow up to 400 mL of amniotic fluid per day and normally excretes urine into the fluid.

DIF: Cognitive Level: Knowledge REF: Page 35 OBJ: 6  
TOP: Amniotic Fluid KEY: Nursing Process Step: Data Collection  
MSC: NCLEX: Health Promotion and Maintenance: Growth and Development

32. Organize the developmental stages in the correct order. *Put a comma and space between each answer choice (a, b, c, d, etc.)*

- a. Fetus
- b. Zygote
- c. Embryo
- d. Blastocyst

e. Morula

ANS:

B, E, D, C, A

The development follows these stages: zygote, morula, blastocyst, embryo, and fetus.

DIF: Cognitive Level: Comprehension REF: Page 34-37 OBJ: 4

TOP: Fetal Development KEY: Nursing Process Step: N/A

MSC: NCLEX: Health Promotion and Maintenance: Growth and Development

33. Put the embryonic/fetal characteristics in the correct order of occurrence from week 3 to week 36 of gestation. *Put a comma and space between each answer choice (a, b, c, d, etc.)*

- a. Subcutaneous fat is present.
- b. Bone marrow forms blood cells.
- c. Spinal cord and brain appear.
- d. Skull and jaw ossify.
- e. Neural tube closes.

ANS:

C, E, D, B, A

Primitive spinal cord and brain appear at 3 weeks. Neural tube closes at 4 weeks. Skull and jaw ossify at 6 weeks. Spleen stops forming blood cells and bone marrow takes over at 29 weeks. Subcutaneous fat is present at 36 weeks.

DIF: Cognitive Level: Comprehension REF: Page 35-38, Table 3-1

OBJ: 5 TOP: Fetal Development

KEY: Nursing Process Step: Data Collection

MSC: NCLEX: Health Promotion and Maintenance: Growth and Development