

Al- Mustaqbal University College



جامعة المستقبل الاهلي
مرحلة الاولى
قسم التقنيات البصرية

First stage.

Department of Optometry(Optics)

Head and neck anatomy

Lec. 7

Bones

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Bone

- **Bone:** is the substance that forms the skeleton of the body. It is composed chiefly of calcium phosphate and calcium carbonate.
- **Bone** marrow, the soft, spongy tissue in the center of many **bones**, makes and stores blood cells.

Function:

- supports the body
- facilitates movement
- protects internal organs
- produces blood cells
- stores and releases minerals and fat

Bone structure of three main cells

These three cells responsible for bone growth and mineral homeostasis.

- **Osteoblasts** make new bone cells and secrete collagen that mineralizes to become bone matrix. They are responsible for bone growth and the uptake of minerals from the blood.
- **Osteocytes** regulate mineral homeostasis. They direct the uptake of minerals from the blood and the release of minerals back into the blood as needed.
- **Osteoclasts** dissolve minerals in bone matrix and release them back into the blood.
- **Periosteum** is a tough, fibrous membrane that covers and protects the outer surfaces of bone.

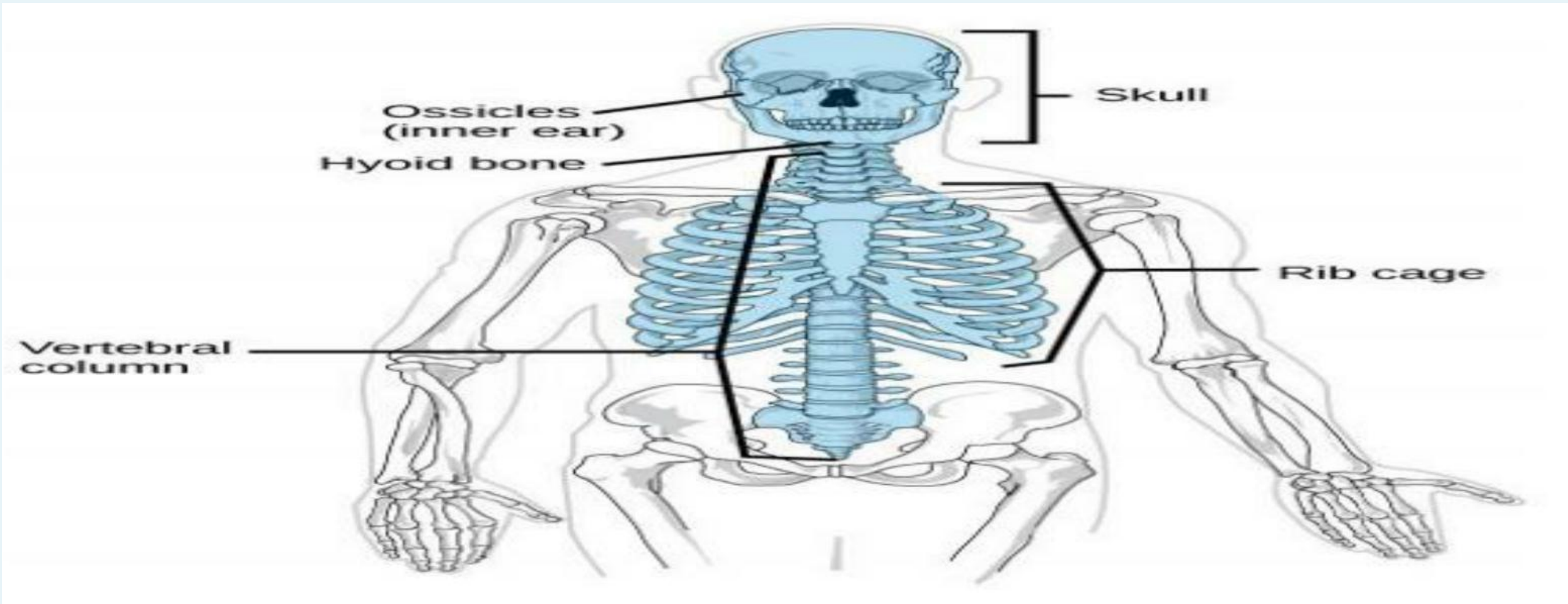
Classification

Bones can be classified on the macro level several ways:

