

UNDERGRADUATE ORTHOPEDICS



About Author

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Undergraduate Orthopedic Introduction

Bone Processors >> Failure

Osteoblast

- Growth >> **Congenital**
- Healing >> **Trauma**

Osteoclast

- Defend >> **Inflammatory**
- Contain >> **Tumor**

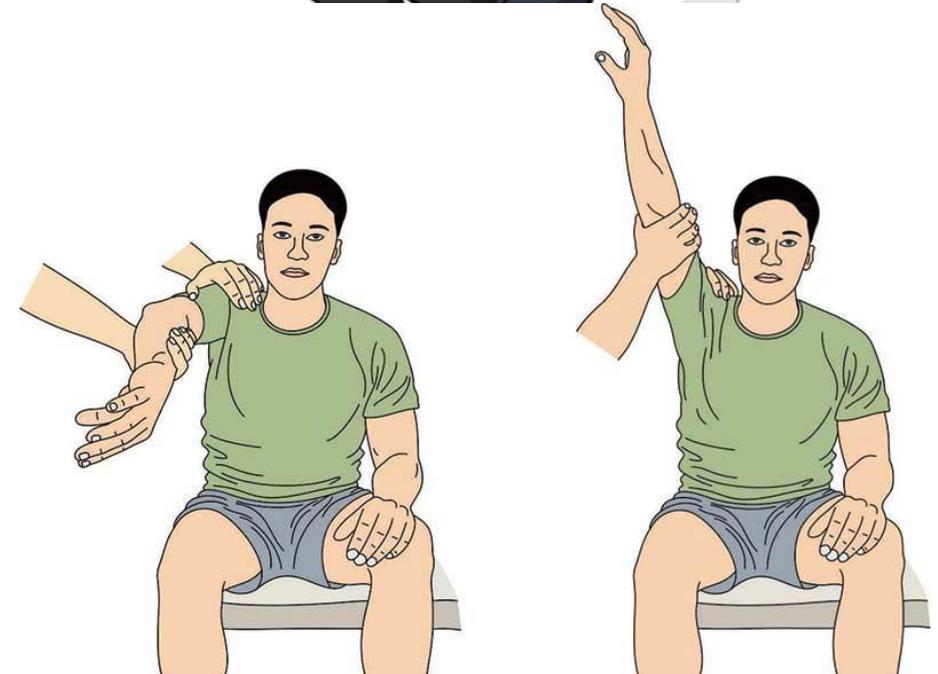
NB, Bone is a dynamic organ under continuous build up (by Osteoblast) and build down (by Osteoclast) regularly. So any deviation in this regular process cause failure = Pathology.

Bone Regions >> Failure

Shoulder girdle Arm Elbow Forearm Wrist hand
Spine
Pelvic girdle Femur Knee Leg Ankle Foot

Scheme diagnose Failure

- Definition & Incidence
 - History: Causes **Failure** Complaints
 -abnormal LOOK >> Swelling , Deformity
 -abnormal FEEL >> Pain , Numbness
 -abnormal MOVE >> Stiffness, Unstability
 - Examination: **Region**
 -LOOK >> Alignment Symmetry Skin
 -FEEL >> Tender points
 -MOVE >> Joints (active and passive)
- Neurovascular examination mandatory لازم



- Investigation

X-ray mandatory لازم

.....adequate: 2 views AP/Lateral 2 joints above and below 2 Occasion now and after 2 w

.....Comment: OLDACID >> Open fracture..Location..Dislocation..Articular..

