

# Growth and Development

Millions of fragile microscopic sperm swim against numerous obstacles to reach the ova and create a new life. At birth, the newborn will fill his lungs with air and cry lustily, signaling to the world that he is ready to begin the cycle of life. This cycle will be marked by ongoing changes, periodic physical growth, and continuous development.

This chapter reviews the more significant events that occur in the normal growth and development of an individual from conception to death. Realizing that each individual is unique, we nonetheless can discover, amid all the complexities of humanity, some constants that are understandable and predictable.

A knowledge of human growth and development is essential in understanding the commonalities that influence individuals as they pass through the cycle of life.

## TOPICS FOR REVIEW

Your review of this chapter should include an understanding of the concept of development as a biological process. You should familiarize yourself with the major developmental changes from conception through older adulthood. Your study should conclude with a review of the effects of aging on the body systems.

# PRENATAL PERIOD

Fill in the blanks.

The prenatal stage of development begins at the time of (1) conception and continues until (2) birth. The science of the development of an individual before birth is called (3) embryology.

Fertilization takes place in the outer third of the (4) Oviduct. The fertilized ovum, or (5) zygote, begins to divide and in approximately 3 days forms a solid mass called a (6) morula. By the time it enters the uterus, it is a hollow ball of cells called a (7) blastocyst.

As it continues to develop, it forms a structure with two cavities. The (8) Amniotic cavity will become a fluid-filled sac for the embryo. The (9) Chorion will develop into an important fetal membrane in the (10) Placenta.

Choose the correct term and write the letter in the space next to the appropriate definition below.

- |                 |                    |
|-----------------|--------------------|
| A. Laparoscope  | F. Endoderm        |
| B. Gestation    | G. In vitro        |
| C. Antenatal    | H. Parturition     |
| D. Histogenesis | I. Embryonic phase |
| E. Quickening   | J. Ultrasonogram   |

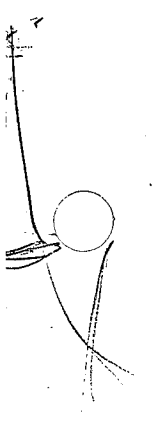


- g 11. "Within a glass"
- \_\_\_\_\_ 12. Inside germ layer
- \_\_\_\_\_ 13. Before birth
- \_\_\_\_\_ 14. Length of pregnancy
- \_\_\_\_\_ 15. Fiberoptic viewing instrument
- \_\_\_\_\_ 16. Process of birth
- \_\_\_\_\_ 17. First fetal movement
- \_\_\_\_\_ 18. Study of how the primary germ layers develop into many different kinds of tissues
- \_\_\_\_\_ 19. Fertilization until the end of the eighth week of gestation
- \_\_\_\_\_ 20. Monitors the progress of the developing fetus



If you have had difficulty with this section, review pages 482-491.

# POSTNATAL PERIOD

Circle the correct answer.

- 
- 
- 
21. During the postnatal period:
- A. The head becomes proportionately smaller
  - B. Thoracic and abdominal contours change from round to elliptical
  - C. The legs become proportionately longer
  - D. The trunk becomes proportionately shorter
  - E. All of the above
22. The period of infancy starts at birth and lasts about:
- A. 4 weeks
  - B. 4 months
  - C. 10 weeks
  - D. 12 months
  - E. 18 months
23. The lumbar curvature of the spine appears \_\_\_\_\_ months after birth.
- A. 1-10
  - B. 5-8
  - C. 8-12
  - D. 11-15
  - E. 12-18
24. During the first 4 months after birth, the birth weight will:
- A. Double
  - B. Triple
  - C. Quadruple
  - D. None of the above
25. At the end of the first year, the weight of the baby will have:
- A. Doubled
  - B. Tripled
  - C. Quadrupled
  - D. None of the above
26. The infant is capable of following a moving object with its eyes at the age of:
- A. 2 days
  - B. 2 weeks
  - C. 2 months
  - D. 4 months
  - E. 10 months
27. The infant can lift its head and raise its chest at the age of:
- A. 2 months
  - B. 3 months
  - C. 4 months
  - D. 10 months
28. The infant can crawl at the age of:
- A. 2 months
  - B. 3 months
  - C. 4 months
  - D. 10 months
  - E. 12 months