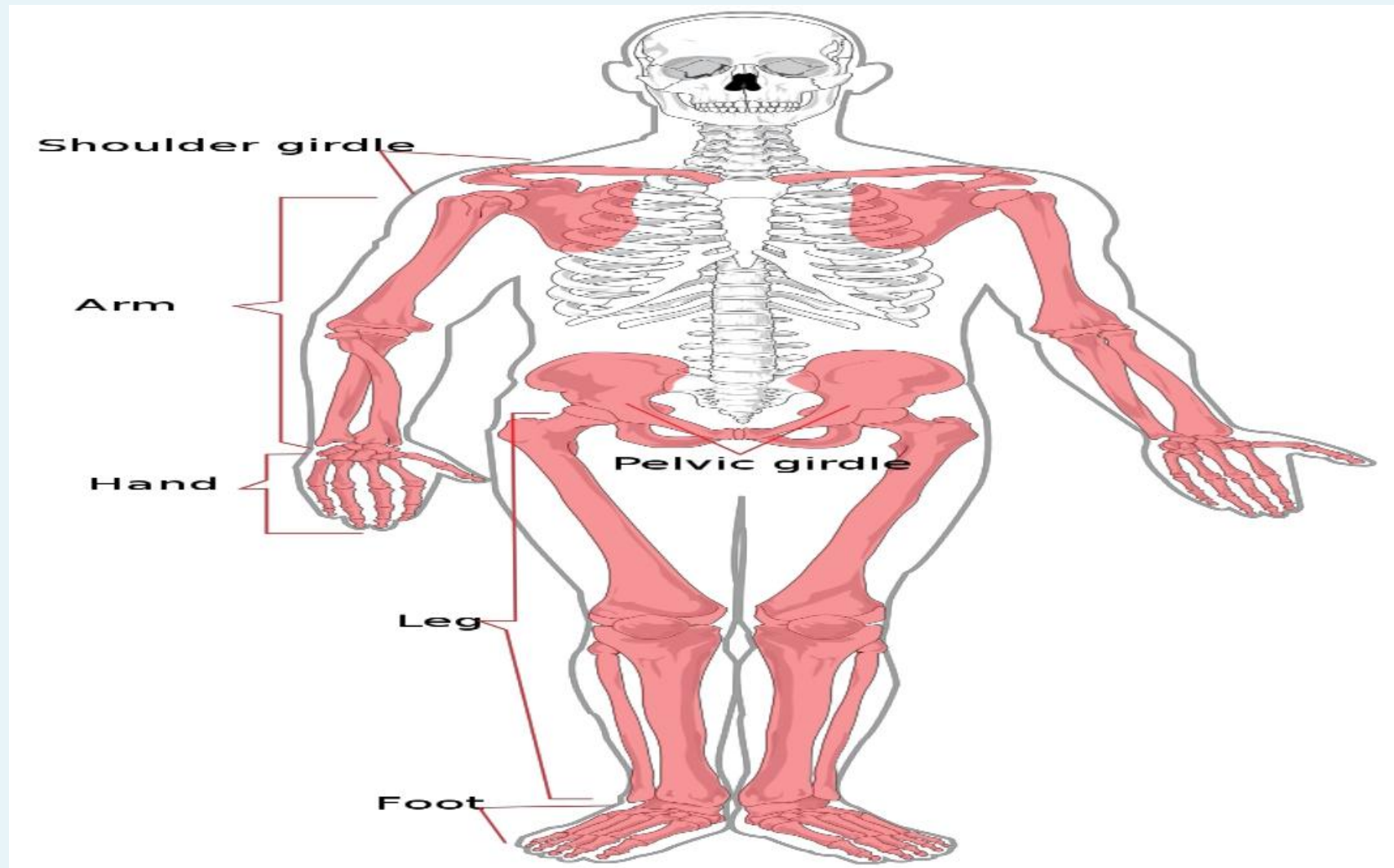
- **By Position**
- **By Shape**
- **By Structure**

