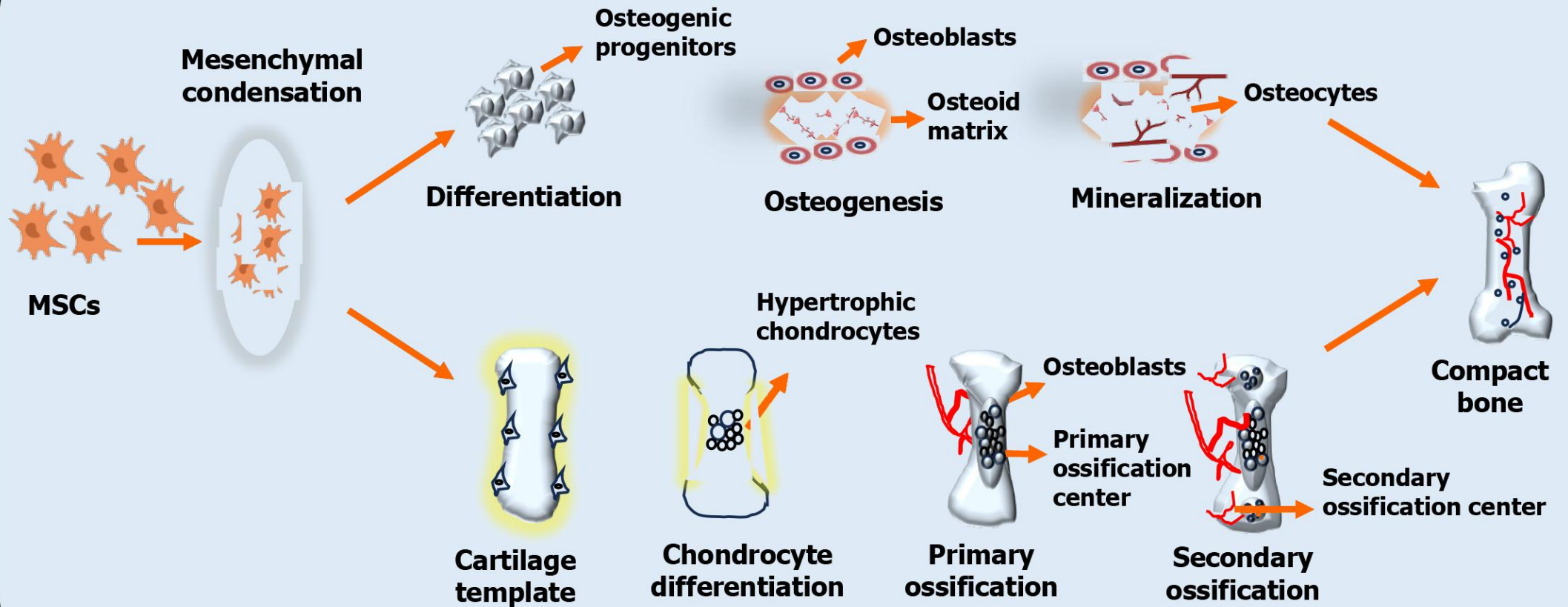






Medical Biology

Osteogenesis

A Intramembrous ossification

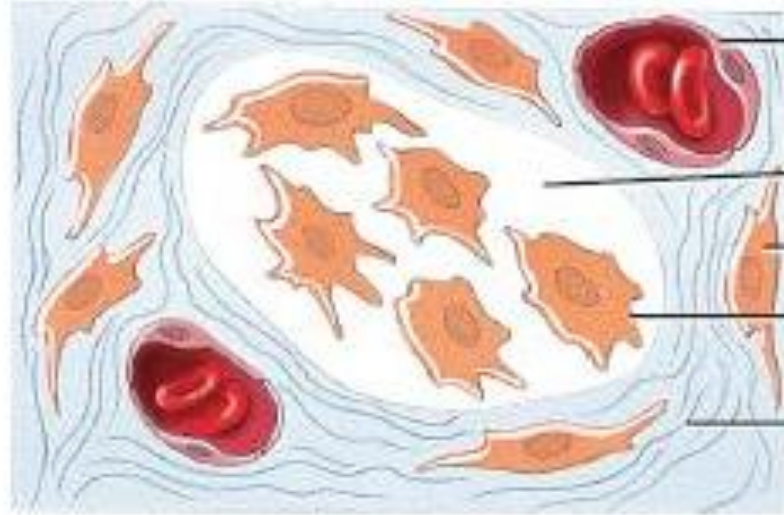


B Endochondral ossification

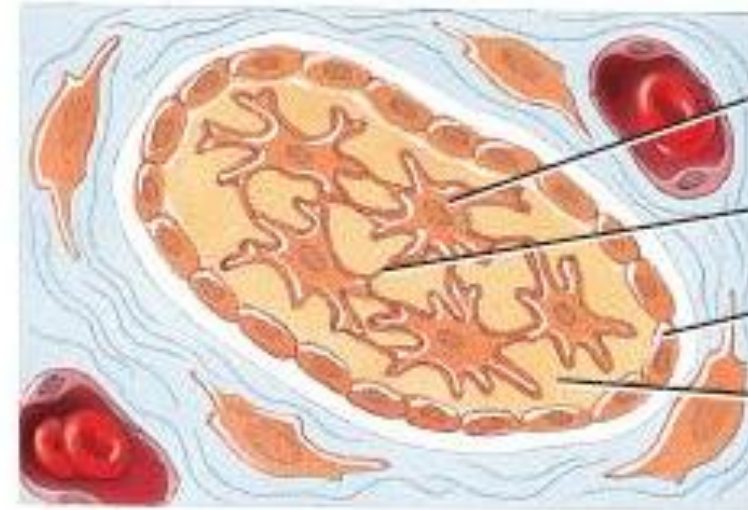


➡ Ossification begins around the 6th -7th week of embryonic life. At this time the embryonic skeleton is made of fibrous membranes and hyaline cartilage.

