

# 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

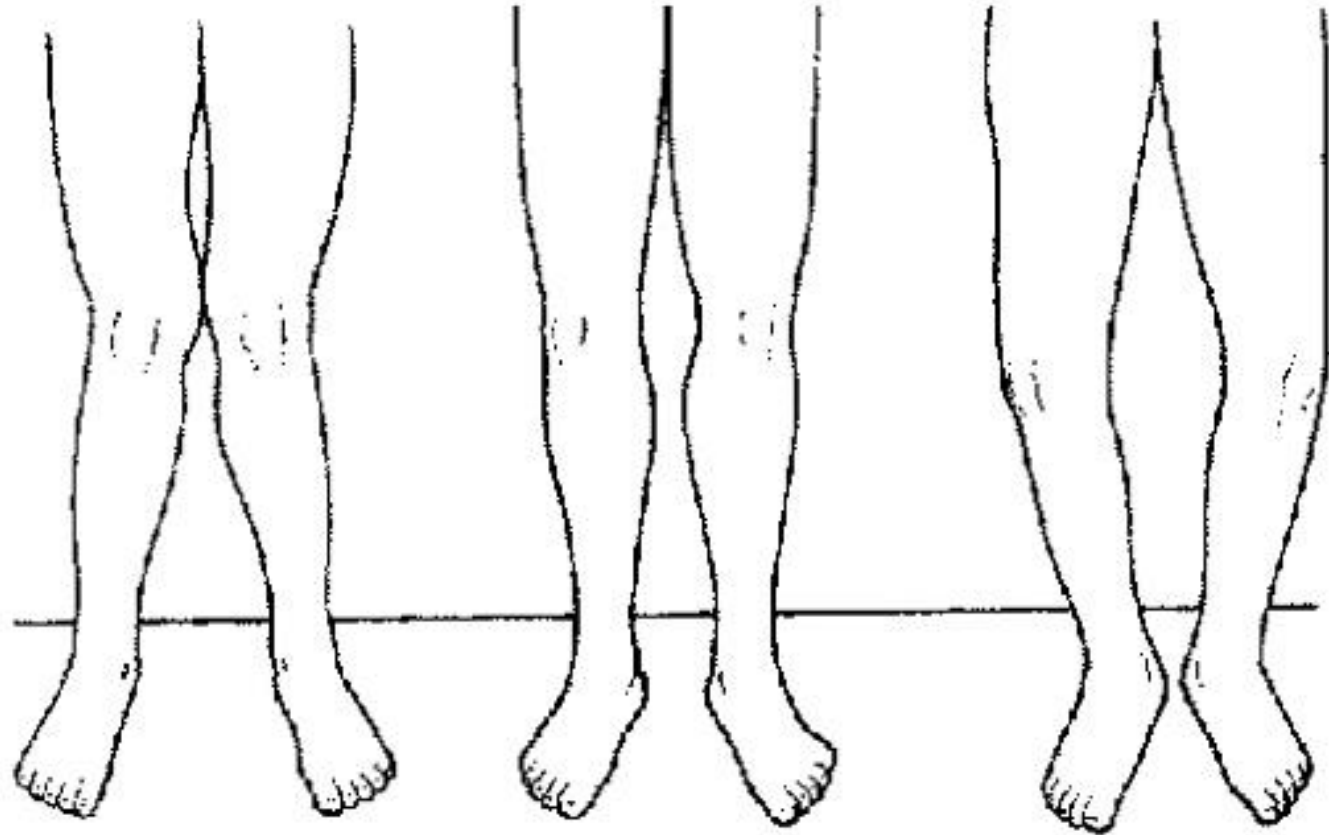
May cause septicemia or irreversible damage

- . **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



**Genu valgum**

**Normal**

**Genu varum**

# Alignment Terminology: Cubitus Varus



Se:8477  
Im:1

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MAHMUOD SAMI ABDULAL MOHAMMED  
Study Date:05/01/1426  
Study Time:03:10:07  
MRN:767839



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# 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**

