



*433 Teams*

# ORTHOPEDICS

## Introduction to Orthopedic

All of the team work is based on 432 team and some added notes from the lectures

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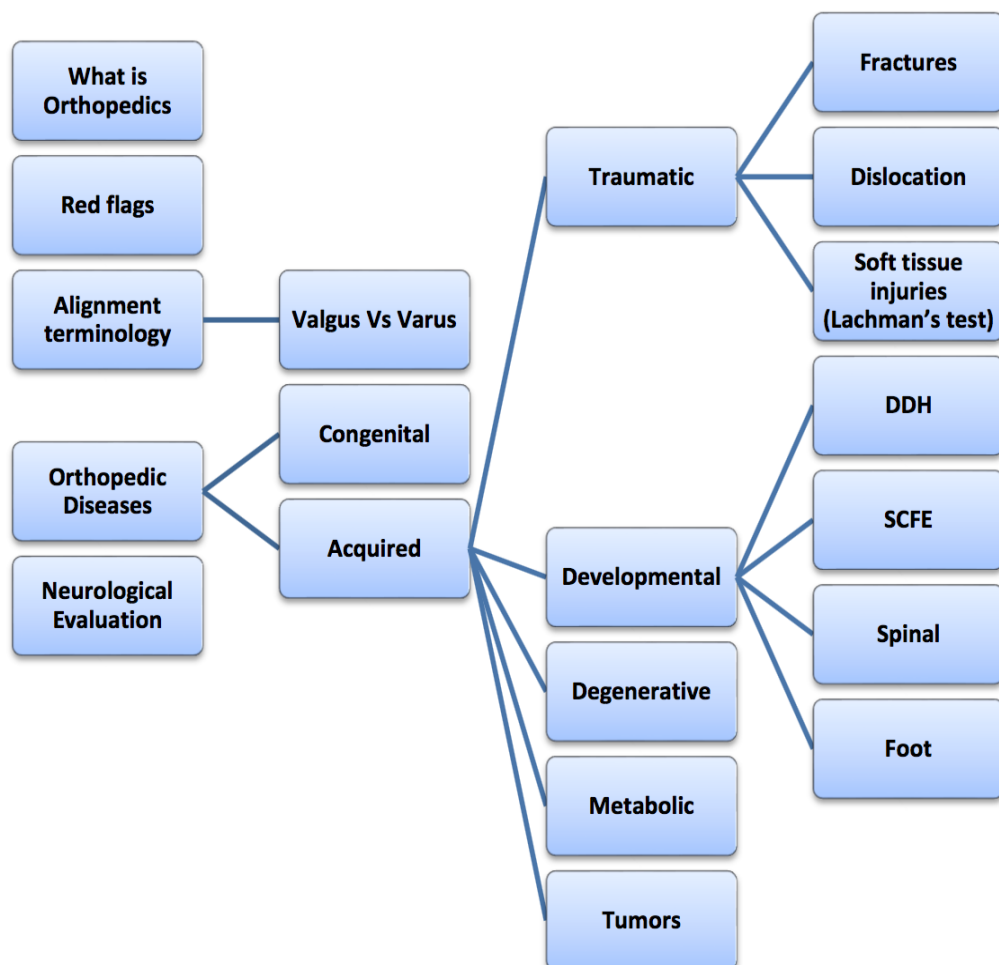
جامعة  
الملك سعود  
King Saud University



## Objectives

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

## MIND MAP



## Orthopedics

- Orthopedic specialty is the branch of medicine which manage trauma and disease of musculoskeletal system. It is also known as: Trauma and Orthopedic Surgery.
- **It includes:** bones, muscles, tendons, ligaments, joints, peripheral nerves, vertebral column and spinal cord and its nerves.
- **Sub-Specialties:** Pediatric Orthopedic, Sport and Reconstructive Orthopedic, Orthopedic Trauma, Arthroplasty, Spinal Surgery , Foot and Ankle surgery and Orthopedic Oncology.

