UNIT 2
SUPPORT AND MOVEMENT
CHAPTER 7
SKELETAL SYSTEM

OVERVIEW

This chapter deals with the skeletal system—the bones that form the framework for the body. It explains the function and structure of bones (learning outcomes 1, 2, and 4). The development of different types of bone is also explained (learning outcome 3). The chapter describes skeletal organization and the location of specific bones within various parts of the skeleton (learning outcomes 5 and 6). Various types of joints and the movements made possible by these joints (learning outcomes 7–9) are also described in this chapter.

Movement is a characteristic of living things. A study of the skeletal system is necessary to understand how complex organisms, such as humans, are organized to accomplish movement.

LEARNING OUTCOMES

7.1 Introduction

1. List the active tissues in a bone.

7.2 Bone Structure

2. Describe the general structure of a bone, and list the functions of its parts.

7.3 Bone Development and Gowth

3. Distinguish between intramembranous and endochondral bones, and explain how such bones develop and grow.

7.4 Bone Function

4. Discuss the major functions of bones.

7.5 Skeletal Organization

5. Distinguish between the axial and appendicular skeletons and name the major parts of each.

7.6–7.12 Skull–Lower Limb

6. Locate and identify the bones and the major features of the bones that constitute the skull, vertebral column, thoracic cage, pectoral girdle, upper limb, pelvic girdle, and lower limb.

7.13 Joints

7. Classify joints according to the type of tissue binding the bones together, and name an example of each.
8. List six types of synovial joints, and describe the actions of each.
9. Explain how skeletal muscles produce movement at joints and identify several types of each joint movement.

FOCUS QUESTION

How do your bones and joints help you to get out of bed and to your anatomy and physiology class?

MASTERY TEST

Now take the mastery test. Do not guess. As soon as you complete the test, correct it. Note your successes and failures so that you can read the chapter to meet your learning needs.

1. Which of the following is not an active tissue found in bone?
   a. cartilage
   b. cuboidal epithelium
   c. blood
   d. nervous tissue

2. The shaft of a long bone is the
   a. epiphysis.
   b. diaphysis.

3. To what part of the bone do tendons and ligaments attach?
   a. bursae
   b. epiphysis
   c. cartilage
   d. periosteum

4. Bone that consists mainly of tightly packed tissue is called _____bone.

5. Bone that consists of numerous branching bony plates separated by irregular spaces is called _____bone.

6. The medullary cavity of a long bone is filled with _____.

7. Bones that develop from layers of membranous connective tissue are called _____ _____.

8. An example of a sesmoid bone is _____.

9. Bones that develop from masses of hyaline cartilage are called _____ _____.

10. The band of cartilage between the primary and secondary ossification centers in long bones is called the
   a. osteoblastic band.
   b. calcium disk.
   c. periosteal plate.
   d. epiphyseal plate.

11. The cells that form new bone are _____; the cells that break down bone are _____.

12. Once bone formation is complete, the bone (remains stable, is remodeled) throughout life.

13. When a bone is fractured, a hematoma is formed from blood escaping from
   a. the periosteum.
   b. bone marrow.
   c. blood vessels within the bone.
   d. surrounding soft tissue.

14. List the major factors that influence bone growth and development.

15. The gap between broken ends of a fractured bone is filled by a _____ _____.

16. To accomplish movement, bones and muscles function together to act as _____.

17. Which of the following bones contains red marrow for blood cell formation in a healthy adult?
   a. pelvis
   b. small bones of the wrist
   c. ribs
   d. shaft of long bones

18. Which of the following substances is NOT normally found in bone?
   a. potassium
   b. calcium
   c. lead
   d. magnesium

19. Calcium is important in
   a. muscle contration.
   b. regulation of thyroid function.
   c. nerve impulse conduction.
   d. blood cell formation.

20. List the major parts of the axial skeleton.

21. List the major parts of the appendicular skeleton.

22. The parts of the spinal column in which the vertebrae are fused is the
   a. cervical spine.
   b. thoracic spine.
   c. sacrum.
   d. coccyx.