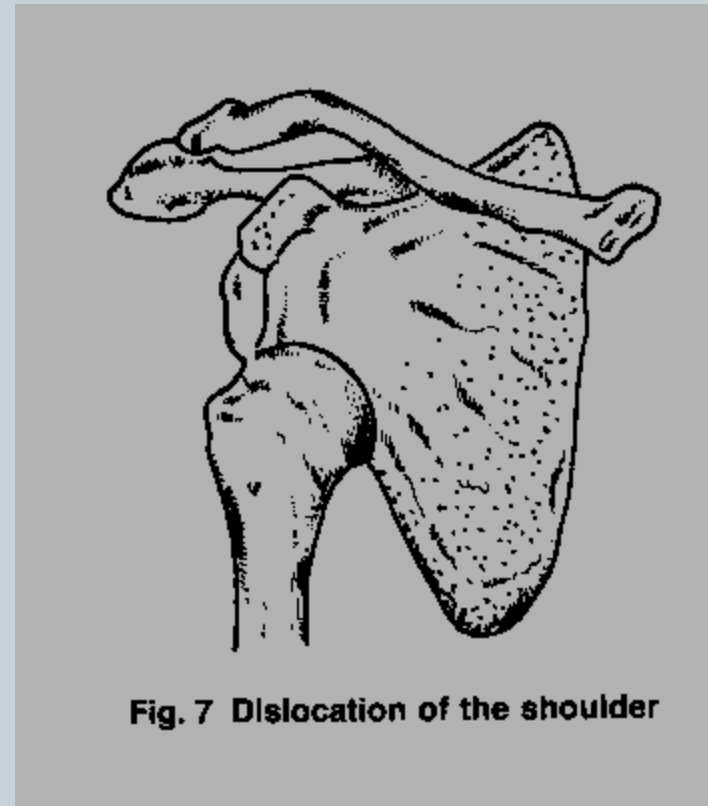
# Dislocations



**Complete  
separation of the  
articular surface**

**Distal to proximal  
fragment**

**Anterior, Posterior, Inferior,  
Superior**



# Fracture Dislocation



Dislocation with fracture of  
the bone



**Always X-Ray Joint  
Above and Below**

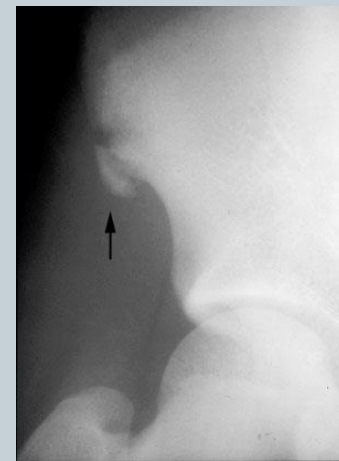
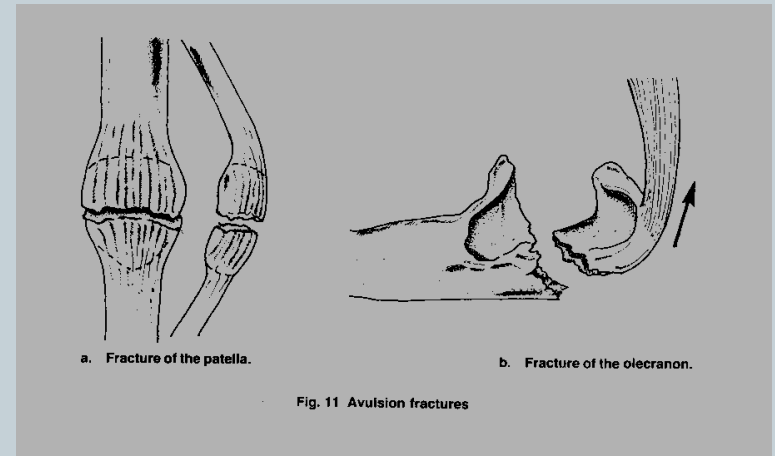


