



THE SKELETAL SYSTEM

The skeleton is constructed of two of the most supportive tissues found in the human body—cartilage and bone. Besides supporting and protecting the body as an internal framework, the skeleton provides a system of levers that the skeletal muscles use to move the body. In addition, the bones provide a storage depot for substances such as lipids and calcium, and blood cell formation goes on within their red marrow cavities.

The skeleton consists of bones connected at joints, or articulations, and is subdivided into two divisions. The axial skeleton includes those bones that lie around the body's center of gravity. The appendicular skeleton includes the bones of the limbs.

Topics for student review include structure and function of long bones, location and naming of specific bones in the skeleton, fracture types, and a classification of joint types in the body.

BONES—AN OVERVIEW

1. Classify each of the following terms as a projection (*P*) or a depression or opening (*D*). Enter the appropriate letter in the answer blanks.

- | | | |
|----------------|----------------|-------------------|
| ___ 1. Condyle | ___ 4. Foramen | ___ 7. Ramus |
| ___ 2. Crest | ___ 5. Head | ___ 8. Spine |
| ___ 3. Fissure | ___ 6. Meatus | ___ 9. Tuberosity |

2. Group each of the following bones into one of the four major bone categories. Use *L* for long bone, *S* for short bone, *F* for flat bone, and *I* for irregular bone. Enter the appropriate letter in the space provided.

- | | | |
|------------------|-------------------|-----------------|
| ___ 1. Calcaneus | ___ 4. Humerus | ___ 7. Radius |
| ___ 2. Frontal | ___ 5. Mandible | ___ 8. Sternum |
| ___ 3. Femur | ___ 6. Metacarpal | ___ 9. Vertebra |

3. Using the key choices, characterize the following statements relating to long bones. Enter the appropriate term(s) or letter(s) in the answer blanks.

Key Choices

- | | | |
|---------------------|---------------|-------------------------|
| A. Diaphysis | C. Epiphysis | E. Yellow marrow cavity |
| B. Epiphyseal plate | D. Red marrow | |

- | | |
|-------|---|
| _____ | 1. Site of spongy bone in the adult |
| _____ | 2. Site of compact bone in the adult |
| _____ | 3. Site of hematopoiesis in the adult |
| _____ | 4. Scientific name for bone shaft |
| _____ | 5. Site of fat storage in the adult |
| _____ | 6. Site of longitudinal growth in a child |

4. Complete the following statements concerning bone formation and destruction, using the terms provided in the key. Insert the key letter or corresponding term in the answer blanks.

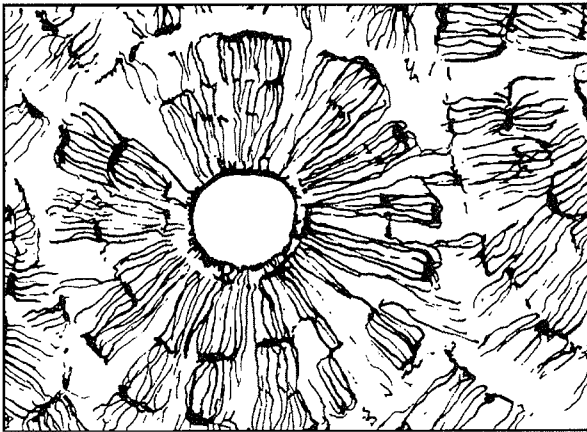
Key Choices

- | | | | |
|---------------|----------------|----------------|--------------------------|
| A. Atrophy | C. Gravity | E. Osteoclasts | G. Parathyroid hormone |
| B. Calcitonin | D. Osteoblasts | F. Osteocytes | H. Stress and/or tension |

- | | |
|-------|--|
| _____ | 1. When blood calcium levels begin to drop below homeostatic levels, <u>(1)</u> is released, causing calcium to be released from bones. |
| _____ | 2. Mature bone cells, called <u>(2)</u> , maintain bone in a viable state. |
| _____ | 3. Disuse such as that caused by paralysis or severe lack of exercise results in muscle and bone <u>(3)</u> . |
| _____ | 4. Large tubercles and/or increased deposit of bony matrix occur at sites of <u>(4)</u> . |
| _____ | 5. Immature, or matrix-depositing, bone cells are referred to as <u>(5)</u> . |
| _____ | 6. <u>(6)</u> causes blood calcium to be deposited in bones as calcium salts. |
| _____ | 7. Bone cells that liquefy bone matrix and release calcium to the blood are called <u>(7)</u> . |
| _____ | 8. Our astronauts must do isometric exercises when in space because bones atrophy under conditions of weightlessness or lack of <u>(8)</u> . |

5. Five descriptions of bone structure are provided in Column A. First identify the structure by choosing the appropriate term from Column B and placing the corresponding answer in the answer blank. Then consider Figure 5–1A, a diagrammatic view of a cross section of bone, and Figure 5–1B, a higher magnified view of compact bone tissue. Select different colors for the structures and bone areas in Column B, and use them to color the coding circles and corresponding structures on the figure diagrams. Because the concentric lamellae would be difficult to color without confusing other elements, identify one lamella by using a bracket and label.

| Column A | Column B |
|--|--|
| _____ 1. Layers of calcified matrix | A. Central (Haversian) canal <input type="radio"/> |
| _____ 2. “Residences” of osteocytes | B. Concentric lamellae |
| _____ 3. Longitudinal canal, carrying blood vessels and nerves | C. Lacunae <input type="radio"/> |
| _____ 4. Nonliving, structural part of bone | D. Canaliculi <input type="radio"/> |
| _____ 5. Tiny canals, connecting lacunae | E. Bone matrix <input type="radio"/> |
| | F. Osteocyte <input type="radio"/> |



A



B

Figure 5–1

6. Circle the term that does not belong in each of the following groupings.

- | | | | |
|----------------------|---------------------|---------------|-------------------|
| 1. Hematopoiesis | Red marrow | Yellow marrow | Spongy bone |
| 2. Lamellae | Canaliculi | Circulation | Osteoblasts |
| 3. Osteon | Marrow cavity | Central canal | Canaliculi |
| 4. Epiphysis surface | Articular cartilage | Periosteum | Hyaline cartilage |

7. Figure 5-2A is a midlevel, cross-sectional view of the diaphysis of the femur. Label the membrane that lines the cavity and the membrane that covers the outside surface.

Figure 5-2B is a drawing of a longitudinal section of the femur. Color the bone tissue gold. Do *not* color the articular cartilage; leave it white. Select different colors for the bone regions listed at the coding circles below. Color the coding circles and the corresponding regions on the drawing. Complete Figure 5-2B by labeling compact bone and spongy bone.

- Diaphysis Area where red marrow is found
 Epiphyseal plate Area where yellow marrow is found