By Position

- Axial skeleton : Bone forming axis of body, e.g skull, rib, sternum and vertebrae

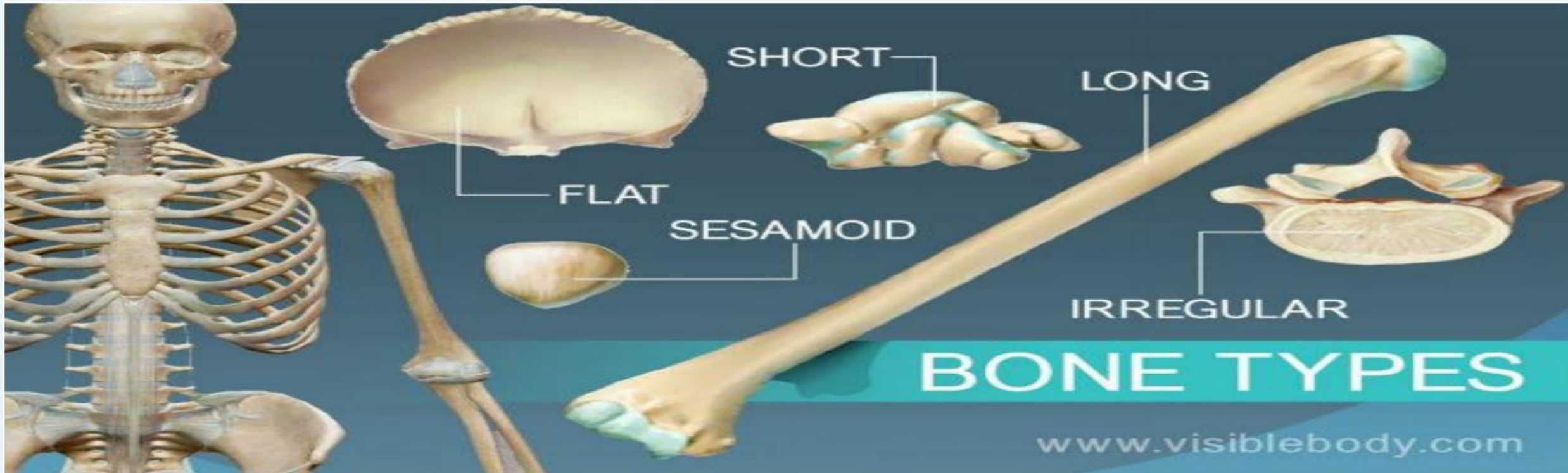


Appendicular skeleton : bones forming appendages of body , e.g. limbs, shoulder and hip.