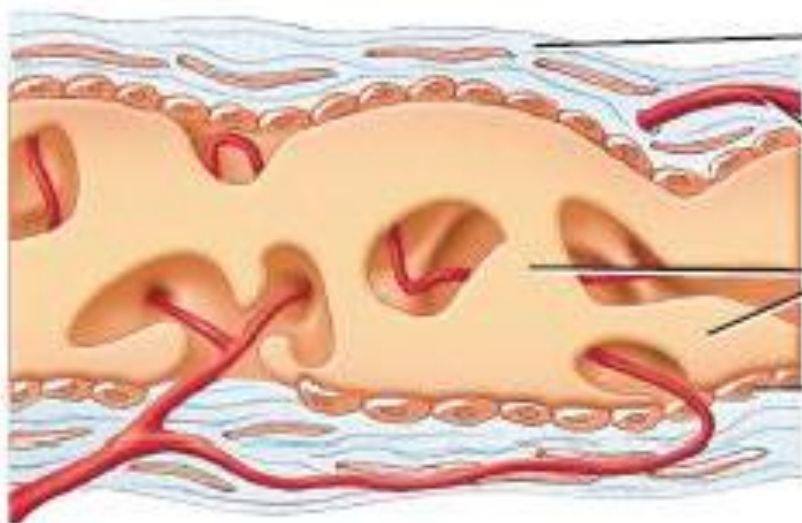
Intramembranous Ossification



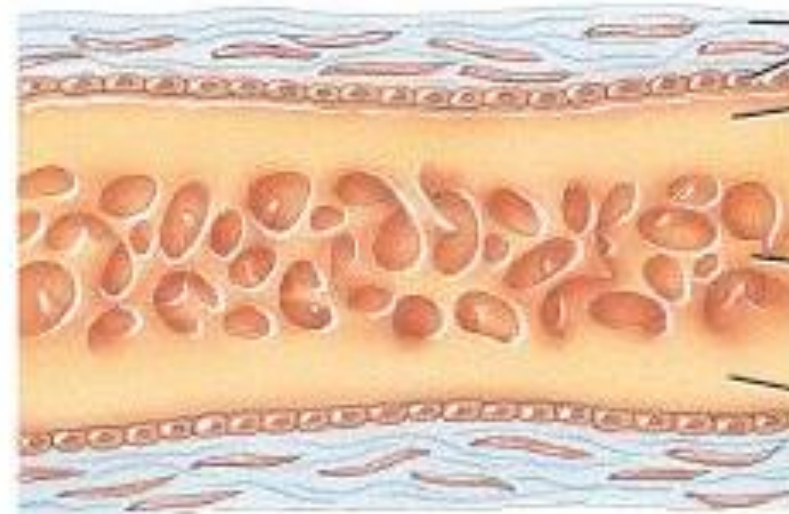
- Blood capillary
- Ossification center
- Mesenchymal cell
- Osteoblast
- Collagen fiber