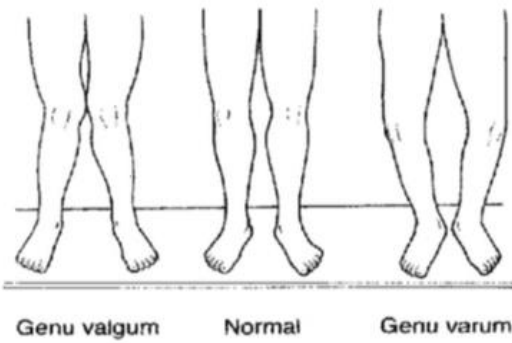
### RED FLAGS:

- **Red Flag** = 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:

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

### Alignment terminology:



**Valgus:** when the limb go lateral and the joint go medial.

**Varus:** when the limb go medial the joint lateral.

In the upper limb the elbow is called **Cubitus**. So, the same as the lower limb we call it either **cubitus valgus or varus**. In examination you have to describe the alignment before you describe the swelling or small wound.



Cubitus Varus

Cubitus Valgus



### Orthopedic Diseases:

#### Congenital

Present since birth (though may not be evident till some time later).



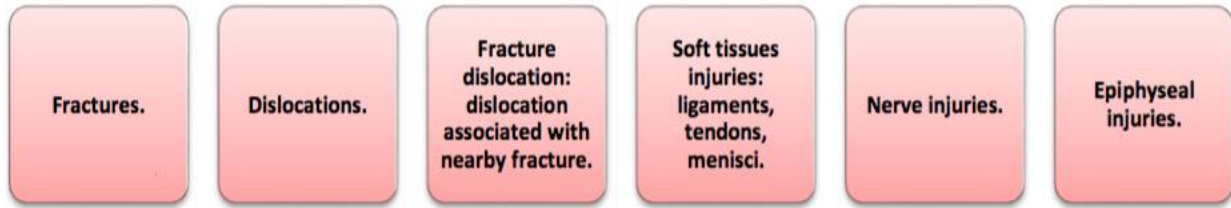
Talipes equinovarus TEV

#### Acquired

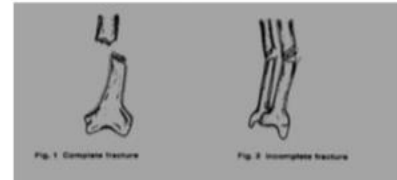
Develop or begin after birth.

- Trauma
- Developmental
- Inflammation
- Infection
- Neuromuscular
- Degenerative
- Metabolic
- Tumor

**- Traumatic:**

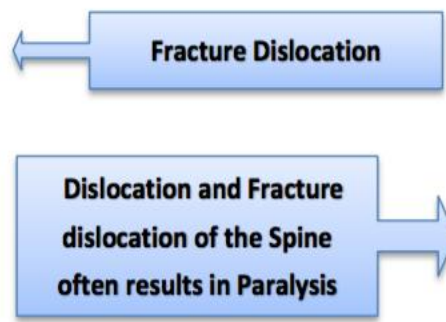
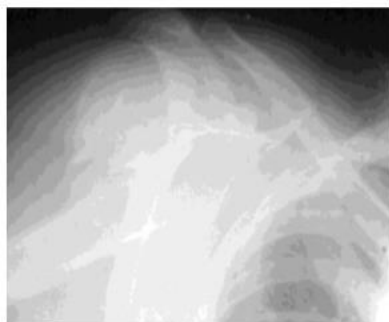
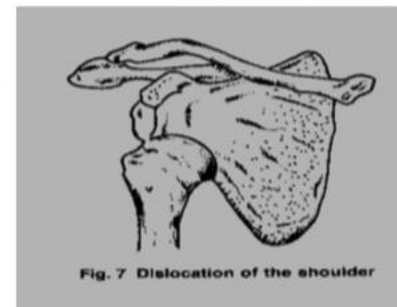


**1- Fractures:** Break in the continuity of bone.



**2- Dislocation:** Complete separation of the articular surface

- How to describe dislocation?
  - o Distal to proximal fragment: Anterior, Posterior, Inferior, or Superior.
- Acute dislocation may be complicated by neurovascular injury.
- Acute dislocations require urgent reduction



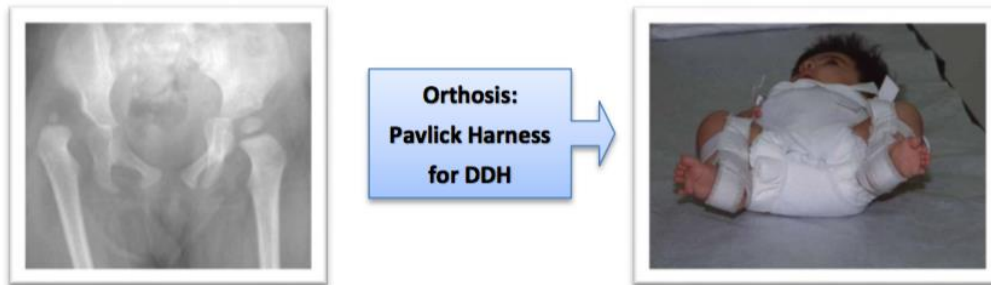
- **Intra-articular Fractures:** If displaced; should always be treated by ORIF= (Open Reduction and Internal Fixation).
- Failure to reduce and fix such fracture results in loss of function, deformity and early degenerative changes.



