

I—TYPES OF BONES

Matching—identify each structure with its corresponding description.

- a. epiphysis
- b. medullary cavity
- c. carpal
- d. articular cartilage
- e. femur
- f. endosteum
- g. vertebra
- h. diaphysis
- i. patella
- j. periosteum
- k. scapulae

1. _____ the thin membrane that lines the medullary cavity
2. _____ an example of a flat bone
3. _____ the shaft of the long bone
4. _____ an example of a long bone
5. _____ the thin layer that cushions jolts and blows
6. _____ an example of a sesamoid bone
7. _____ an attachment for muscle fibers
8. _____ an example of a short bone
9. _____ the end of a long bone
10. _____ the tubelike, hollow space in the diaphysis of long bones
11. _____ an example of an irregular bone

► *If you had difficulty with this section, review pages 193-197.*

II—BONE TISSUE STRUCTURE, BONE MARROW, AND REGULATION OF BLOOD CALCIUM LEVELS

Multiple Choice—select the best answer.

12. Which of the following is *not* a component of bone matrix?
 - a. inorganic salts
 - b. organic matrix
 - c. collagenous fibers
 - d. all of the above are components of bone matrix
13. Small spaces in which bone cells lie are called:
 - a. lamellae.
 - b. lacunae.
 - c. canaliculi.
 - d. interstitial lamellae.
14. The basic structural unit of compact bone is:
 - a. trabeculae.
 - b. cancellous bone.
 - c. osteon.
 - d. none of the above.
15. The cells that produce the organic matrix in bone are:
 - a. chondrocytes.
 - b. osteoblasts.
 - c. osteocytes.
 - d. osteoclasts.
16. The bones in an adult that contain red marrow include all of the following *except*:
 - a. ribs.
 - b. tarsals.
 - c. pelvis.
 - d. femur.
17. Low blood calcium evokes a response from:
 - a. calcitonin.
 - b. the thyroid.
 - c. parathyroid hormone.
 - d. none of the above.

True or false

18. _____ Haversian canals run lengthwise, whereas Volkmann's canals run transverse to the bone.
19. _____ Giant, multinucleate cells that are responsible for bone resorption are called *osteocytes*.
20. _____ Bone marrow is found not only in the medullary cavities of certain long bones but also in the spaces of cancellous bone.
21. _____ Calcitonin functions to stimulate osteoblasts and inhibit osteoclasts.
22. _____ *Hematopoiesis* is a term referring to the formation of new haversian systems.
23. _____ Yellow marrow is found in almost all of the bones of an infant's body.
26. The epiphyseal plate is composed mostly of:
a. chondrocytes.
b. osteocytes.
c. osteoclasts.
d. none of the above.
27. Bone loss normally begins to exceed bone gain between the ages of:
a. 30 and 35 years.
b. 35 and 40 years.
c. 55 and 60 years.
d. 65 and 70 years.
28. The first step to healing a bone fracture is:
a. callus formation.
b. fracture hematoma formation.
c. alignment of the fracture.
d. collar formation.

True or false

29. _____ The addition of bone to its outer surface resulting in growth in diameter is called *appositional growth*.
30. _____ Most bones of the body are formed by intramembranous ossification.
31. _____ Once an individual reaches skeletal maturity, the bones undergo years of metabolic rest.
32. _____ Lack of exercise tends to weaken bones through decreased collagen formation and excessive calcium withdrawal.
33. _____ When bones reach their full length, the epiphyseal plate disappears.

► *If you had difficulty with this section, review pages 197-202.*

III—BONE DEVELOPMENT, REMODELING, AND REPAIR

Multiple Choice—select the best answer.

24. The primary ossification center is located at the:
a. epiphysis.
b. diaphysis.
c. articular cartilage.
d. none of the above.
25. The primary purpose of the epiphyseal plate is:
a. mending fractures.
b. enlarging the epiphysis.
c. providing bone strength.
d. lengthening long bones.

► *If you had difficulty with this section, review pages 202-207.*

IV—CARTILAGE

Multiple Choice—select the best answer.