Internal bone quality..**Displacement...>>**

CT: for articular fracture

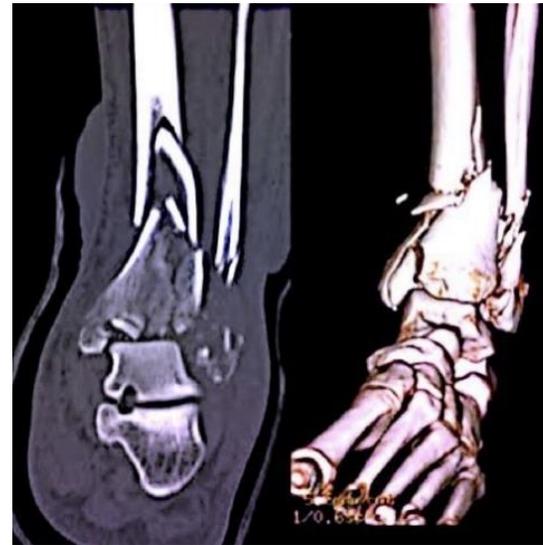
MRI: for ligaments injury

Ultrasound: for soft tissue injury

Lab: Preoperative and Inflammatory

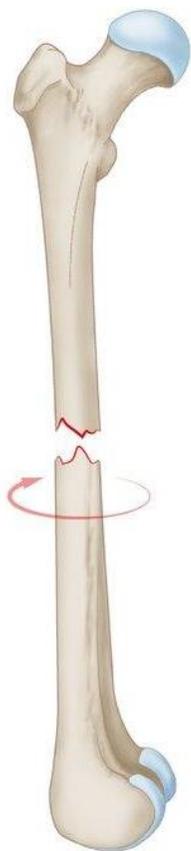
- Classification: severity

Aim: diagnostic, prognostic, communication

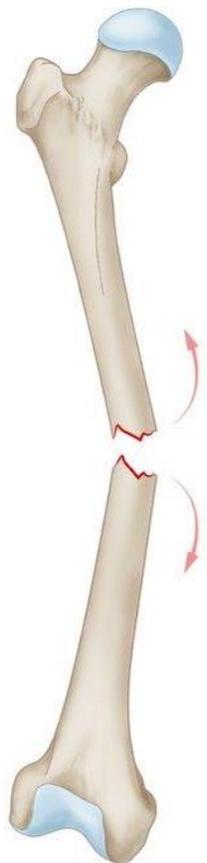


NB, Displacement

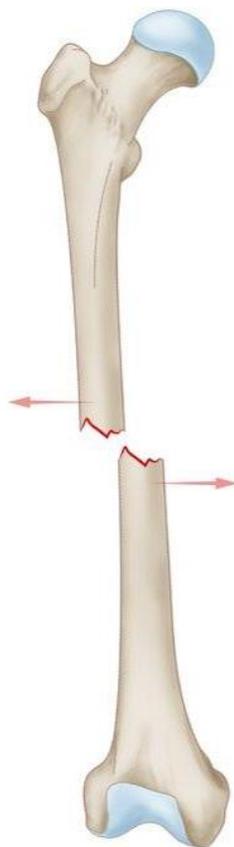
Rotation



Angulation



Translation



Longitudinal



X ray comment امتحان

Plain X-ray anteroposterior view

Inadequate: no name, no age, no date, no side
no 2 joint, no 2 views, no 2 occasions

OLDACID

Open >> not in image

Location >> fracture at shaft radius and ulna

Dislocation >> no

Articular >> intact

Comminution >> no

Internal bone quality >> no osteoporosis

Displacement >> distal part both bone displaced
laterally with angulation

Comment on next page x rays as shown





- Complications

General

- General early: Shock:

- *Neurogenic (pain) treatment by morphia

- *Hypovolumic treatment resustation fluids

- General late: prolonged bed

- Chest: Infection, Atelectiasis, Pulm embolism

- GIT: Gastric ulcers, Paralytic ilus, Constipation

- Urinary: UTI, stones, retention

- LL: Ulcers, muscle atrophy, DVT

Local

- Early ← Local → late

- injury skin.....*Sepsis osteomyelitis

- injury SC.....*Volkmanns isch.

- injury muscle.....*Myositis ossificans

- injury tendon.....*Deformity

- injury Nerves.....*Seudeuk atrophy

- injury Vs.....*Compartement \$

- injury growth plate.....*Gross arrest

- injury joint.....*Arthritis

- injury bone.....*Delayed/Non/Malunion

- injury viscera.....*Psychoneurosis

• Treatment

General

- Polytrauma...ABCDE
- Shock..
 - *Neurogenic(pain) treatment by morphia
 - *Hypovol. ttt resustation fluids 1L and blood



Local

- **Surgical** or Conservative



P VON U

P	*Polytrauma pt with multiple # *Bilateral # *Pathological#
V	Vascular injury
O	Open #
N	Neurologic injury (spine)
U	*Uncompliance pt *Union (non,mal) *Unstable (shaft>50% displacement/ angle >20⁰_40⁰/ no rotation accepted) (Articular surface >2mm)

