

Human Anatomy & Physiology

BIO 163 – Lecture Test 3

Bone Tissue

1. Describe the structure and tell the location of the two kinds of bone tissue, namely compact (dense) and spongy (cancellous). (pg 179)

Compact – circular lamellae; outer layer (superficial) of the bone

Spongy – no osteons; trabeculae; interlaced bone; sponge like look; inner (deep) area of bone, ends of bones

Compact (Dense) Bone Tissue

2. Osteons are typical of what kind of bone? **Compact**
What are the layers of minerals in an osteon called? **Lamella**
What brings nutrients to bone cells? **The central canal; blood vessels**
What are found in lacunae? **Osteocytes; bone cells**
What do canaliculi join? **They are canals that join bone cells to the central canal**
What does the central canal contain? **Blood in blood vessels**
Does the Haversian canal extend the **length** or the width of a bone? **Length**
Do the Volkmans canals extend the length or the **width** of a bone? **Width**
3. Locate the epiphysis and diaphysis of a bone. (pg 176)
Epiphysis – ends of a bone
Diaphysis – shaft of a bone
Define hemopoiesis / hematopoiesis. **The production of blood cells; in ends of long bones; ilium; sternum**
4. What tissue forms the perichondrium and periosteum? **Dense irregular connective tissue**
What is necessary for the repair of bone? (pg 177) **The periosteum; osteoprogenitor**
5. Where are the articular cartilages located? **Around the ends of long bones; hyaline cartilage**
What disorder involves the degeneration of articular cartilages? (pg 269) **Osteoarthritis**
What causes this degeneration? **Wear & tear; use**
What causes rheumatoid arthritis? (pg 270) **Autoimmune disease (production of anti-bodies that destroy your own body); inflammation of synovial membrane**
6. Where is fat found in the skeletal system? **The medullary cavity of long bones; marrow cavity**
7. What bone cells are involved in the exchange of nutrients and wastes with the blood? **Osteocyte (mature)**

Bone Development

8. List the two types of bone development.
Endochondral Ossification– in cartilage; hyaline cartilage
Intramembranous Ossification – bone forms in membrane; Areolar c.t. a.k.a. loose fibrous c.t.
Are bones formed endochondrally different in structure from bones formed intramembranously? **NO**
Which method forms most of the bones of the human? **Endochondral ossification**
Which method uses a cartilage model for bone formation? **Endochondral ossification**
Which method uses sheets of fibrous connective tissue? **Intramembranous ossification**
Name bones made by each method.
Intramembranous – Skull, Mandible, Clavicle
Endochondral – all other bones
How are skull bones formed? **Intramembranously**
9. (pg 182)
In endochondral bone development, where is the primary center of ossification? **In the Diaphysis**
Ossification in males is usually complete by what age? **25**
What are bone cells destroyed by? **Osteoclasts; have several nuclei**
What is the function of the epiphyseal plate? (pg 183-184) **Growth of bone; in length**
Where are these plates located? **In the Epiphysis; ends**
What is the epiphyseal line? **Solid line in bone; where the growth plate was**
The death of chondrocytes leads to the hollowing out of the center of bone and the formation of what?
Medullary or Marrow cavity
Appositional growth involves what? **Growth of the width or thickness of bone**

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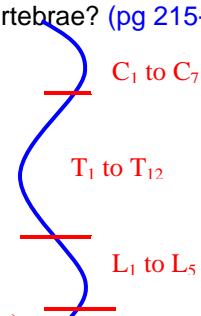
10. Does bone change once it is formed? **Yes; all the time**
 Bone is remodeled along the lines of what? **Stress, force, demands of gravity, etc.**
 When does bone development begin in the embryo? (pg 184) **During the fetal period; 7 ½ weeks**
11. What hormones stimulate bone growth before puberty? **The “growth hormone”; Anterior lobe of pituitary gland; Thyroid Hormones, T₃ & T₄**
 During puberty? **Sex hormones; Estrogen, testosterone**
 The growth spurt is the result of what? **Increase of sex hormones**
12. List changes that occur with aging of bone. **Loss of calcium; loss of bone mass; Osteoporosis – in spongy bone**

Fractures

13. Define the following: (pg 188, 268)
 - Simple Fracture – **complete break of the bone**
 - Compound Fracture – **complete break and through the skin**
 - Greenstick Fracture – **partial break; one side**
 - Sprain – **ligament stretched or torn; joint stays in alignment**
 - Dislocation – **bones forced out of alignment**
14. List the four shapes of bone and give an example of each shape.
 - Long Bones – femur, humerus, tibia, etc.**
 - Short Bones – wrist & anklebones**
 - Flat Bones – sternum, scapula, ribs, most skull bones – back & front run parallel**
 - Irregular Bones – vertebrae, hipbones, etc.**
 Locate the axial and appendicular skeletons.
 - Axial – long axis of the body; skull, vertebra column, rib cage**
 - Appendicular – everything else; including the hip, clavicle**
 List the bones of each of these skeletons. **See above**
15. What is a projection from a bone called? **A process**
 What is the name for a hole in bone? **Foramen**
 What are small round processes called? **Tubercles**
 What is a condyle? **A rounded articular projection; helps form joints**
 A trochanter is a large projection seen only on the humerus. True or False – **only on a femur**

