

Cartilage	Hyaline cartilage Elastic cartilage Fibro cartilage	Cartilage cells	Chondrocytes Chondroblasts	Mature cells Active cells
	Bones	Shapes	Long bones Short bones Seasamoid bones Flat bones Irregulat bones	Humerus, femur Carpals, tarsals Patella Cranium, sternum Vertebrae
		Functions	Support Protection Movement Storage Hemopoiesis	Body, soft organs Brain, spinal cord, viscera At joints with the help of muscles Calcium, phosphorus Blood cell formation
		Consistency	Cmpact bone Soft bone	Dense, outer layer Inner layer, trabeculae
Bone structure	Long bone structure	Periosteum Endosteum Diaphysis Medullary cavity Epiphysis Epiphysial line Articular cartilage	Outer layer of bone Inner layer of bone Shaft Fatty (yellow) marrow Ends of bone, articulation, red marrow Remnants of growth plate Covers over epiphysis, reduces friction	
	Bone cells	Osteogenic cells Osteocytes Osteoblasts Osteoclasts	Developing cells Mature cells Bone forming cells Bone absorbing cells	
	Bone tissue	Haversian system (Osteons) Central canal Lamella Volkmann's canal Lacunae Osteoid Hydroxyapatite	Structural unit Blood vessels, nerves run thru Canals around central canal Canals connecting lamella Cavity containing osteocytes Bone matrix Bone mineral	
	Bone formation	Intramembranous ossification Endochondral ossification	Flat bones Long bones	
		Primary ossification	In diaphysis	
		Secondary ossification	In epiphysis	
		Epiphysial plate: where primary and secondary meet		

Bone and blood calcium balance

Calcium needed for	Nerve impulse transmission Muscle contraction Blood clotting
Osteoblast	Deposits bone minerals on bone
Osteoclast	Secretes lysosome and acids to breakdown and dissolve bone mineral hydroxyapatite and releases into blood
Parathyroid hormone	Increases blood calcium levels Increases osteoclast activity, resorbs calcium from bone and increases blood calcium levels
Calcitonin hormone (from thyroid gland)	Decreases blood calcium levels Removes calcium from blood and deposits on bone

Bone fractures	Simple	Complete fracture but the pieces are in place
	Compound	Complete fracture but pieces pulles out of place
	Communited	Fracture where bones have pierced the skin and are exposed
	Compressed	Vertebrae are compressed due to osteoporosis
	Depressed	Dents into the bone: hit on head with a blunt object
	Spiral	Breaks along a spiral
	Green stick	Outer layer is cracked
Fracture repair	Stage one	Hematoma formation
	Stage two	Fibrocartilage callus formation
	Stage three	Bony callus formation
	Stage four	Bone remodelling

Bone disease conditions

Osteomalacia	Mineral deficiency in adults leading to bone deformity
Rickets	Mineral deficiency in children leading to bone deformity
Osteoporosis	Bone resorption leading to porous and fragile bones
Osteomyelitis	Bacterial infection of bones
Osteoarthritis	Wasting of bone and cartilage at joints leading to pain