



Skeletal system

Anatomy Department
Beni-Suef University

Intended learning objectives (ILOs)

By the end of this lecture the student will be able to:

1. Describe the functions of the skeletal system.
2. Classify the bones according to shape and location.
3. Describe the blood and nerve supply of bone.
4. Describe bone growth and remodeling.

Functions of the bones:

- 1. Support.**
- 2. Protection.**
- 3. Assistance in movement.**
- 4. Storage of minerals: e.g. calcium and phosphorus.**
- 5. Blood cell production.**
- 6. Triglyceride storage: Yellow bone marrow**

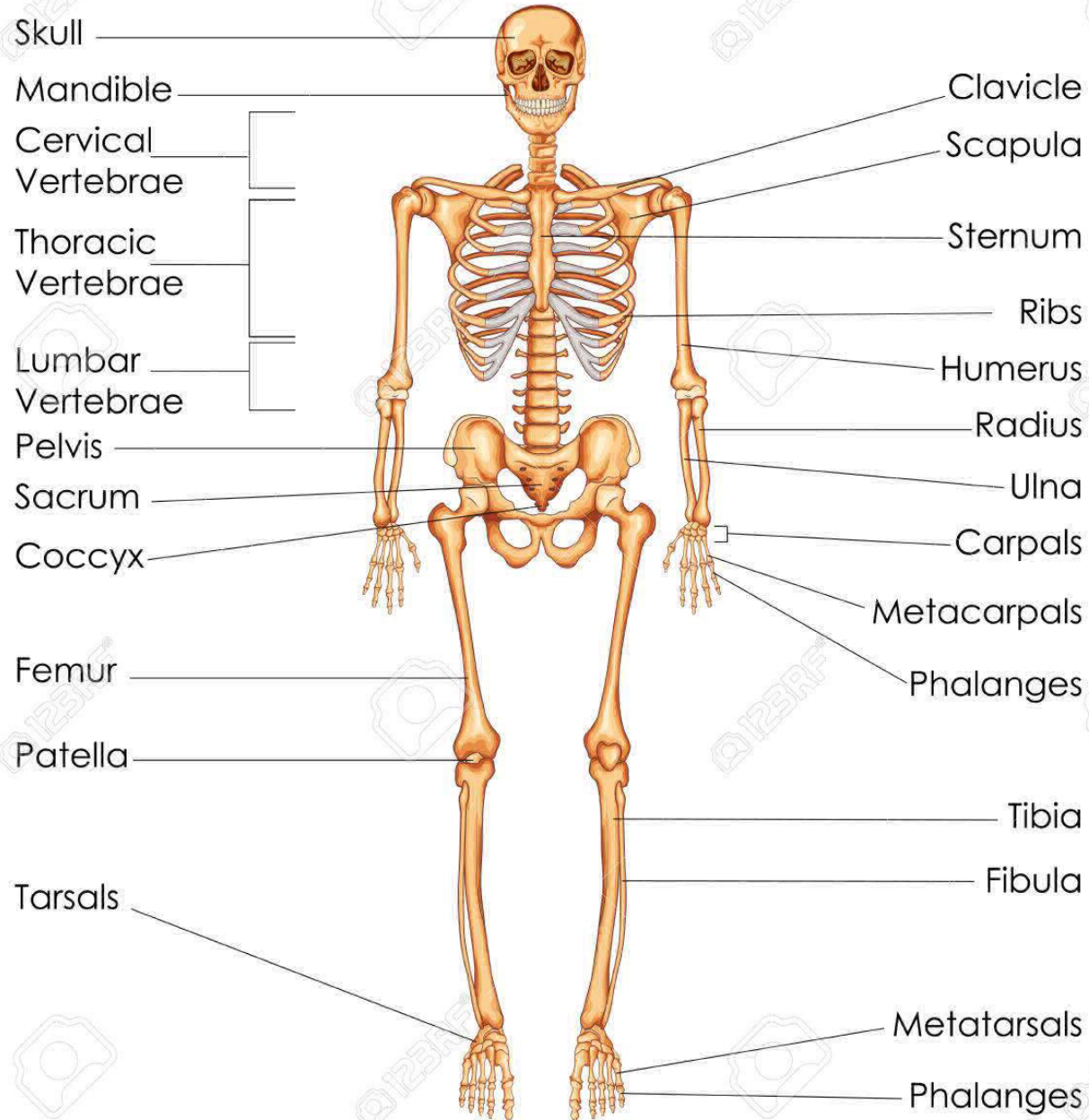
Classification of the bones:

- A. According to position in the body.*
- B. According to shape.*
- C. According to histological structure.*
- D. According to the type of ossification.*

A. Classification according to the position in the body:

- I. Axial skeleton: skull, Mandible, Vertebral column and Bones of the thorax (ribs and sternum).
- II. Appendicular skeleton: bones of the upper and lower limbs and each limb is composed of limb girdle and free limb

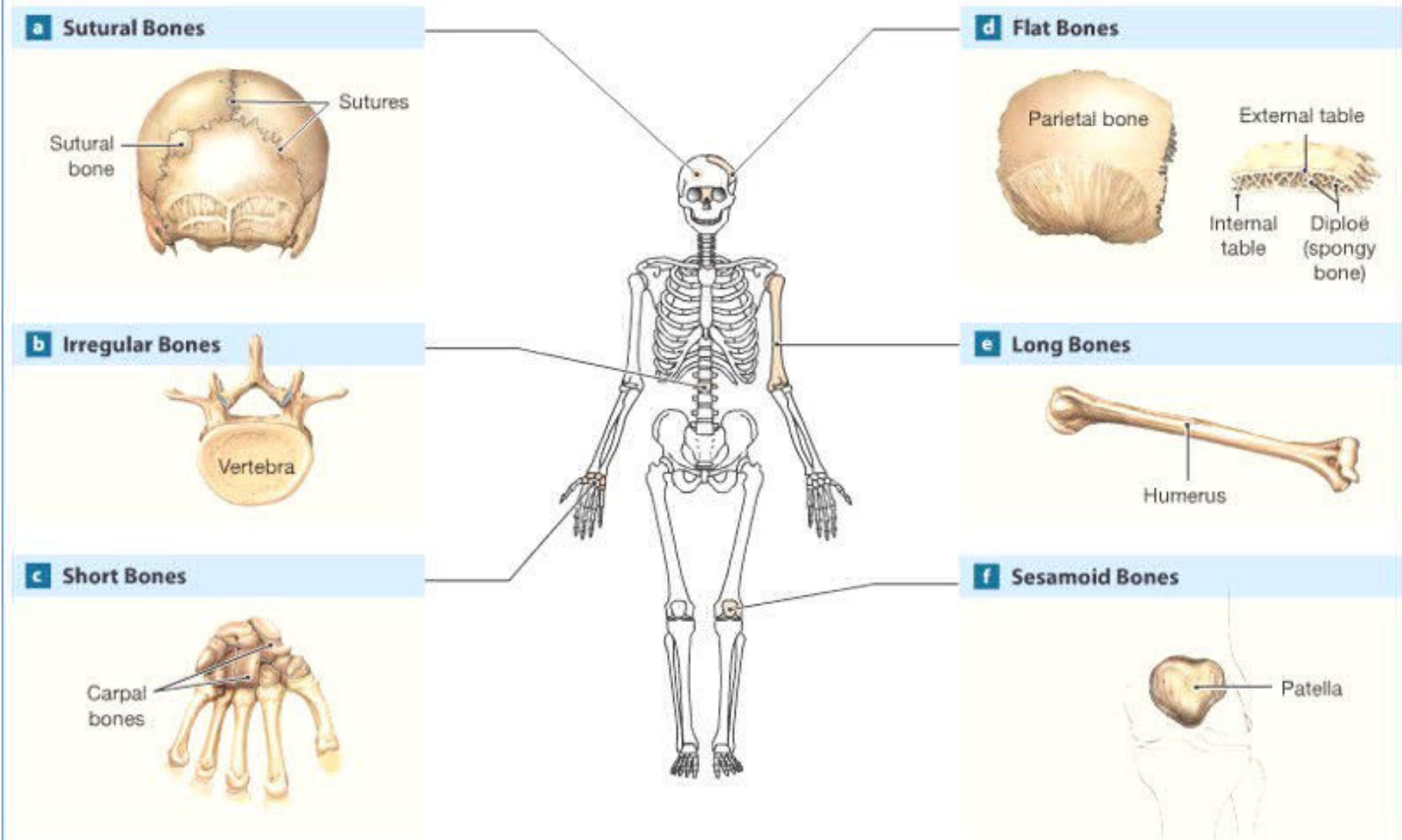
Skeleton



B. Classification according to the shape of the bones:

- I. Long bones
- II. Short long bones
- III. Short bones
- IV. Flat bones
- V. Irregular bones
- VI. Pneumatic bones
- VII. Sesamoid bones
- VIII. Sutural bones

Figure 6-1 A Classification of Bones by Shape.

