

APPENDICULAR SKELETON

key

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

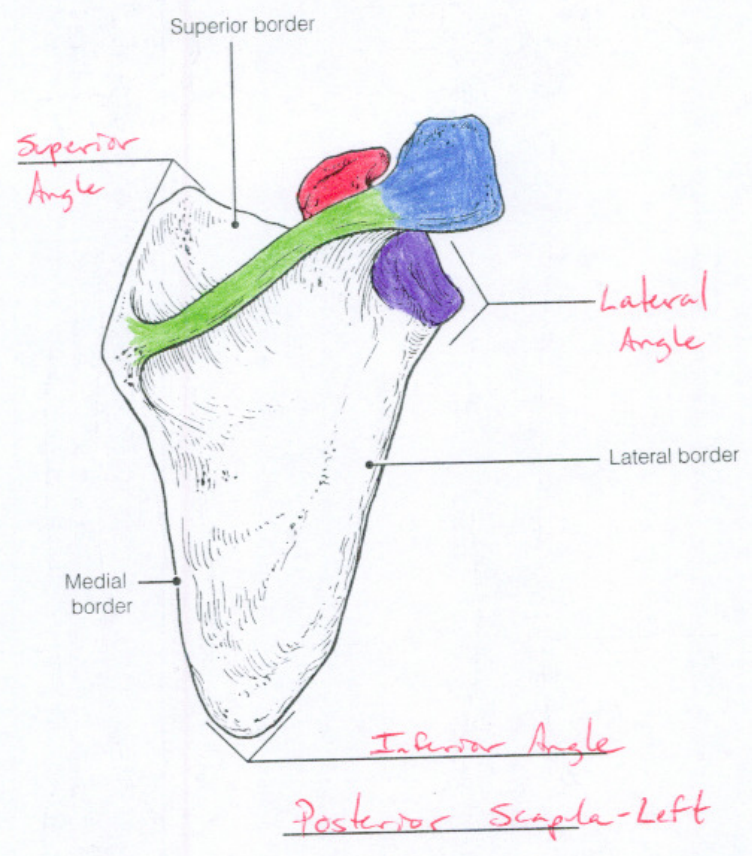


Figure 5-8

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 |

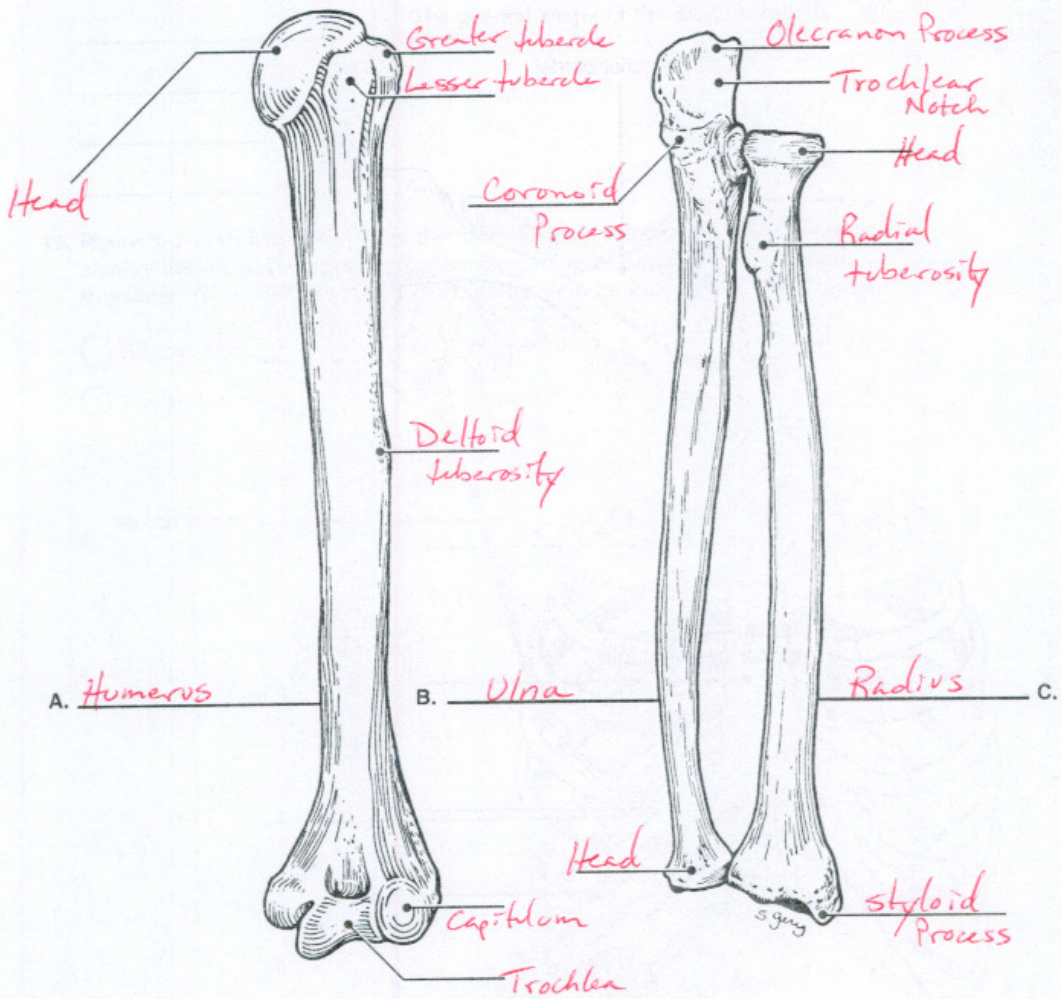


Figure 5-9

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

Pectoral: A, C, D Pelvic: B, E, F

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 |

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

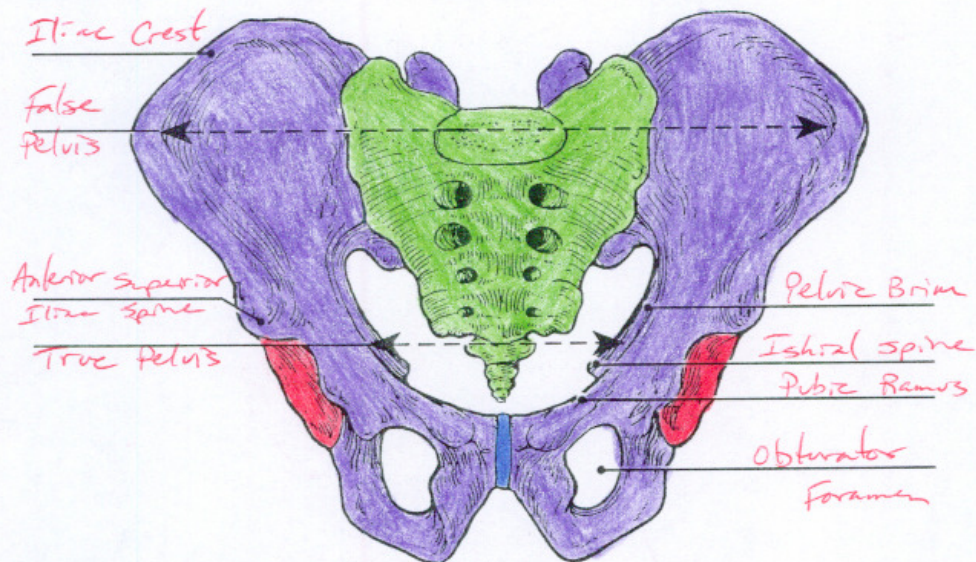


Figure 5-11

1. Female Inlet is large and more circular
2. Female Sacrum is less curved; Pubic arch is rounder
3. Female Ischial spines are shorter; pelvis is shallower

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 |

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

- V _____ 17. Bones of the ankle
- O _____ 18. Bones forming the instep of the foot
- P _____ 19. Opening in a coxal bone formed by the pubic and ischial rami
- G, E _____ 20. Sites of muscle attachment on the proximal end of the femur
- U _____ 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.

- Pelvic _____ 1. The pectoral girdle is formed by the articulation of the hip bones and the sacrum.
- Phalanges _____ 2. Bones present in both the hand and the foot are carpals.
- T _____ 3. The tough, fibrous connective tissue covering of a bone is the periosteum.
- Acetabulum _____ 4. The point of fusion of the three bones forming a coxal bone is the glenoid cavity.
- Sciatic _____ 5. The large nerve that must be avoided when giving injections into the buttock muscles is the femoral nerve.
- T _____ 6. The long bones of a fetus are constructed of hyaline cartilage.
- Hip Bones _____ 7. Bones that provide the most protection to the abdominal viscera are the ribs.
- T _____ 8. The largest foramen in the skull is the foramen magnum.
- Femur _____ 9. The intercondylar fossa, greater trochanter, and tibial tuberosity are all bone markings of the humerus.
- T _____ 10. The first major event of fracture healing is hematoma formation.
- Kyphosis _____ 11. An exaggerated thoracic curvature known as "dowager's hump" is an abnormal condition called scoliosis.