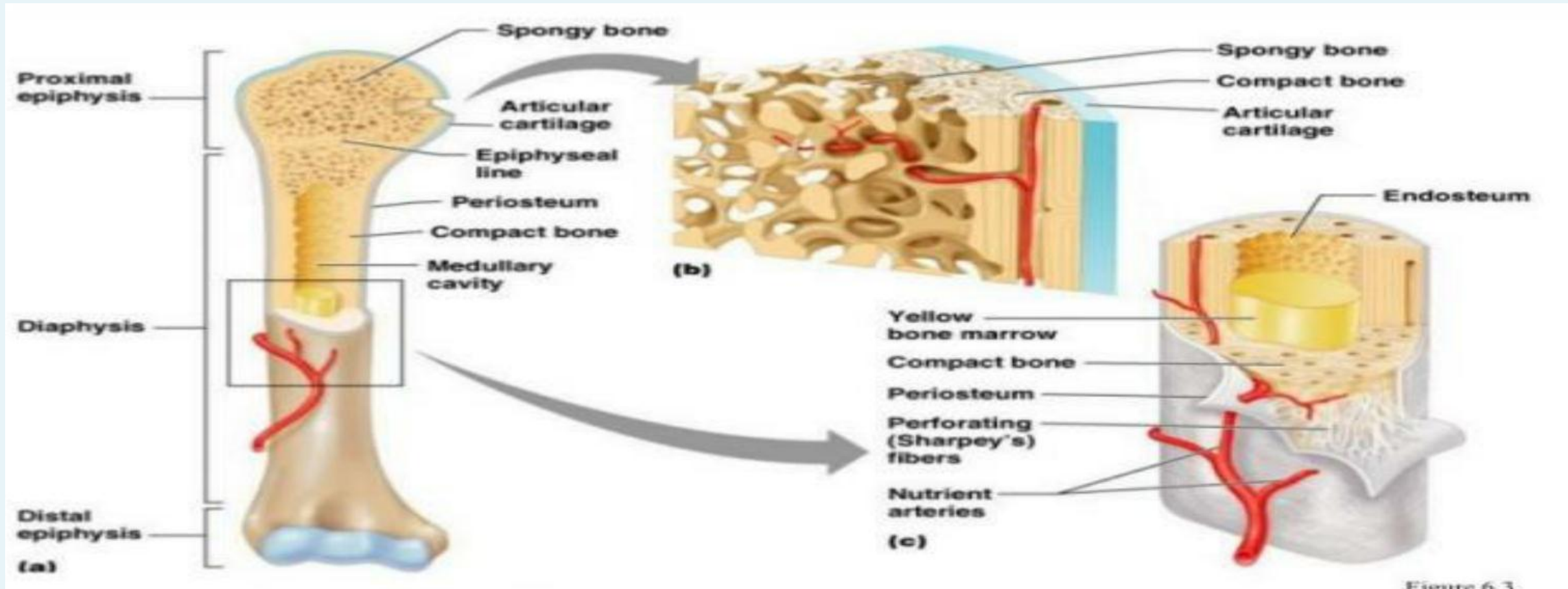
By Shape

- **Long Bones** - longer than they are wide (e.g. humerus)
- **Short bones** - cube shaped, e.g. bones in wrist and ankle
- **Flat bones** - Thin, flattened and a bit curved (e.g. sternum and most skull bones)
- **Irregular bones** - Complicated shapes (e.g. vertebrae, maxilla and mandible)
- **Sesamoid**



By Structure

- **Compact** (cortical) bone
- **Spongy** (cancellous, trabecular) bone



Compact Bone & Spongy (Cancellous Bone)