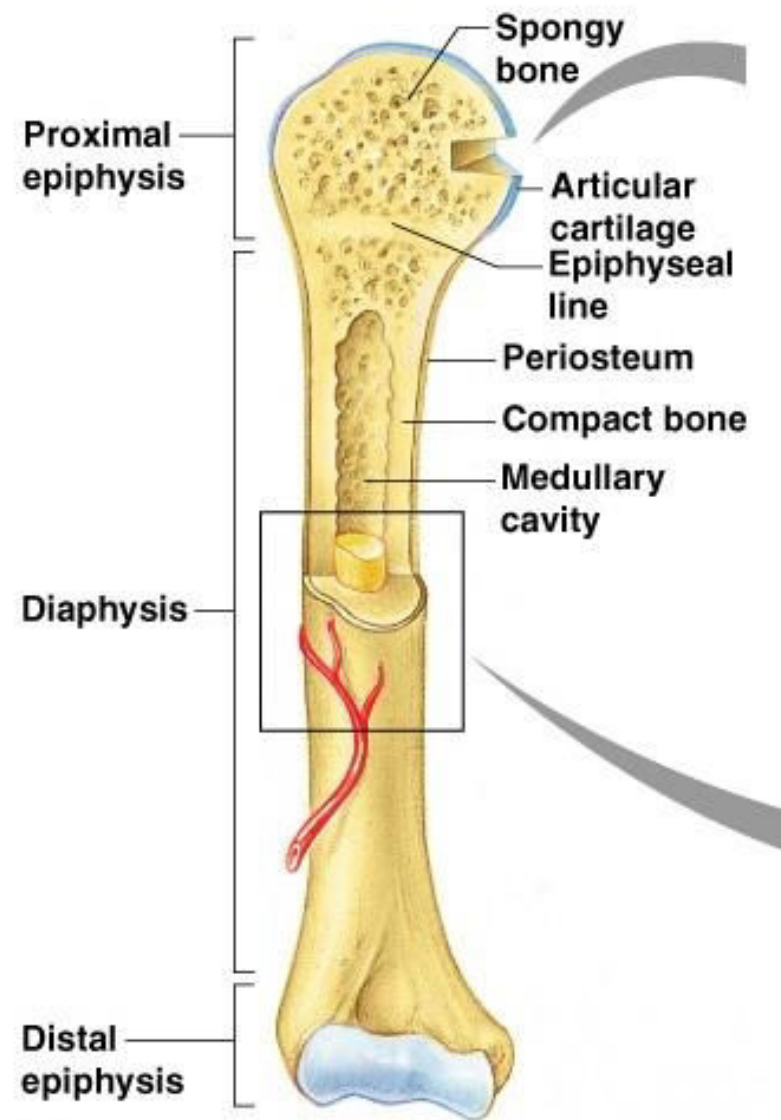


C. Classification according to the histological structure:

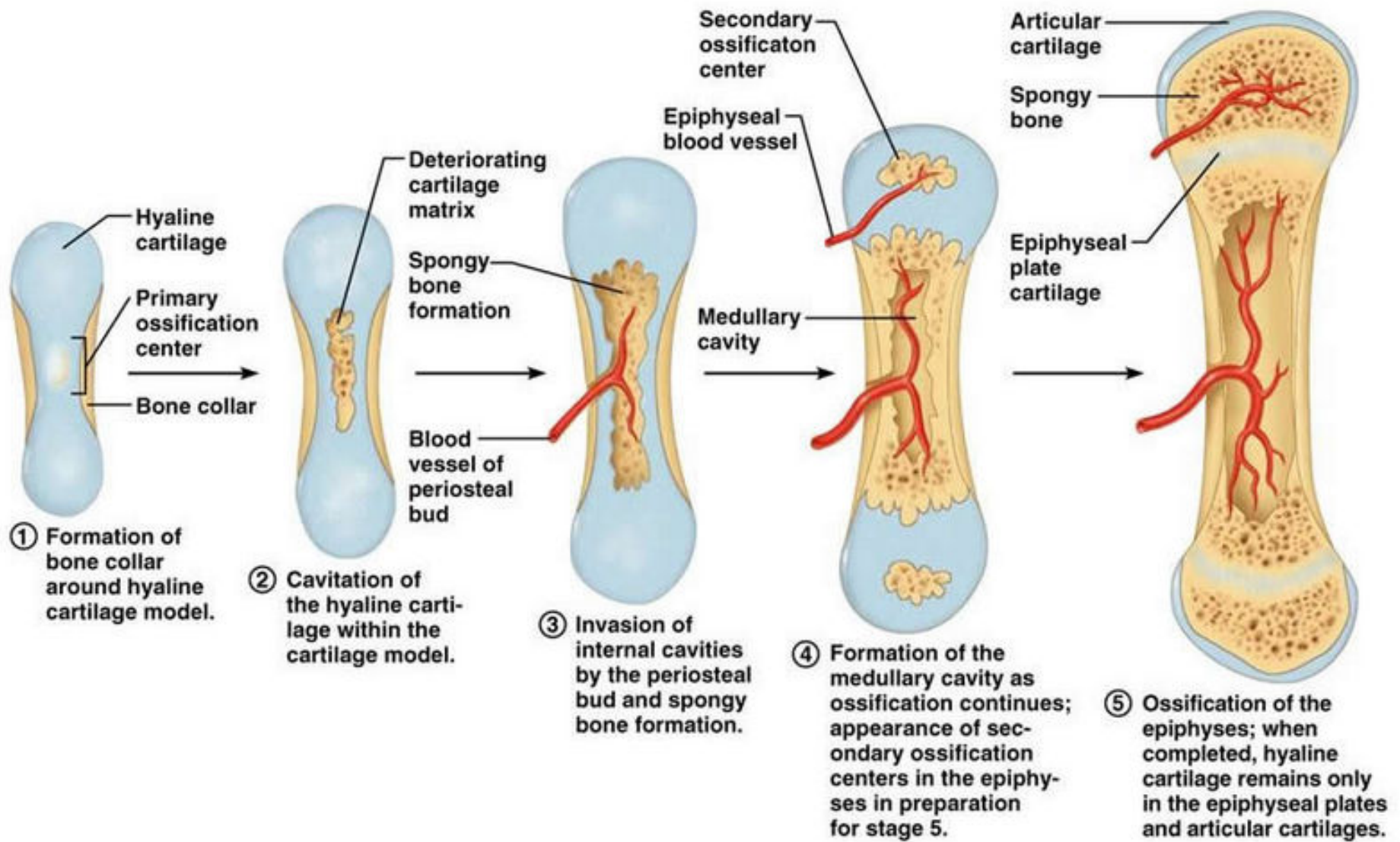
- I. Dense, compact bone
- II. Spongy, cancellous bone