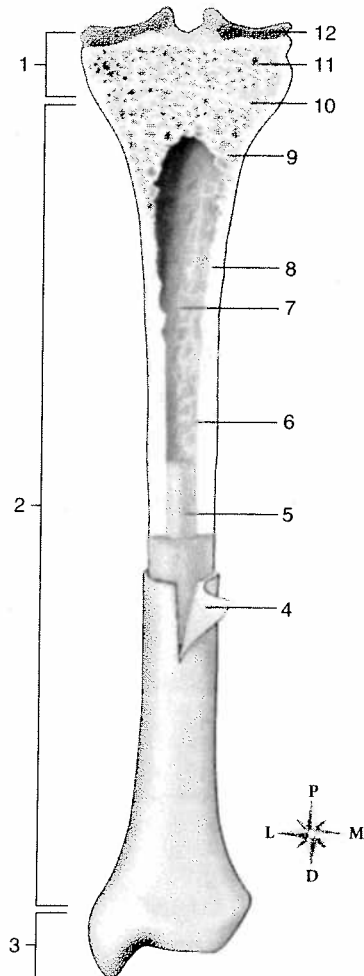
34. The fibrous covering of cartilage is:
 a. periosteum.
 b. perichondrium.
 c. chondroclast.
 d. none of the above.
35. The external ear, epiglottis, and the auditory tube are composed of:
 a. hyaline cartilage.
 b. fibrocartilage.
 c. elastic cartilage.
 d. none of the above.

36. Vitamin D deficiency can result in:
 a. scurvy.
 b. rickets.
 c. osteochondroma.
 d. none of the above.

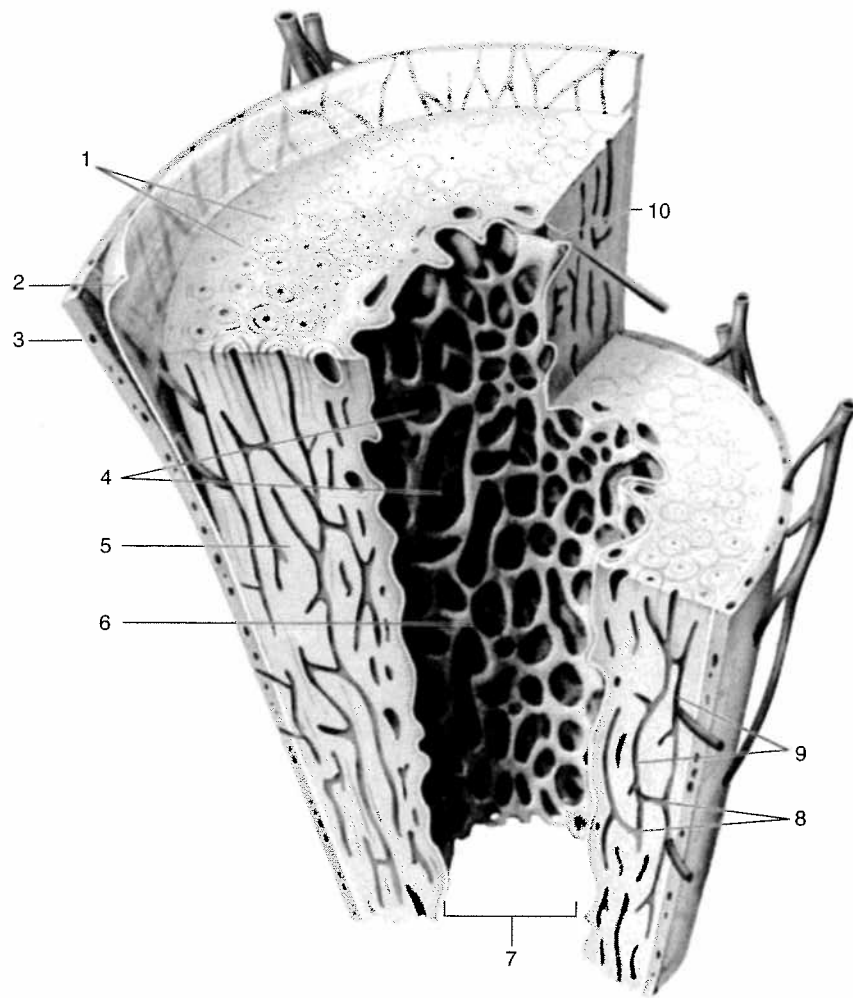
True or false

37. _____ Both bone and cartilage are well-vascularized.
38. _____ The intervertebral discs are composed of fibrocartilage.
39. _____ The growth of cartilage occurs by both appositional and interstitial growth.

Labeling—label the following diagrams.



- 1 _____
- 2 _____
- 3 _____
- 4 _____
- 5 _____
- 6 _____
- 7 _____
- 8 _____
- 9 _____
- 10 _____
- 11 _____
- 12 _____



- 1 _____
- 2 _____
- 3 _____
- 4 _____
- 5 _____

- 6 _____
- 7 _____
- 8 _____
- 9 _____
- 10 _____

► If you had difficulty with this section, review pages 207-209.