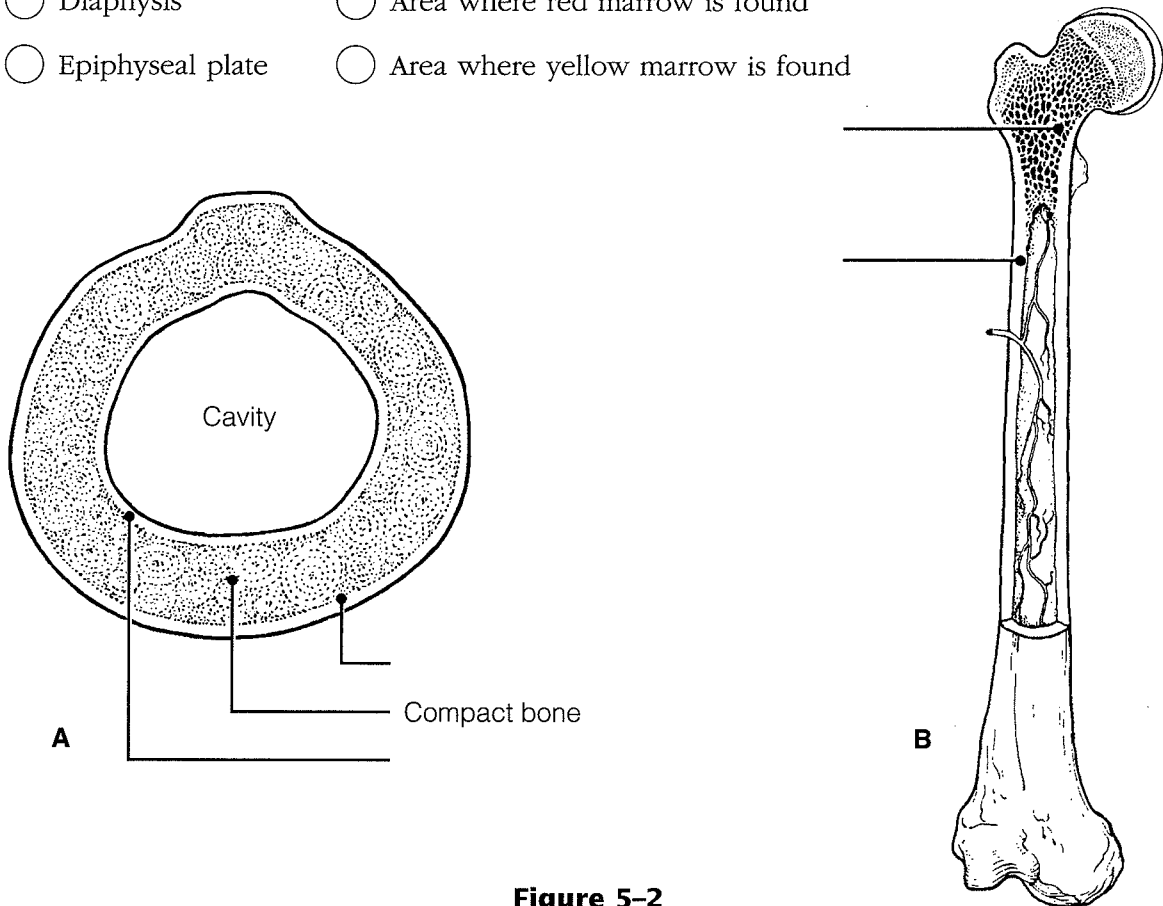


Figure 5-2

8. The following events apply to the endochondral ossification process as it occurs in the primary ossification center. Put these events in their proper order by assigning each a number (1-6).

- _____ 1. Cavity formation occurs within the hyaline cartilage.
 _____ 2. Collar of bone is laid down around the hyaline cartilage model just beneath the periosteum.
 _____ 3. Periosteal bud invades the marrow cavity.
 _____ 4. Perichondrium becomes vascularized to a greater degree and becomes a periosteum.
 _____ 5. Osteoblasts lay down bone around the cartilage spicules in the bone's interior.
 _____ 6. Osteoclasts remove the cancellous bone from the shaft interior, leaving a marrow cavity that then houses fat.

AXIAL SKELETON**Skull**

9. Using the key choices, identify the bones indicated by the following descriptions. Enter the appropriate term or letter in the answer blanks.

- | | | |
|-------|--|--|
| _____ | 1. Forehead bone | Key Choices A. Ethmoid B. Frontal C. Hyoid D. Lacrimals E. Mandible F. Maxillae G. Nasals H. Occipital I. Palatines J. Parietals K. Sphenoid L. Temporals M. Vomer N. Zygomatic |
| _____ | 2. Cheekbone | |
| _____ | 3. Lower jaw | |
| _____ | 4. Bridge of nose | |
| _____ | 5. Posterior part of hard palate | |
| _____ | 6. Much of the lateral and superior cranium | |
| _____ | 7. Most posterior part of cranium | |
| _____ | 8. Single, irregular, bat-shaped bone, forming part of the cranial floor | |
| _____ | 9. Tiny bones, bearing tear ducts | |
| _____ | 10. Anterior part of hard palate | |
| _____ | 11. Superior and middle nasal conchae formed from its projections | |
| _____ | 12. Site of mastoid process | |
| _____ | 13. Site of sella turcica | |
| _____ | 14. Site of cribriform plate | |
| _____ | 15. Site of mental foramen | |
| _____ | 16. Site of styloid process | |
| _____ | 17. _____ | |
| _____ | 18. Four bones, containing paranasal sinuses | |
| _____ | 19. _____ | |
| _____ | 20. _____ | |
| _____ | 21. Its condyles articulate with the atlas | |
| _____ | 22. Foramen magnum contained here | |
| _____ | 23. Middle ear found here | |
| _____ | 24. Nasal septum | |
| _____ | 25. Bears an upward protrusion, the "cock's comb," or crista galli | |
| _____ | 26. Site of external acoustic meatus | |

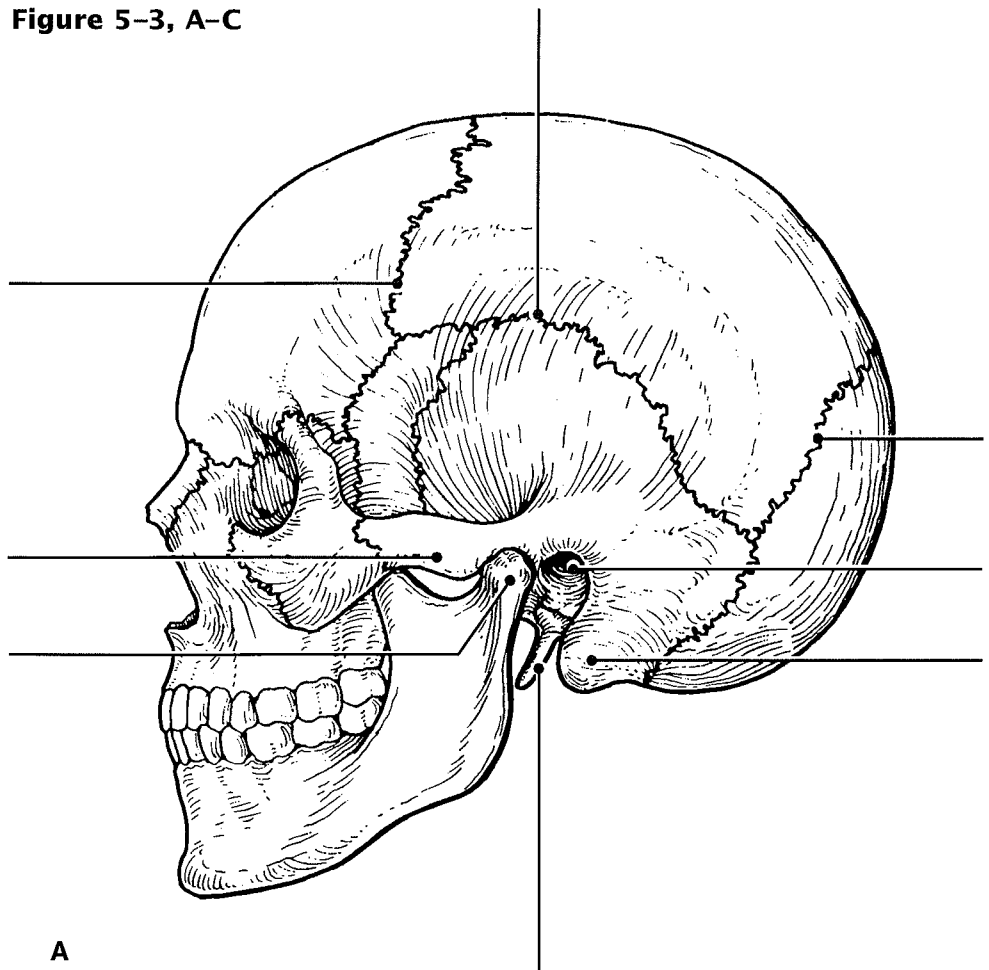
10. For each statement that is true, insert *T* in the answer blank. For false statements, correct the underlined words by inserting the correct words in the answer blanks.

- _____ 1. When a bone forms from a fibrous membrane, the process is called endochondral ossification.
- _____ 2. When trapped in lacunae, osteoblasts change into osteocytes.
- _____ 3. Large numbers of osteocytes are found in the inner periosteum layer.
- _____ 4. Primary ossification centers appear in the epiphyses of a long bone.
- _____ 5. Epiphyseal plates are made of spongy bone.
- _____ 6. In appositional growth, bone reabsorption occurs on the periosteal surface.
- _____ 7. "Maturation" of newly formed (noncalcified) bone matrix takes about 10 days.

11. Figure 5-3, A-C shows lateral, anterior, and inferior views of the skull. Select different colors for the bones listed below and color the coding circles and corresponding bones in the figure. Complete the figure by labeling the bone markings indicated by leader lines.

