Introduction to Orthopaedics

Orthopedic Surgery = Not only Bone Surgery

- Orthopedic specialty is the branch of medicine which manage trauma and disease of Musculoskeletal system

- It includes : bones, muscles, tendons, ligaments, joints, peripheral nerves, vertebral column and spinal cord and its nerves

Orthopedic Specialty

- Sub-Specialties in orthopedic include :
  - General
  - Pediatric Orthopedic
  - Sport and Reconstructive Orthopedic
  - Orthopedic Trauma
  - Arthroplasty
  - Spinal Surgery
  - Foot and Ankle surgery
  - Oncology
  - Hand Surgery
  - Upper Limb (New)

Red Flags

- Red Flags = Warning Symptom or Sign
- Red flags should always be looked for and remembered
- Presence of a red flag means the necessity for urgent or different action/intervention

Examples of Red Flags

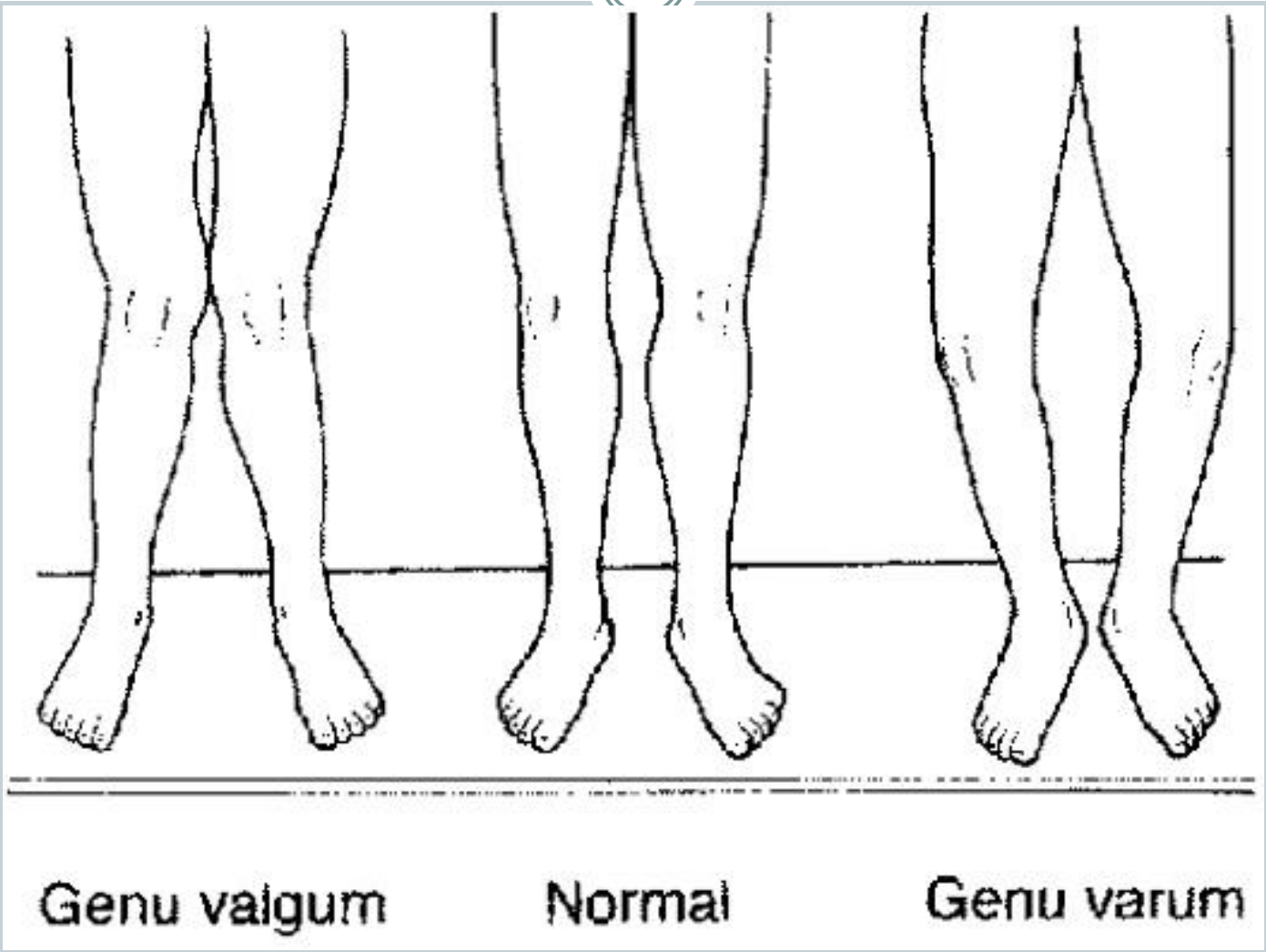
- Open Fractures : more serious and very high possibility of infection and complications
- Complicated Fractures : fracture with injury to major blood vessel, nerve or nearby structure
- Compartment Syndrome : increase in intra-compartment pressure which endangers the blood circulation of the limb and may affect nerve supply
- Cauda Equina Syndrome : compression of the nerve roots of the Cauda Equina at the spinal canal which affect motor and nerve supply to lower limbs and bladder (also saddle or peri-anal area)