D. Classification of bones according to the type of ossification:

- I. Intramembranous ossification
- II. Endochondral ossification

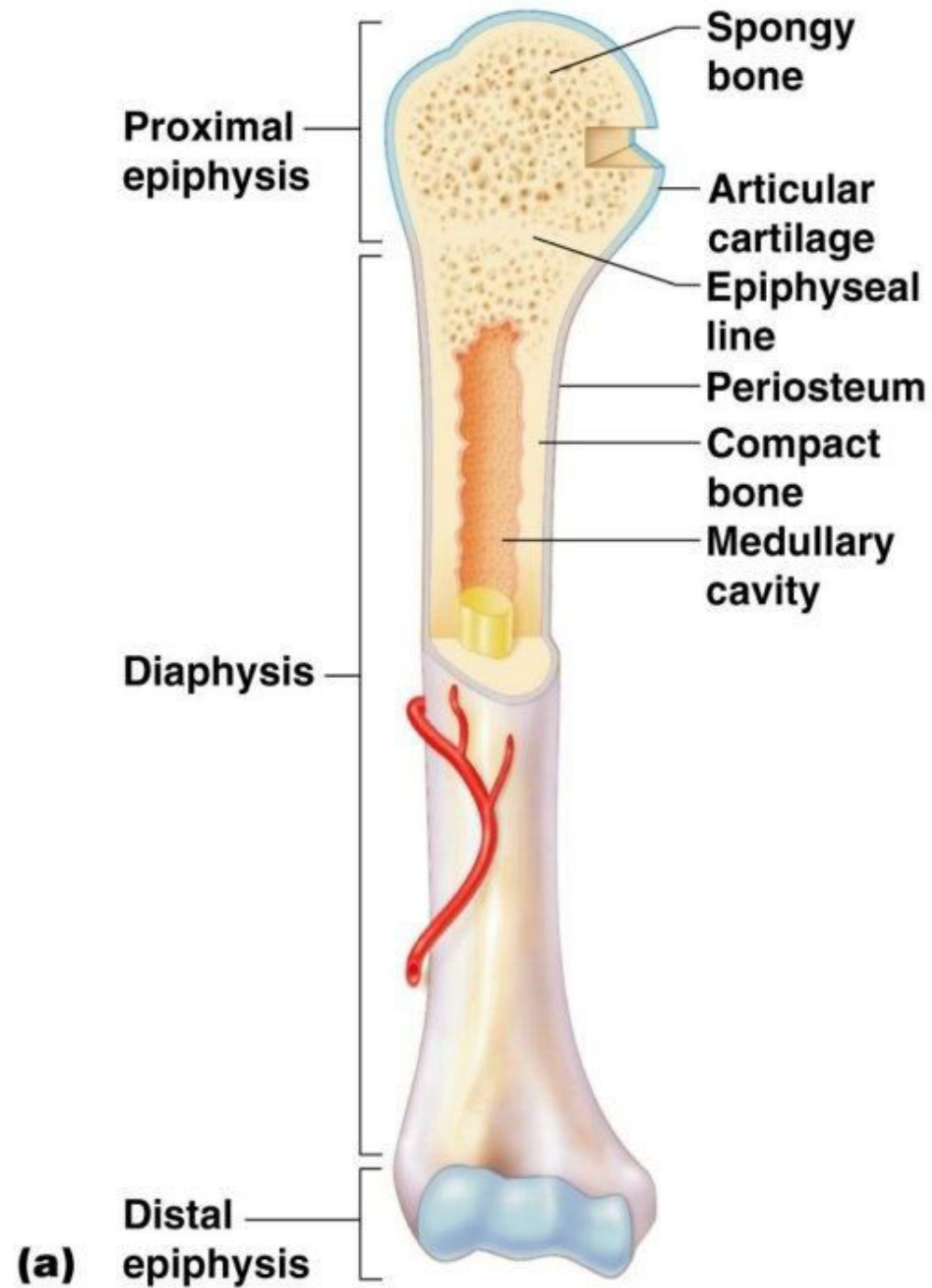


(a)



Structure of long bone

- The hyaline articular cartilage
- Epiphysis
- The epiphyseal line
- Diaphysis



Growth of long bones:

1. Growth in length
2. 2. Growth in width

Functions of the periosteum:

1. attachments of muscles and ligaments.
2. nutritive functions
3. osteogenic functions
4. Its presence limits the internal osteogenic activity and deposition of more bone.