- Osteocyte in lacuna
- Canaliculus
- Osteoblast
- Newly calcified bone matrix

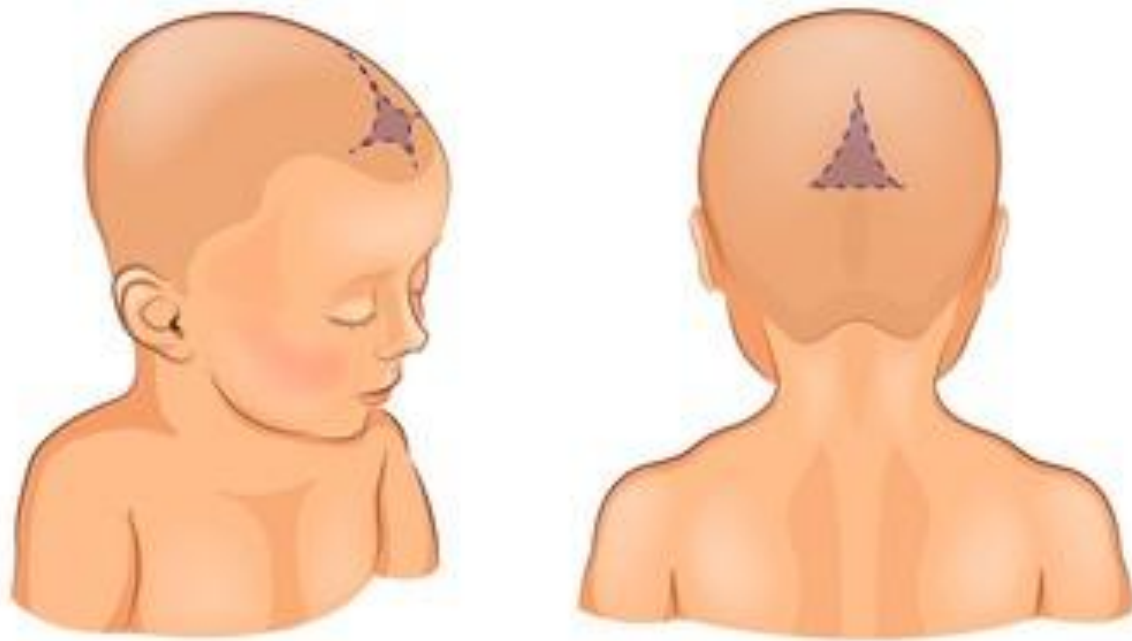


- Mesenchyme condenses
- Blood vessel
- Spongy bone trabeculae
- Osteoblast

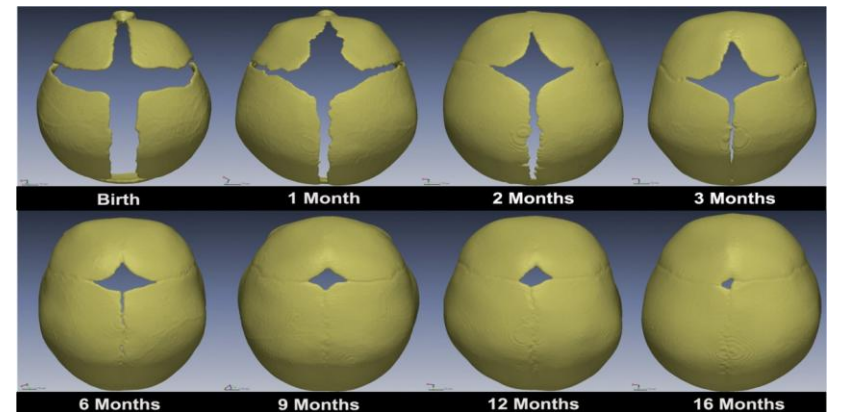


- Periosteum
- Compact bone tissue (external table)
- Spongy bone tissue (diploe)
- Compact bone tissue (internal table)

