

## BONE AND JOINT ANATOMY

### I. ANATOMY OF BONE

A. Gross anatomy of a long bone (Fig. 6.3, p. 169 [159]) Observe the following on a labeled beef bone and on a longitudinally sectioned human femur.

1. **Epiphysis**
2. **Diaphysis**
3. **Periosteum**
4. **Articular cartilage**
5. **Compact bone**
6. **Spongy bone**
7. **Red bone marrow**
8. **Medullary (marrow) cavity**
9. **Yellow bone marrow**
10. **Epiphyseal plate**
11. **Epiphyseal line**

B. **Nutrient foramina** of bones (Fig. 7.6, p. 204 [190]) Blood vessels and nerves enter the bones through these small openings (singular is **foramen**). Use real human bones, including the skull, to find examples of them. Notice the supraorbital, infraorbital, and mental foramina of the skull. Can you find nutrient foramina on a human femur?

C. Microscopic anatomy of **compact bone** (Fig. 6.10, p. 174 [165]) Use the text illustration and the microscopes.

1. **Osteon**
2. **Central canal**
3. **Concentric lamellae**
4. **Lacunae (in life these contain \_\_\_\_\_)**

### II. STRUCTURAL AND FUNCTIONAL CLASSIFICATION OF JOINTS

A. Structural classification (Text pp.242-246 [225-229]) **Give examples of each.**

1. **Fibrous joint** (Joints bound by connective tissue)

Example: \_\_\_\_\_

- 2. **Cartilaginous joint** (Joints connected by cartilage) Use the skeleton for examples.

Example: \_\_\_\_\_

Example: \_\_\_\_\_

Example: \_\_\_\_\_

- 3. **Synovial joint** (Complex joints designed for free movement) Use the text illustration for the structures listed below (Fig. 8.7, p. 246 [8.5, p.229])

Example: \_\_\_\_\_

**Joint cavity (contains synovial fluid)**

**Articular cartilage**

**Tendon**

**Synovial membrane**

**Fibrous capsule**

**Periosteum**

- B. Functional classification of synovial joints (Fig. 8.8, 8.10,8.12, pp. 247-248 [8.6, p. 231]) Use the skeletons to **give an example of each.**

1. **Hinge** Example: \_\_\_\_\_

2. **Ball-and-socket** Example: \_\_\_\_\_

3. **Plane (gliding)** Example: \_\_\_\_\_

- C. The knee joint (Fig.8.31b,d, p.259 [8.11, p. 240]): Learn the following on a knee model. (Please be careful with the knee models, which are not nearly as sturdy as the real item!)

**Femur**

**Tibia**

**Fibula**

**Quadriceps femoris tendon**

**Patellar ligament**

**Anterior cruciate ligament**

**Posterior cruciate ligament**

**Fibular (lateral) collateral ligament**

**Tibial (medial) collateral ligament**

**Lateral meniscus**

**Medial meniscus**

**Optional notes on the joints**

1. The most common type of arthritis, *osteoarthritis*, results from wear and tear on the **articular cartilages** of joints such as the knees, hips, and others that bear weight.
2. *Rheumatoid arthritis* begins with damage to the **synovial membrane**, which is caused by “auto-antibodies” that attack the synovial membranes. The inflammation that results causes swelling and ultimately deformation of the affected joints.
3. A blow to the lateral side of the knee, as in a football tackle, can tear the **tibial collateral ligament** and **medial meniscus**. Ask your athletic friends who have had knee surgery what ligaments had to be repaired.
4. An X-ray can reveal whether a child is done growing in height. If an **epiphyseal plate** is seen at a joint, is the period of growth over?

