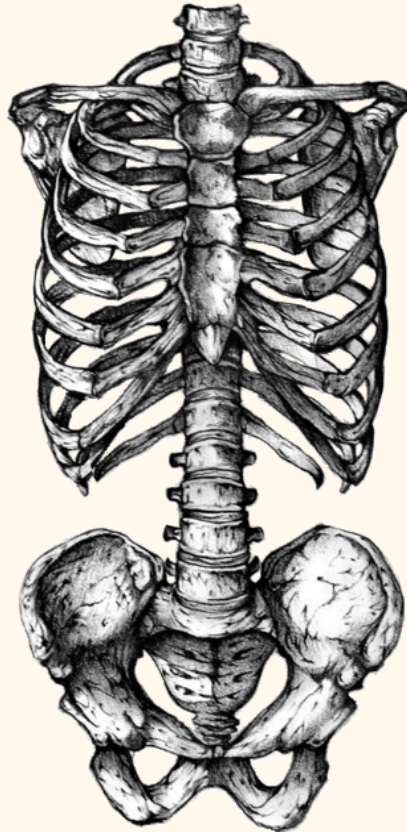


434 Orthopedics Team

# Lecture 1

## Introduction to Orthopedics

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### Objectives (from 433)

- 1-To explain what is Orthopedic and what conditions will be discussed during this course.
- 2-Explain what do we mean by Red Flags.
- 3- List the different causes of orthopedic disease.
- 4-Describe some of clinical examination tests.
- 5-Introduce titles of Clinical Skills which will be taught during this course.

## **Orthopedic Surgery = Not only Bone Surgery:**

Orthopedic specialty is the branch of Surgery 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.

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

**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:

### **1. Open Fractures :**

More serious and very high possibility of infection and complications.

### **2. Complicated Fractures :**

Fracture with injury to major blood vessel, nerve or nearby structure.

### **3. Compartment Syndrome :**

Increase in intra-compartment pressure which endangers the blood circulation of the limb and may affect nerve supply.

### **4. 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).

### **5. Multiple Trauma or Pelvic Injury :**

More than one fracture or injury sustained at the same time. Consider massive blood loss and associated injuries.

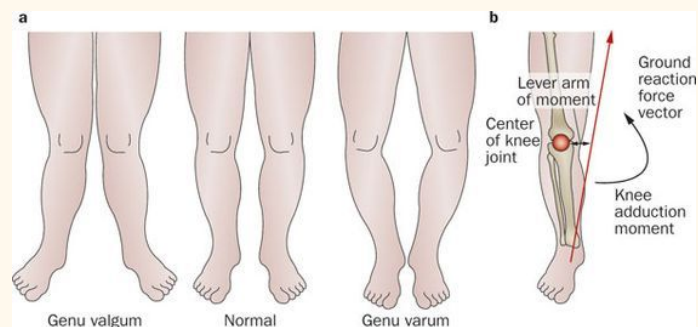
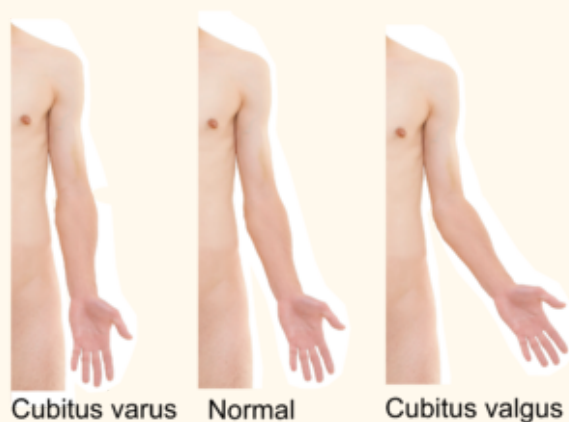
## 6. Infection of Bone, Joint and Soft Tissue:

- Osteomyelitis** : Infection of the bone.
- Septic Arthritis** :Infection of the joint.
- Cellulitis** :spreading Infection of the soft tissue May cause septicemia or irreversible damage.

## 7. Acute joint Dislocations :

Requires urgent reduction or may cause serious complications.

### Alignment terminology:



- Cubitus varus** (varus means a deformity of a limb in which part of it is deviated towards the midline of the body) is a common deformity in which the extended forearm is deviated towards midline of the body. Cubitus varus is often referred to as "Gunstock deformity", due to the crooked nature of the healing.