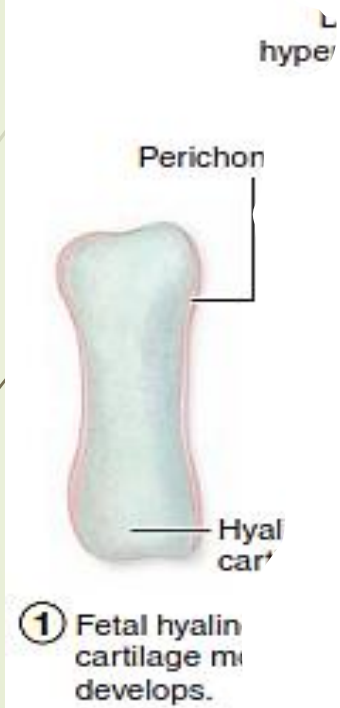
FONTANELLE

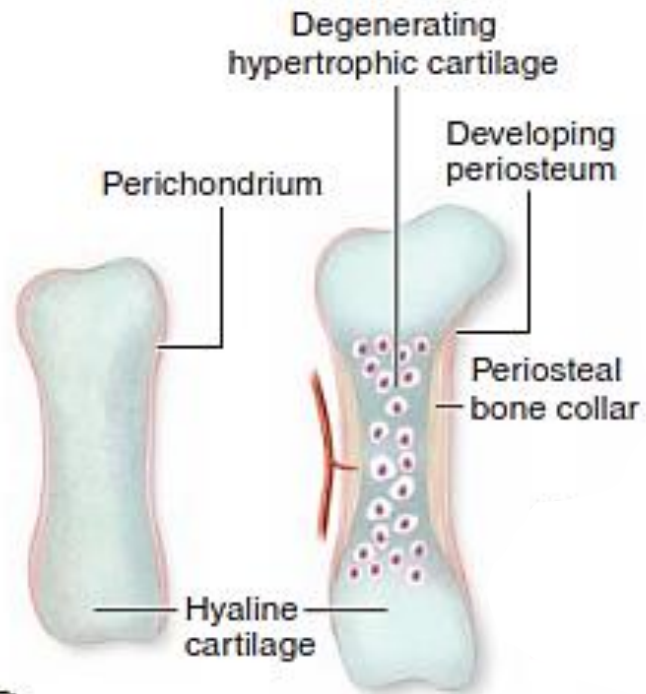


shutterstock.com • 769539667

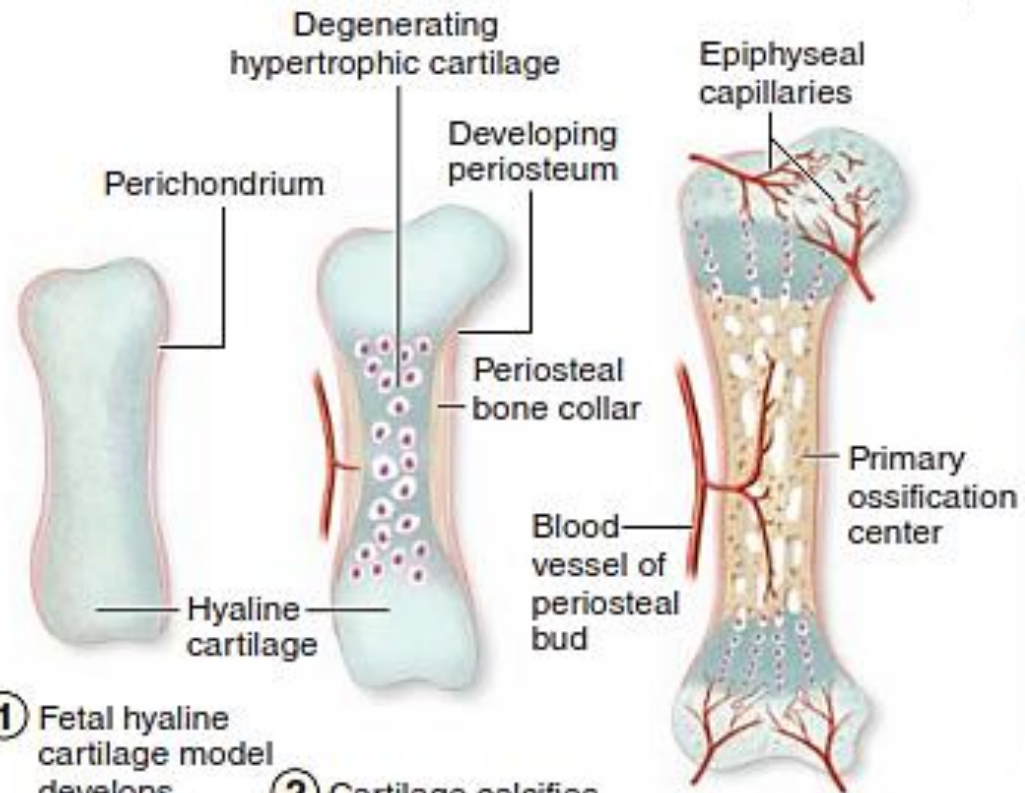


Endochondral ossification



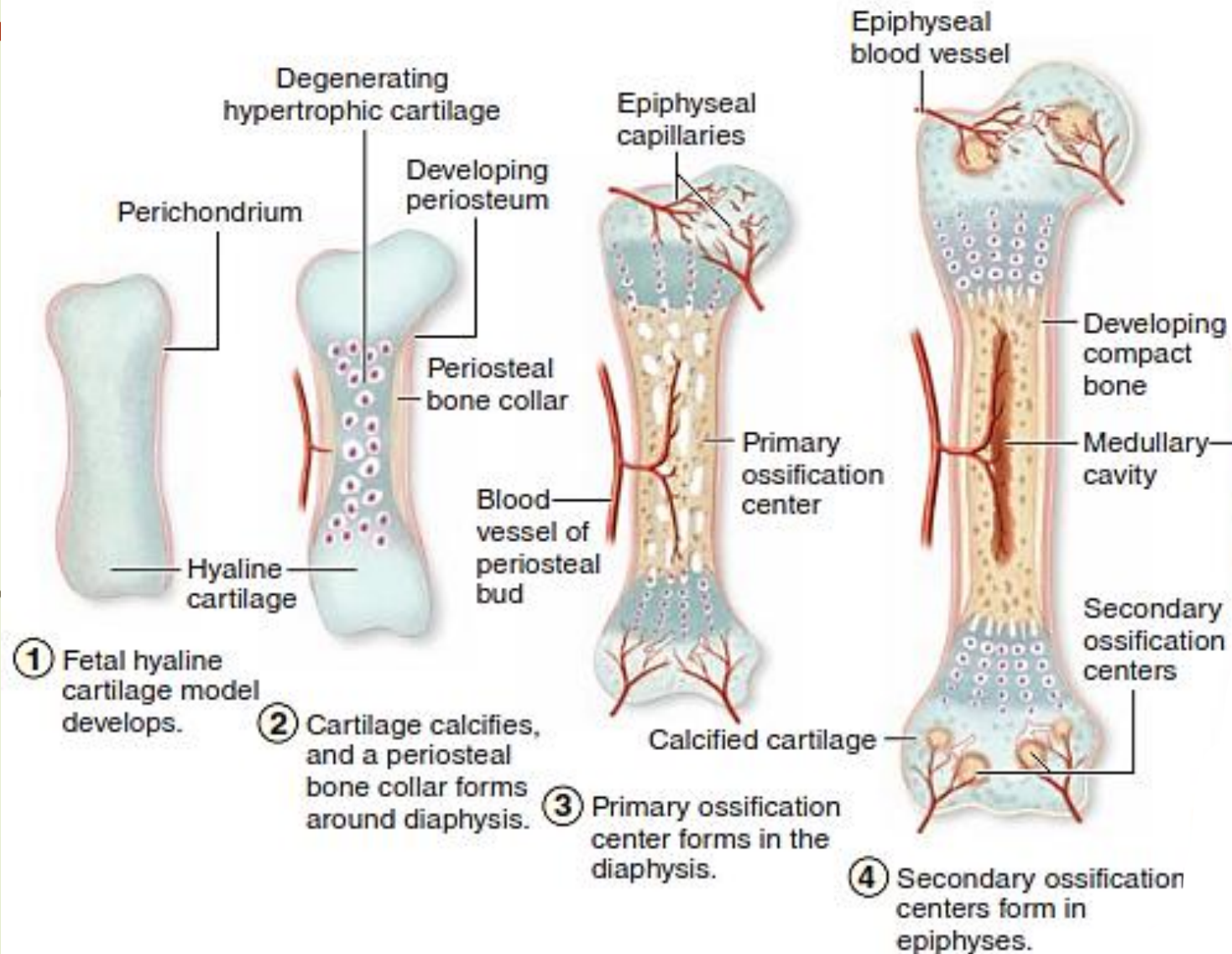


- ① Fetal hyaline cartilage model develops.
- ② Cartilage calcifies, and a periosteal bone collar forms around diaphysis.

