

A. Bones – an overview:

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

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

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 answer blanks.

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

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

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

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

Using the key choices, characterize the following statements relating to bone formation and destruction. Enter the appropriate letter(s) for the term(s) in the answer blanks.

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|----------------------|-----------------------|-----------------------|---------------------------------|
| 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, _____ is released, causing calcium to be released from the bones.
- _____ 2. Mature bone cells, called _____, maintain bone in a viable state.
- _____ 3. Disuse caused by paralysis or severe lack of exercise results in muscle and bone _____.
- _____ 4. Large tubercles and/or increased deposit of bony matrix occur at sites of _____.
- _____ 5. Immature, or matrix-depositing, bone cells are referred to as _____.

- _____ 6. _____ 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 _____.
- _____ 8. Our astronauts must do isometric exercises when in space to prevent atrophy due to lack of _____.

Match the appropriate term to the description. Enter the appropriate letter in the answer blanks.

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|-------------------------------------|----------------------|-----------------------|
| A. Central (Haversian) canal | C. Lacunae | E. Bone matrix |
| B. Lamellae | D. Canaliculi | F. Osteocyte |

- _____ 1. Layers of calcified matrix
- _____ 2. "Residences" of osteocytes
- _____ 3. Longitudinal canal, carrying blood vessels and nerves
- _____ 4. Nonliving, structural part of bone
- _____ 5. Tiny canals, connecting lacunae

Circle the term that does not belong in each of the following groupings. Briefly state why it doesn't belong.

- | | | | |
|------------------|---------------------|---------------|-------------------|
| 1. Rigidity | Calcium salts | Collagen | Hardness |
| 2. Hematopoiesis | Red marrow | Yellow marrow | Spongy bone |
| 3. Lamellae | Canaliculi | Circulation | Osteoblasts |
| 4. Osteon | Articular cartilage | Periosteum | Hyaline cartilage |

B. Bone fractures

Using the key choices, identify the fracture types and treatments described below. Enter the appropriate letter for the term in each answer blank.

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|----------------------------|-------------------------------|---------------------------|
| A. Colles' fracture | C. Open fracture | E. Pott's fracture |
| B. Linear fracture | D. Greenstick fracture | F. Closed fracture |

- _____ 1. Bone is broken cleanly; the ends do not penetrate the skin.
- _____ 2. Bones of the distal radius/ulna are broken due to low bone density.
- _____ 3. A break common in children; bone splinters but break is incomplete.
- _____ 4. A fracture in which the bone is crushed; common in vertebral column.
- _____ 5. A fracture in which the bone ends penetrate through the skin surface.
- _____ 6. A fracture common in athletes; ends of tibia and fibula break due to sudden direction changes.

For each of the following statements about bone breakage and the repair process, indicate if it is true (T), or if it is false (F). If the statement is false, correct the portion in the underlined areas.

- _____ 1. A hematoma usually forms at a fracture site.
- _____ 2. Deprived of nutrition, osteocytes at the fracture site die.
- _____ 3. Non-bony 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 composed of compact bone.

C. Joints

For each joint described below, select the type and write its letter in the blank. If the type is other than synovial, also classify the class it belongs to by writing its number in the blank as well.

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|------------------|--------------------|
| A. Cartilaginous | 1. Epiphyseal disk |
| B. Fibrous | 2. Suture |
| C. Synovial | 3. Symphysis |

- _____ 1. Has amphiarthrotic and synarthrotic examples.
- _____ 2. All have a fibrous capsule lines with synovial membrane surrounding a joint cavity.
- _____ 3. Bone regions united by fibrous connective tissue
- _____ 4. Joints between skull bones
- _____ 5. Joint between atlas and axis bones
- _____ 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

Thought question: Which structural joint type is NOT commonly found in the axial skeleton and why not? _____

For each of the following statements about the homeostatic imbalances of bones and joints, indicate if it is true (T), or if it is false (F). If the statement is false, correct the portion in the underlined areas.

- _____ 1. In a sprain, the ligaments reinforcing a joint are excessively stretched or torn.
- _____ 2. Age-related erosion of articular cartilages and forming bone 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 largely vascularized.
- _____ 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 due to 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.

D. Developmental Aspects of the Skeleton

Using the choices below, identify the body systems that relate to bone tissue viability. Write the appropriate letter in the answer blanks.

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|-------------------------|--------------------|------------------------|
| 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

Complete the following statements concerning fetal and infant skeletal development. Write the missing words in the answer blanks.

“Soft spots”, or membranous joints called ____ (1) ____ in the fetal skull, allow the skull to be ____ (2) ____ slightly during birth passage. They also allow for continued brain ____ (3) ____ during the later months of fetal development and early infancy. Eventually these soft spots are replaced by immovable joints called ____ (4) ____.

The two spinal curvatures well developed at birth are the ____ (5) ____ and ____ (6) ____ curvatures. Because they are present at birth, they are called ____ (7) ____ curvatures. The secondary curvatures develop as the baby matures. The ____ (8) ____ curvature develops as the baby begins to lift his or her head. The ____ (9) ____ curvature develops when the baby begins to walk or assume the upright posture.

- _____ 1.
- _____ 2.
- _____ 3.
- _____ 4.
- _____ 5.
- _____ 6.
- _____ 7.
- _____ 8.
- _____ 9.