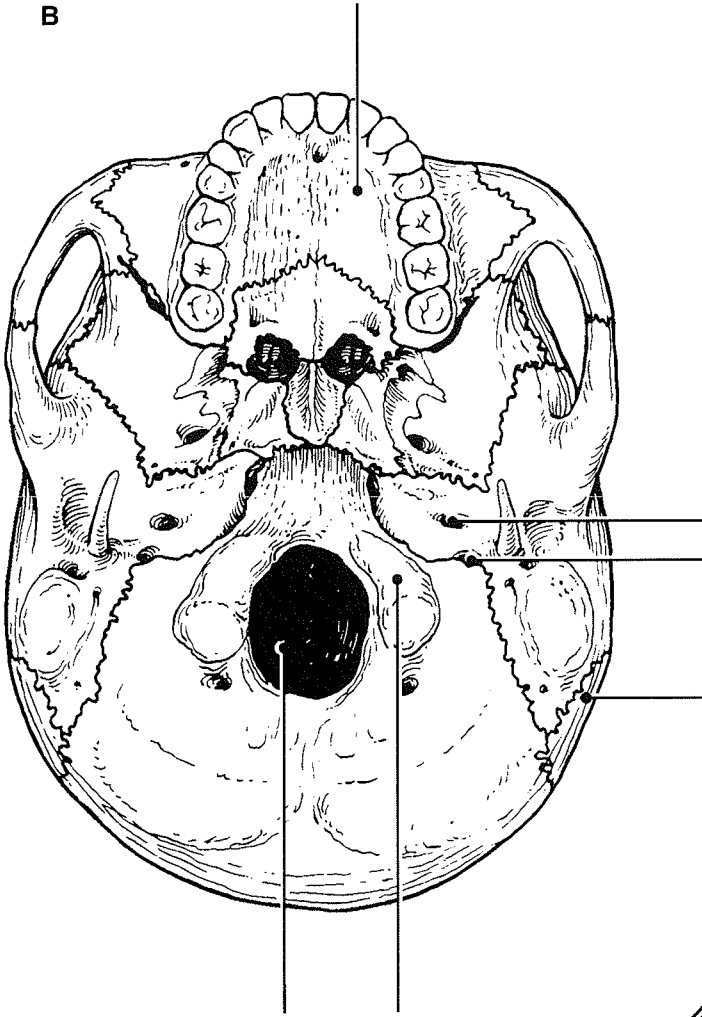
- Frontal
- Parietal
- Mandible
- Maxilla
- Sphenoid
- Ethmoid
- Temporal
- Zygomatic
- Palatine
- Occipital
- Nasal
- Lacrimal
- Vomer

Figure 5-3, A-C

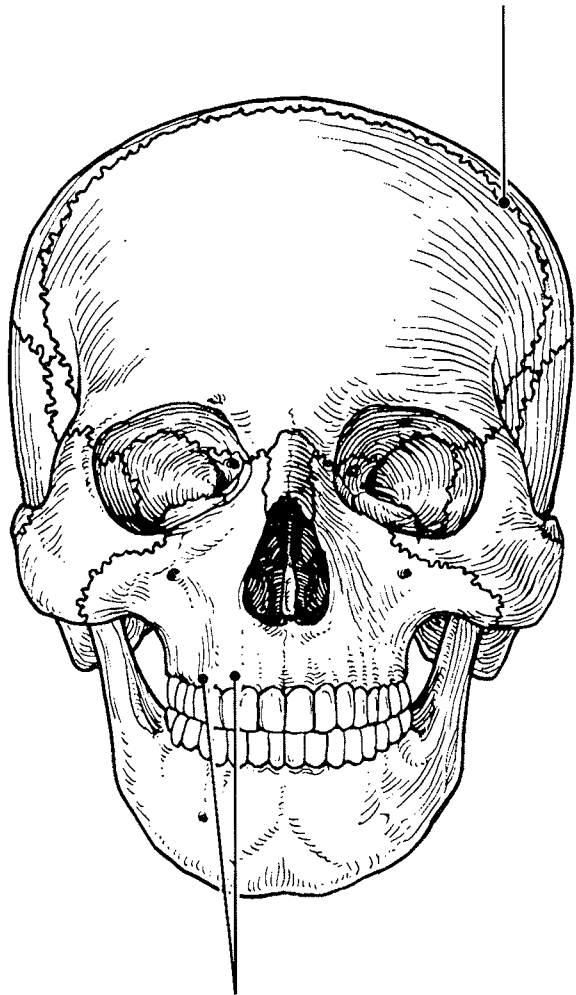


A

B



C



12. An anterior view of the skull, showing the positions of the sinuses, is provided in Figure 5-4. First select different colors for each of the sinuses and use them to color the coding circles and the corresponding structures on the figure. Then briefly answer the following questions concerning the sinuses.

- Sphenoid sinus
- Ethmoid sinuses
- Frontal sinus
- Maxillary sinus

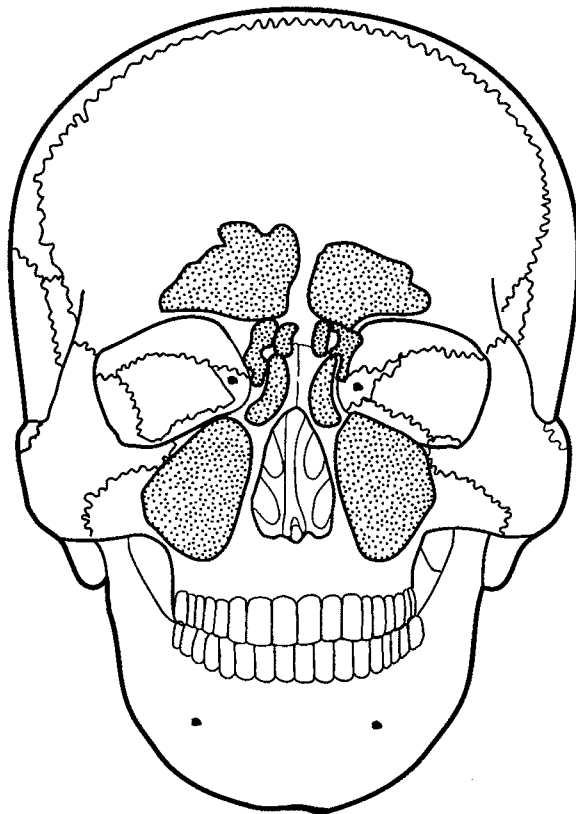


Figure 5-4

1. What *are* sinuses? _____
2. What purpose do they serve in the skull? _____

3. Why are they so susceptible to infection? _____

Vertebral Column

13. Using the key choices, correctly identify the vertebral parts/areas described as follows. Enter the appropriate term(s) or letter(s) in the spaces provided.

Key Choices

- | | | |
|----------------------------|-------------------------------|-----------------------|
| A. Body | C. Spinous process | E. Transverse process |
| B. Intervertebral foramina | D. Superior articular process | F. Vertebral arch |

- _____ 1. Structure that encloses the nerve cord
- _____ 2. Weight-bearing part of the vertebra
- _____ 3. Provide(s) levers for the muscles to pull against
- _____ 4. Provide(s) an articulation point for the ribs
- _____ 5. Openings allowing spinal nerves to pass

14. The following statements provide distinguishing characteristics of the vertebrae composing the vertebral column. Using the key choices, identify each described structure or region by inserting the appropriate term(s) or letter(s) in the spaces provided.

Key Choices

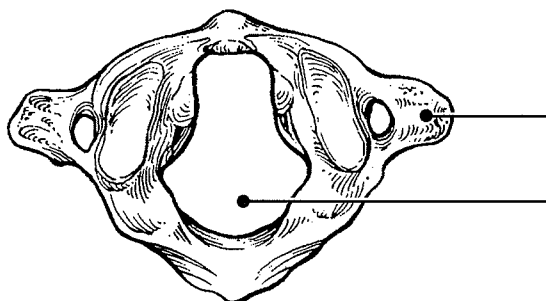
- | | | |
|------------------------------|--------------------|----------------------|
| A. Atlas | D. Coccyx | F. Sacrum |
| B. Axis | E. Lumbar vertebra | G. Thoracic vertebra |
| C. Cervical vertebra—typical | | |

- _____ 1. Type of vertebra(e) containing foramina in the transverse processes, through which the vertebral arteries ascend to reach the brain
- _____ 2. Its dens provides a pivot for rotation of the first cervical vertebra
- _____ 3. Transverse processes have facets for articulation with ribs; spinous process points sharply downward
- _____ 4. Composite bone; articulates with the hip bone laterally
- _____ 5. Massive vertebrae; weight-sustaining
- _____ 6. Tailbone; vestigial fused vertebrae
- _____ 7. Supports the head; allows the rocking motion of the occipital condyles
- _____ 8. Seven components; unfused
- _____ 9. Twelve components; unfused

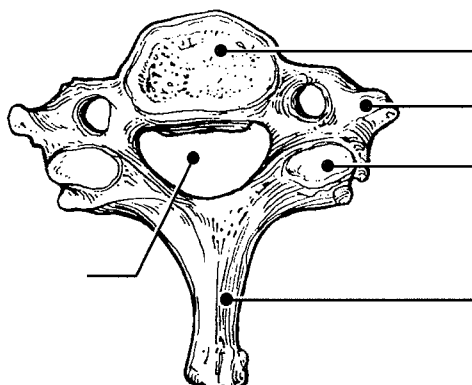
15. Complete the following statements by inserting your answers in the answer blanks.

