

Calcium balance (9-11mg/100mL)

-Falling blood Ca^{2+} -> parathyroid releases PTH, increases blood PTH -> stimulates osteoclasts to degrade bone matrix and release Ca^{2+} into blood

-Major hormones are calcitriol (activated vit D), PTH, and calcitonin

Fractures

Closed	Impacted
Open	Depressed
Incomplete	Linear
Complete	Transverse
Greenstick	Oblique
Hairline	Spiral
Comminuted	Non-displaced
Displaced	

Fracture healing

- (1) Haematoma forms
- (2) Fibrocartilaginous callous
- (3) Bony callus forms
- (4) Bone remodeling

- Activation
- Resorption (osteoclasts)
- Formation (osteoblasts)

Carpals

Trapezium	Trapezoid	Scaphoid	Hamate	Capitate
Pisiform	Triquetrum	Lunate		

Vertebra

Cervical- 7
Thoracic- 12
Lumbar- 5
Sacral- 5 fused
Coccyx- 4 fused

Joints

- Synovial (most upper + lower limbs, OA & RA)
- Fibrous
- Cartilaginous

Synovial joints

- Joint capsule supported by ligaments
- Joint cavity (contains synovial fluid)
- Articular cartilage covering the ends of the bones (important for OA)
- Synovial membrane secretes synovial fluid (important for RA)

Sprains and strains

Sprains affect *ligaments*; commonly knee, ankle, wrist, elbow; 1st-3rd degree

Strains affect *muscles*; microscopic, partial, full tear

Osteomalacia and rickets

- Due to vitamin D deficiency, soft bones not rigid; adult disease
- Hypocalcaemia and hypophosphatemia
- Child homologue to osteomalacia is rickets- irregular broad growth plates

Osteoporosis

- Common metabolic bone disease
- Bones become porous, easily fractured
- Common sites hip, wrist, vertebra- neck of femur, trochanteric

Osteomyelitis

- Serious bone infection, most often bacterial
- Exogenous* from soft tissue to bone ie open fracture
- Endogenous* through the bloodstream from another infection
- More common in males, infants, children and elderly

Osteoarthritis

- Degenerative joint disease, age related disorder of synovial joints
- Loss of articular cartilage (ends of bones in synovial joints, acts as shock absorber and protect bones)
- New bone formations (osteophytes) on joint margins
- More degeneration than repair (chondrocytes can't keep up)

Rheumatoid arthritis

- Systemic non infectious inflammatory auto immune disease
- Affects synovial membrane first (secretes synovial fluid)- followed by articular cartilage, fibrous joint capsule and ligaments)
- 1-2% adults, females 3:1, 30-40yrs
- Fingers and feet most affected- *metacarpophalangeal*