- Cubitus valgus** is a medical deformity in which the forearm is angled away from the body to a greater degree than normal when fully extended. A small degree of cubitus valgus (known as the carrying angle) is acceptable and occurs in the general population.

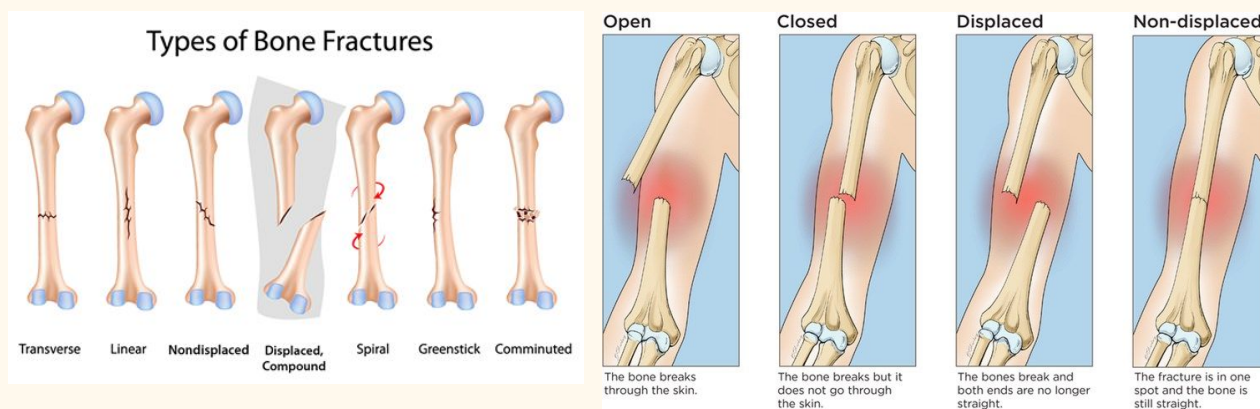


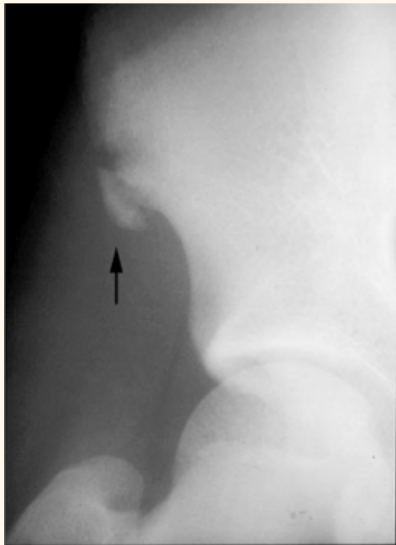

## Acquired or Congenital Conditions:

### Acquired conditions include :

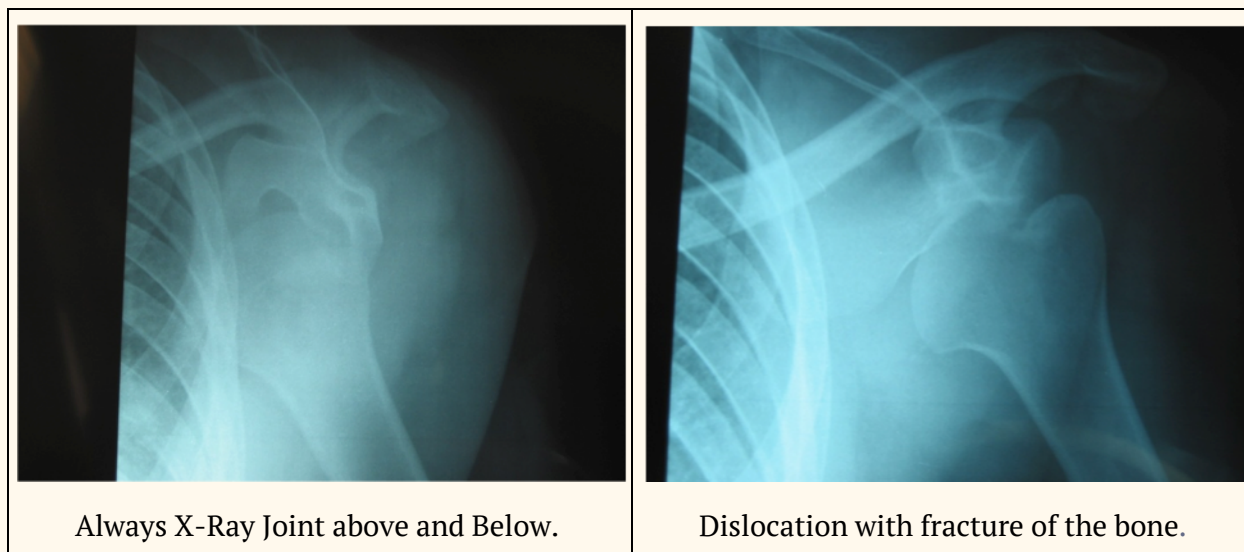
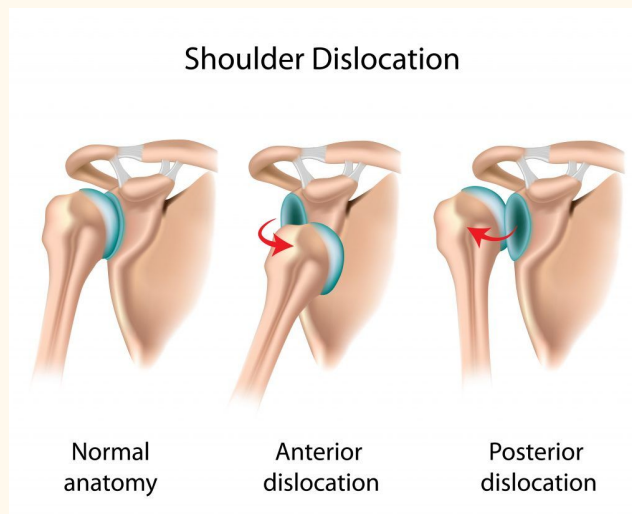
