Skeletal System

Study Sheet · Learn It with Prof. Melanie

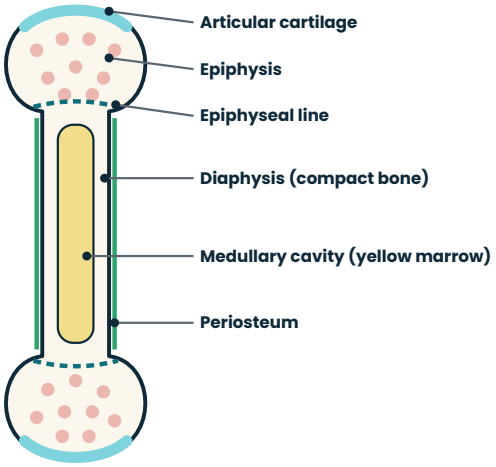
1 Functions and Bone Types

- **Functions:** support, protection, movement, mineral storage (calcium, phosphorus), blood cell production (red marrow), fat storage (yellow marrow)
- **206 bones:** 80 axial, 126 appendicular

Type	Examples
Long	Femur, humerus, phalanges
Short	Carpals, tarsals
Flat	Sternum, ribs, scapula, most skull bones
Irregular	Vertebrae, some facial bones
Sesamoid	Patella (forms in a tendon)

Bone cells: osteo**b**lasts **b**uild · osteo**c**lasts **c**arve away · osteocytes maintain

2 Parts of a Long Bone



Spongy bone at the ends holds **red marrow**; the epiphyseal **plate** is where children's bones grow longer.

3 Axial Skeleton

Area	Key bones and facts
Cranium (8)	Frontal, 2 parietal, 2 temporal, occipital, sphenoid, ethmoid
Face (14)	Maxilla, mandible (only movable skull bone), zygomatic, nasal
Ribs (12 pairs)	True 1–7 · false 8–12 · floating 11–12
Sternum	Manubrium, body, xiphoid process
Other	Sutures (immovable skull joints), fontanels (infant soft spots), hyoid (touches no other bone)

7 Cervical	**12** Thoracic	**5** Lumbar	**1** Sacrum (5 fused)	**1** Coccyx

Hoots' tip: Breakfast at **7**, lunch at **12**, dinner at **5**: cervical, thoracic, lumbar.

4 Appendicular Skeleton

Region	Bones	Region	Bones
Shoulder girdle	Clavicle (collarbone), scapula (shoulder blade)	**Pelvic girdle**	Hip bones: ilium, ischium, pubis
Upper arm	Humerus	**Thigh / knee**	Femur (longest), patella (kneecap)
Forearm	Radius (thumb side), ulna (olecranon)	**Lower leg**	Tibia (shin, weight-bearing), fibula
Wrist / hand	8 carpals, 5 metacarpals, 14 phalanges	**Ankle / foot**	7 tarsals (calcaneus = heel), 5 metatarsals, 14 phalanges

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5 Joints

Fibrous immovable (sutures) · **Cartilaginous** slightly movable (discs, pubic symphysis) · **Synovial** freely movable

Synovial joint	Examples
Ball-and-socket	Shoulder, hip
Hinge	Elbow, knee, fingers
Pivot	Atlas and axis
Saddle	Base of the thumb
Condyloid	Wrist, knuckles
Gliding	Between carpals

Ligament bone to bone · **Tendon** muscle to bone · **Bursa** fluid sac

6 Movements

Movement	Opposite
Flexion (bend)	**Extension** (straighten)
Abduction (away)	**Adduction** (toward midline)
Supination (palm up)	**Pronation** (palm down)
Dorsiflexion (toes up)	**Plantar flexion** (toes down)
Inversion (sole in)	**Eversion** (sole out)

Rotation turning on an axis · **Circumduction** moving in a circle

7 Fractures



Transverse straight across

Oblique slanted

Spiral twisting force

Comminuted 3+ pieces

Greenstick incomplete; children

Open (compound) through the skin

Closed (simple) skin intact · **Compression** collapsed vertebra · **Impacted** ends driven together · **Pathologic** diseased bone · **Colles** distal radius. **Reduction** realigns; **ORIF** = open reduction, internal fixation.

8 Disorders and Tests

Disorder	Key facts	Disorder	Key facts
Osteoporosis	Low bone density; DEXA scan	**Scoliosis**	Sideways curve
Osteoarthritis	Wear and tear of cartilage	**Kyphosis**	Hunchback (upper back)
Rheumatoid arthritis	Autoimmune; synovial membrane	**Lordosis**	Swayback (lower back)
Gout	Uric acid crystals; big toe	**Sprain / strain**	Ligament / muscle or tendon
Osteomyelitis	Bone infection	**Osteomalacia**	Soft bones; low vitamin D

9 Word Parts

Part	Meaning	Part	Meaning
oste/o	Bone	**cost/o**	Rib
arthr/o	Joint	**spondyl/o**	Vertebra
chondr/o	Cartilage	**myel/o**	Marrow, spinal cord
crani/o	Skull	**-malacia**	Softening

10 MA Skills

- **Casts:** check circulation, sensation, movement; report numbness or color change; keep dry
- **Crutches:** 1½–2 in. below armpit; weight on hands
- **RICE:** Rest, Ice, Compression, Elevation
- **X-ray:** remove metal; ask about pregnancy

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