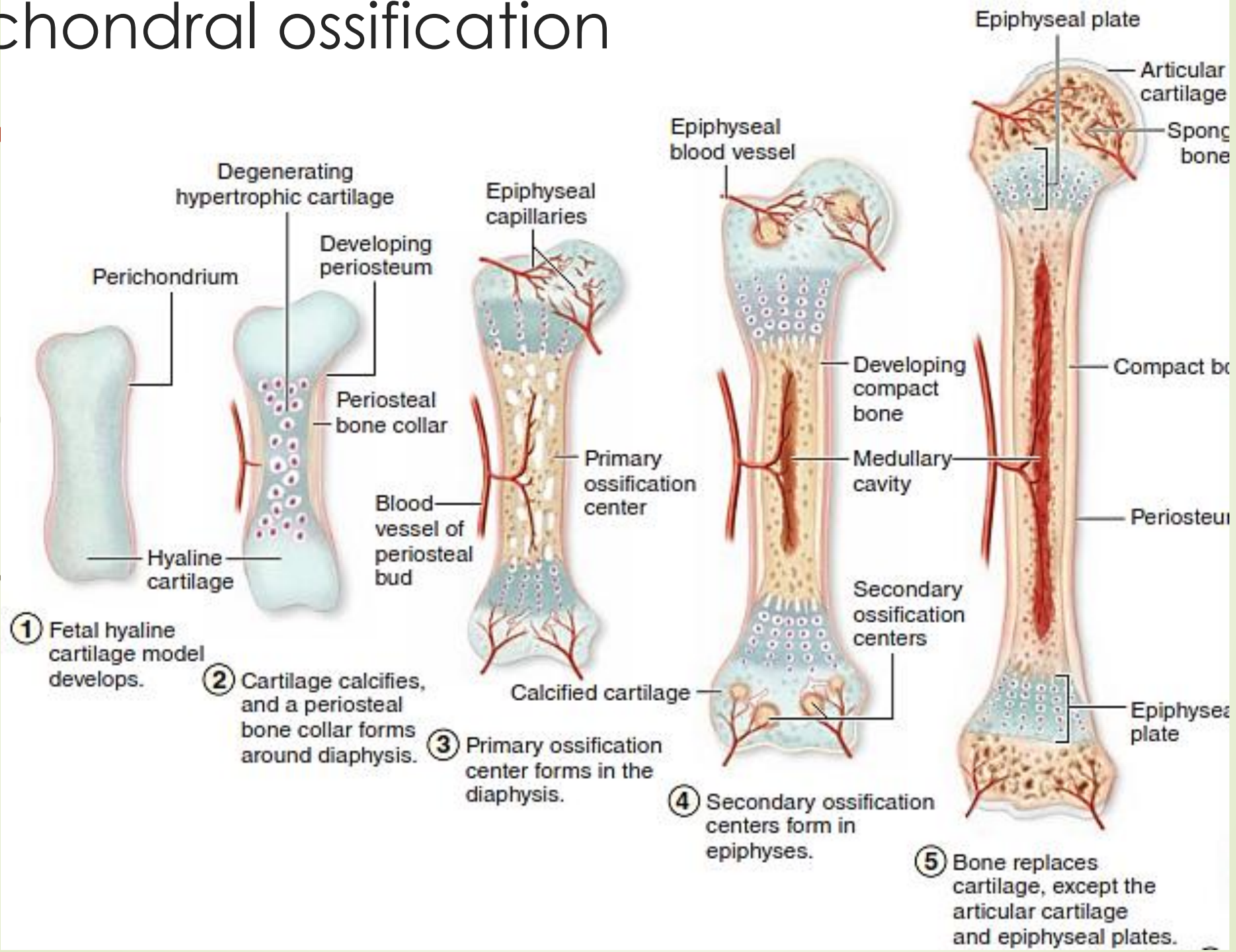


- ① Fetal hyaline cartilage model develops.
- ② Cartilage calcifies, and a periosteal bone collar forms around diaphysis.
- ③ Primary ossification center forms in the diaphysis.

