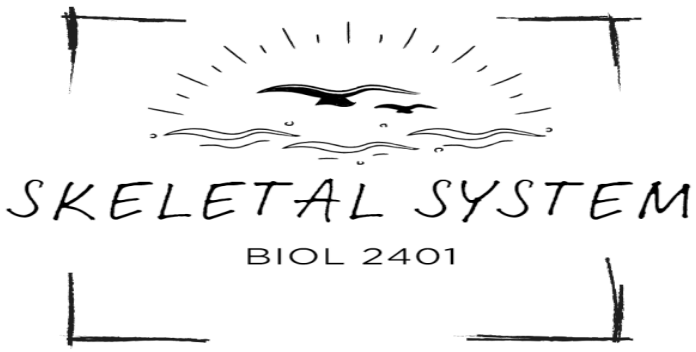


**Note from SI:**

We are beginning material for Exam 3! 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!

**Vocab:**

- **Osteocyte: mature bone cell**
- **Osteoblast: cells that make bone**
- **Osteoclast: cell that breaks down bone**
- Chondrocyte: mature cartilage cell
- Osteon: unit of compact bone; made up of concentric circles called Haversian canals
- Calcitonin: hormone that increases the deposition of calcium into the bones
- Mesenchymal cells: stem cells found in bone marrow
- Osteoid: organic, unmineralized part of bone matrix
- Resting zone: cartilage on epiphyseal side of epiphyseal plate, inactive

- Proliferation zone: cartilage on diaphysis side of epiphyseal plate, 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
- 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
- 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) What is in **mature** bone cells, maintaining the **bone matrix**, detecting mechanical stress on bone, may trigger **deposition** of new bone matrix?
    - Osteoblasts
    - Osteoclasts
    - Osteocyte
    - Osteoclast
2) What does the loss of protein in the bones result in?
    - Soft bones
    - Brittle bones
    - No bones
    - Bones changing color
3) What is the result of insufficient calcium in the bones?

- Soft bones
- Brittle bones
- No bones
- Bones changing color

4) The formation and development of bone connective tissue, also known as "osteogenesis", 8th - 12th week of embryonic development, continuing through adolescence:
    - Calcification
    - Embryonic development
    - Interstitial growth
    - Ossification

5) Are osteons only found in compact bones?
    - Yes
    - No

6) When is the embryonic skeleton completed?
    - 2nd trimester
    - 12 weeks gestation (1st trimester)
    - 36 weeks (3rd trimester)
    - It forms after the baby is born

7) Where does hematopoiesis occur?
    - In the brain
    - In the osteoclast
    - in the bone marrow

- In the head of the bone

8) What are the two types of bone marrow?

- Red and Blue
- Red and Yellow
- Red and White
- Yellow and White

9) Red bone marrow is active bone marrow, while yellow bone marrow is inactive; yellow in color because it is filled with adipose:

- True
- False

10) 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

11) 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

12) What replaces spongy bone?

- calcium
- Compact bone
- Blood vessels
- Brittle bone

13) When do chondroblasts divide less often?

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

14) When does bone lengthening cease?

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

15) When do bones thicken?

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

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

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

17) What is apoptosis?

- Plays a role in absorption, osteoclasts undergo it, and it controls 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 controls cell death

18) What produces calcitonin?

- Calcium
- Yellow and red bone marrow
- Produced by parafollicular cells of thyroid gland, response to high calcium

19) What does wolf's 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