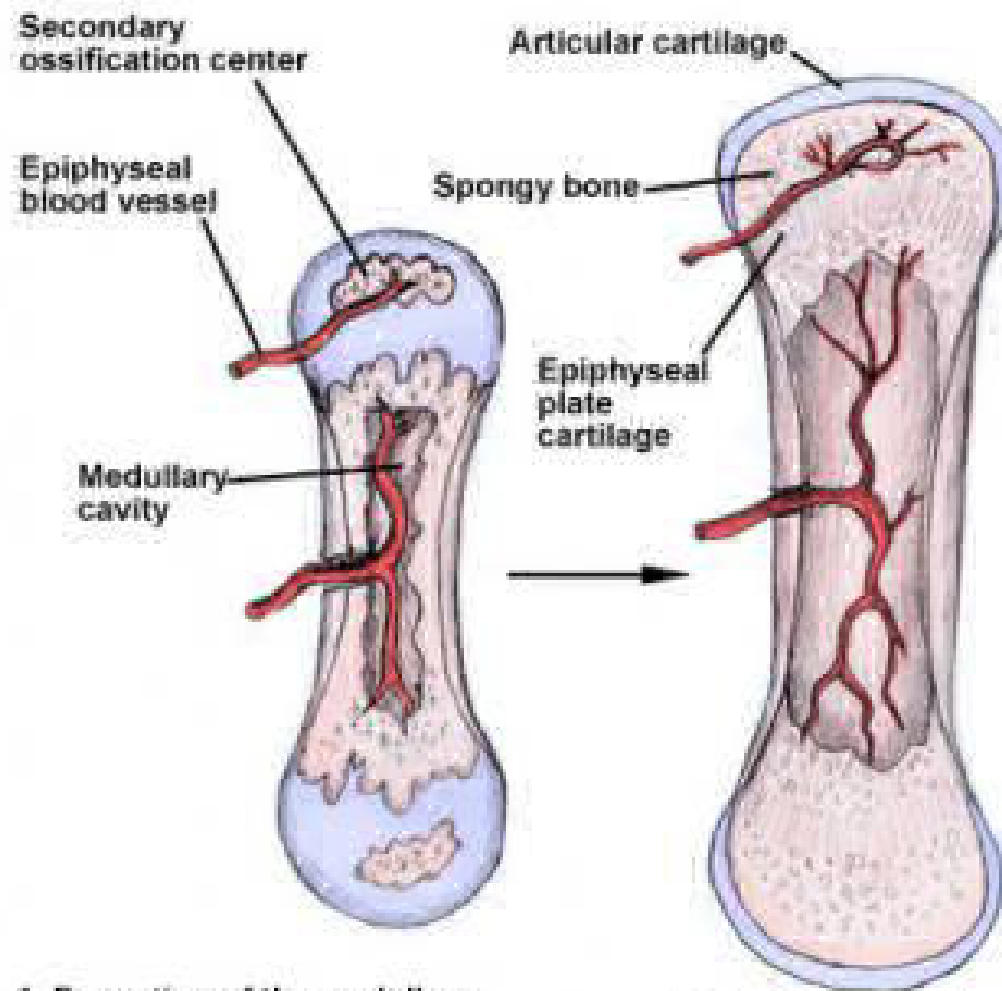
- The bone marrow:
 - Red bone marrow
 - Yellow bone marrow
- Bone remodeling
- Factors Affecting Bone Growth and Bone Remodeling

- Arterial Supply of the long bones:

1. Periosteal arteries
2. The nutrient artery
3. The metaphyseal and epiphyseal arteries

- Venous Drainage of the long bones:

1. Periosteal veins
2. The nutrient vein
3. The metaphyseal and epiphyseal veins



4- Formation of the medullary cavity as ossification continues; appearance of secondary ossification centers in the epiphyses in preparation for stage 5.

5- Ossification of the epiphyses; when completed, hyaline cartilage remains only in the epiphyseal plates and articular cartilages.

Quiz

1. Which of the following is not part of axial skeleton?
 - a. Sternum.
 - b. Mandible.
 - c. Humerus.
 - d. Sacrum.

2. The outer covering of each bone made from connective tissue is called:

- a. perichondrium.
- b. Periosteum.
- c. Diaphysis.
- d. Epiphysis.

3. The long shaft of the long bone is called:

- a. Epiphysis.
- b. Diaphragm.
- c. Diaphysis.
- d. Metaphysis.

4. The growth in length of the long bone occurs at:

- a. Periosteum.
- b. Diaphysis.
- c. Epiphysis.
- d. Epiphyseal plate.

Thank you