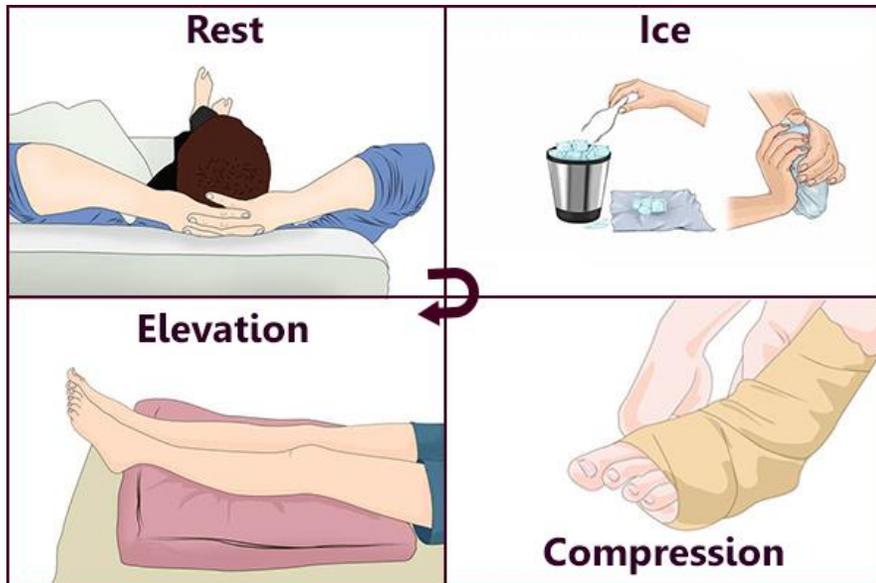


Conservative management

- Conservative..RICE protocol

.....Rest..Ice..Compression..Elevation

NB Connect injured part to support Slab..Splint..Orthosis..Cast



Operative treatment

ORF..Open reduction and fixation

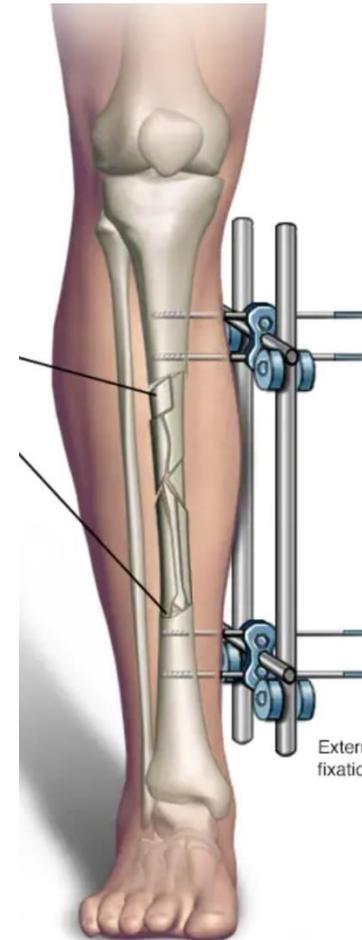
Joint **Prosthesis**

Internal

- **On bone surface..**
Plate and screws
- **Intramedullary..**Nails
- **Both..**K wire