Endochondral ossification



Endochondral ossification



EPIPHYSEAL CARTILAGE (GROWTH PLATE)

Resting zone

Proliferative

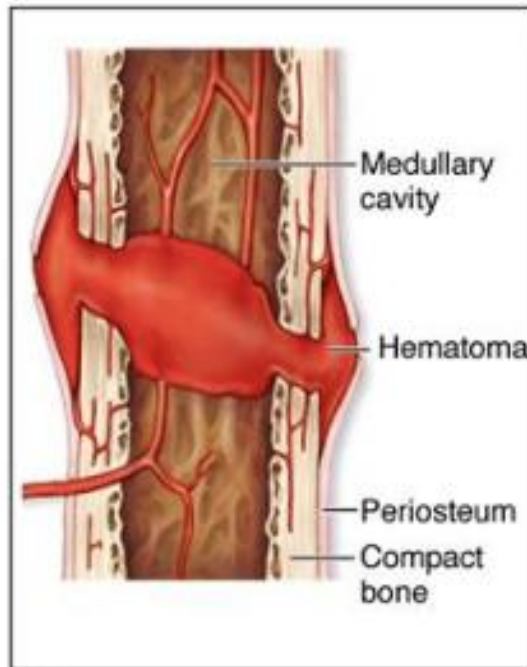
Hypertrophic

Calcification

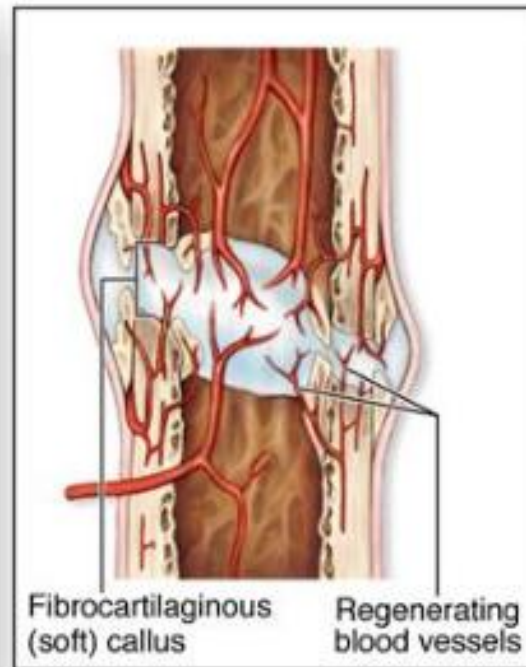
Ossification



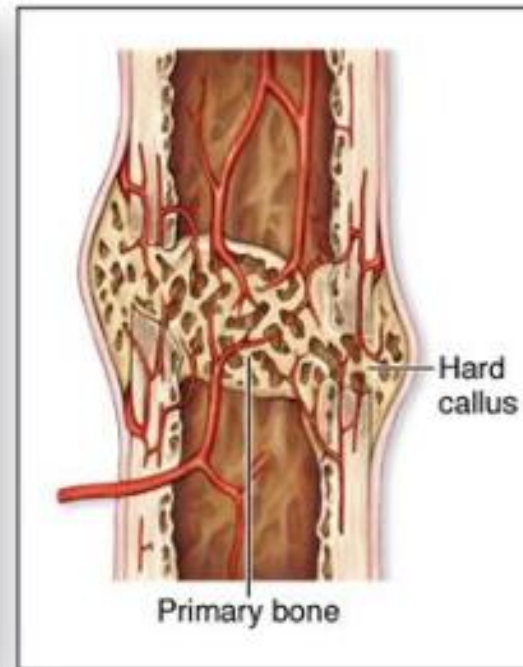
Fracture Repair



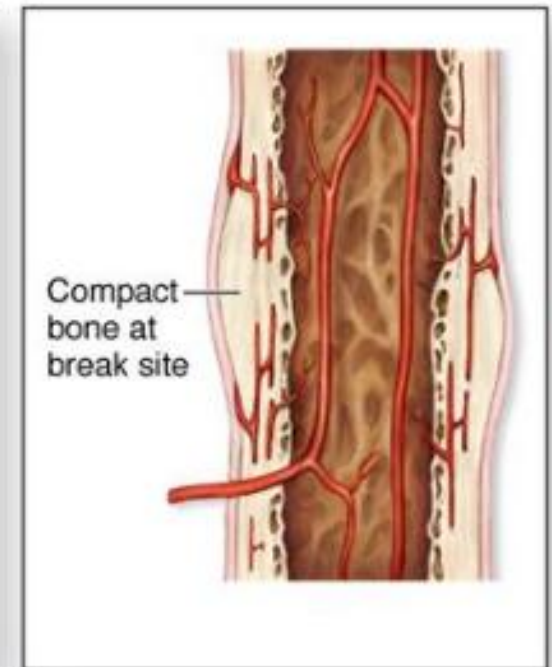
① A fracture hematoma forms.



② A fibrocartilaginous (soft) callus forms.



③ A hard (bony) callus forms.