Vertebrae

16. How can one tell the difference among cervical, thoracic, and lumbar vertebrae? (pg 215-218)
 - Cervical – large foramina**
 - Thoracic – facets on the transverse processes**
 - Lumbar – thin and tapered transverse processes**



- List the kinds of vertebrae and the number of each.
- Cervical – C₁ to C₇; cervical curvature; convex anteriorly**
 - Thoracic – T₁ to T₁₂; thoracic curvature; concave anteriorly**
 - Lumbar – L₁ to L₅; lumbar curvature; convex anteriorly**
 - Sacrum – 5 fused vertebrae; concave anteriorly**
 - Coccyx – 4 fused vertebrae; concave anteriorly**
- List the vertebra in order from the superior to inferior. (see previous answer)
- What part of the vertebra supports the weight of the body? **Thoracic – body of vertebrae**
- The spinal cord goes through what part of the vertebra? **foramen**
- The spinal cord goes through what part of the skull? **Foramen Magnum**
- Which is the largest and strongest separate (not fused) vertebra? **Lumbar**
- What is located between the bodies of vertebrae? **Intervertebral Discs; fibrocartilage**
- What part of the sacrum is used to measure the inlet of the pelvis? (pg 235) **Sacral Promontory**
- How are male and female pelvi (coxal bone) different? (pg 236)
 - Male – Pubic Arch more acute; 50 – 60°; Pelvic inlet heart shape**
 - Female – Pubic Arch broader; 80 – 90°; Pelvic inlet oval; wider side to side**
- What causes death from whiplash? **The Dens (Odontoid process of the C2 axis) is forced into the brain (medulla – heart rate, blood pressure, breathing)**
- Describe the location and appearance of spinal curvatures. (pg 215; figure 7.13) **see answer above**

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Other Bones of Skeleton

17. The olfactory nerve goes through what bone in the skull? **The cribriform plate of the Ethmoid bone**
The covering of the brain (the dura) attaches to what part of the skull? **Crista Galli of the Ethmoid bone**
What is usually broken when a person breaks a hip? **The anatomical neck of the femur**
What part of the coxal bone do you sit on? **The Ischial tuberosity**
Locate the true, false, and floating ribs.
 1 to 7 – True; own cartilage
 8 to 12 – False; some share cartilage
 11 & 12 – Floating; no cartilage attached to sternum
Where are the costal cartilages? **The cartilage that joins the ribs to the sternum**
Do males have the same number of ribs as females? **Yes**

Joints

Diarthroses/arthritis – **Synovial Joints; freely movable; limbs**
Synarthroses/arthritis – **sutures; immovable joints; skull**
Amphiarthroses/arthritis – **slightly movable; spinal column**

Synovial Joints – **has joint cavity; articular cartilages; articular capsule made of synovial membrane; contains synovial fluid; has reinforcing ligaments**

18. Describe the motion of the ball and socket joint? **(pg 260) Multiaxial; flexion / extension; abduction / adduction**
Describe the motion of the hinge joint? **Flexion and Extension only**
Which joint has the greatest range of motion? **Ball and Socket joint**
Name some examples of a hinge joint? **Elbow, knee**
What joint is triaxial? **Ball & Socket**
Most knee injuries involve the stretch of what ligament? **(pg 268) Anterior Cruciate Ligament**
What is a meniscus? **Fibrocartilage in knee or jaw joint**
What is the function of a meniscus? **Reduce wear & tear; make more stable**
Torn cartilages usually involve which cartilage, articular or **menisci**? **Menisci**
What is the function of a bursa? **(figure pg 267, pg 253) Reduce friction**
What are they filled with? **Synovial Fluid**
Are bursas fat filled? **NO; they are found outside of articular capsule**
Distinguish between a tendon and a ligament?
 Tendon – connects muscle to bone
 Ligament – connects bone to bone
What makes synovial fluid? **Synovial membrane**
Does the synovial membrane cover the articular cartilage? **NO; only up to it**
Does the fluid become more viscous (thicker) or **less viscous (thinner)** with increased motion? **(pg 252) Thinner**
19. Give examples of the following:
 Flexion – decrease angle between bones; out of anatomical position; bending knee or elbow; anterior or posterior direction
 Extension – increase angle between bones; putting body back into anatomical position; straightening knee or elbow
 Abduction – “moving away”; increase angle; raising the arm laterally
 Adduction – “moving toward”; decrease angle; lowering arms towards median
Which of these actions will increase the angle between bones? **Extension; Abduction**