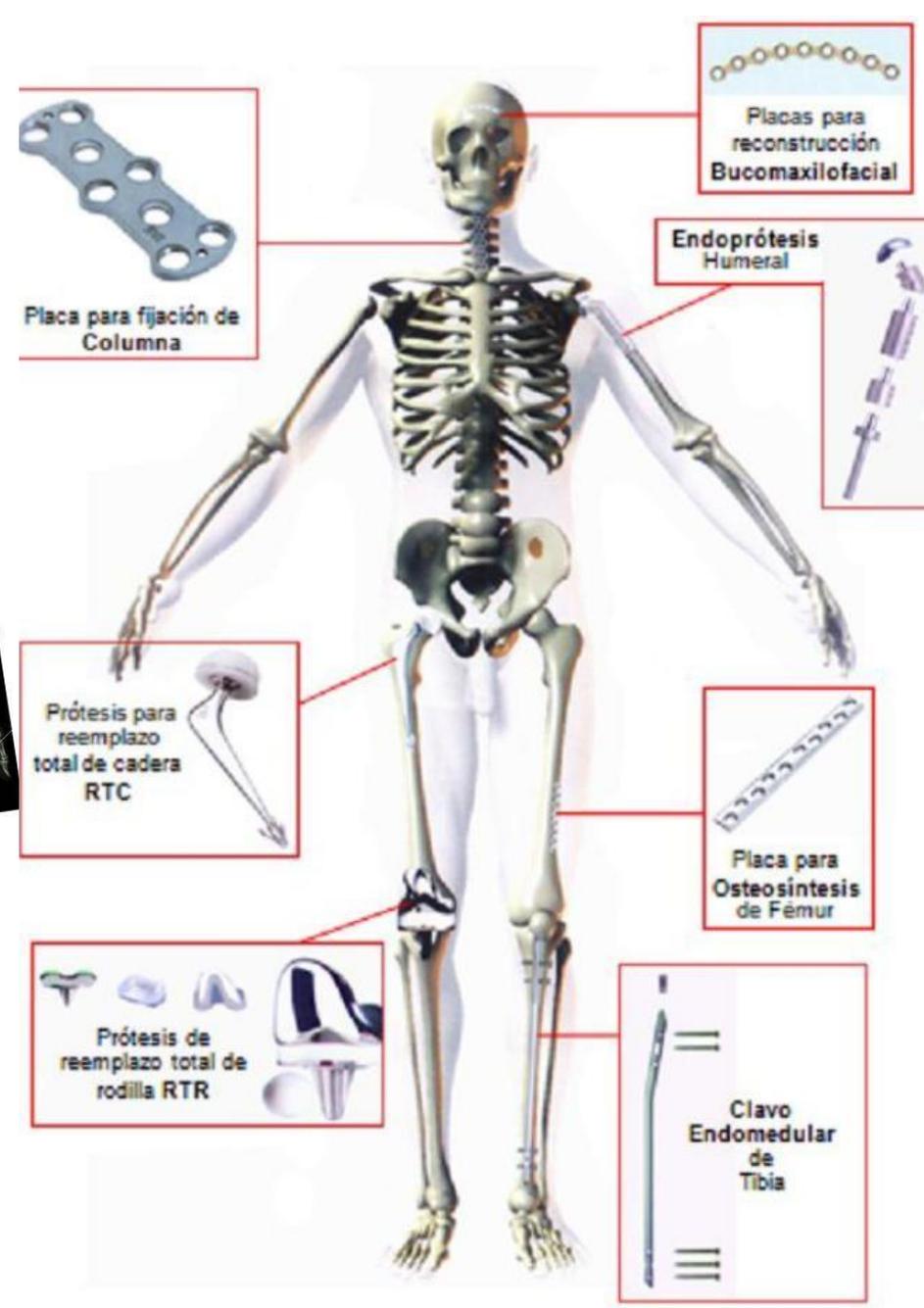