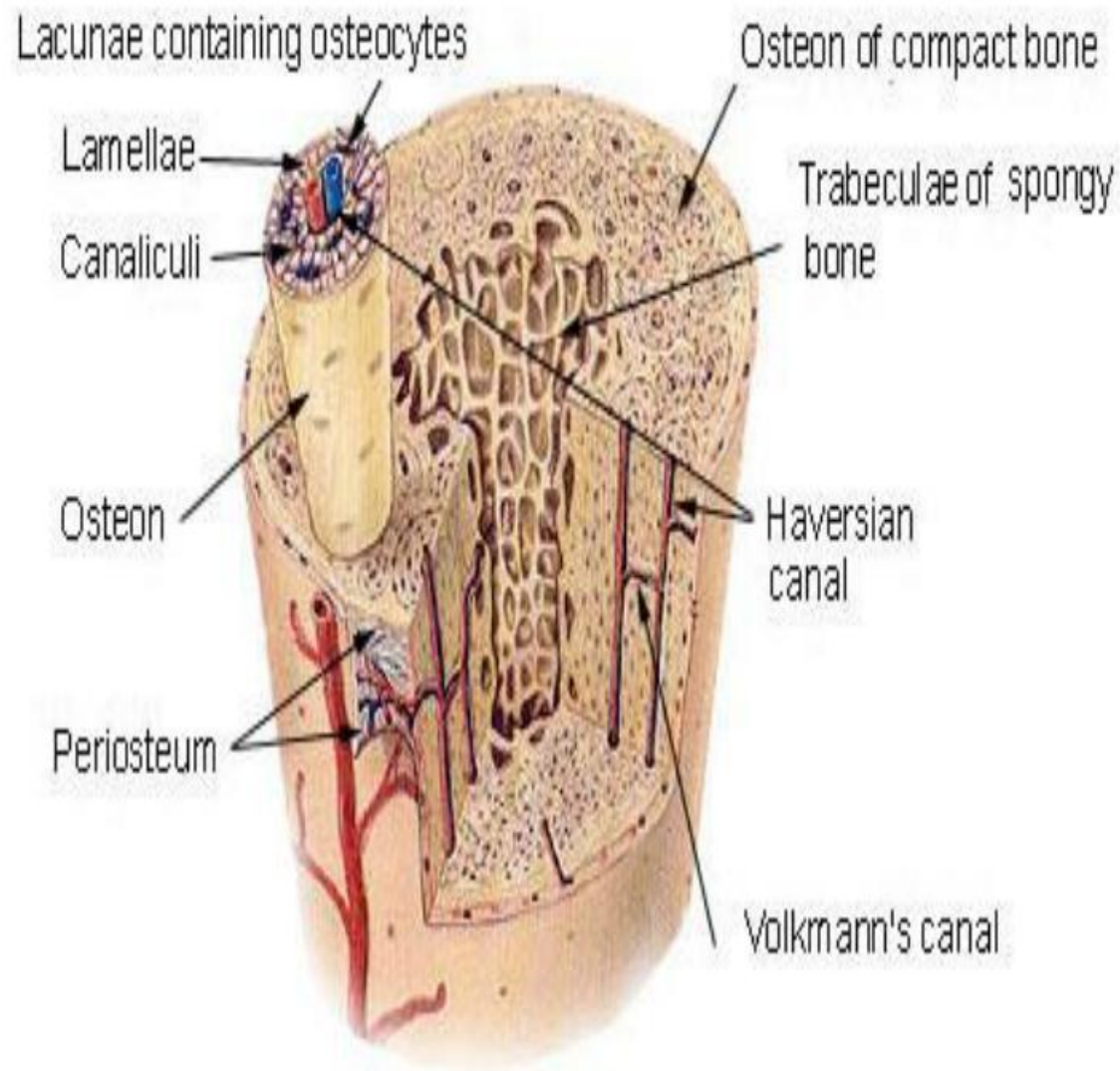
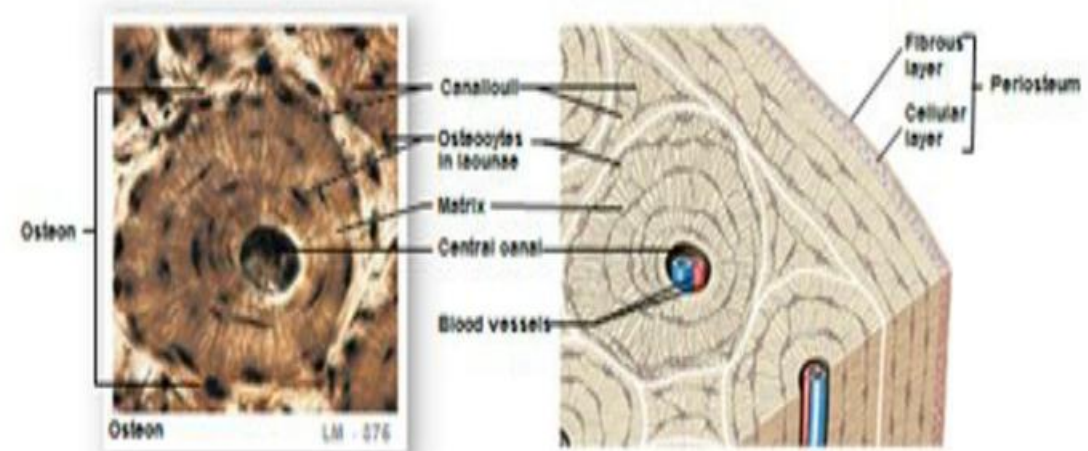


