

BONE I

I. INTRODUCTION

- A. Osteology: - the study of bones
- B. Bones are organs
- C. Adult skeleton: 206 bones
 - 1. Skeleton subdivided into:
 - a. Axial skeleton – Bones of head, neck and trunk
 - b. Appendicular skeleton – Bones of upper and lower extremities

II. GROSS ANATOMY OF BONES

- A. Bone Shape
 - 1. Long Bones
 - a. Longer than they are wide.
 - 2. Short Bones
 - a. Approximately as long as they are wide.
 - 3. Flat Bones
 - a. relatively thin, have broad surface
 - 4. Irregular Bones
 - a. have irregular and varied shapes
- B. Gross Anatomy of a Long Bone
 - 1. Diaphysis - cylindrical shaft
 - 2. Medullary Cavity - hollow inside of diaphysis
 - a. Lined with endosteum
 - b. Contains yellow bone marrow (adipose)

3. Epiphysis (plural: epiphyses) - ends of the bone. Composed of:
 - a. outside layer of compact bone surrounding spongy bone
 - b. in the spaces of the spongy bone = red bone marrow (hemopoietic tissue) for blood cell production.

4. Articular Cartilage - hyaline cartilage on the epiphyses
 - a. helps joints move easily
5. Epiphyseal Plate - hyaline cartilage plate between diaphysis and epiphysis
 - a. Function: lengthwise bone growth

6. Periosteum - dense irregular connective tissue that covers outside of bone
 - a. exception: periosteum not found on articular surfaces of bone
 - b. Sharpey's fibers (perforating fibers) attach it to the bone.
 - c. There are cells (osteoblasts) associated with the periosteum, which are responsible for the bone width growth.

III. BONE HISTOLOGY

- A. 3 kinds of cells:
 1. Osteoblasts: create bone
 2. Osteocytes: maintain bone matrix
 3. Osteoclasts: breakdown/reabsorb bone
- B. Compact bone: Made up of osteons = Haversian Systems
 1. Osteons (Haversian Systems) consist of:
 - a. Central Canal (Haversian Canal): opening that runs parallel to length of diaphysis; contains blood vessels/nerves
 2. Concentric Lamellae: rings of bone matrix around a central canal

 3. Osteocytes: mature bone cells
 4. Lacunae: spaces where osteocytes reside
 5. Canaliculi: tiny channels that radiate from lacunae. Contain cytoplasmic projections of osteocytes for diffusion for nutrients.

6. Perforating (Volkmann's) Canals: canals that run perpendicular to the central canals; connect central canals
7. Interstitial Lamellae (Interstitial Systems): incomplete remnants of osteons

8. Circumferential Lamellae: rings of bone that run the entire circumference of the shaft; made by cells of periosteum.