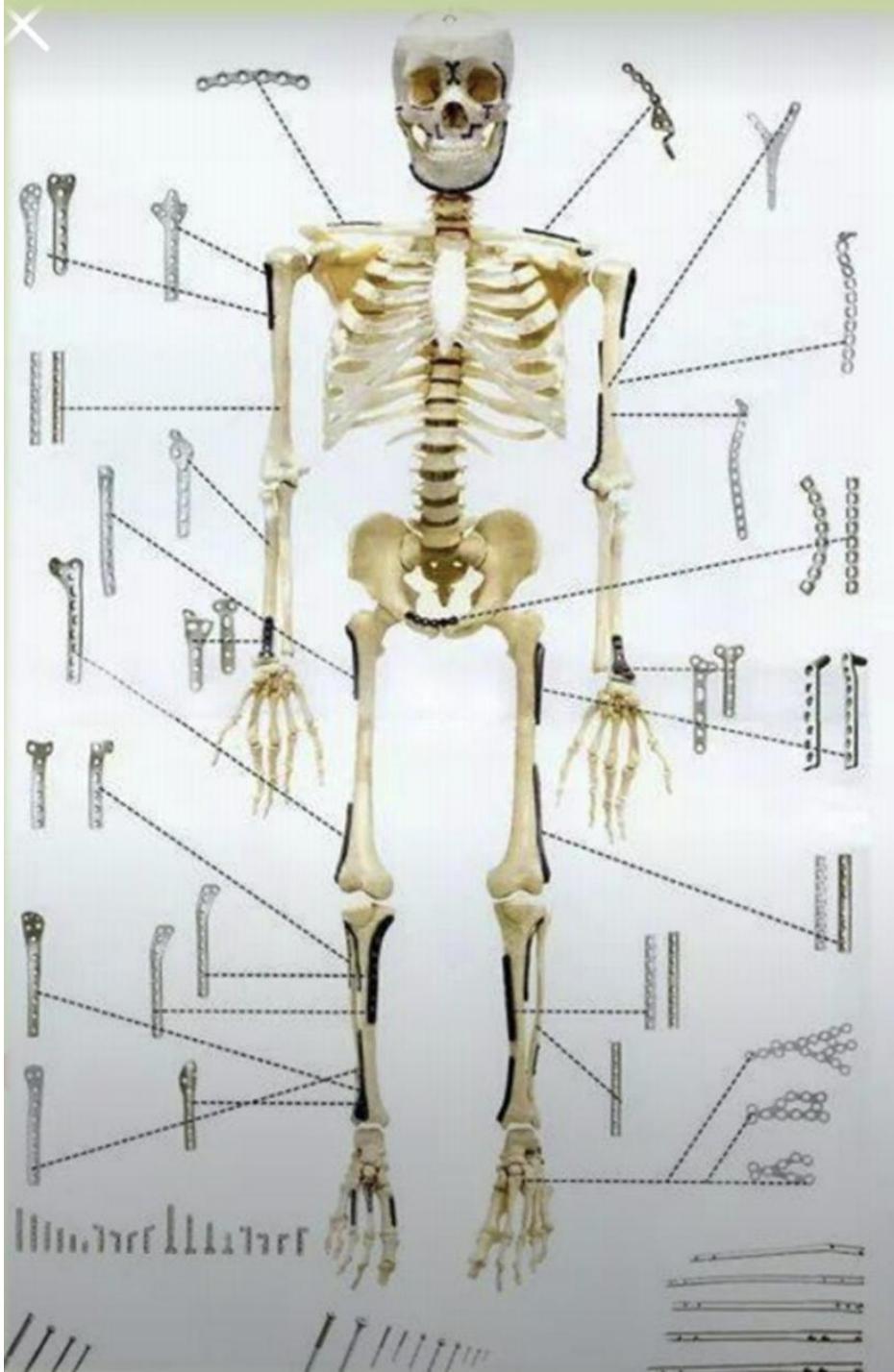
External