V—MECHANISMS OF DISEASE

Fill in the blanks.

- 40. _____ is a malignant tumor of hyaline cartilage that arises from chondroblasts.
- 41. _____ is the most common primary malignant tumor of skeletal tissue.

- 42. _____ is a common bone disease often occurring in postmenopausal women and manifesting symptoms of porous, brittle, and fragile bones.
- 43. _____ is also known as *osteitis deformans*.
- 44. _____ is a bacterial infection of the bone and marrow tissue.

▶ *If you had difficulty with this section, review pages 209-210.*

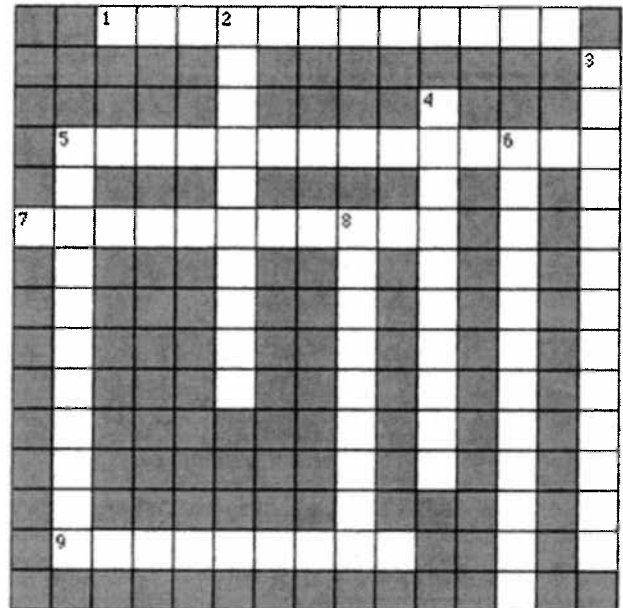
Crossword Puzzle

Across

- 1. Ossification that replaces cartilage with bone
- 5. Spongy bone (two words)
- 7. Contains osteons (two words)
- 9. Ends of long bone

Down

- 2. Bone-absorbing cell
- 3. Bone marrow (two words)
- 4. Bone-forming cell
- 5. Cartilage cell
- 6. Bone formation
- 8. Bone cell



APPLYING WHAT YOU KNOW

45. Mrs. Harris is a 60-year-old white woman. She has noticed in recent years that her height has slightly decreased. Recently, she fractured her wrist in a slight fall. Which skeletal system disorder might she be suffering from? What techniques could be used to diagnose her condition? What treatments are available?

- 46. Mrs. Wiedeke had advanced cancer of the bone. As the disease progressed, Mrs. Wiedeke required several blood transfusions throughout her therapy. She asked the doctor one day to explain the necessity for the transfusions. What explanation might the doctor give to Mrs. Wiedeke?
- 47. Dr. Kennedy, an orthopedic surgeon, called the admissions office of the hospital and advised them that he would be admitting a patient in the next hour with an epiphyseal fracture. Without any other information, the patient is assigned to the pediatric ward. What prompted this assignment?

48. Ms. Strickland was in an auto accident. When the surgeon described the details of the surgery to her family, he stated that he was able to “patch” her fractures. Explain what he might have meant by “patching” the fractures.

57. Bones serve as the major reservoir for _____, a vital substance required for normal nerve and muscle function.

58. _____ is the most abundant type of cartilage.



DID YOU KNOW

- Approximately 25 million Americans have osteoporosis. Four out of five are women.



ONE LAST QUICK CHECK

Fill in the blanks.

49. There are _____ types of bones.

50. The _____ is the hollow area inside the diaphysis of a bone.

51. A thin layer of cartilage covering each epiphysis is the _____.

52. The _____ lines the medullary cavity of long bones.

53. _____ is used to describe the process of blood cell formation.

54. Blood cell formation is a vital process carried on in _____.

55. The _____ is a strong fibrous membrane that covers a long bone except at joint surfaces.

56. Bones may be classified by shape. Those shapes include _____, _____, and _____.

Matching—identify the term with the proper selection.

- a. outer covering of bone
- b. dense bone tissue
- c. fibers embedded in a firm gel
- d. needlelike threads of spongy bone
- e. ends of long bones
- f. connect lacunae
- g. cartilage cells
- h. structural unit of compact bone
- i. mature bone cells
- j. ring of bone

59. _____ trabeculae

60. _____ compact

61. _____ spongy

62. _____ periosteum

63. _____ cartilage

64. _____ osteocytes

65. _____ canaliculi

66. _____ lamellae

67. _____ chondrocytes

68. _____ haversian system