## Developmental:

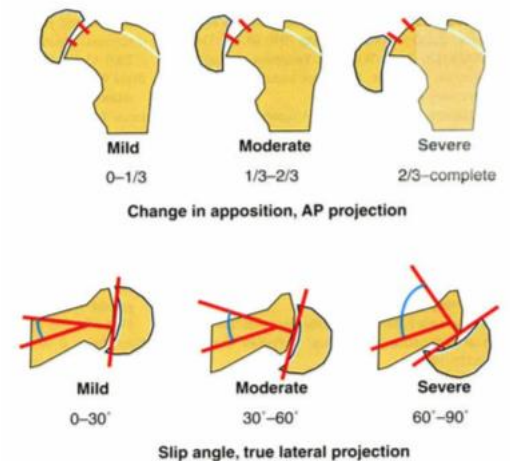
### 1-Developmental Dislocation of Hip (DDH):

The hip joint has not formed normally. The ball is loose in the socket and may be easy to dislocate. **The mother complains of difficulty in changing the baby's diaper.** At the beginning we do US because it's easier. When the baby become few months old, we do x-ray.



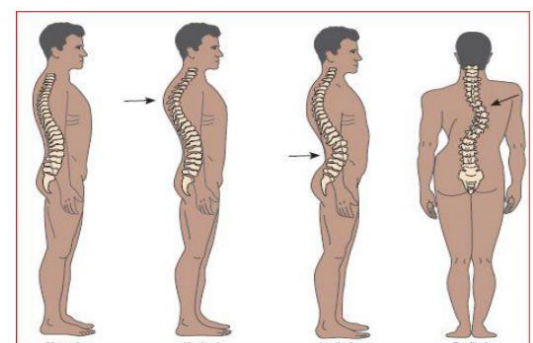
### 2- Slipped Capital Femoral Epiphysis (SCFE):

For reasons that are not well understood, the ball at the upper end of the femur (thigh bone) slips off in a backward direction. This is due to weakness of the growth plate. Most often, it develops during periods of accelerated growth, shortly after the onset of puberty.



### 3-Spinal Deformities:

- **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 spin from the mid line:
  - Most of the time it's painless and
  - Developmental (but it could be congenital).
  - Mostly affect female more than male.



## Degenerative:

- Occur at any joint
- Can be primary or secondary
- Increased wear and tear
- Can lead to pain, deformity, loss of function
- Increase with advancing age
- Management depends on type and age

### The changes which can happen in osteoarthritic hip:

- Decrease in the joint space because the cartilage becomes thinner.
- There may be sclerosis of the hip.
- There will be an osteophyte.

### The changes which can happen in osteoarthritic knee:

- Decrease medial joint space.
- Osteophytes formation.
- Sclerosis.



## Metabolic:

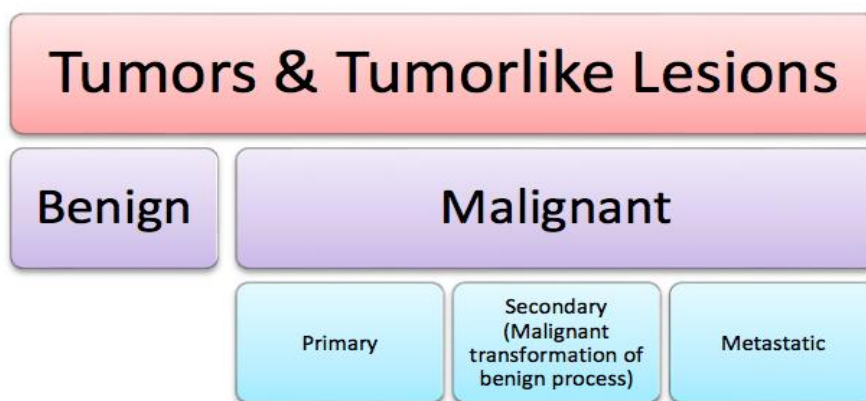
### Rickets: Bow Legs

- Unique to children
- It's due to vitamin D, calcium deficiency or insufficient exposure to the Sunlight (nutritional & sun exposure).
- Sometimes the cause is the kidney disease & it's called renal rickets.