23. The only movable bone of the skull is the
    a. nasal bone.
    b. mandible.
    c. maxilla.
    d. vomer.
24. The bone that forms the back of the skull and joins the skull along the lambdoid suture is the _____bone.
25. The upper jaw is formed by the _____ bones.
26. The membranous areas (soft spots) of an infant's skull are called _____.
27. What part of the vertebral column acts as a shock absorber?
    a. vertebral bodies
    b. intervertebral disks
    c. lamina
    d. spinous processes
28. Which of the vertebrae support the most weight?
    a. cervical
    b. thoracic
    c. lumbar
    d. sacral
29. The functions of the thoracic cage include
    a. production of blood cells.
    b. contribution to breathing.
    c. protection of heart and lungs.
    d. support of the shoulder girdle.
30. True ribs articulate with the _____ _____ and _____.
31. The pectoral girdle is made of two _____ and two _____.
32. The _____ crosses over the ulna when the palm of the hand faces backward.
33. The wrist consists of
    a. 8 carpal bones.
    b. 5 metacarpal bones.
    c. 14 phalanges.
    d. distal segments of the radius and the ulna.
34. When the hands are placed on the hips, they are placed over the
    a. iliac crest.
    b. acetabulum.
    c. ischial tuberosity.
    d. ischial spines.
35. The longest bone in the body is the
    a. tibia.
    b. fibula.
    c. femur.
    d. patella.
36. The lower end of the fibula can be felt as an ankle bone. The correct name is the
    a. head of the fibula.
    b. lateral malleolus.
    c. talus.
    d. lesser trochanter.
37. Synovial membrane is found in
    a. immovable joints.
    b. slightly movable joints.
    c. freely movable joints.
38. The function of bursae is to
    a. act as shock absorbers.
    b. facilitate movement of tendons over bones.
    c. reduce friction between bony surfaces.
    d. protect joints from infection.
39. The type of joint that permits the widest range of motion is
    a. ball-and-socket.
    b. gliding.
    c. condyloid.
    d. pivot.
40. Moving the parts at a joint so that the angle between them is increased is called
    a. flexion.
    b. extension.
    c. elevation.
    d. abduction.

STUDY ACTIVITIES

I. Aids to Understanding Words

Define the following word parts. (p. 131)

acetabul-

ax-

-blast

carp-

-clast

condyl-

corac-

cribr-

crist-

fov-

glen-

inter-

intra-

meat-

odont-

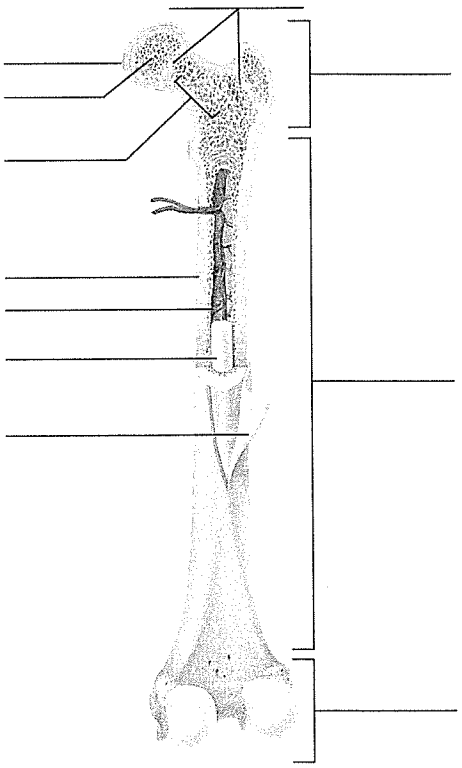
poie-

II. 7.1 Introduction (p. 131)

List the living tissues of bone. (p. 131)

III. 7.2 Bone Structure (pp. 131–133)

A. Label the following parts in the accompanying drawing of a long bone: diaphysis, articular cartilage, spongy bone, compact bone, medullary cavity, yellow marrow, periosteum, epiphyseal disks, proximal epiphysis, distal epiphysis, space occupied by red marrow.



B. Describe the classification of bone by their shape

C. How does the structure of bone make its function possible?

D. The vascular fibrous tissue covering the bone whose function is the formation and repair of bone tissue is the _____. (p. 131)

E. What is the structural difference between compact and spongy bone? (p. 131)

F. Osteocytes are found in the

a. central canals.

b. lacunae.

c. medullary cavity.

d. periosteum.