Examples of Red Flags

- Infection of Bone, Joint and Soft Tissue
  Osteomyelitis : Infection of the bone
  Septic Arthritis :Infection of the joint
  Cellulitis :spreading Infection of the soft tissue
  May cause septicemia or irreversible damage

. Multiple Trauma or Pelvic Injury: more than one fracture or injury sustained at the same time
  consider massive blood loss and associated injuries
. Acute joint Dislocations : requires urgent reduction or may cause serious complications

Alignment terminology



Alignment Terminology: Cubitus Varus

Alignment terminology: Cubitus Valgus

Congenital or Acquired

- Acquired conditions include :
  - **Trauma**
  - **Developmental**
  - **Inflammation**
  - **Infection**
  - **Neuromuscular**
  - **Degenerative**
  - **Metabolic**
  - **Tumor**

Congenital Anomaly : Talipes Equino Varus TEV

Traumatic Injuries

- Fractures
- Dislocations
- Soft tissues injuries: ligaments, tendons
- Nerve injuries
- Epiphyseal injuries

Fractures: Break in the continuity of bone

Fig. 1 Complete fracture

Fig. 2 Incomplete fracture

Dislocations

Complete separation of the articular surface

Distal to proximal fragment

Anterior, Posterior, Inferior, Superior

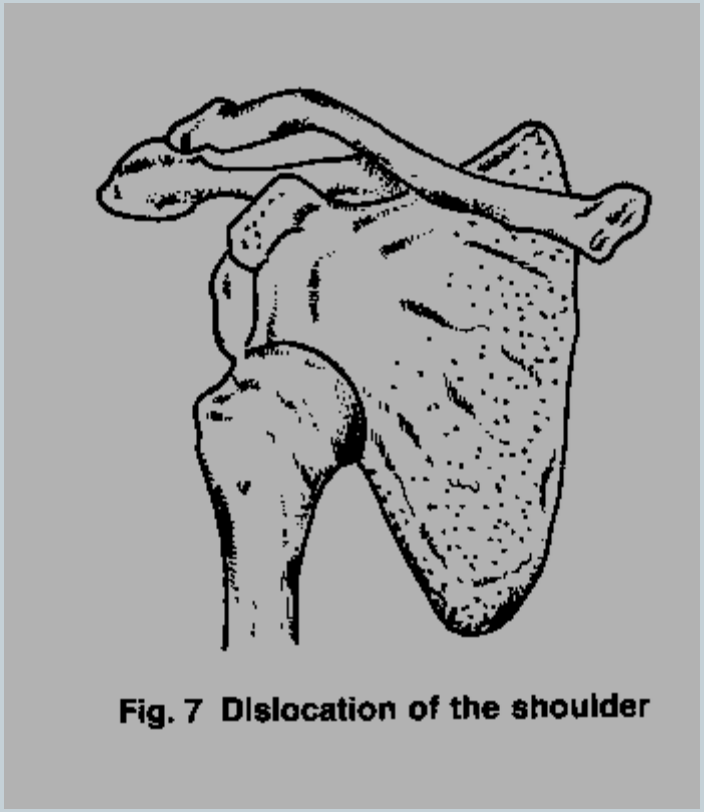


Fig. 7 Dislocation of the shoulder

Fracture Dislocation

Dislocation with fracture of the bone

Always X-Ray Joint Above and Below

Avulsion Fracture

Force due to Resisted Muscle Action:-

"Avulsion"

