Epiphyseal cartilage is divided into 5 zones:

- Resting zone – hyaline cartilage with typical chondrocytes
- Proliferative zone – chondrocytes divide rapidly forming columns of stacked cells parallel to long axis of bone
- Hypertrophic cartilage – swollen chondrocytes containing glycogen; hypertrophy compresses matrix into thin septa between chondrocytes
- Calcified cartilage zone – loss of chondrocytes by apoptosis accompanied by calcification of septa by formation of hydroxyapatite crystals
- Ossification zone – bone tissue first appears; capillaries and osteoprogenitor cells from periosteum invade cavities left by chondrocytes; osteoprogenitor cells form osteoblasts which deposit osteoid

Bone growth, remodelling and repair

- Osteogenesis and bone growth involve the partial resorption of bone tissue formed earlier, while simultaneously laying down new bone at a rate exceeding that of bone removal
- Osteoblasts and osteoclasts work in tandem to resorb and reform bone tissue; this allows the bone to be a dynamic tissue that is able to adopt to stresses exerted on the bone
The synovial membrane

- The synovial membrane (aka synovium) is the soft tissue found between the joint capsule and the joint cavity of synovial joints (diarthroses).
- The synovial membrane is concerned with the secretion of synovial fluid that must fill the synovial cavity to keep the cartilage of diarthroses joints friction-free and lubricated.

**Synovial Joint**

- The synovial membrane has two layers:
  - An outer layer (subintima) that can be made from almost any type of CT-fibrous, fatty or areolar.
  - The inner layer (intima) that consists of a sheet of cells thinner than a piece of paper; the intima layer is continuous with the edges of cartilage that surrounds the ends of the bones.
- The synovial membrane is characterized by the presence of 2 types of cells:
  - **Type A**
    - Macrophage like synovial cells
    - Derived from blood monocytes and remove wear-and-tear debris from the synovial fluid
    - Constitute about 25% of the cells lining the synovium
    - Regulate inflammatory events within diarthrotic joints

*Taken from Wikipedia.org, Synovial Joint, available at [https://en.wikipedia.org/wiki/Synovial_fluid](https://en.wikipedia.org/wiki/Synovial_fluid)*