Chapter 6: The Skeletal System

I. INTRODUCTION

A. Function
1. Provides _____ and allows us to move
2. Protects the soft body parts, produces _____ cells, and acts as a storage unit for minerals and fat
3. There are _____ bones in the adult skeleton, along with cartilage, ligaments, and joints.

II. BONE

A. Although bones are composed of nonliving minerals such as _____ and _____, they are very much alive.

B. The word _____ comes from the Greek, meaning "dried up body."

C. Classified according to their shape

	Bones	Description
1		Bones are longer than they are wide
2		Equal in width and length
3		Thinner and can be either flat or curved
4		Odd in shape and include the hipbone

D. Basic Bone Anatomy—ex. long bone
1. Periosteum
    a. Outer covering of tough fibrous connective tissue
    b. Contains blood vessels, lymph vessels, and nerves
    c. Acts as anchor points for _____ and tendons
2. _____ and Diaphysis
    a. Both ends of a long bone increase in size to form the epiphysis.
    b. The region running between two epiphyses is called the _____.
    c. The diaphysis is hollow (called the medullary cavity). It acts as a storage area for the yellow bone marrow.
        i. Red marrow makes _____ blood cells.
        ii. Yellow marrow has a high fat content and can convert to red marrow in an emergency.

E. Bone tissue - Two types

	Bone Tissue	Description
1		a. Dense, hard tissue normally composing the shafts of long bones; found as the outer layer of the other bone types b. Mature bone cells form concentric circles around blood vessels. c. The area around the bone cells is filled with bone matrix.
2		a. Arranged in bars and plates b. Irregular holes give the bone a spongy appearance and make the bone lighter in weight.

F. Surface structure of bones

1. Bone is not perfectly smooth.
2. Projections act as points of _____ for muscles, ligaments, or tendons.
3. Grooves and depressions act as pathways for nerves and blood vessels.
4. Projecting structures and depressions can work together as joining or articulation points to form joints, such as the ball-and-socket joint in your hip.

G. Bone growth and repair

1. _____: formation of bone in the body
2. Types of cells involved in bone formation and growth: (osteoprogenitor cells, osteoblasts, _____, and osteoclasts)
3. Bone development and growth - bone development begins when you are an embryo through ossification.
4. Bone repair
    a. Hematoma forms; inflammation
    b. Soft _____ forms (cartilage)
    c. Bony callus forms
    d. The bone is remodeled until the fracture is nearly undetectable.

III. CARTILAGE

A. Cartilage is a special form of dense connective tissue that can withstand a fair amount of _____, tension, and _____.
B. Made up of cells called chondrocytes. They exist in holes in a gel-like matrix.
C. Location and functions
    1. The flexible part of your nose and ears are _____.
    2. Makes a flexible connection between bones, as between the ribs and sternum, allowing chest flexion during deep breathing
    3. Cartilage acts as a cushion between _____; articular cartilage is located on the ends of bones and acts as a shock absorber, preventing the ends from grinding together during movement.

IV. JOINTS

A. When two or more bones join, an articulation or _____ is formed.
B. Many joints must be held together, yet still be movable, which is accomplished by special connective tissue called _____.
C. Tendons are cordlike structures that attach muscle to _____.
D. Joints can be classified by function or structure.
    1. Function
        a. Immobile
        b. Move a little
        c. Move _____
    2. Structure
        a. Fibrous: bones joined by short connective tissue strands
        b. Cartilaginous: bones united by _____
        c. Synovial: bones united by _____ filled joint cavity
            i. Pivot joint—turnstile movement in the neck and forearm
            ii. Ball-and-socket joint—hip and _____
            iii. Hinge joint—allow up and down movement in the _____ and elbows
            iv. Gliding joint—wrists and ankles
            v. Saddle joint—shaped like a saddle found in the thumb
            vi. Ellipsoidal joint—oval-shaped bone end fitting into an elliptical cavity in the other bone so there is movement from one plane to another but no rotation –fingers and toes

	Types of Joints	**Description/Examples**
i		Turnstile movement in the neck and forearm
ii		Hips and shoulders
iii		Allow up and down movement in the knees and elbows
iv		Wrists and Ankles
v		Shaped like a saddle found in the thumb
vi		Oval-shaped bone end fitting into an elliptical cavity in the other bone so there is movement from one plane to another but not rotation - fingers and toes

E. Movement classification

	Movement	**Description**

1		Decreasing the angle of joint
2		Increasing angle of a joint
3		Pointing toes down
4		Bending the foot up toward the body
5		Moving away from the body's midline
6		Moving toward the midline of the body
7		Turning the foot inward toward the other foot
8		Turning the foot outward away from opposing foot
9		Circular arm movement

V. BONES OF THE SKELETON

A. Two main divisions of the skeleton

1. _____ skeleton—bones of the thorax, spinal column, hyoid bone, bones of the middle ear, and skull. They protect the body organs and are composed of 80 bones.
    a. The _____—many bones forming brain case and facial structures
    b. The Thorax—ribs and sternum, protects thoracic cavity
    c. The _____ Column
        i. Also called vertebral column; houses the spinal cord; the superhighway for information coming to and from the central nervous system
        ii. The individual bones or vertebrae are numbered and classified according to the body region where they are located.
2. _____ skeleton—these are the bones of your arms, _____, hips, and shoulders and are comprised of 126 bones
    a. The appendicular region consists of the arms and legs.
    b. Half the bones in the body are located in the hands and _____.

VI. COMMON DISORDERS OF THE SKELETAL SYSTEM

A. Aging affects the cartilage and bones; although a natural process, it can sometimes be slowed.

1. Composition of cartilage changes as we age, becoming more _____ and yellow due to calcification; this can lead to _____, an inflammatory process of the joints, reducing flexibility and decreasing range of motion.
2. Bone mass decreases with age. Beginning in our 50s the breakdown of bone is greater than the buildup.
    a. Osteoporosis: light, weak, porous bones. More common in _____, but can be diagnosed in men.
    b. Treatment and prevention of osteoporosis
        i. Even though bone loss is a natural aging process, it can be slowed by a healthy lifestyle.
        ii. Proper _____ intake during the formative years and through adulthood decreases the risk of osteoporosis.

iii. Vitamin D is important because it allows the body to absorb ingested calcium from the digestive tract.
iv. Exercise, especially weight-bearing, plays a vital role in developing, and maintaining strong bones.
v. Drink less _____.
vi. Quit smoking.
vii. Medication

B. Bone fractures
1. A _____ fracture looks like a piece of hair on the x-ray. It is a fine fracture that doesn't completely break or displace the bone.
2. Simple or closed fracture—a break with minimal displacement and no tear in the skin
3. Greenstick fractures are incomplete breaks often found in children
4. Spiral fracture—caused by a _____ motion to the bone
5. Comminuted fracture—when the bone fragments or _____
6. Compound or open fracture—when the bone protrudes through the _____, with the potential of infection from exposure.

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Multiple Choice:

1. **2.** **3**. **4**. **5**. **6**.

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Multiple Choice:

1. **2.** **3**. **4**. **5**. **6**.

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Multiple Choice:

1. **2.** **3**. **4**. **5**. **6**.

Review Questions:

Multiple Choice:

1. **2.** **3**. **4**. **5**. **6**.

Short Answer

1. __

2. __

3. __