- **On side..**Ex fix
- **Ring..**Ilizarov



Hemi-arthroplasty
Total arthroplasty





Follow up and rehabilitation

- Rest 1week RICE protocol (rest-ice-connection-elevation)
- **Exercises...Stretching/Strenthing.**



Standing hamstring stretch



Quadriceps stretch



Side-lying leg lift



Quad sets



Straight leg raise

***(PAPAR F)** بابار فيل

PAPAR F

Pendulum

Assisted
(not full ROM)

Passive

Active

Resisted = WB

Free ROM

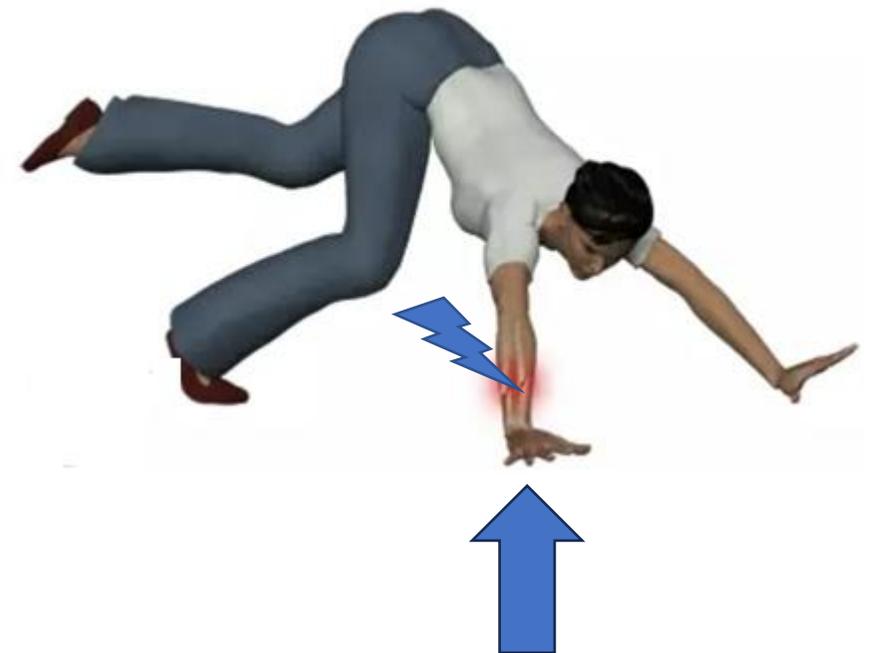
Undergraduate Orthopedic schedule

Failures	Congenital	Traumatic	Inflammatory	Neoplastic		
Shoulder girdle	Winging scapula	Clavicle # Shoulder D	Osteomyelitis Septic arthritis Osteoporosis Osteoarthritis Rickets Tendinitis Neuritis	Benign Malignant		
Arm	Shortening	Humerus #				
Elbow	Stiffness	Elbow D				
Forearm	Madlung	#Radius & Ulna				
Wrist & Hand	Syndactyly Polydactyly	DER# Scaphoid #				
Spine	Scoliosis	Cx# Lumbar #				
Pelvic girdle	DDH	#Pelvis Hip D Trochanteric #				
Thigh	Shorting	Femur #				
Knee	Varus valgus	Knee D				
Leg	In-out toeing	#Tibia				
Ankle & Foot	Flat-out Talipus	Pott's # Ankle sprain				
Others	Dwarf	Pediatric Soft-tissue				

Undergraduate Trauma

Trauma types

- **High** energy trauma accidents, **Low** energy trauma fall.
- **Direct** as hit trauma at site of injury.
Indirect as Falling on out stretched hand (FOOSH) transmitted force.
- **Primary** by accident , **Secondary** by edema.
- **Healing**..primary direct or Secondary indirect.
- **Trauma** to bone or soft-tissue.



Classification of fractures



Extra-articular

or

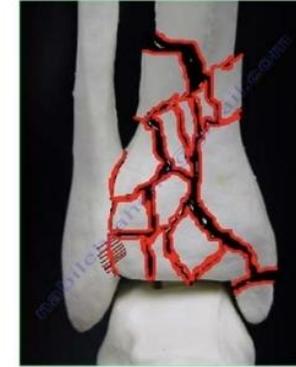


Intra-articular



Simple

or



Comminuted



Diaphyseal

or



Metaphyseal



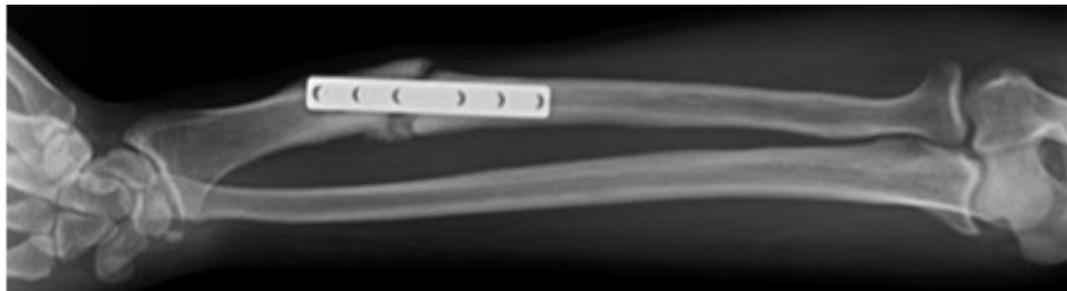
Open
(Skin is not intact)



Closed
(Skin is intact)

Bone healing

- **Stages** >> Hematoma ..Granulation tissue..1ry Callus .. 2nd Callus
- **PREREQUISITES** >> Vascularity + Mechanical Stability
- **Types** >> 1ry.. No stages direct bone to bone contact eg anatomic reduction by plates
 - >> 2nd ..Stages with Callus formation eg cast or ex fixation
 - >> **Non Union**.. Inadequate vascularity or Stability >> treated by surgical adequate stabilization and bone graft
 - >> **Malunion**..Union but with Deformity >> Surgical osteotomy