### Osteoporosis:

- **Fracture of the Neck of the Femur (NOF):** The most dangerous complication especially in old people.
- **Colles fracture**
- **Spinal Osteoporosis:**
  - Mainly affect female more than male due to the decrease of the level of estrogen after the menopause.
  - It's painless & can cause the fractures.
- **Osteoporotic fractures** are painful & can affect the patient's life & he may die from it (especially hip fracture).

### - Bone Tumors:



### In the x-ray, there are:

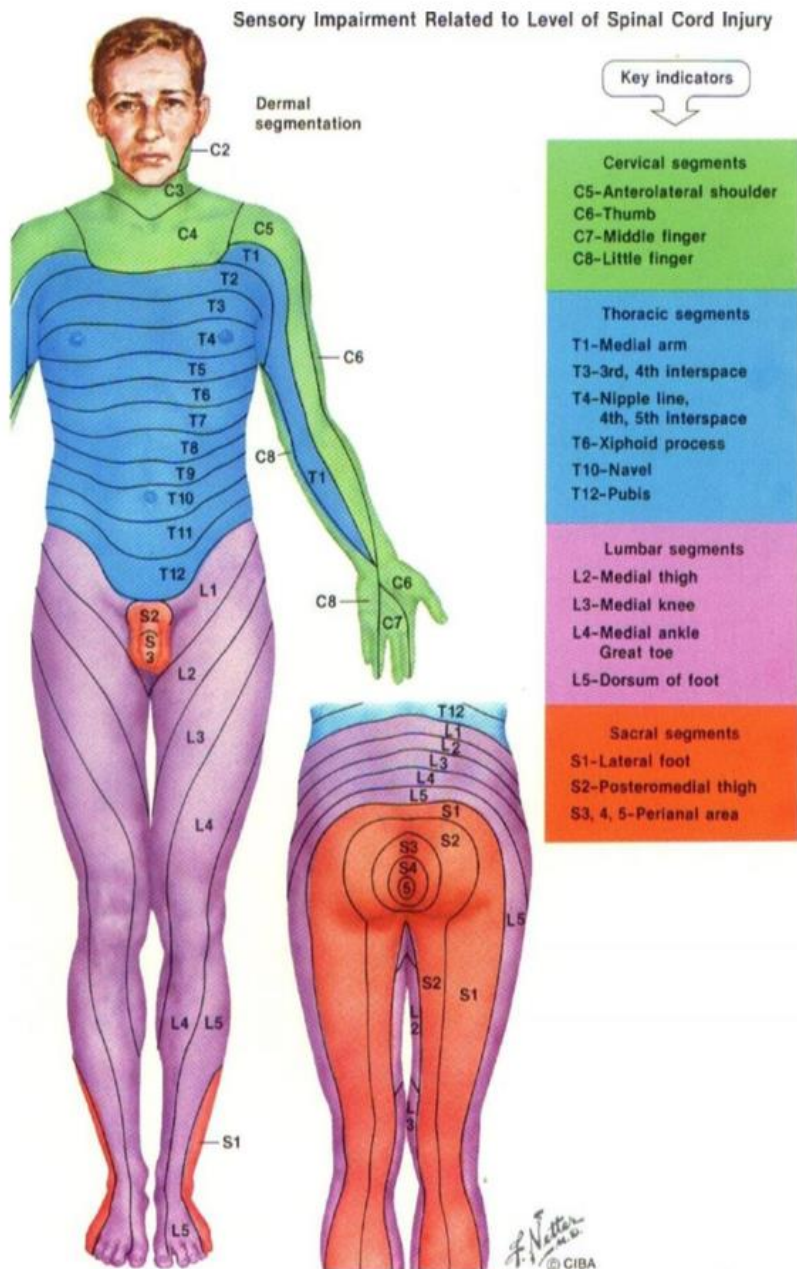
- Bone destruction.
- Pathological fracture.
- Ill-defined lesion.
- Most likely it's malignant tumor.