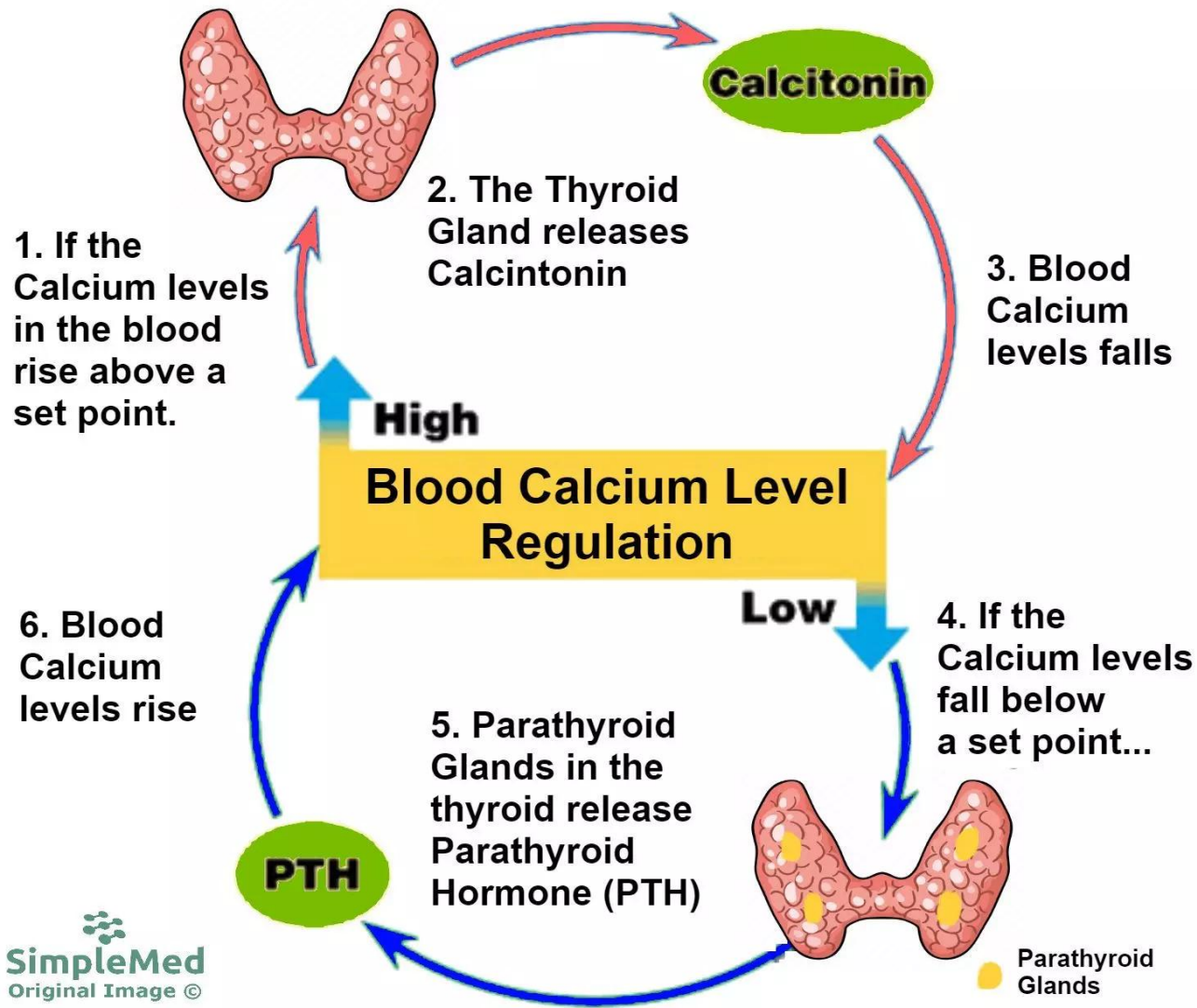


④ The bone is remodeled.