29. The infant can stand alone at the age of:
- A. 2 months
  - B. 3 months
  - C. 4 months
  - D. 10 months
  - E. 12 months
30. The permanent teeth, with the exception of the third molar, have all erupted by age \_\_\_\_\_ years.
- A. 6
  - B. 8
  - C. 12
  - D. 14
  - E. None of the above
31. Puberty starts at age \_\_\_\_\_ years in boys.
- A. 10-13
  - B. 12-14
  - C. 14-16
  - D. None of the above
32. Most girls begin breast development at about age:
- A. 8
  - B. 9
  - C. 10
  - D. 11
  - E. 12
33. The growth spurt is generally complete by age \_\_\_\_\_ in males.
- A. 14
  - B. 15
  - C. 16
  - D. 18
34. An average age at which girls begin to menstruate is \_\_\_\_\_ years.
- A. 10-12
  - B. 11-12
  - C. 12-13
  - D. 13-14
  - E. 14-15
35. The first sign of puberty in boys is:
- A. Facial hair
  - B. Increased muscle mass
  - C. Pubic hair
  - D. Deepening of the voice
  - E. Increased testicular enlargement

Write the letter of the correct word in the blank next to the appropriate definition.

- |                |               |
|----------------|---------------|
| A. Neonatology | F. Postnatal  |
| B. Neonatal    | G. Infancy    |
| C. Adolescence | H. Childhood  |
| D. Deciduous   | I. Senescence |
| E. Puberty     |               |

- \_\_\_\_\_ 36. Begins at birth and lasts until death
- \_\_\_\_\_ 37. Concerned with the diagnosis and treatment of disorders of the newborn
- \_\_\_\_\_ 38. Teenage years
- \_\_\_\_\_ 39. From the end of infancy to puberty
- \_\_\_\_\_ 40. Baby teeth
- \_\_\_\_\_ 41. First 4 weeks of infancy
- \_\_\_\_\_ 42. Secondary sexual characteristics occur
- \_\_\_\_\_ 43. Begins at birth and lasts about 18 months
- \_\_\_\_\_ 44. Old age



*If you have had difficulty with this section, review pages 491-495.*

## EFFECTS OF AGING

Fill in the blanks.

45. Old bones develop indistinct and shaggy margins with spurs, a process called \_\_\_\_\_.
46. A degenerative joint disease common in the aged is \_\_\_\_\_.
47. The number of \_\_\_\_\_ units in the kidney decreases by almost 50% between the ages of 30 and 75.
48. During old age, respiratory efficiency decreases, and a condition known as \_\_\_\_\_ results.
49. Fatty deposits accumulate in blood vessels as we age, and the result is \_\_\_\_\_ which narrows the passageway for the flow of blood.
50. Hardening of the arteries or \_\_\_\_\_ occurs during the aging process.
51. Another term for high blood pressure is \_\_\_\_\_.
52. Hardening of the lens is \_\_\_\_\_.
53. If the lens becomes cloudy and impairs vision, it is called a \_\_\_\_\_.
54. \_\_\_\_\_ causes an increase in the pressure within the eyeball and may result in blindness.



*If you have had difficulty with this section, review pages 495-497.*

# UNSCRAMBLE THE WORDS

55. ANNFCYI  
 56. NAALTTSOP  
 57. OGSSNEGRAONEI  
 58. GTEYZO  
 59. HDOOLHCID



Take the circled letters, unscramble them, and fill in the statement.

**The secret to Farmer Brown's prize pumpkin crop.**

60. \_\_\_\_\_

## APPLYING WHAT YOU KNOW

61. Heather's mother told the pediatrician during Heather's 1-year visit that Heather had tripled her birth weight, was crawling actively, and could stand alone. Is Heather's development normal, retarded, or advanced?

62. Clarke is 70 years old. She has always enjoyed food and has had a hearty appetite. Lately, however, she has complained that food "just doesn't taste as good anymore." What might be a possible explanation?

63. Mr. Altman, age 68, has noticed hearing problems, but only under certain circumstances. He has difficulty with certain tones, especially high or low tones, but has no problem with everyday conversation. What might be a possible explanation?

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64. WORD FIND

Can you find 14 terms from this chapter? Words may be spelled top to bottom, bottom to top, right to left, left to right, or diagonally.