## - Neurological Evaluation:

### • Sensory:



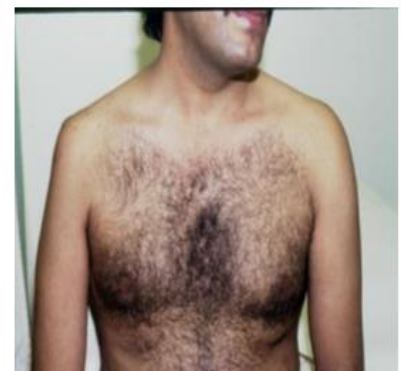
### Axillary Nerve or Circumflex Nerve



### - Muscle wasting:

There are differences between the R & L side:

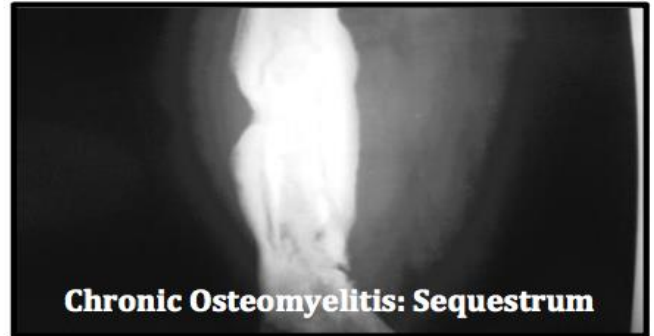
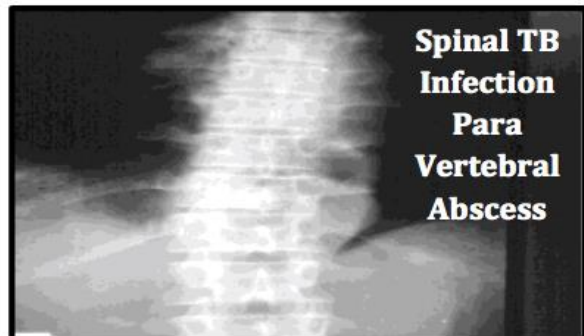
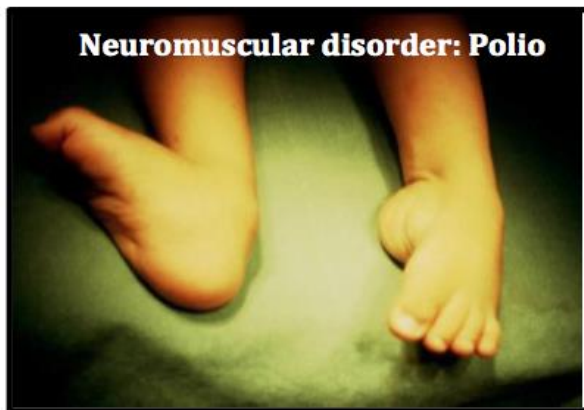
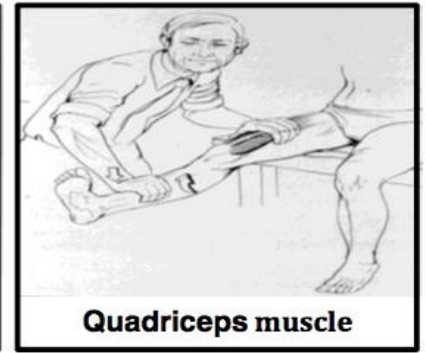
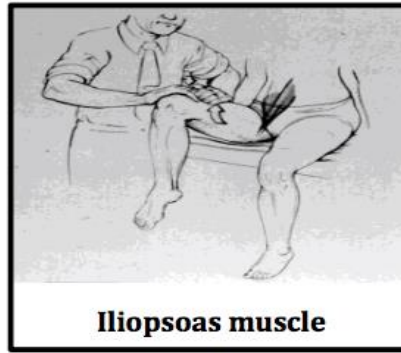
- Difference in the shoulder's shape (the left one has normal contour while the right one is slipped).
- There is atrophy of the muscle at the right side due to nerve damage.



### - Muscle Power Testing:

- **Muscle Power testing:**

- 0 = no power.
- 1= simple contracting.
- 2= slight contraction within the gravity.
- 3= muscle power against gravity
- 4= against gravity with resistance
- 5= against gravity with normal resistance



### 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, mobilization of stiff joint or spine, training non-weight bearing or partial weight bearing.
- Physiotherapy modalities include: heat, cold, exercise, ultrasound, traction, electrical stimulation.

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