Transverse pattern

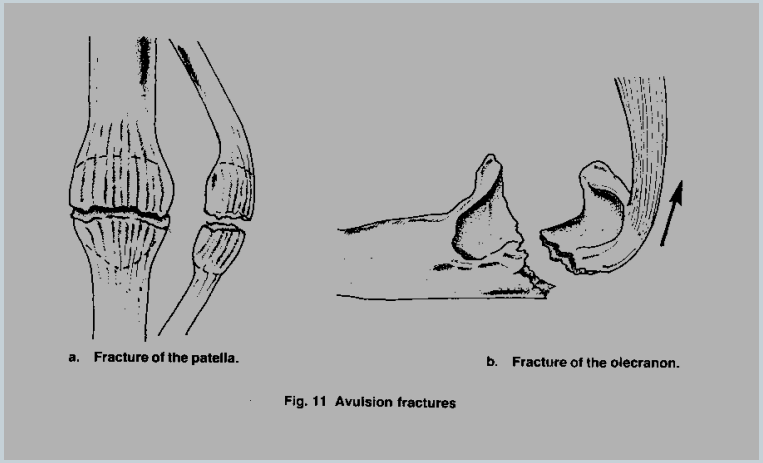


Fig. 11 Avulsion fractures

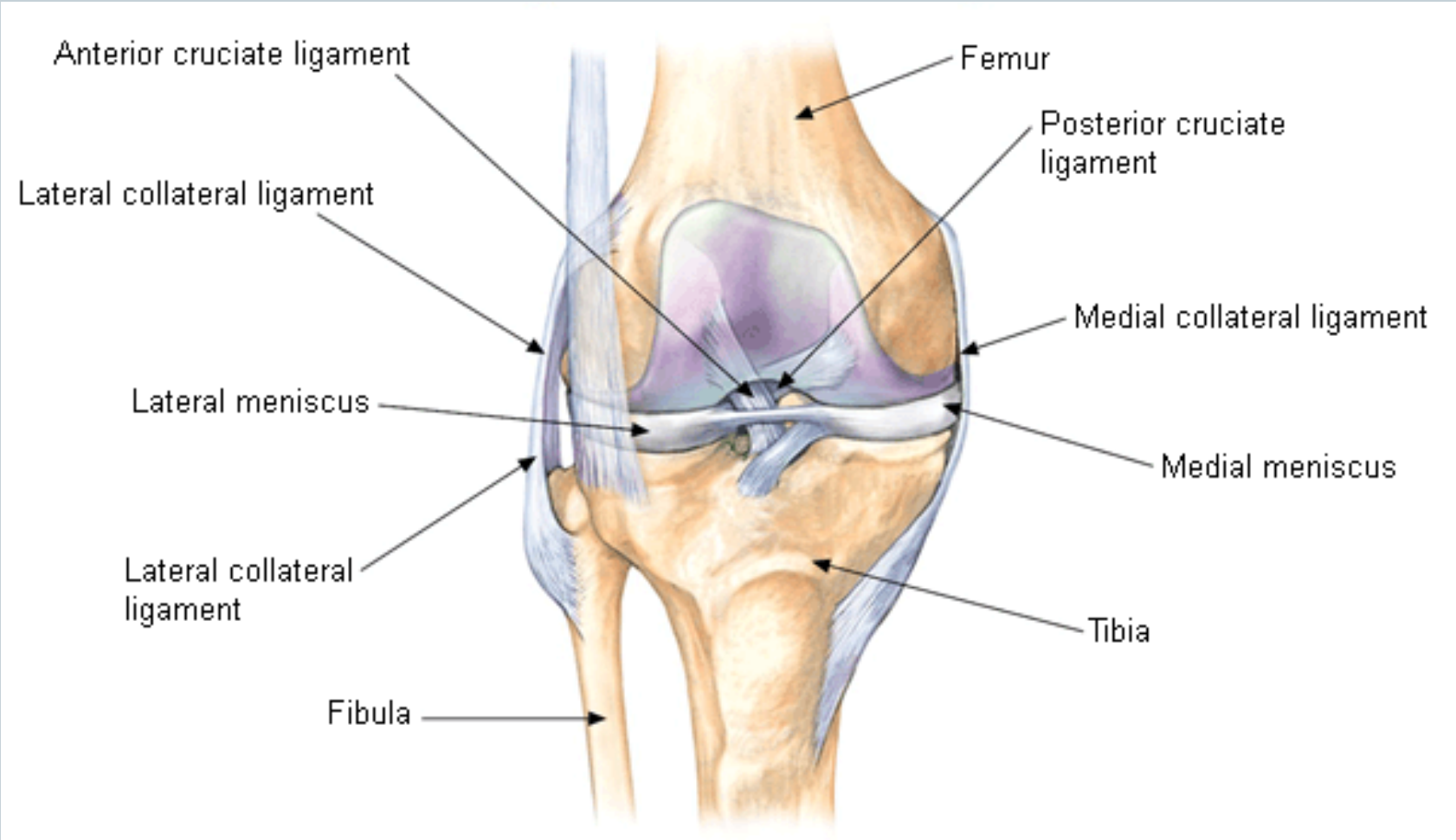
Intra-articular Fractures

- If displaced ; should always be treated by ORIF=

  Open Reduction and Internal Fixation

  failure to reduce and fix such fracture results in loss of function, deformity and early degenerative changes