- _____ 1. In describing abnormal curvatures, it could be said that (1) is an exaggerated thoracic curvature, and in (2) the vertebral column is displaced laterally.
- _____ 2.
- _____ 3. Intervertebral discs are made of (3) tissue. The discs provide (4) to the spinal column.
- _____ 4.

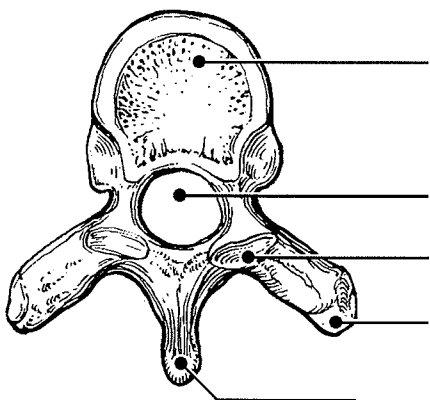
16. Figure 5-5, A-D shows superior views of four types of vertebrae. In the spaces provided below each vertebra, indicate in which region of the spinal column it would be found. In addition, specifically identify Figure 5-5A. Where indicated by leader lines, identify the vertebral body, spinous and transverse processes, superior articular processes, and vertebral foramen.



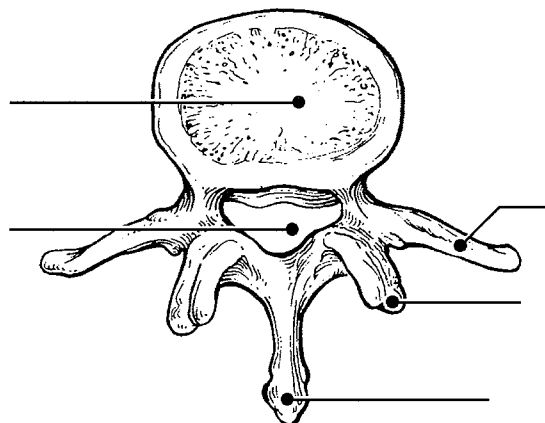
A _____



B _____



C _____



D _____

Figure 5-5

17. Figure 5–6 is a lateral view of the vertebral column. Identify each numbered region of the column by listing in the numbered answer blanks the region name first and then the specific vertebrae involved (for example, sacral region, S# to S#). Also identify the modified vertebrae indicated by numbers 6 and 7 in Figure 5–6. Select different colors for each vertebral region and use them to color the coding circles and the corresponding regions.

- 1. _____ ○
- 2. _____ ○
- 3. _____ ○
- 4. _____ ○
- 5. _____ ○
- 6. _____ ○
- 7. _____ ○

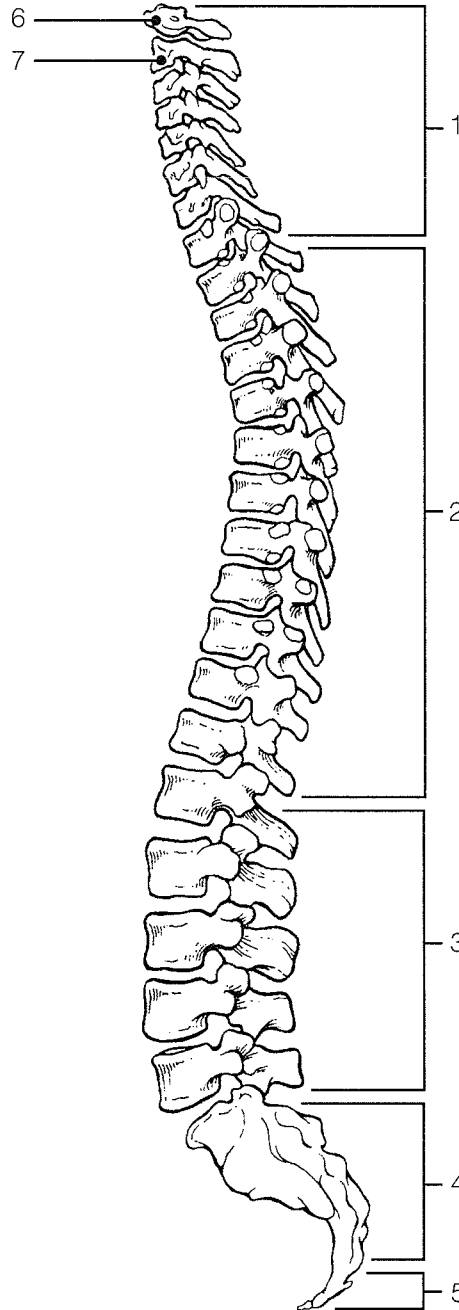


Figure 5–6

Thoracic Cage

18. Complete the following statements referring to the thoracic cage by inserting your responses in the answer blanks.

- _____ 1. The organs protected by the thoracic cage include the (1) and the (2). Ribs 1 through 7 are called (3) ribs, _____ 2. whereas ribs 8 through 12 are called (4) ribs. Ribs 11 and _____ 3. 12 are also called (5) ribs. All ribs articulate posteriorly with the (6), and most connect anteriorly to the (7), _____ 4. either directly or indirectly.
- _____ 5. The general shape of the thoracic cage is (8).
- _____ 6.
- _____ 7.
- _____ 8.

19. Figure 5-7 is an anterior view of the thoracic cage. Select different colors to identify the structures below and color the coding circles and corresponding structures. Then label the subdivisions of the sternum indicated by leader lines.

- All true ribs All false ribs
- Costal cartilages Sternum

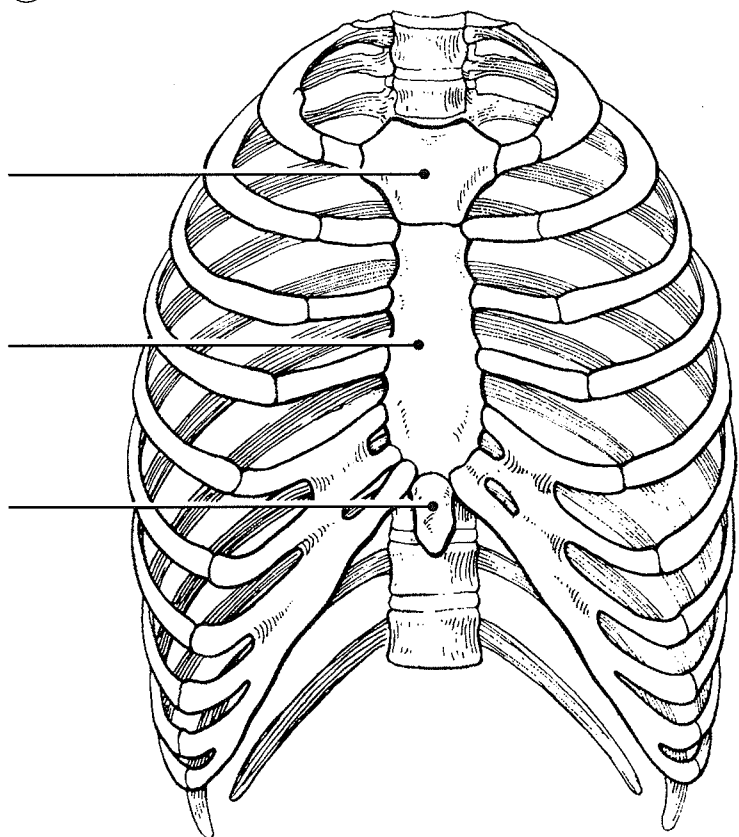


Figure 5-7

APPENDICULAR SKELETON

Several bones forming part of the upper limb and/or shoulder girdle are shown in Figures 5–8 to 5–11. Follow the specific directions for each figure.

20. Identify the bone in Figure 5–8. Insert your answer in the blank below the illustration. Select different colors for each structure listed below and use them to color the coding circles and the corresponding structures in the diagram. Then, label the angles indicated by leader lines.

