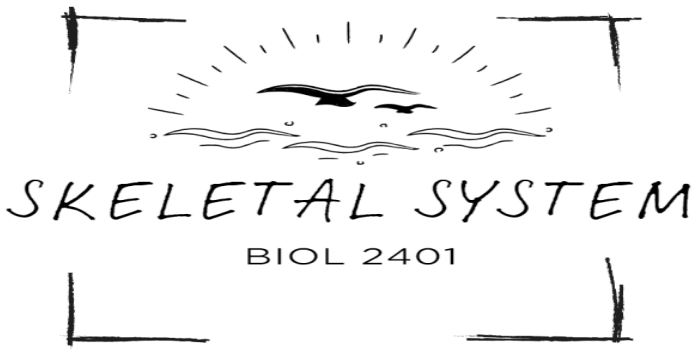

Note from SI:

As we've covered in previous SI sessions, study strategies, process of elimination on test questions, and repeating the material on a weekly / daily basis is very important. **Please remember how beneficial it can be to review your lecture notes within 24 hours of having the lecture, keep your worksheets from the SI sessions, and utilizing my SI website for study materials.** You've got this, and I have full confidence that you will succeed in this course!

***Please remember to always review and study your professors material, SI is only one hour, and while we cover a lot of information and work on the material, I cannot cover everything**

Vocab:

- Mesenchymal cells: stem cells found in bone marrow
- Osteoid: organic, unmineralized part of bone matrix
- Interstitial zone: the epiphyseal plate, a growth region in long bones that is responsible for longitudinal bone growth
- **Epiphyseal zones:** the regions of the epiphysis, or the rounded ends of long bones, where the bone grows in length
- Resting zone: cartilage on epi side of epi plate, inactive

- Proliferation zone: cartilage on diaphysis side of epi, rapidly dividing, active, lengthening occurs bc new cells are formed and old cells are pushed upward
- Hypertrophic zone: a part of the growth plate in the skeletal system where chondrocytes mature and prepare to calcify
- Calcification zone: surrounding cartilage matrix calcifies, chondrocytes die
- Ossification zone: calcified cartilage, covered with new bone by osteoclasts, replaced with spongy bone
- Osteoclasts: remove bone on endosteal surface
- **Growth hormone:** most important hormone, stimulates epiphyseal plate, infancy and childhood
- **Thyroid hormone:** watches activity of growth hormone
- **Testosterone:** a hormone that is produced used for maintaining and gaining bone mass in men

  *Excess hormones cause abnormal growth
- **Parathyroid hormone:** (PTH) a hormone that regulates calcium levels in the blood and bones
- Osteoblasts: deposit of new bone matrix
- Fractures: breaks in bone
- Complete fracture = full break, incomplete fracture = not full break
- Open (compound): skin is penetrated
- Closed (simple): skin is not penetrated
- Reduction: realignment of broken bone ends

- Closed reduction = manipulates position, open reduction = surgery / pins
- Hematoma: blood clot from torn blood vessels

Questions:

1) When is osteoid secreted?
    - During adulthood
    - During embryonic period and when new bone is formed
    - During the geriatric stage of life
    - During teenage years up until 21 years of age
2) What does mesenchyme form and what does it condense?
    - Forms magnesium, condenses tissues and blood cells
    - Forms pension, condenses outer layer of compact bone
    - Forms periosteum, condensed outer layer of compact bone
    - Forms periosteum, condenses outer layer of spongy bone
3) What replaces spongy bone?
    - calcium
    - Compact bone
    - Blood vessels
    - Brittle bone

4) When do chondroblasts divide less often?

- Near end of adolescence
- Near the beginning of adolescence
- Near death
- Near the end of adulthood

5) When does bone lengthening cease?

- Females: 16 years, Males: 21 years
- Females: 18 years, Males: 18 years
- Females: 18 years, Males: 21 years

6) When do bones thicken?

- Response to increased muscle activity or stress of weight on body

7) What percent of bone mass is recycled each week?

- 5-6%
- 5-10%
- 5-7%
- 7-10%

8) What is apoptosis?

- Plays a role in absorption, osteoclasts undergo it, and it constrolls cell death
- Plays a role in secretion, osteoblasts undergo it, it controls cell reproduction
- Plays a role in absorption, osteoblasts undergo it, it controls cell death
- Plays a role in secretion, osteoclasts undergo it, and it constrolls cell death

9) What produces calcitonin?

- Calcium
- Yellow and red bone marrow

- Produced by parafollicular cells of thyroid gland, response to high calcium

10) What does wolves law state?

- Bones deteriorate and die at a constant rate
- Bones grow and remodel in response to demands placed on them
- Bones stay at a constant state
- Bone grow but they do not remodel due to the climate

***Bonus down below**

highlighted/bolded quick facts:

- Bone remodeling consists of both bone deposit and bone resorption
- Triggers for osteoblasts deposits are mechanical signals, increased calcium
- Resorption is the function of osteoclasts
- OSTEOCLASTS PHAGOCYTIZE = OSTEOCLASTS EAT
- Controls of remodeling: hormonal, response to mechanical stress,
- Curved bones are thickest where they are most likely to buckle
- Repair 4 major stages: hematoma formation, fibrocartilaginous callus formation, bony callus formation, bone remodeling
- Bone disorders: osteomalacia / rickets, osteoporosis, paget's disease

- Joints:
- <u>Structural: fibrous, cartilages, synovial</u>
- Functional: synarthrosis, amphiarthrosis, diarthroses

<u>Visuals:</u>