Soft tissue injuries of the knee

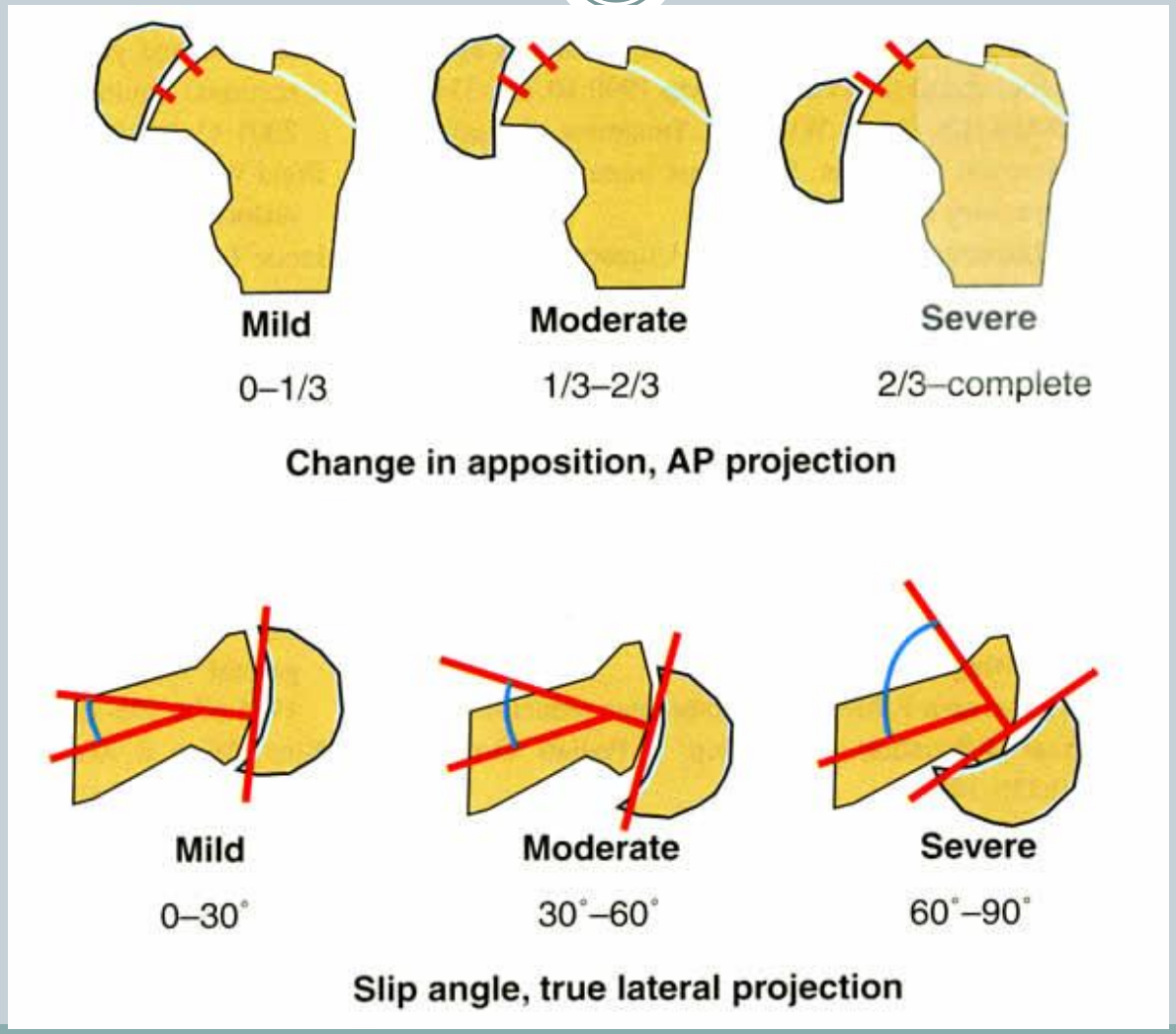


Anterior Cruciate Ligament injury: MRI

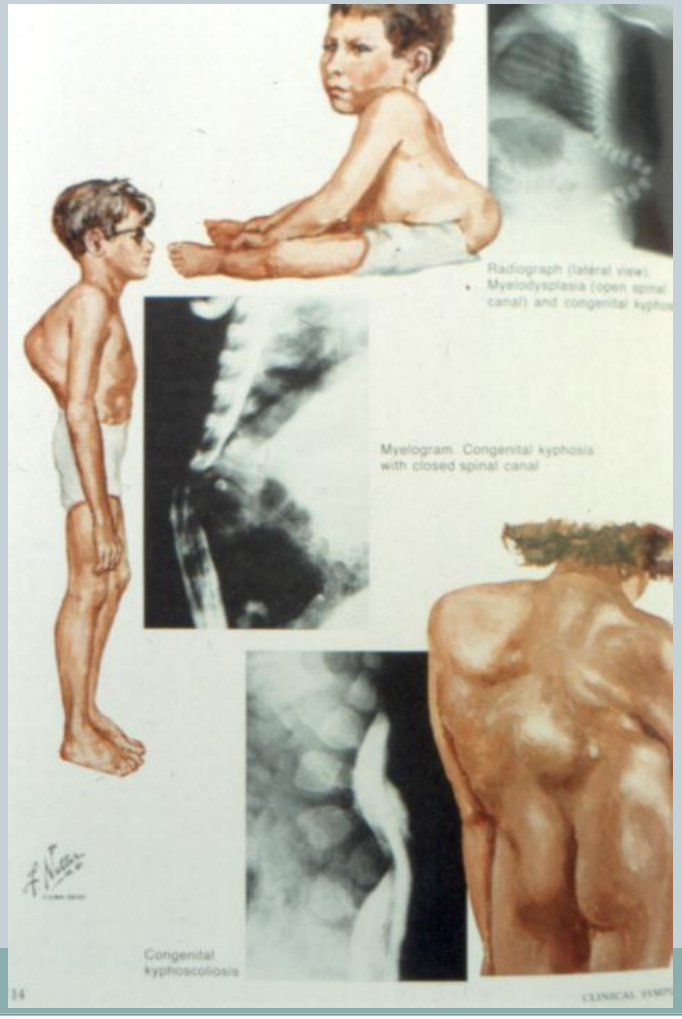