Spine Glenoid cavity Coracoid process Acromion

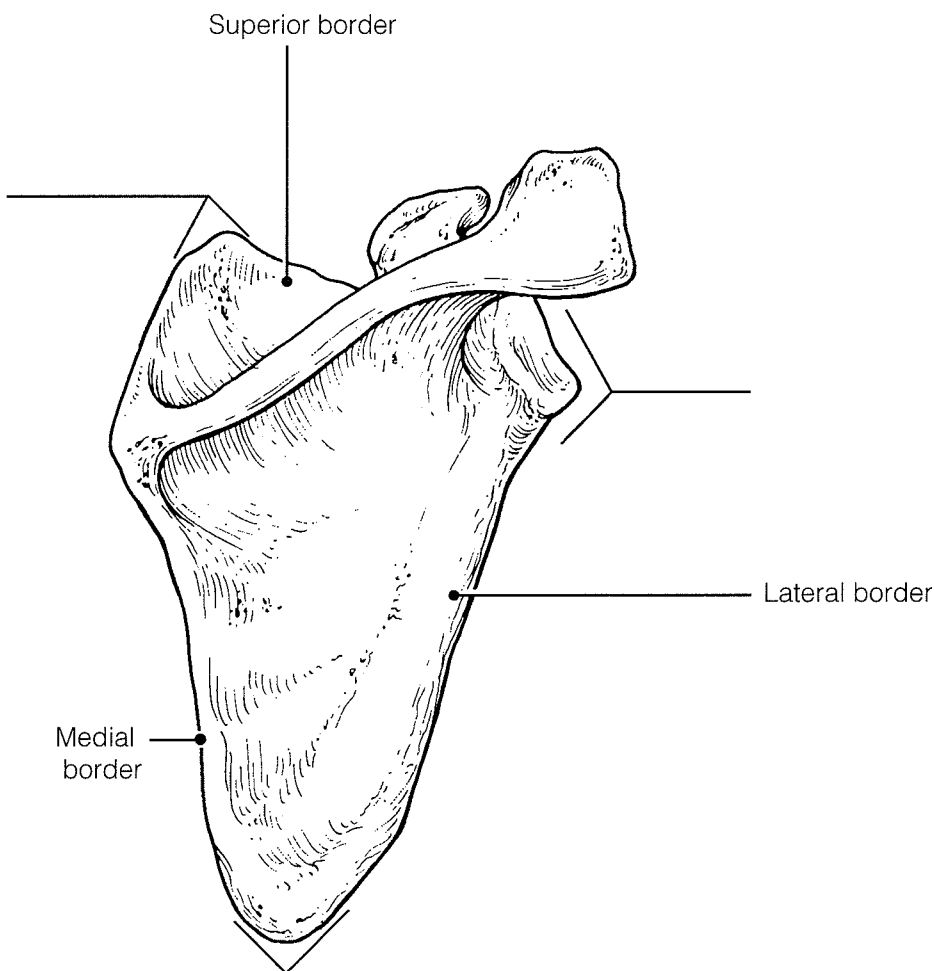


Figure 5–8

21. Identify the bones in Figure 5–9 by labeling the leader lines identified as A, B, and C. Color the bones different colors. Using the following terms, complete the illustration by labeling all bone markings provided with leader lines.

- | | | |
|-------------------|--------------------|-------------------|
| Trochlear notch | Capitulum | Coronoid process |
| Trochlea | Deltoid tuberosity | Olecranon process |
| Radial tuberosity | Head (three) | Greater tubercle |
| | Styloid process | Lesser tubercle |

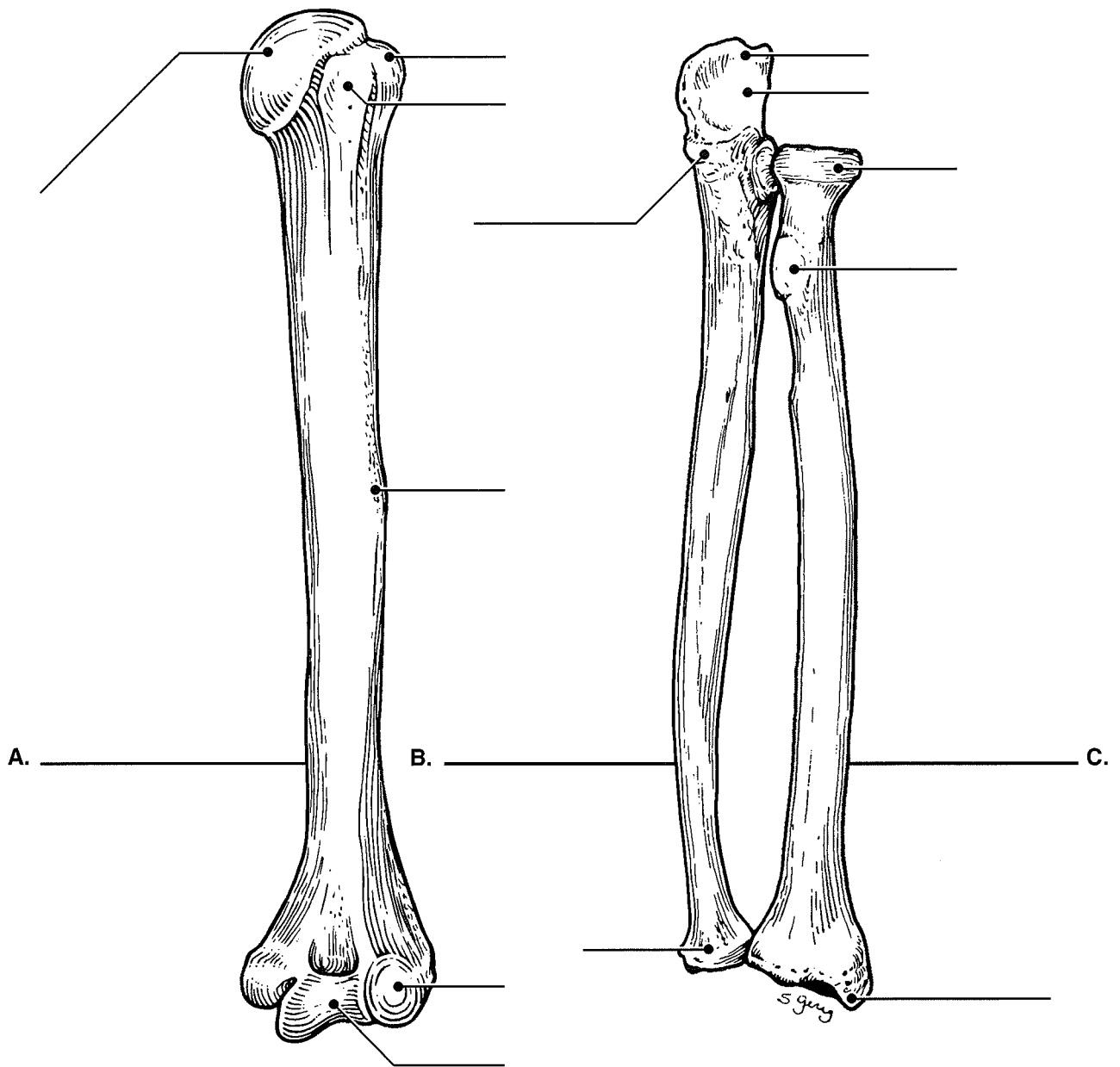


Figure 5–9

22. Figure 5–10 is a diagram of the hand. Select different colors for the following structures, and use them to color the coding circles and the corresponding structures in the diagram.

- Carpals
 Metacarpals
 Phalanges

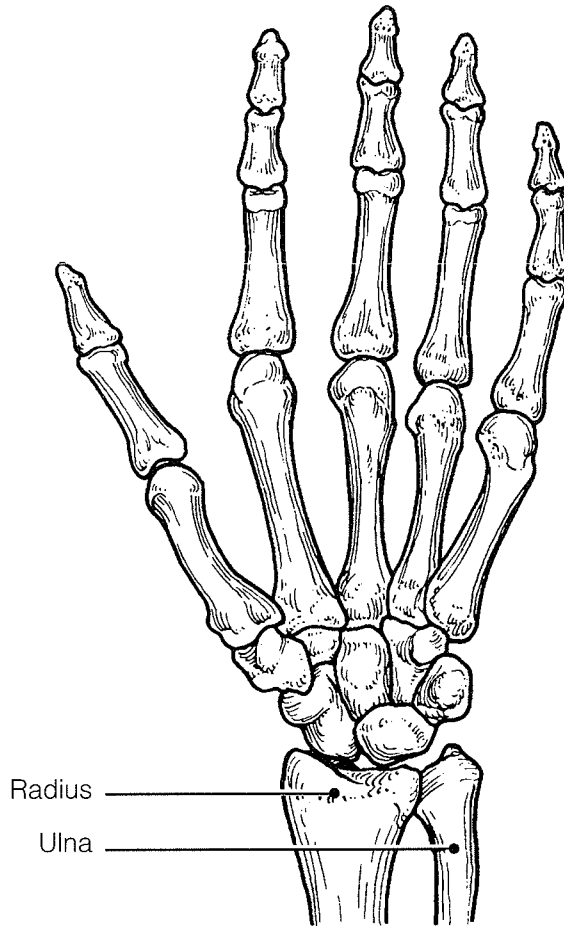


Figure 5–10

23. Compare the pectoral and pelvic girdles by choosing descriptive terms from the key choices. Insert the appropriate key letters in the answer blanks.