#### 1. Trauma:

- a. **Fractures:** Break in the continuity of bone.




 <p><b>Avulsion Fracture</b></p>	 <p><b>Intra-articular Fractures</b></p>
<p>Force due to Resisted Muscle Action: “Avulsion” Transverse pattern.</p>	<p>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.</p>

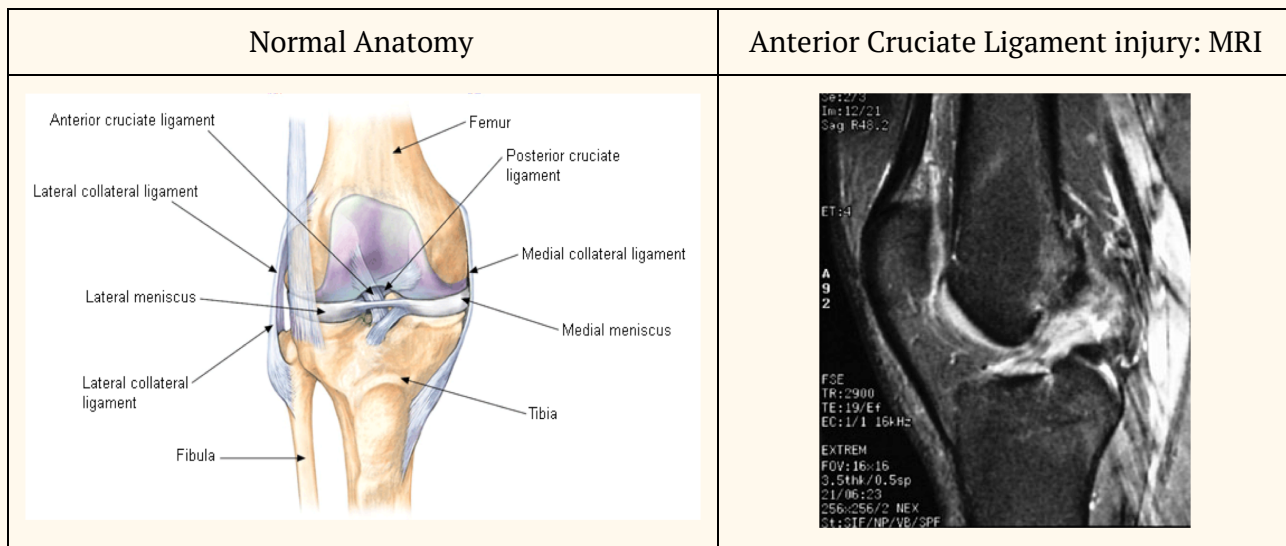
- b. **Dislocations:** Complete separation of the articular surface, Distal to proximal fragment; Anterior, Posterior, Inferior, Superior.