(Developmental Dislocation of Hip) DDH

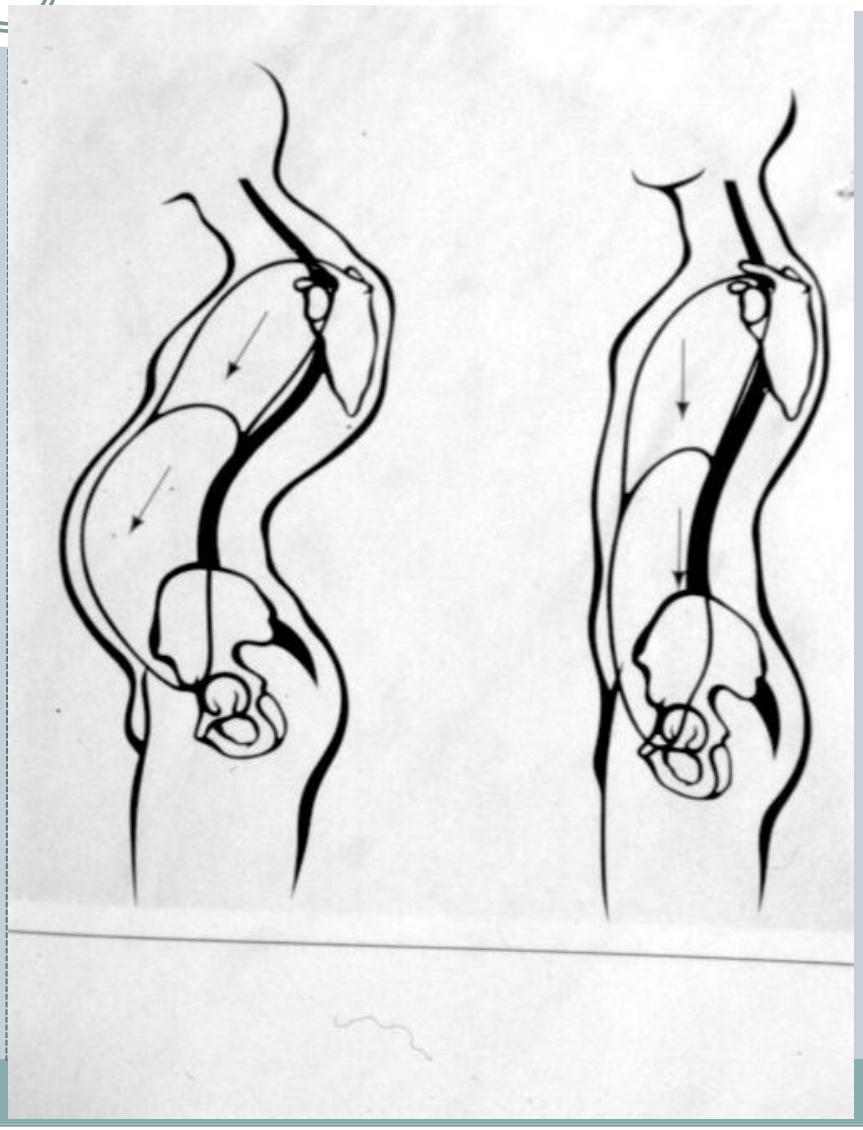
Developmental Foot deformity: Hallux Valgus

Developmental: SCFE (Slipped Capital Femoral Epiphysis)