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 |

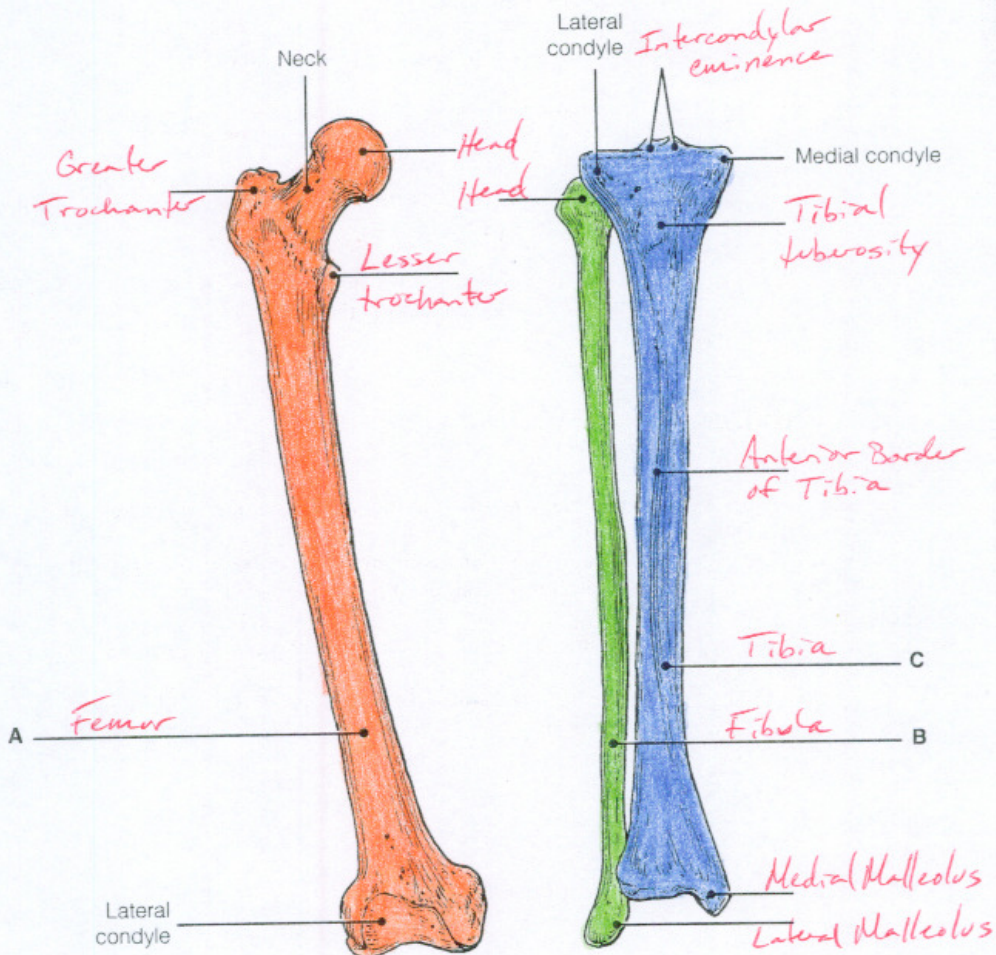


Figure 5-12

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

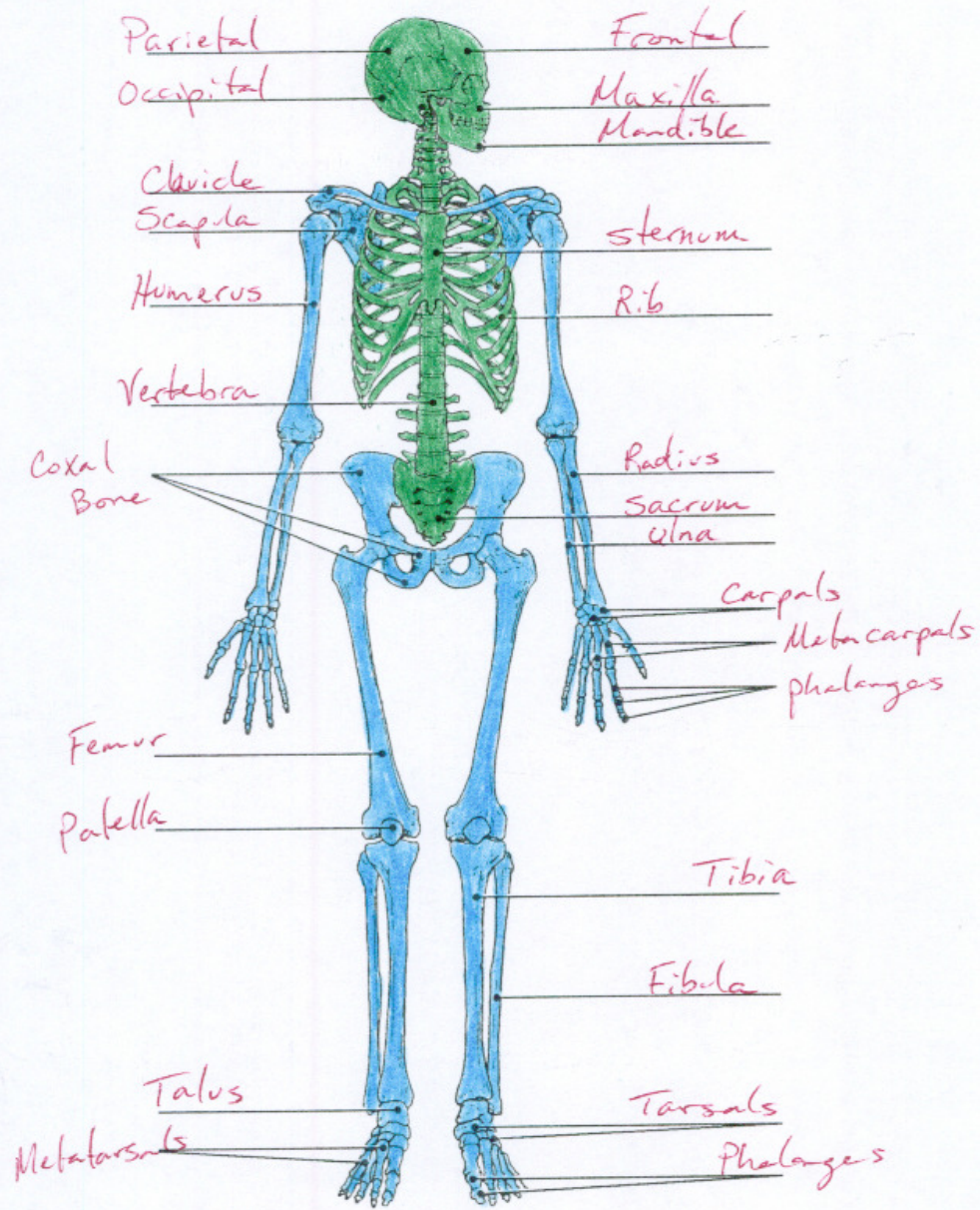


Figure 5-13

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 | |

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

Greenstick fx



Compound fx



Simple fx



Depressed fx



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.

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

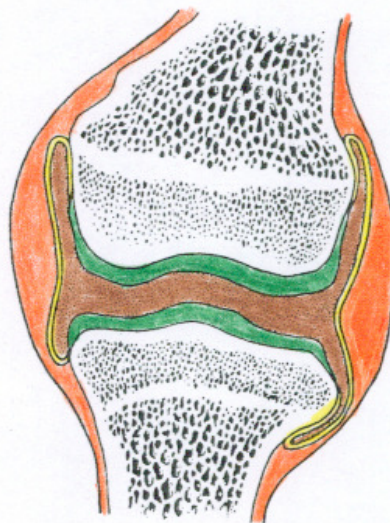


Figure 5-15

- 1. Synovial fluid The lubricant that minimizes friction and abrasion of joint surfaces is (1).
- 2. Articular Cartilage The resilient substance that keeps bone ends from crushing when compressed is (2).
- 3. Ligaments (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 | Key B: | 1. Epiphyseal disk |
| | B. Fibrous | | 2. Suture |
| | C. Synovial | | 3. Symphysis |

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

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

Synovial or Diarthrotic joints, since the axial skeleton is more for support + protection, it is less concerned with joint mobility.

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.

- T* 1. In a sprain, the ligaments reinforcing a joint are excessively stretched or torn.
- Osteoarthritis* 2. Age-related erosion of articular cartilages and formation of painful bony spurs are characteristic of gouty arthritis.
- Acute* 3. Chronic arthritis usually results from bacterial invasion.
- Vascularized* 4. Healing of a partially torn ligament is slow because its hundreds of fibrous strands are poorly aligned.
- T* 5. Rheumatoid arthritis is an autoimmune disease.
- Gouty Arthritis* 6. High levels of uric acid in the blood may lead to rheumatoid arthritis.
- Rickets* 7. A "soft" bone condition in children, usually caused by a lack of calcium or vitamin D in the diet, is called osteomyelitis.
- T* 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 |

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