# Avulsion Fracture



**Force due to  
Resisted Muscle  
Action:-**

**“Avulsion”  
Transverse pattern**



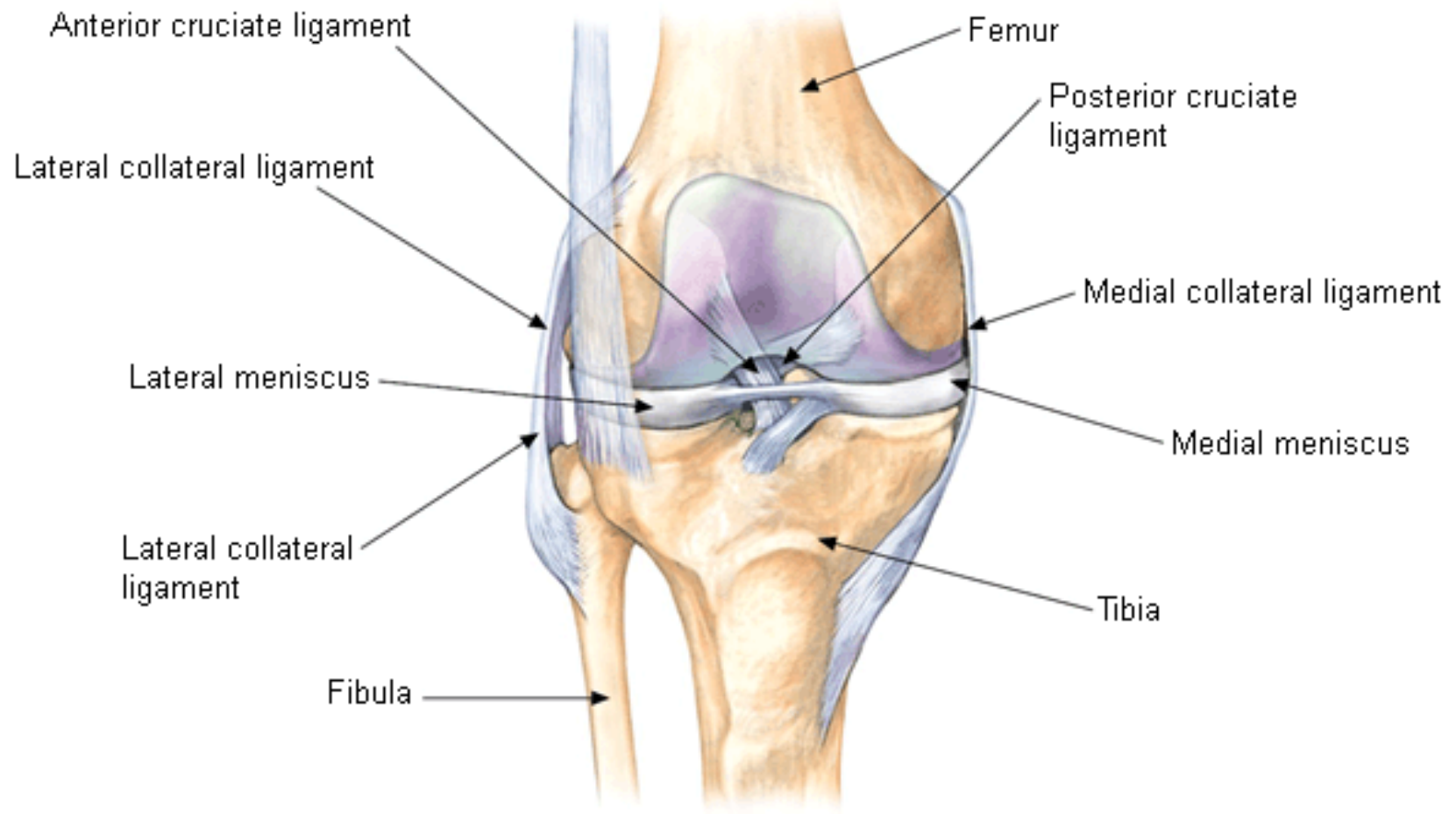


# Intra-articular Fractures

- 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



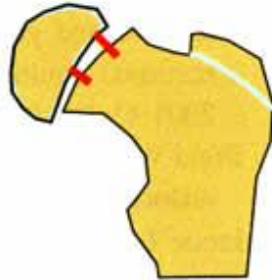
# (Developmental Dislocation of Hip) DDH