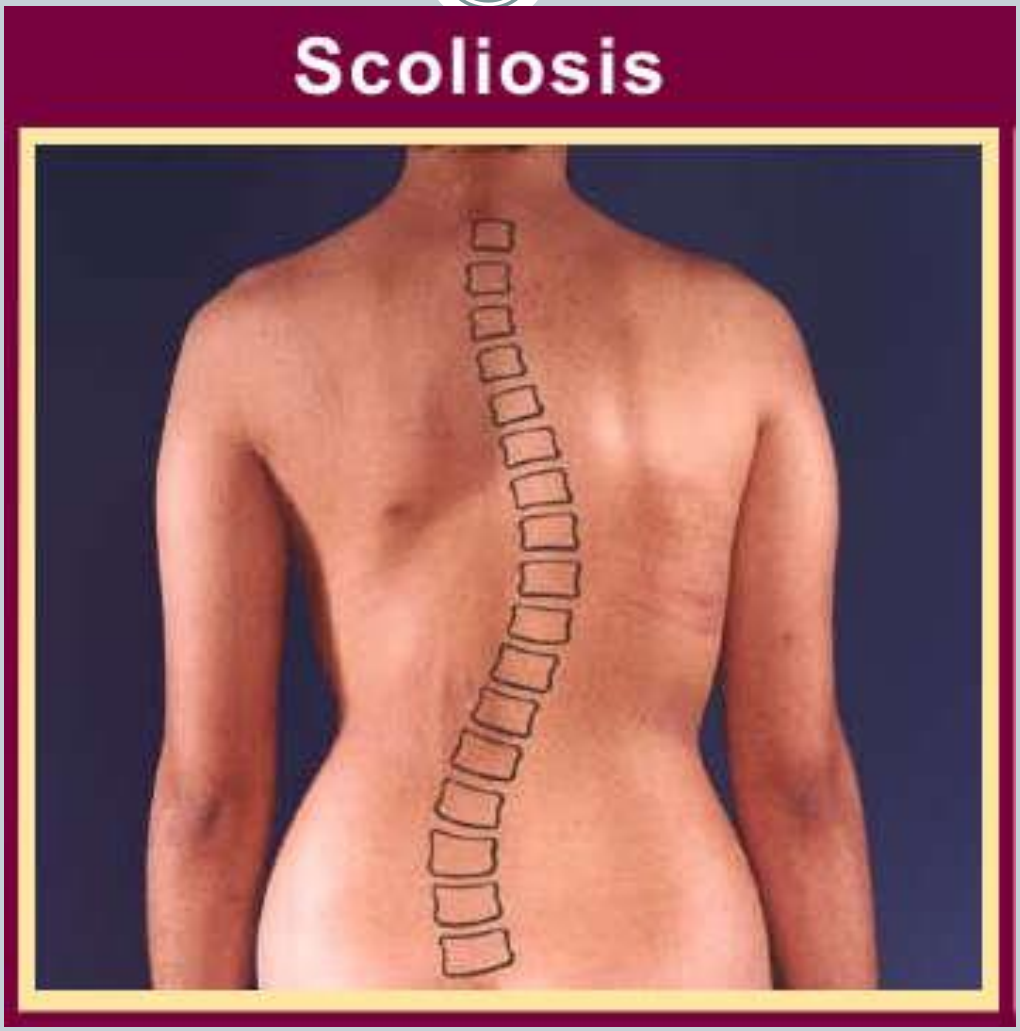


Spinal Deformities: Kyphosis or Hyperlordosis





Spinal Deformity: Scoliosis



Degenerative Disorders

- Occur at any joint
- Can be primary or secondary
- Can lead to pain and/or deformity and/or loss of function