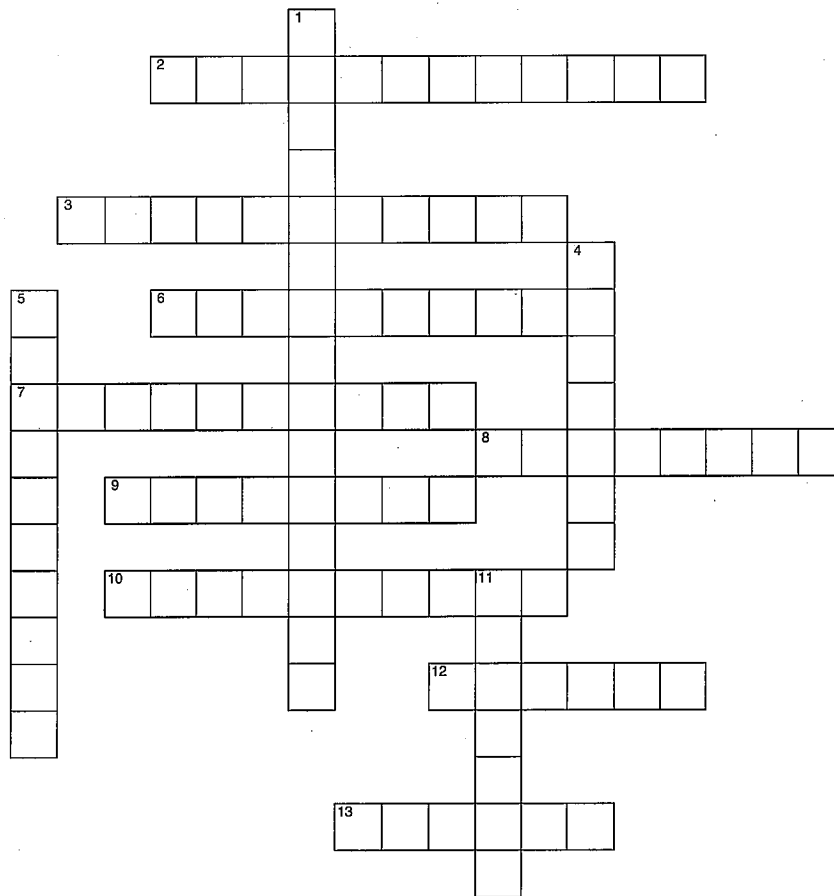
F T P N O I T A T S E G K F U  
Z E P O C S O R A P A L H E A  
E O R I L T O H H O C J V J T  
C M V T N T I M L N L Z P U O  
M A B I I F R M R E D O T C E  
H Q C R D L A M E S O D E R M  
N N M U Y U I N M F O W G O P  
K N V T C O C Z C H H F R C N  
H G Y R Y K L T A Y D U C V P  
L A T A N T S O P T L U N Q G  
Q N K P Y Y S W G A I K E M T  
U G P Q N H O Y X Y H O Z B N  
I Y T R E B U P L A C E N T A

Childhood	Infancy	Parturition
Ectoderm	Laparoscope	Placenta
Embryology	Mesoderm	Postnatal
Fertilization	Morula	Puberty
Gestation	Oviduct	

## DID YOU KNOW?

Brain cells do not regenerate. One beer permanently destroys 10,000 cells.

# GROWTH/DEVELOPMENT



## Across

2. Study of how germ layers develop into tissues
3. Process of birth
6. Name of zygote after implantation
7. Science of the development of the individual before birth
8. Eye disease marked by increased pressure in the eyeball
9. Cloudy lens
10. Old age
12. Name of zygote after 3 days
13. Fertilized ovum

## Down

1. Fatty deposit buildup on walls of arteries
4. First 4 weeks of infancy
5. Hardening of the lens
11. Will develop into a fetal membrane in the placenta

# CHECK YOUR KNOWLEDGE

## Multiple Choice

Circle the correct answer.