Key Choices

- | | |
|----------------|--|
| A. Flexibility | D. Shallow socket for limb attachment |
| B. Massive | E. Deep, secure socket for limb attachment |
| C. Lightweight | F. Weight-bearing |

Pectoral: _____, _____, _____ Pelvic: _____, _____, _____

24. Using the key choices, identify the bone names or markings according to the descriptions that follow. Insert the appropriate term or letter in the answer blanks.

Key Choices

- | | | | |
|---------------------|-----------------------|----------------------|--------------------|
| A. Acromion | F. Coronoid fossa | K. Olecranon fossa | P. Scapula |
| B. Capitulum | G. Deltoid tuberosity | L. Olecranon process | Q. Sternum |
| C. Carpals | H. Glenoid cavity | M. Phalanges | R. Styloid process |
| D. Clavicle | I. Humerus | N. Radial tuberosity | S. Trochlea |
| E. Coracoid process | J. Metacarpals | O. Radius | T. Ulna |

- _____ 1. Raised area on lateral surface of humerus to which deltoid muscle attaches
- _____ 2. Arm bone
- _____ 3. _____ 4. Bones composing the shoulder girdle
- _____ 5. _____ 6. Forearm bones
- _____ 7. Point where scapula and clavicle connect
- _____ 8. Shoulder girdle bone that has no attachment to the axial skeleton
- _____ 9. Shoulder girdle bone that articulates anteriorly with the sternum
- _____ 10. Socket in the scapula for the arm bone
- _____ 11. Process above the glenoid cavity that permits muscle attachment
- _____ 12. Commonly called the collarbone
- _____ 13. Distal medial process of the humerus; joins the ulna
- _____ 14. Medial bone of the forearm in anatomical position
- _____ 15. Rounded knob on the humerus that articulates with the radius
- _____ 16. Anterior depression; superior to the trochlea; receives part of the ulna when the forearm is flexed
- _____ 17. Forearm bone involved in formation of elbow joint
- _____ 18. _____ 19. Bones that articulate with the clavicle
- _____ 20. Bones of the wrist
- _____ 21. Bones of the fingers
- _____ 22. Heads of these bones form the knuckles

25. Figure 5-11 is a diagram of the articulated pelvis. Identify the bones and bone markings indicated by leader lines on the figure. Select different colors for the structures listed below and use them to color the coding circles and the corresponding structures in the figure. Also, label the dashed line showing the dimensions of the true pelvis and that showing the diameter of the false pelvis. Complete the illustration by labeling the following bone markings: obturator foramen, iliac crest, anterior superior iliac spine, ischial spine, pubic ramus, and pelvic brim. Last, list three ways in which the female pelvis differs from the male pelvis and insert your answers in the answer blanks.

- Coxal bone
- Pubic symphysis
- Sacrum
- Acetabulum

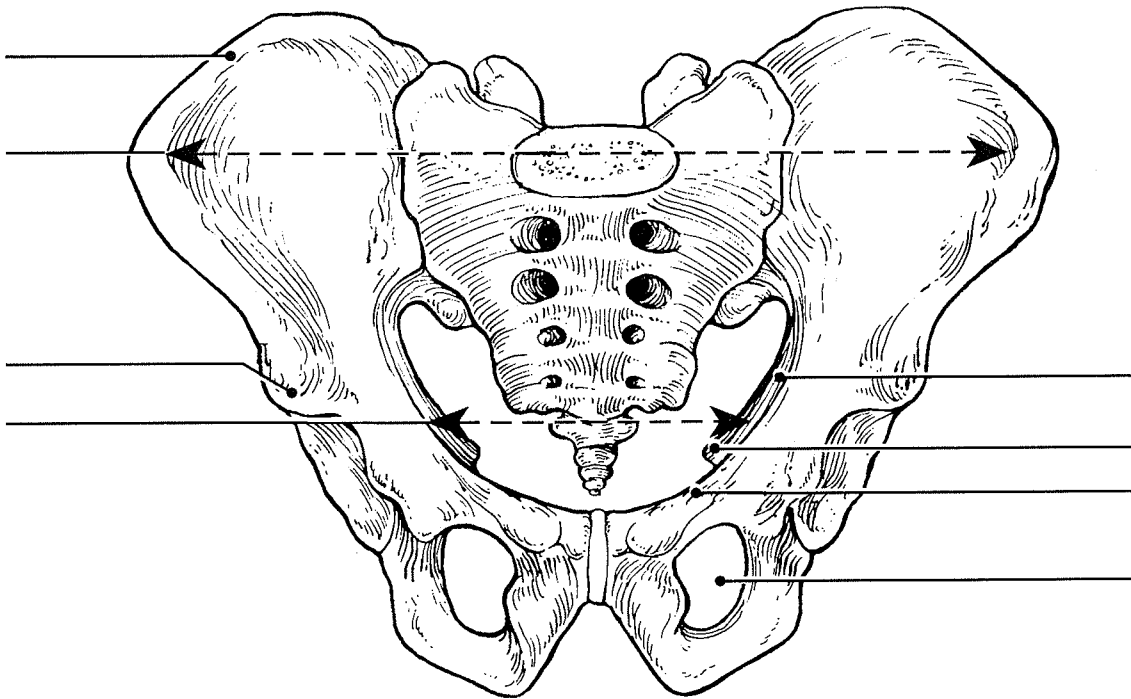


Figure 5-11

1. _____
2. _____
3. _____

26. Circle the term that does not belong in each of the following groupings.

1. Tibia Ulna Fibula Femur
2. Skull Rib cage Vertebral column Pelvis
3. Ischium Scapula Ilium Pubis
4. Mandible Frontal bone Temporal bone Occipital bone
5. Calcaneus Tarsals Carpals Talus

27. Using the key choices, identify the bone names and markings, according to the descriptions that follow. Insert the appropriate key term(s) or letter(s) in the answer blanks.

Key Choices

- | | | |
|-----------------------------------|-------------------------|----------------------|
| A. Acetabulum | I. Ilium | Q. Patella |
| B. Calcaneus | J. Ischial tuberosity | R. Pubic symphysis |
| C. Femur | K. Ischium | S. Pubis |
| D. Fibula | L. Lateral malleolus | T. Sacroiliac joint |
| E. Gluteal tuberosity | M. Lesser sciatic notch | U. Talus |
| F. Greater sciatic notch | N. Medial malleolus | V. Tarsals |
| G. Greater and lesser trochanters | O. Metatarsals | W. Tibia |
| H. Iliac crest | P. Obturator foramen | X. Tibial tuberosity |

- _____ 1. Fuse to form the coxal bone (hip bone)
- _____ 2. Receives the weight of the body when sitting
- _____ 3. Point where the coxal bones join anteriorly
- _____ 4. Upper margin of iliac bones
- _____ 5. Deep socket in the hip bone that receives the head of the thigh bone
- _____ 6. Point where the axial skeleton attaches to the pelvic girdle
- _____ 7. Longest bone in body; articulates with the coxal bone
- _____ 8. Lateral bone of the leg
- _____ 9. Medial bone of the leg
- _____ 10. Bones forming the knee joint
- _____ 11. Point where the patellar ligament attaches
- _____ 12. Kneecap
- _____ 13. Shinbone
- _____ 14. Distal process on medial tibial surface
- _____ 15. Process forming the outer ankle
- _____ 16. Heel bone

- _____ 17. Bones of the ankle
- _____ 18. Bones forming the instep of the foot
- _____ 19. Opening in a coxal bone formed by the pubic and ischial rami
- _____ 20. Sites of muscle attachment on the proximal end of the femur
- _____ 21. Tarsal bone that articulates with the tibia

28. For each of the following statements that is true, insert *T* in the answer blank. If any of the statements are false, correct the underlined term by inserting the correct term in the answer blank.

- _____ 1. The pectoral girdle is formed by the articulation of the hip bones and the sacrum.
- _____ 2. Bones present in both the hand and the foot are carpals.
- _____ 3. The tough, fibrous connective tissue covering of a bone is the periosteum.
- _____ 4. The point of fusion of the three bones forming a coxal bone is the glenoid cavity.
- _____ 5. The large nerve that must be avoided when giving injections into the buttock muscles is the femoral nerve.
- _____ 6. The long bones of a fetus are constructed of hyaline cartilage.
- _____ 7. Bones that provide the most protection to the abdominal viscera are the ribs.
- _____ 8. The largest foramen in the skull is the foramen magnum.
- _____ 9. The intercondylar fossa, greater trochanter, and tibial tuberosity are all bone markings of the humerus.
- _____ 10. The first major event of fracture healing is hematoma formation.