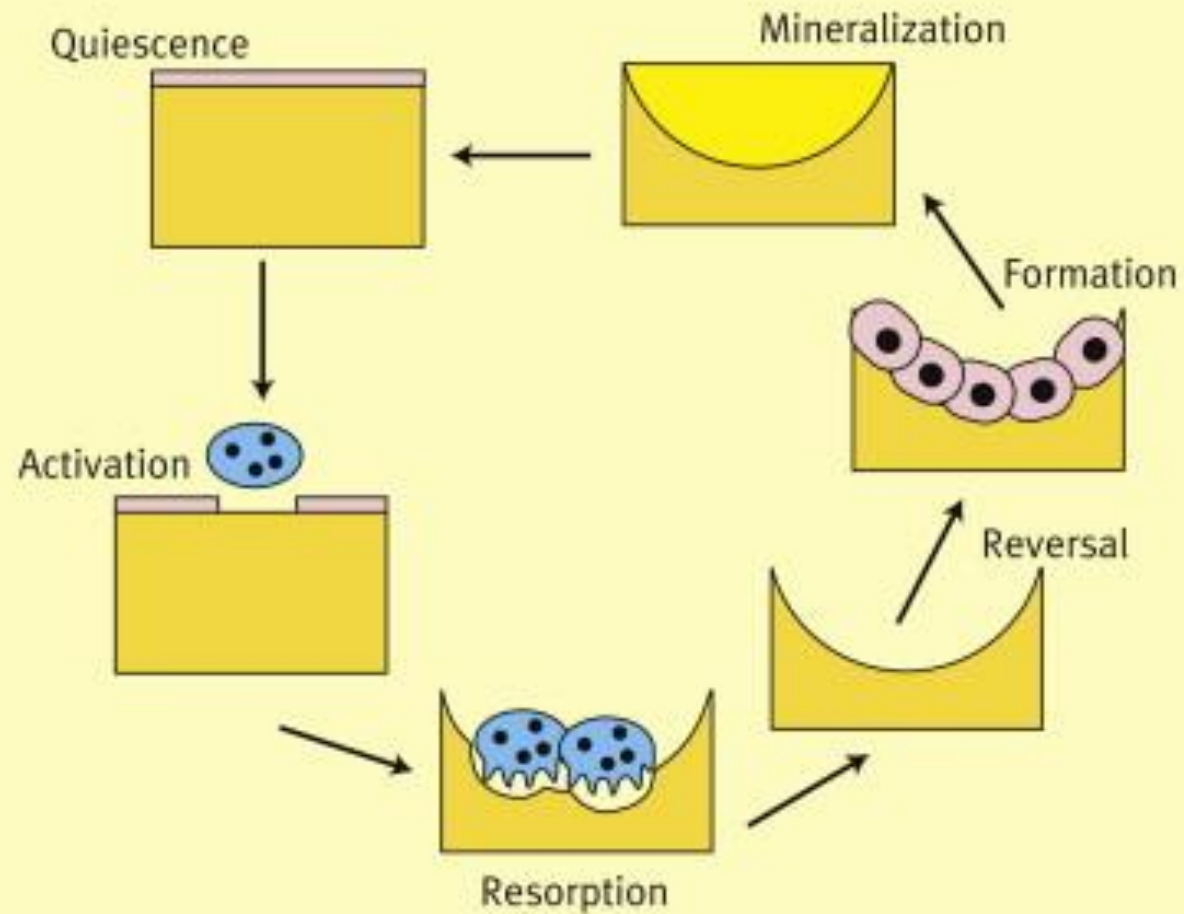


Green
stick
fracture

Metabolic Role of Bone



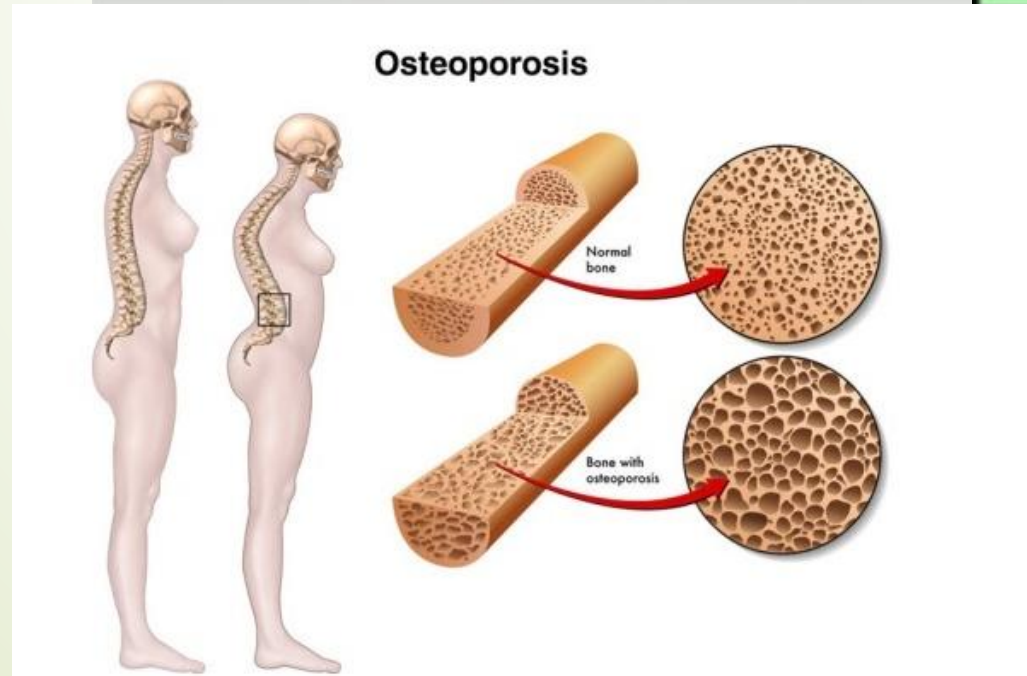
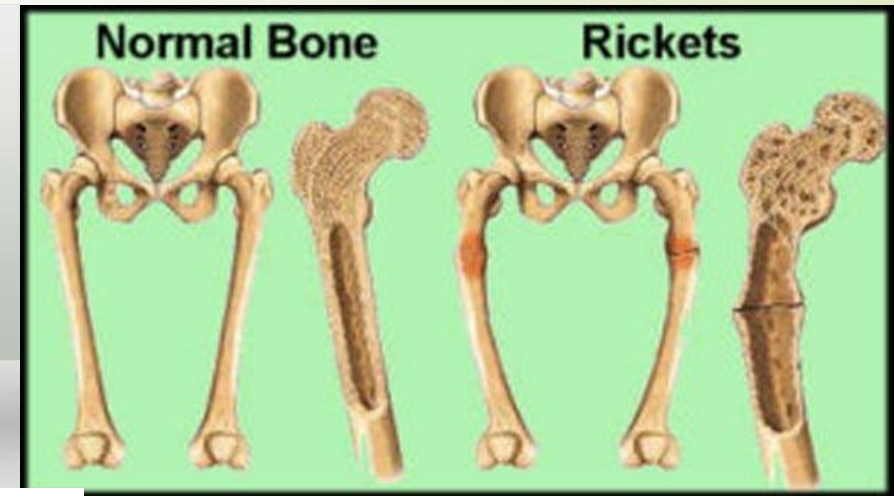
Key stages of bone remodelling cycle



Bone Remodeling

Clinical notes:

- Rickets
- Osteomalacia
- osteoporosis



Osteomalacia is softening of bones caused due to the deficiency of vitamin D

THANK YOU