# Developmental Foot deformity: Hallux Valgus



# Developmental: SCFE (Slipped Capital Femoral Epiphysis)



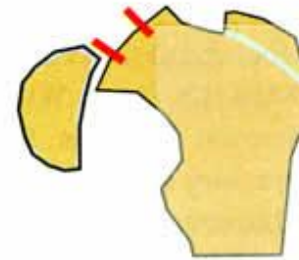
**Mild**

0–1/3



**Moderate**

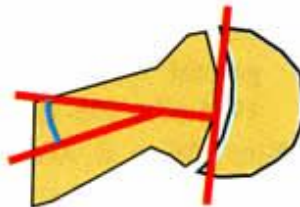
1/3–2/3



**Severe**

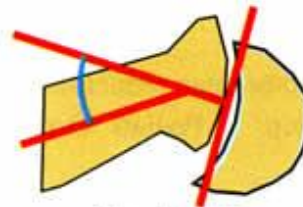
2/3–complete

**Change in apposition, AP projection**



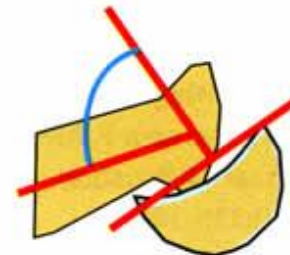
**Mild**

0–30°



**Moderate**

30°–60°



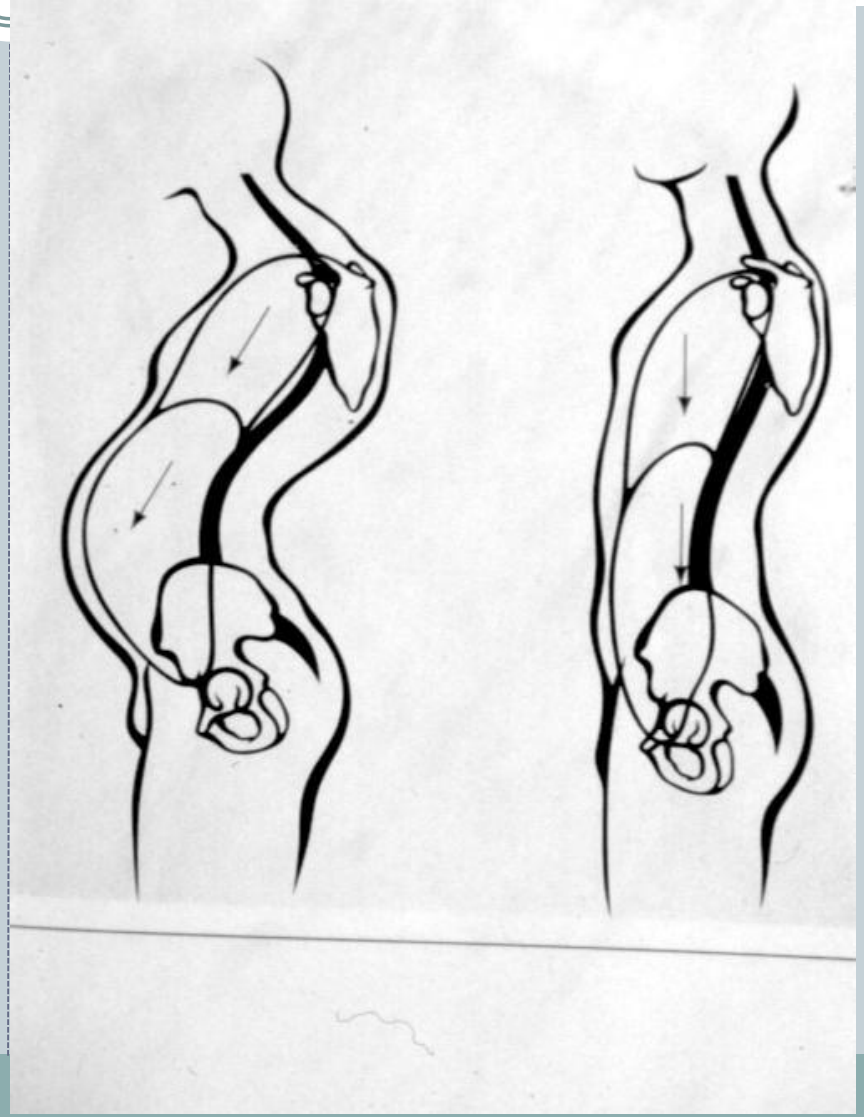
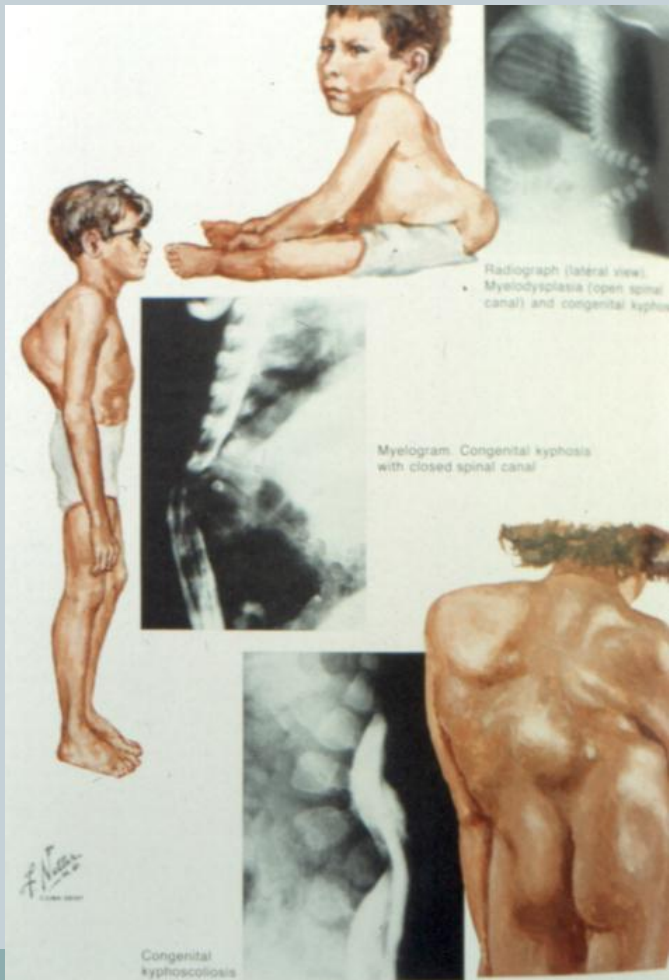
**Severe**

60°–90°

**Slip angle, true lateral projection**



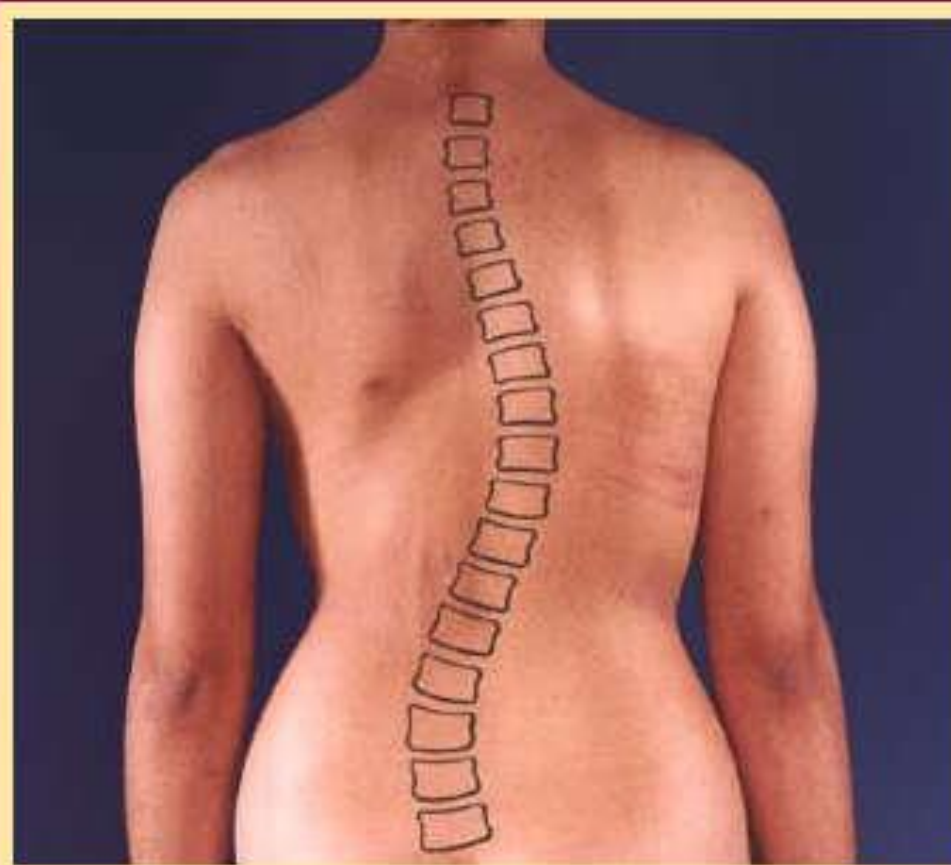
# Spinal Deformities: Kyphosis or Hyperlordosis