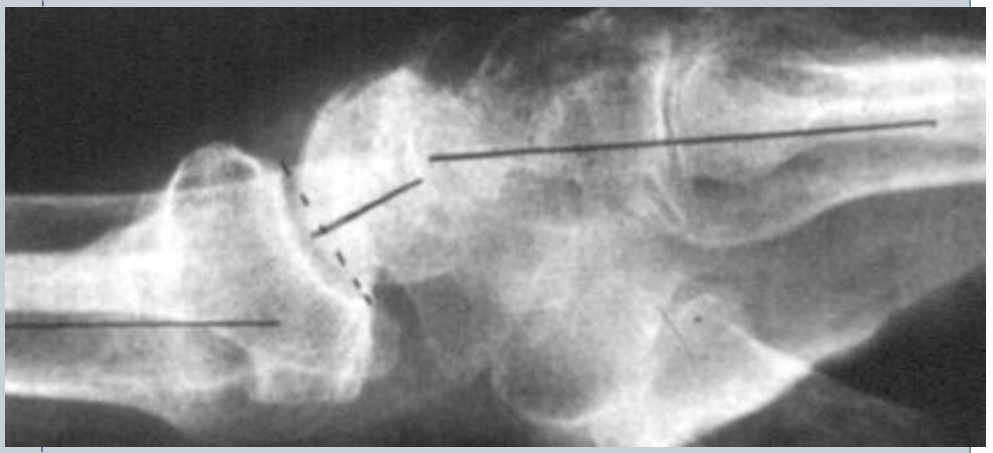
OA Hip

Osteoarthritis of Knee

Metabolic Disorders (Rickets): Bow Legs

Osteoporosis: Pathological Fracture

Osteoporosis: Colles fracture

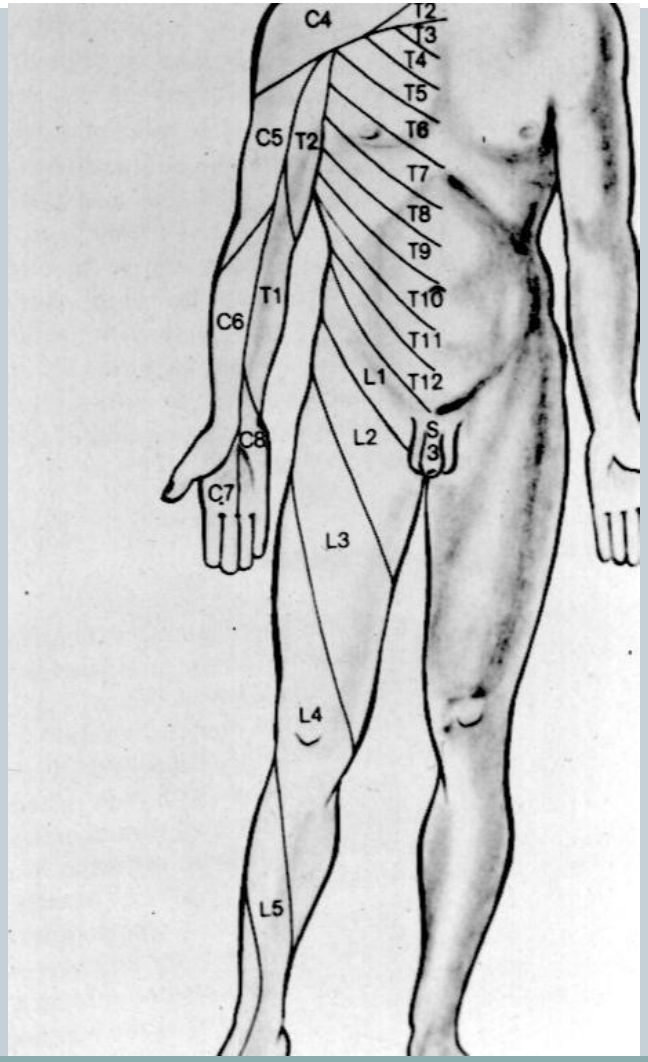


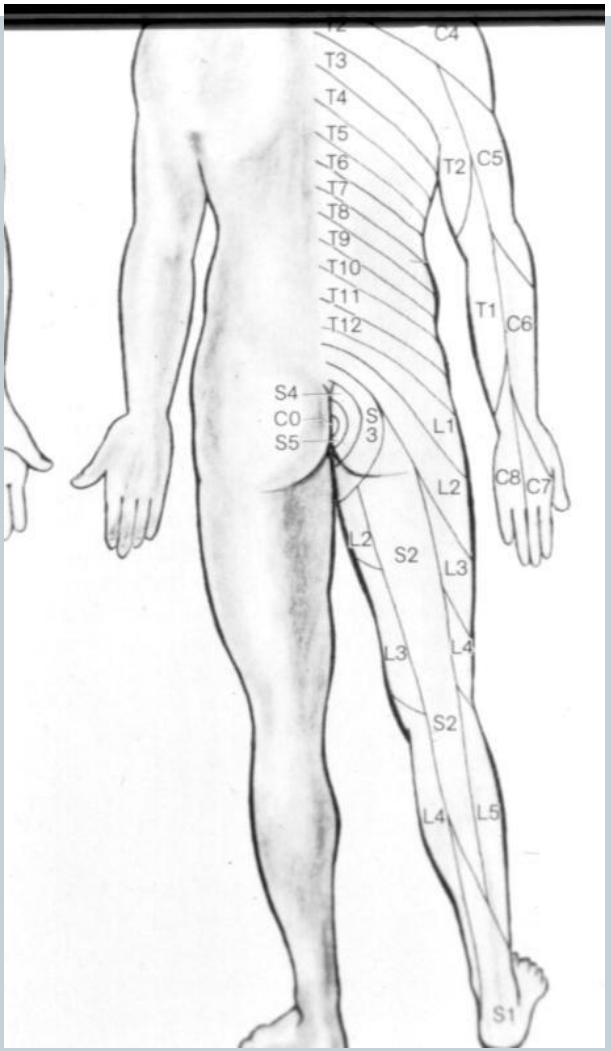
Bone Tumors

Bone Tumor

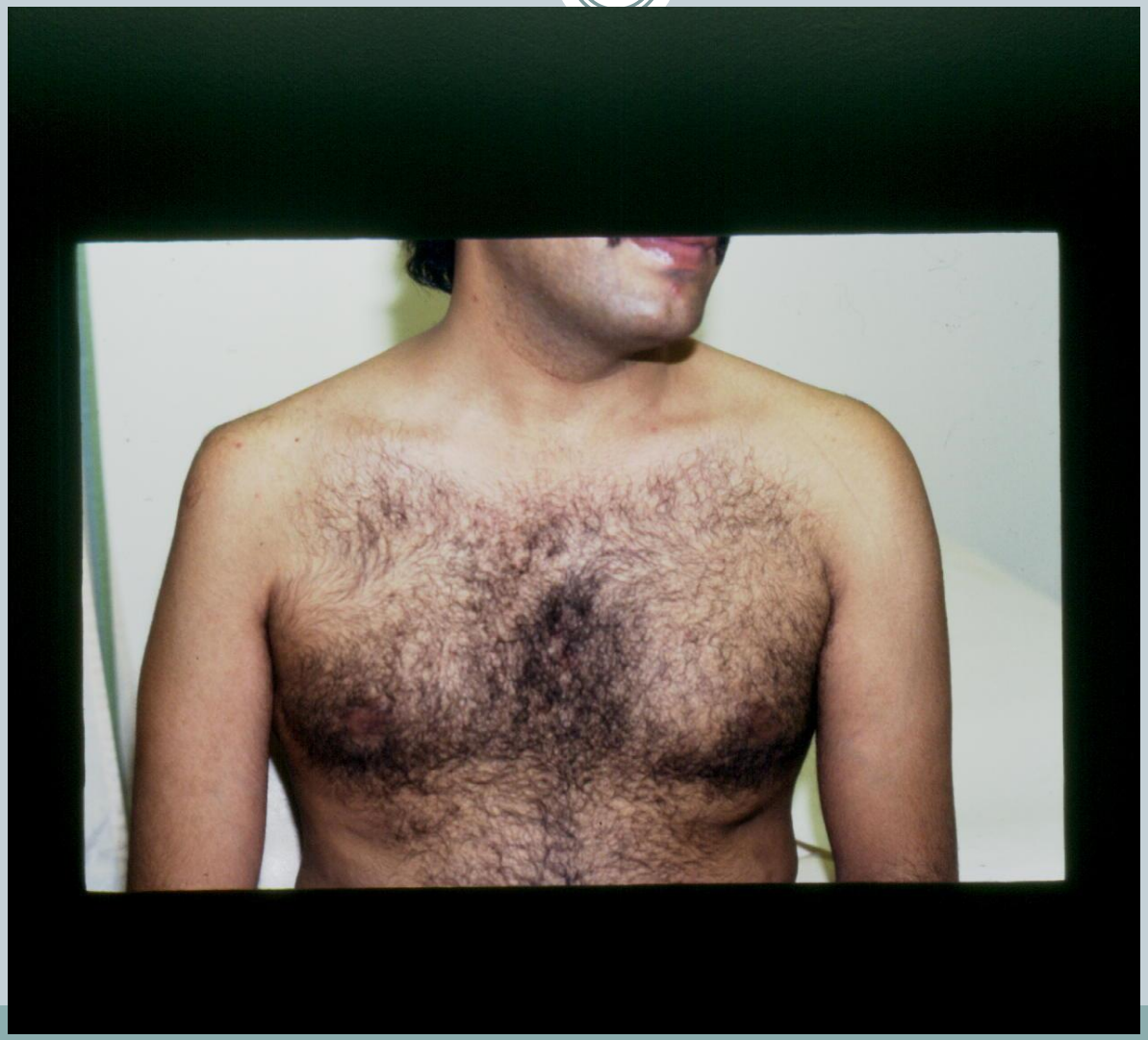
Bone tumors

Neurological Evaluation : Sensory & Motor





Nerve Injury: Muscle wasting



Spinal Cord Injury

- Often results from fracture dislocation of spine
- When injury is at cervical spine it may result in Tetraplegia
- Injury at dorsal spine may result in Paraplegia

Neuromuscular disorder: Polio

Chronic Osteomyelitis : discharging sinus

Chronic Osteomyelitis : Sequestrum

Physiotherapy for Orthopedic Patients

- Physiotherapy is an important part of orthopedic and trauma management
- It is used for : pain relief, prevention of stiffness, muscle strengthening, mobilisation of stiff joint or spine, training non-weight bearing or partial weight bearing
- Physiotherapy modalities include: heat, cold, exercise, ultrasound, traction, electrical stimulation

Clinical Skill: Cast application

Clinical Skills: Knee Aspiration