29. The bones of the thigh and the leg are shown in Figure 5-12. Identify each and put your answers in the blanks labeled A, B, and C. Select different colors for the lower limb bones listed below and use them to color in the coding circles and corresponding bones on the diagram. Complete the illustration by inserting the terms indicating bone markings at the ends of the appropriate leader lines in the figure.

Femur

Tibia

Fibula

Head of femur

Anterior border of tibia

Head of fibula

Intercondylar eminence

Lesser trochanter

Medial malleolus

Tibial tuberosity

Greater trochanter

Lateral malleolus

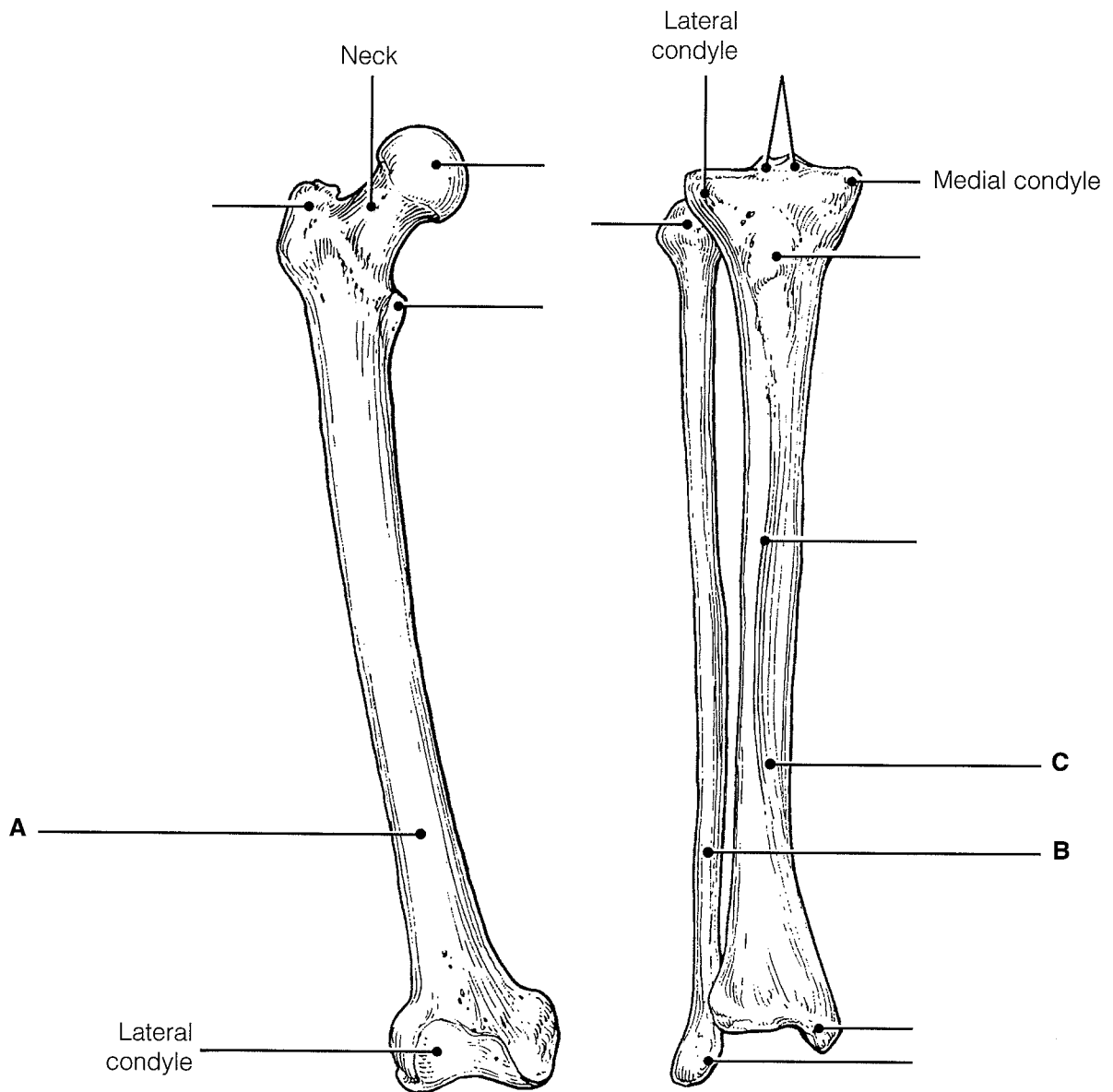


Figure 5-12

30. Figure 5–13 is a diagram of the articulated skeleton. Identify all bones or groups of bones by writing the correct labels at the end of the leader lines. Then, select two different colors for the bones of the axial and appendicular skeletons and use them to color in the coding circles and corresponding structures in the diagram.

- Axial skeleton Appendicular skeleton

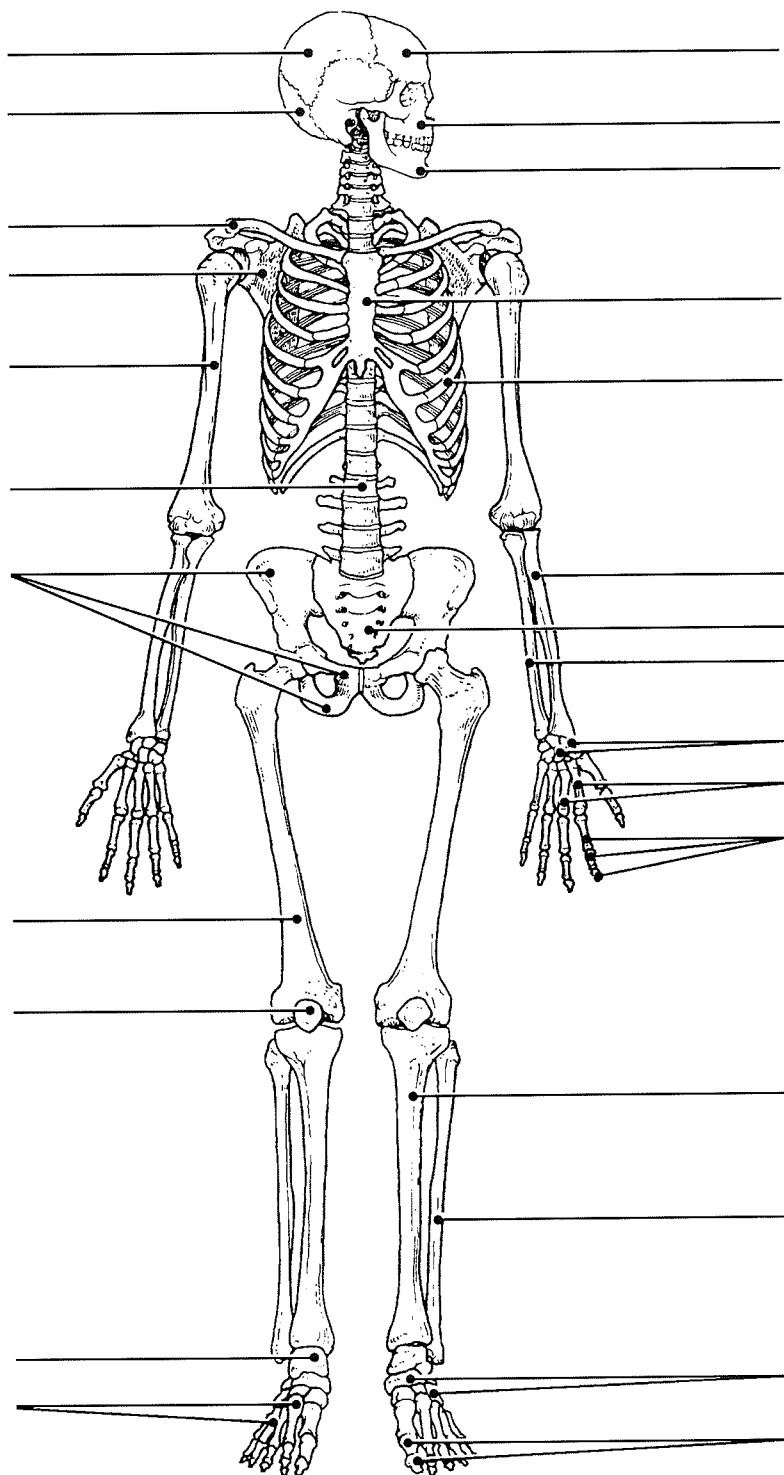


Figure 5-13

BONE FRACTURES

31. Using the key choices, identify the fracture (fx) types shown in Figure 5-14 and the fracture types and treatments described below. Enter the appropriate key letter or term in each answer blank.