# Spinal Deformity: Scoliosis



## 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



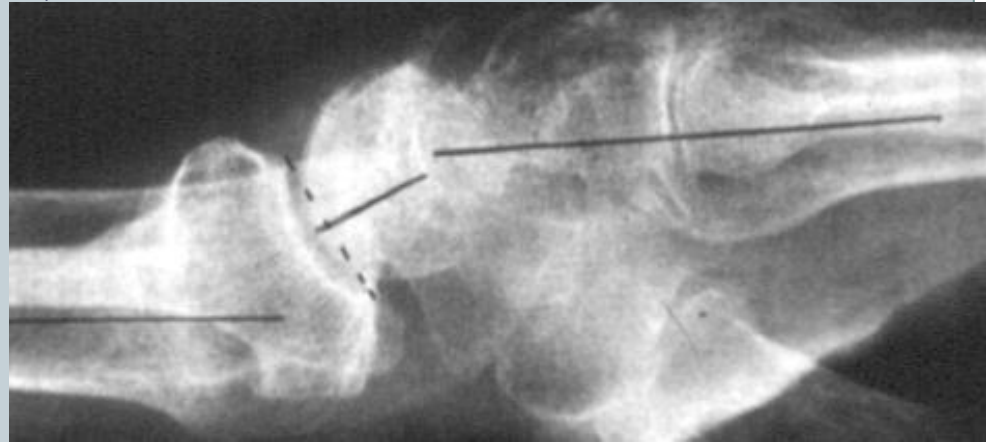
# Metabolic Disorders (Rickets): Bow Legs



# Osteoporosis: Pathological Fracture



# Osteoporosis: Colles fracture



# Bone Tumors



# Bone Tumor

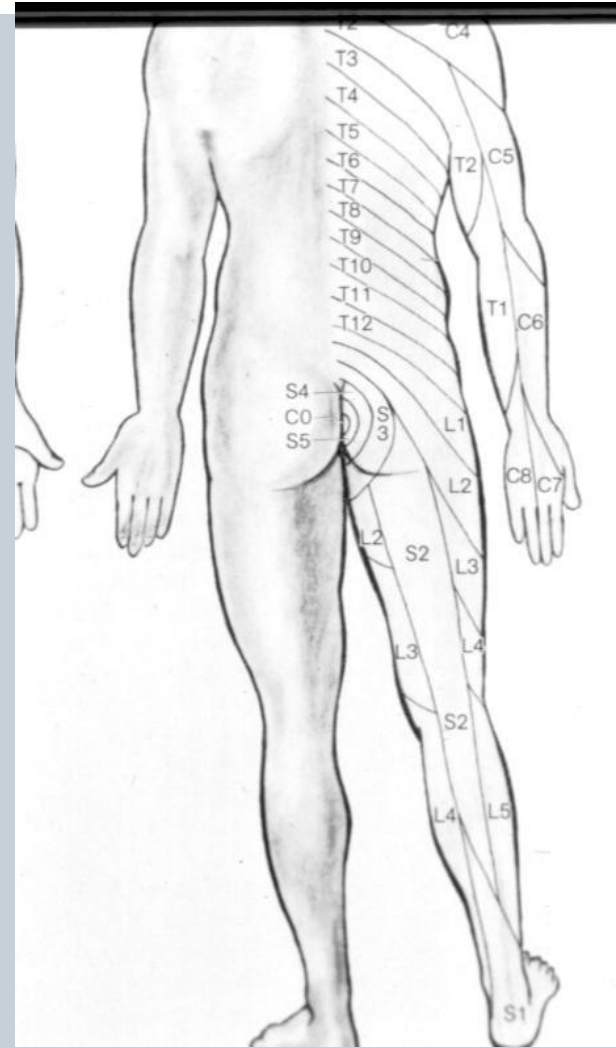
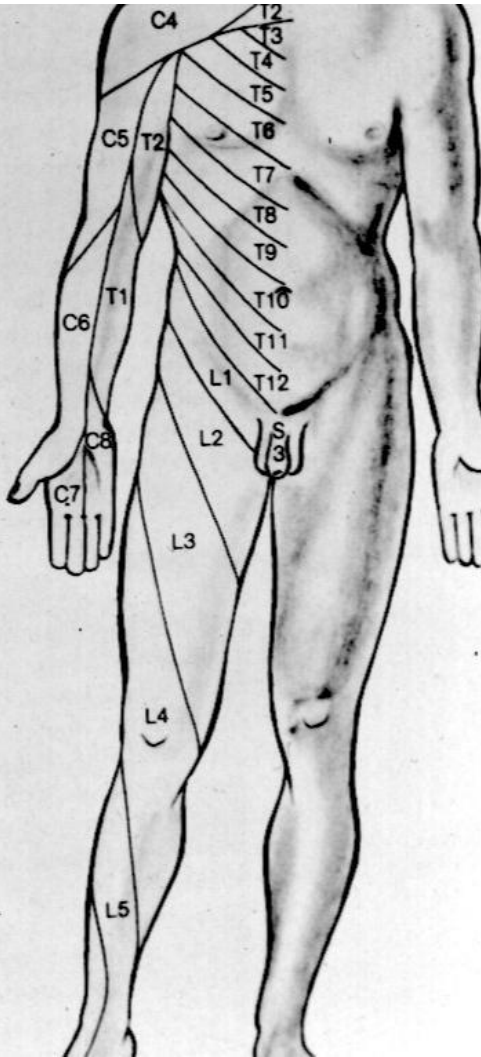