1. When the human embryo is a hollow ball of cells consisting of an outer cell layer and an inner cell mass, what is it called?
  - A. Morula
  - B. Chorion
  - C. Blastocyst
  - D. Zygote
2. Degenerative changes in the urinary system that accompany old age include which of the following?
  - A. Decreased capacity of bladder and the inability to empty or void completely
  - B. Decrease in the number of nephrons
  - C. Less blood flow through the kidneys
  - D. All of the above
3. The frontal and maxillary sinuses of the facial region acquire permanent placement or develop fully when the individual is in a stage of development known as:
  - A. Infancy
  - B. Childhood
  - C. Adolescence
  - D. Adulthood
4. The first 4 weeks of human life after birth are referred to as which of the following?
  - A. Neonatal
  - B. Infancy
  - C. Prenatal
  - D. Embryonic
5. Any hardening of the arteries is referred to as which of the following?
  - A. Angioma
  - B. Atherosclerosis
  - C. Angina
  - D. Arteriosclerosis
6. Which of the following is characteristic of the disorder called presbyopia?
  - A. It is very characteristic of old age.
  - B. It causes farsightedness in some individuals.
  - C. It is characterized by a lens in the eye becoming hard and losing its elasticity.
  - D. All of the above
7. Which of the following events is *not* characteristic of infancy?
  - A. One spinal curvature is present
  - B. The head accounts for approximately one fourth of total body height
  - C. Quickening apparent
  - D. 50% increase in body length
8. Which of the following events is *not* characteristic of adolescence?
  - A. Bone closure
  - B. Development of secondary sexual characteristics
  - C. Very rapid growth
  - D. All of the above events are characteristic of adolescence.

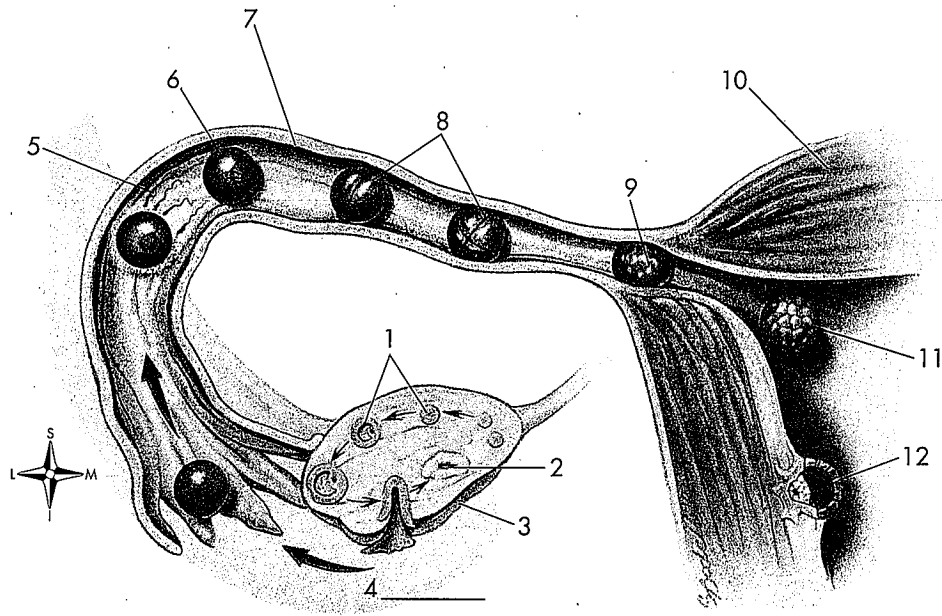
9. Which of the following events is *not* characteristic of the prenatal period of development?
- A. Blastocyst is formed.
  - B. Histogenesis occurs.
  - C. Bone closure occurs.
  - D. Amniotic cavity is formed.
10. Which of the following structures is derived from ectoderm?
- A. Lining of lungs
  - B. Brain
  - C. Kidneys
  - D. All of the above

## Matching

*Select the most appropriate answer from column B for each item in column A. There is only one correct answer for each item.*

<i>Column A</i>	<i>Column B</i>
_____ 11. Arteriosclerosis	A. High blood pressure
_____ 12. Atherosclerosis	B. Chorion
_____ 13. Parturition	C. Birth
_____ 14. Cataract	D. "Bag of waters"
_____ 15. Adolescence	E. Hardening of arteries
_____ 16. Amniotic sac	F. Degeneration
_____ 17. Glaucoma	G. Fat accumulation in arteries
_____ 18. Senescence	H. Secondary sexual characteristics
_____ 19. Hypertension	I. Clouding of eye lens
_____ 20. Placenta	J. High eye pressure

# Fertilization and Implantation



1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_
6. \_\_\_\_\_

7. \_\_\_\_\_
8. \_\_\_\_\_
9. \_\_\_\_\_
10. \_\_\_\_\_
11. \_\_\_\_\_
12. \_\_\_\_\_