- c. **Nerve injuries:**

Muscle wasting	Spinal Cord Injury
	<p>Often results from fracture dislocation of spine. When injury is at cervical spine it may result in <b>Tetraplegia</b>. Injury at dorsal spine may result in <b>Paraplegia</b>.</p>

- d. **Soft tissues injuries:** ligaments, tendons. Example: Soft tissue injuries of the knee:



- e. **Epiphyseal injuries.**

## 2. Developmental:

### 1-Developmental Dislocation of Hip (DDH):

**Q: Is it Acquired or Congenital? Acquired.**

Dx? Underdeveloped Epiphysis (seen on the left side of the x-ray).



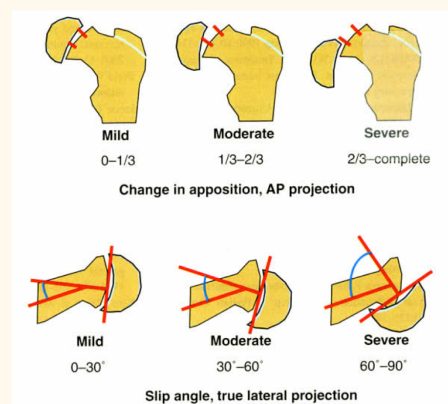
2-Developmental Foot deformity: **Hallux Valgus** causes symptoms on the medial edge of the foot, the sole, and the small toes.

3-**Slipped Capital Femoral Epiphysis (SCFE or skiffy, slipped upper femoral epiphysis, SUFE or souffy, coxa vara adolescentia)** is a medical term referring to a fracture through the growth plate (physis), which results in slippage of the overlying end of the femur (epiphysis).

### 4-Spinal Deformity:

**Hyperlordosis** is an excessive inwards curvature of the lumbar (lower) spine. It's very common among females in our society.

**Kyphosis** is an exaggerated curvature of the upper (thoracic) spine that creates a hunchback appearance.



**Scoliosis** it is the lateral deviation of the spine from the midline: Most of the time it's painless and Developmental (but it could be congenital). Mostly affect female more than male.

### 3. Degenerative:

- a. Occur at any joint Knee & hip.
- b. Most common sites can be primary or secondary.
- c. Can lead to pain and/or deformity and/or loss of function.