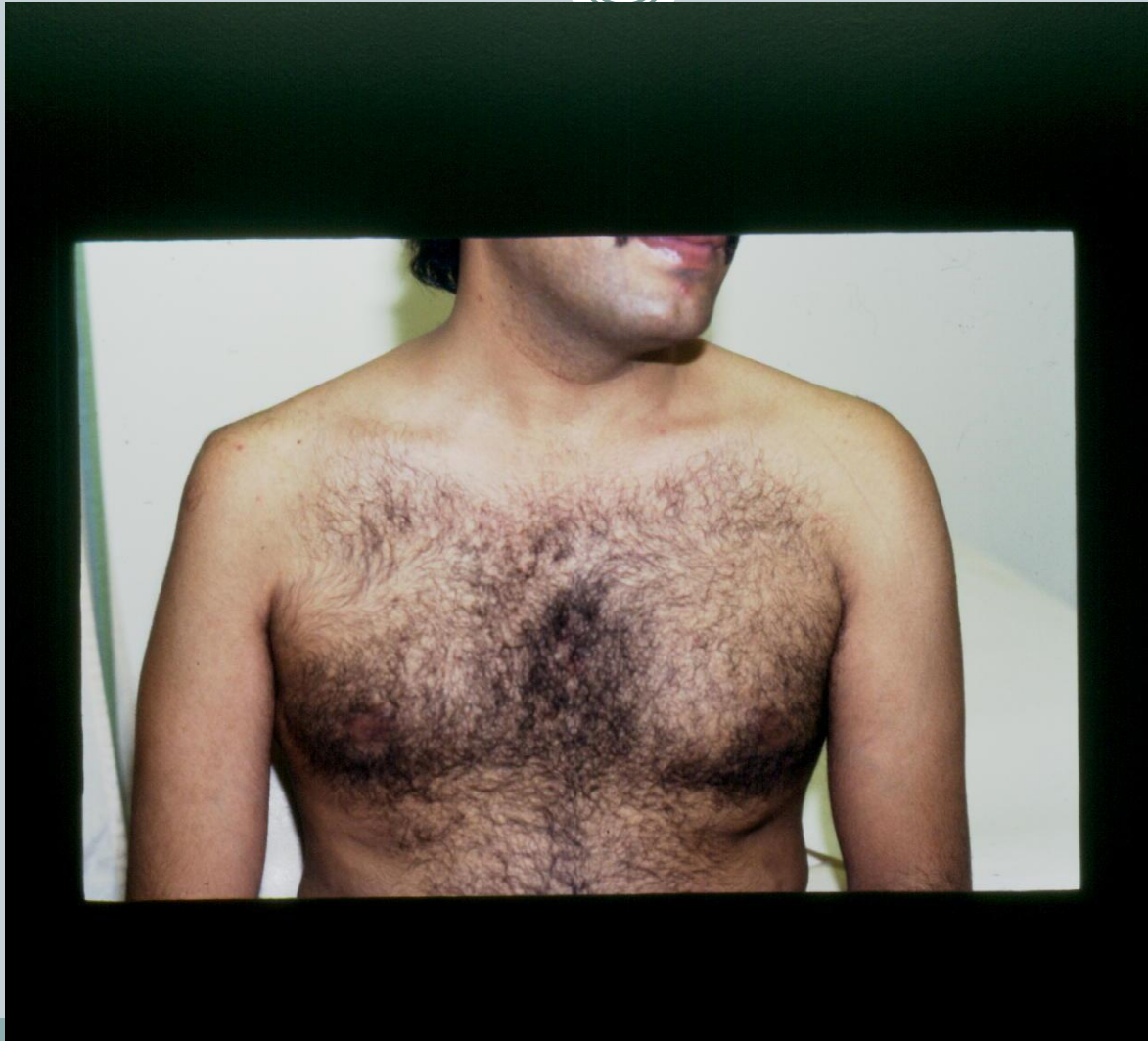
# Bone tumors



# Neurological Evaluation : Sensory & Motor



# Nerve Injury: Muscle wasting

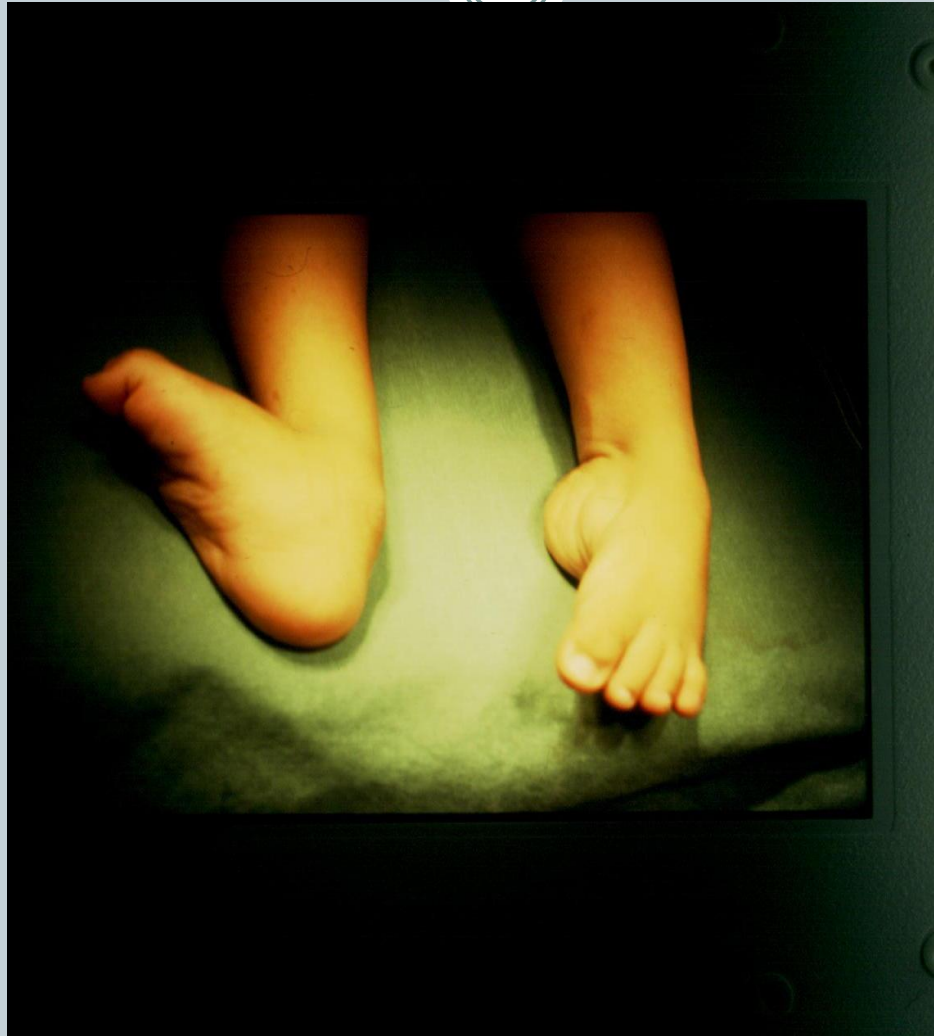


# Spinal Cord Injury



- 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

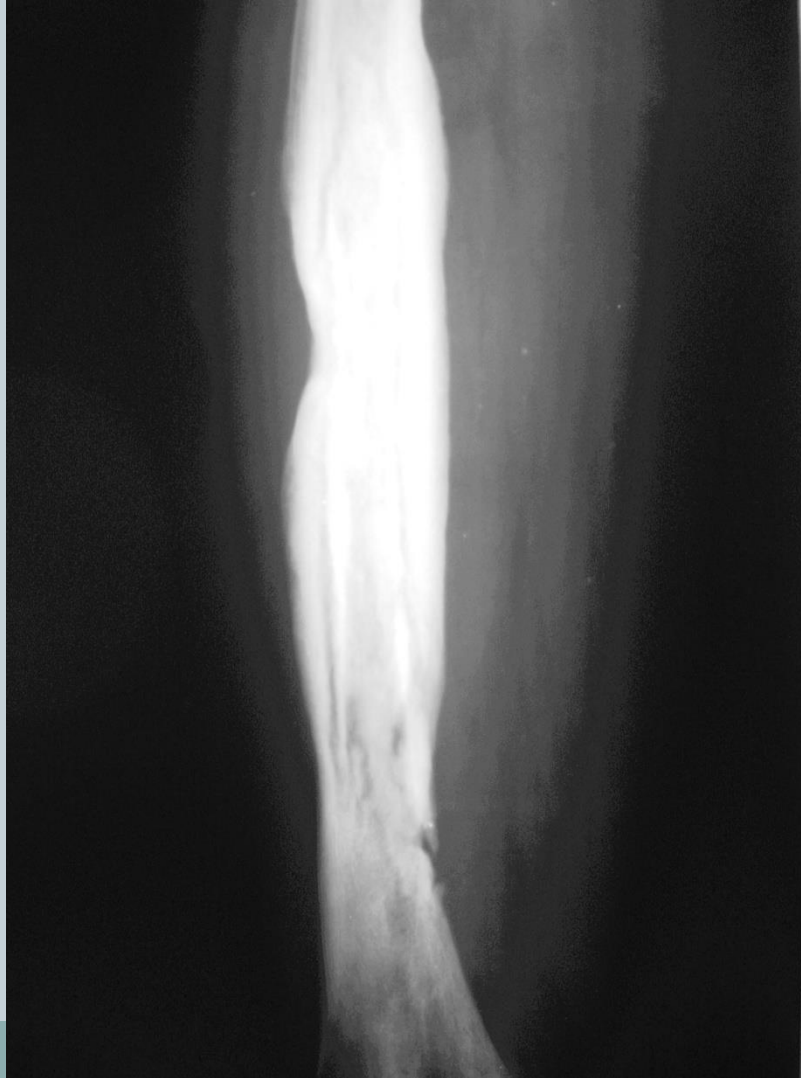


# Chronic Osteomyelitis : discharging sinus





# Chronic Osteomyelitis : Sequestrum



# Physiotherapy for Orthopedic Patients



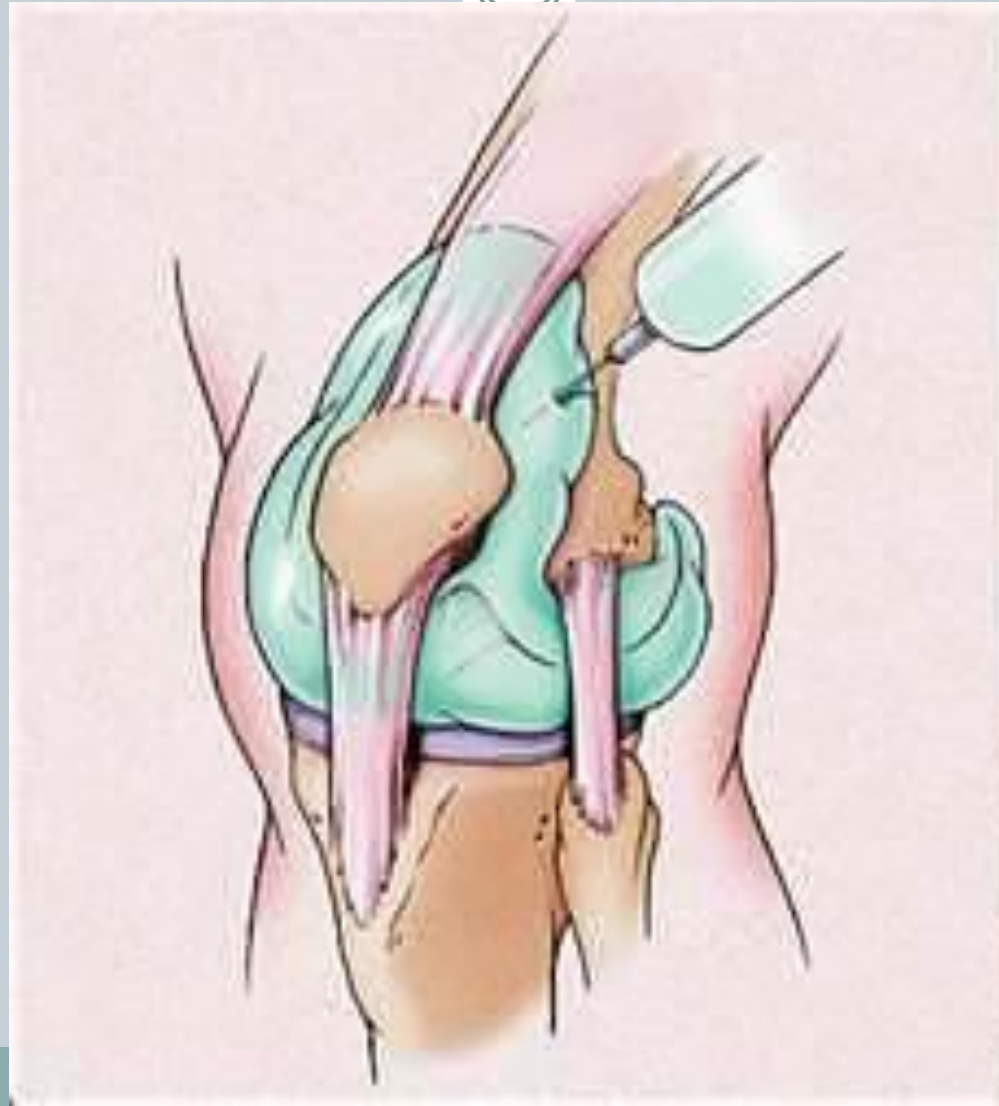
- Physiotherapy is an important part of orthopedic and trauma management
- It is used for : pain relief, prevention of stiffness, muscle strengthening, mobilisation of stiff joint or spine, training non-weight bearing or partial weight bearing
- Physiotherapy modalities include: heat, cold, exercise,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



# Clinical Skill: Cast application



# Clinical Skills: Knee Aspiration



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