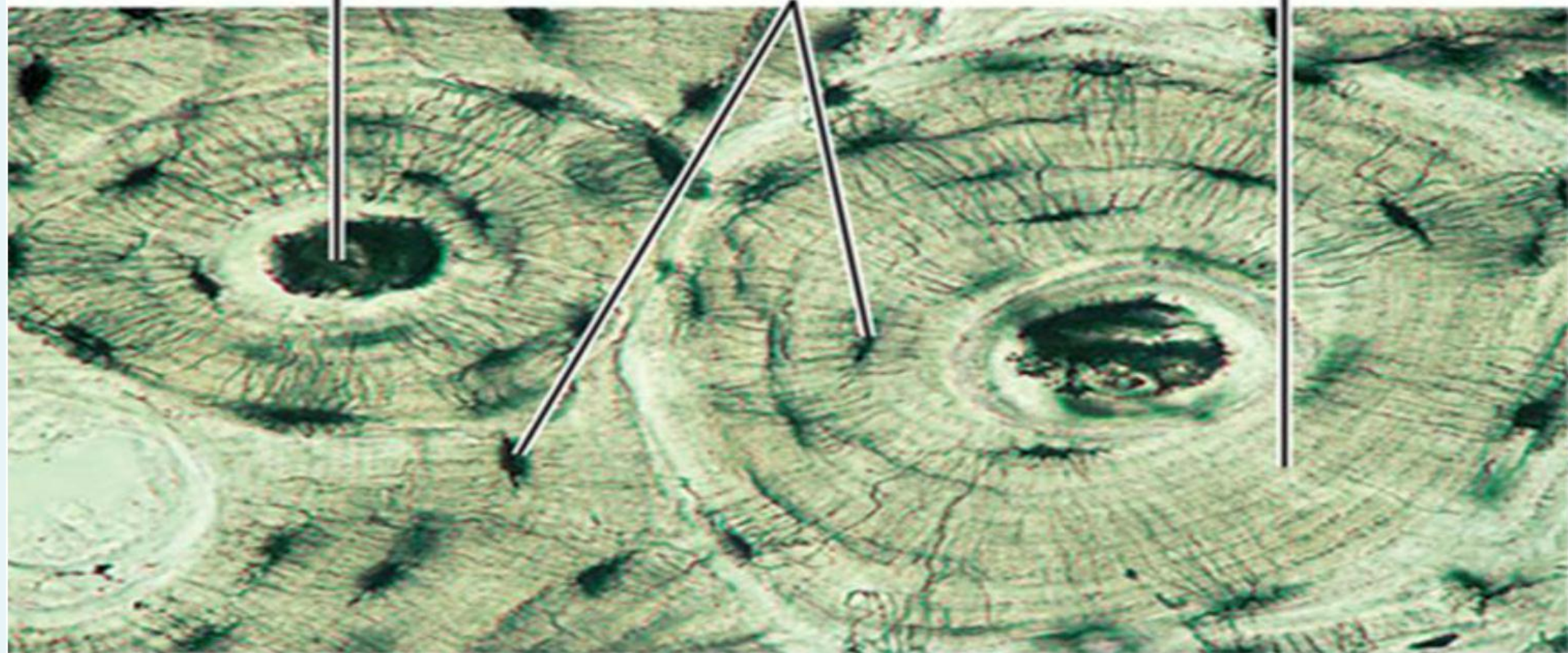
Figure 4-15 Bone



Central
canal

Osteocytes
in lacunae

Mineralized
matrix



D

Bone

Structure of long bones

- Diaphysis
- Epiphysis
- Metaphysis
- Articular cartilage
- Periosteum
- Medullary canal (marrow cavity)
- Endosteum