Key Choices

- | | | |
|-------------------------|------------------------|--------------------|
| A. Closed reduction | D. Depressed fracture | G. Simple fracture |
| B. Compression fracture | E. Greenstick fracture | H. Spiral fracture |
| C. Compound fracture | F. Open reduction | |

- _____ 1. Bone is broken cleanly; the ends do not penetrate the skin
- _____ 2. Nonsurgical realignment of broken bone ends and splinting of bone
- _____ 3. A break common in children; bone splinters, but break is incomplete
- _____ 4. A fracture in which the bone is crushed; common in the vertebral column
- _____ 5. A fracture in which the bone ends penetrate through the skin surface
- _____ 6. Surgical realignment of broken bone ends
- _____ 7. A result of twisting forces

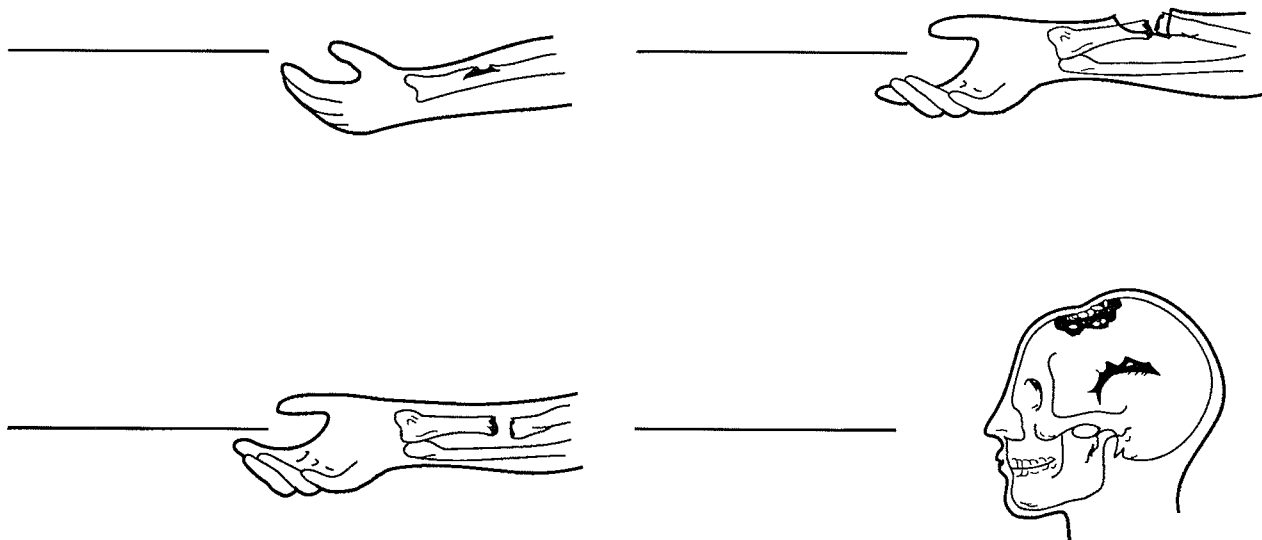


Figure 5-14

32. For each of the following statements that is true about bone breakage and the repair process, insert *T* in the answer blank. For false statements, correct the underlined terms by inserting the correct term in the answer blank.

- _____ 1. A hematoma usually forms at a fracture site.
- _____ 2. Deprived of nutrition, osteocytes at the fracture site die.
- _____ 3. Nonbony debris at the fracture site is removed by osteoclasts.
- _____ 4. Growth of a new capillary supply into the region produces granulation tissue.
- _____ 5. Osteoblasts from the medullary cavity migrate to the fracture site.
- _____ 6. The fibrocartilage callus is the first repair mass to splint the broken bone.
- _____ 7. The bony callus is initially composed of compact bone.

JOINTS

33. Figure 5–15 shows the structure of a typical diarthrotic joint. Select different colors to identify each of the following areas and use them to color the coding circles and the corresponding structures on the figure. Then, complete the statements below the figure.

- Articular cartilage of bone ends
- Fibrous capsule
- Synovial membrane
- Joint cavity

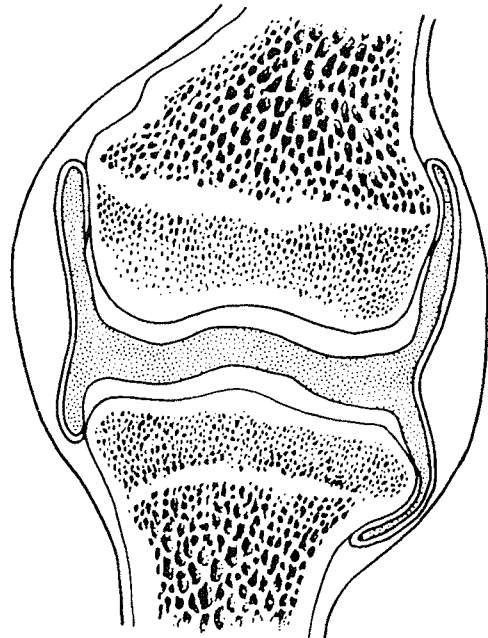


Figure 5-15

- 1. _____ The lubricant that minimizes friction and abrasion of joint surfaces is (1).
- 2. _____ The resilient substance that keeps bone ends from crushing when compressed is (2).
- 3. _____ (3), which reinforce the fibrous capsule, help to prevent dislocation of the joint.

34. For each joint described below, select an answer from Key A. Then, if the Key A selection *is other than C* (a synovial joint), see if you can classify the joint further by making a choice from Key B.

Key Choices

- Key A: A. Cartilaginous
 B. Fibrous
 C. Synovial

- Key B: 1. Epiphyseal disk
 2. Suture
 3. Symphysis

- _____ 1. Has amphiarthrotic and synarthrotic examples
- _____ 2. All have a fibrous capsule lined with synovial membrane surrounding a joint cavity
- _____ 3. Bone regions united by fibrous connective tissue
- _____ 4. Joints between skull bones
- _____ 5. Joint between the atlas and axis
- _____ 6. Hip, elbow, and knee
- _____ 7. All examples are diarthroses
- _____ 8. Pubic symphysis
- _____ 9. All are reinforced by ligaments
- _____ 10. Joint providing the most protection to underlying structures
- _____ 11. Often contains a fluid-filled cushion
- _____ 12. Child's long-bone growth plate made of hyaline cartilage
- _____ 13. Most joints of the limbs
- _____ 14. Often associated with bursae
- _____ 15. Have the greatest mobility

35. Which structural joint type is *not* commonly found in the axial skeleton and why not?

Homeostatic Imbalances of Bones and Joints

36. For each of the following statements that is true, enter *T* in the answer blank. For each false statement, correct the underlined words by writing the correct words in the answer blank.

- _____ 1. In a sprain, the ligaments reinforcing a joint are excessively stretched or torn.
- _____ 2. Age-related erosion of articular cartilages and formation of painful bony spurs are characteristic of gouty arthritis.
- _____ 3. Chronic arthritis usually results from bacterial invasion.
- _____ 4. Healing of a partially torn ligament is slow because its hundreds of fibrous strands are poorly aligned.
- _____ 5. Rheumatoid arthritis is an autoimmune disease.
- _____ 6. High levels of uric acid in the blood may lead to rheumatoid arthritis.
- _____ 7. A “soft” bone condition in children, usually caused by a lack of calcium or vitamin D in the diet, is called osteomyelitis.
- _____ 8. Atrophy and thinning of bone owing to hormonal changes or inactivity (generally in the elderly) is called osteoporosis.

DEVELOPMENTAL ASPECTS OF THE SKELETON

37. Using the key choices, identify the body systems that relate to bone tissue viability. Enter the appropriate key terms or letters in the answer blanks.

Key Choices

- | | | |
|------------------|-------------|-----------------|
| A. Endocrine | C. Muscular | E. Reproductive |
| B. Integumentary | D. Nervous | F. Urinary |

- _____ 1. Conveys the sense of pain in bone and joints
- _____ 2. Activates vitamin D for proper calcium usage
- _____ 3. Regulates uptake and release of calcium by bones
- _____ 4. Increases bone strength and viability by pulling action
- _____ 5. Influences skeleton proportions and adolescent growth of long bones
- _____ 6. Provides vitamin D for proper calcium absorption