Osteoarthritis of Hip



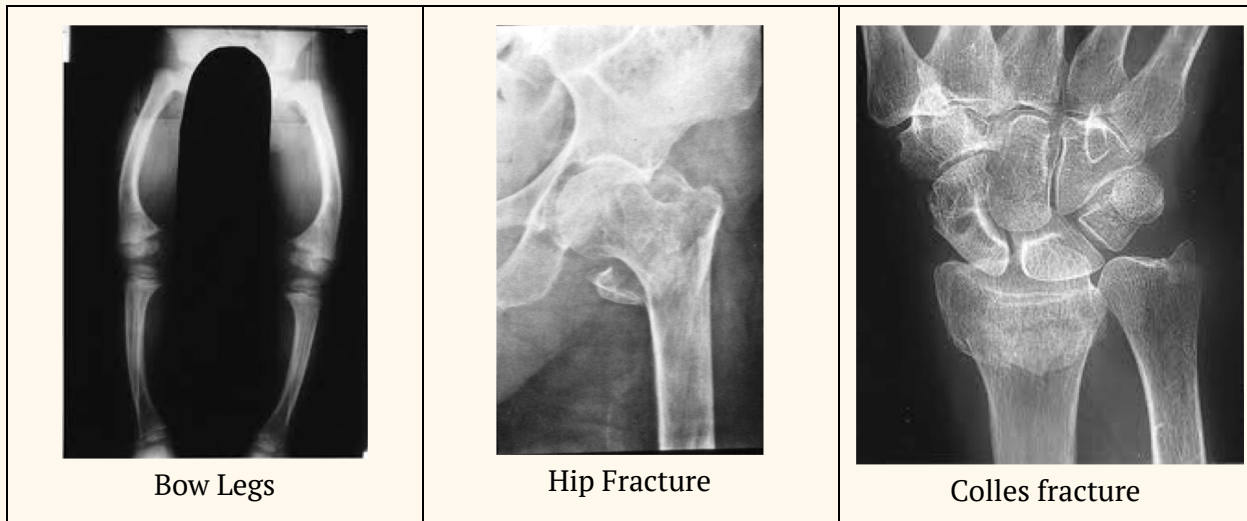
Osteoarthritis of Knee

#### X-Ray Findings:

- 1- Thick Subchondral bone.
- 2- Osteophytes.
- 3- Joint Space Narrowing.
- 4- Bone cysts.

### 4. Metabolic:

<b>Rickets</b>	<b>Osteoporosis</b>
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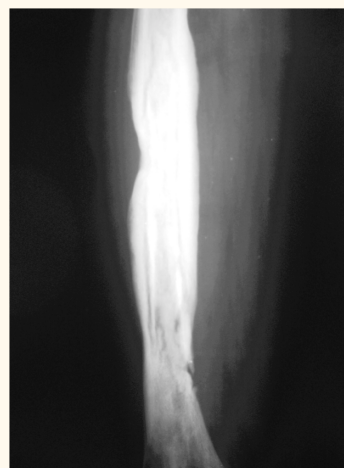


**5. Tumor: Bone Tumor:**



**6. Infection:**

Chronic Osteomyelitis



Sequestrum



discharging sinus

## 7. Neuromuscular:

**Poliomyelitis** is a disease of the anterior horn motor neurons of the spinal cord and brainstem caused by poliovirus. Flaccid asymmetric weakness and muscle atrophy are the hallmarks of its clinical manifestations, due to loss of motor neurons and denervation of their associated skeletal muscles. Because of the success of poliovirus vaccine, poliomyelitis, once one of the most feared human infectious diseases, is now almost entirely preventable by proper immunization.



## 8. Inflammation.

### Congenital conditions:

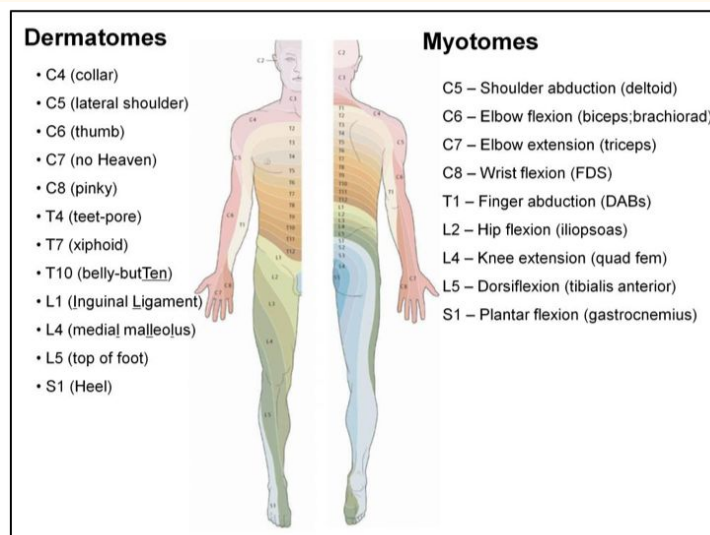
Example of a Congenital Anomaly :

**Talipes Equinovarus** TEV (once called clubfoot) is a deformity of the foot and ankle that a baby can be born with. It is not clear exactly what causes talipes. In most cases, it is diagnosed by the typical appearance of a baby's foot after they are born.



## Clinical:

### 1-Neurological Evaluation : Sensory & Motor.



## 2-Physiotherapy for Orthopaedic Patients:

Physiotherapy is an important part of recovery, It is used for: pain relief, prevention of stiffness, muscle strengthening, mobilization of stiff joint or spine, training non-weight bearing or partial weight bearing. Physiotherapy modalities include: heat, cold, exercise, ultrasound, traction, electrical simulation.

## 3-Clinical Skill:

Cast application & Knee Aspiration



# Thank You!

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