Soft tissue trauma

- Contusion: Small amount blood collection
- Hematoma: Huge amount blood collection
- Edema : Excess fluid collection
- Bullae: Massive fluid collection



Treatment by conservative RICE protocol



- Tenting: Fracture pointed into skin
- Skin avulsion: Exposed bone
- Crushed limb: Mushed muscles
- Open fractures >>

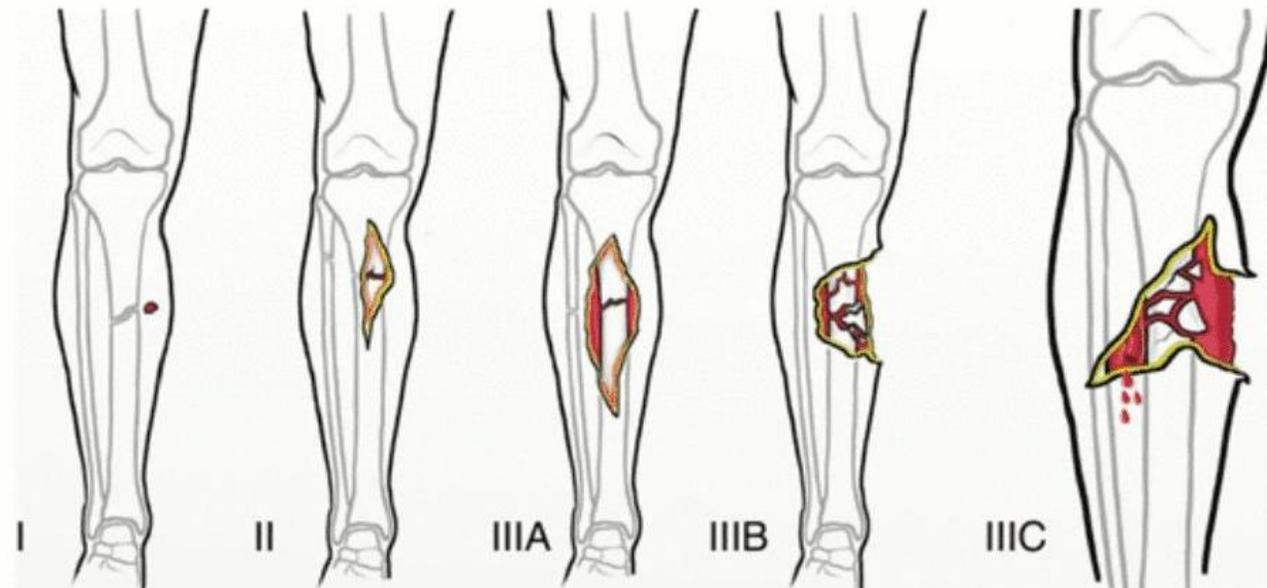
Treatment by surgery to save the limb from Amputation



Open fractures

- **Definition:** Skin cut with fracture hematoma continues with outside
- **Management:** **Scheme**+ operative debridement according
- **Classification**

- I < 1 cm
- II 1-10 cm
- III > 10 cm



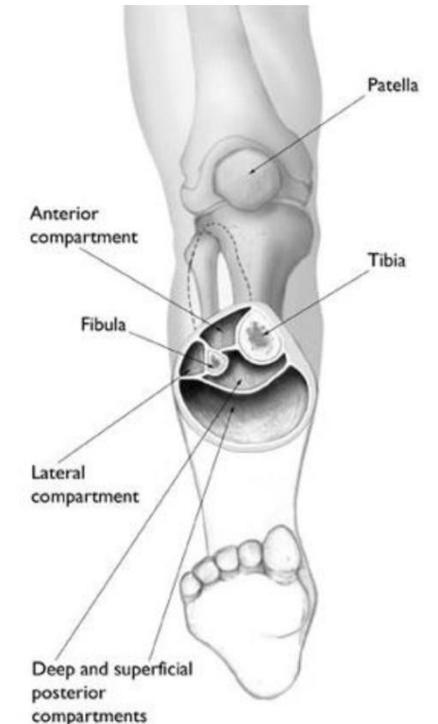
Wash with saline
and betadine
Give antibiotics

Wound >>	Clean	Quiry	Infected.....
Fixation >>	Internal	wait and see	Ex fixation

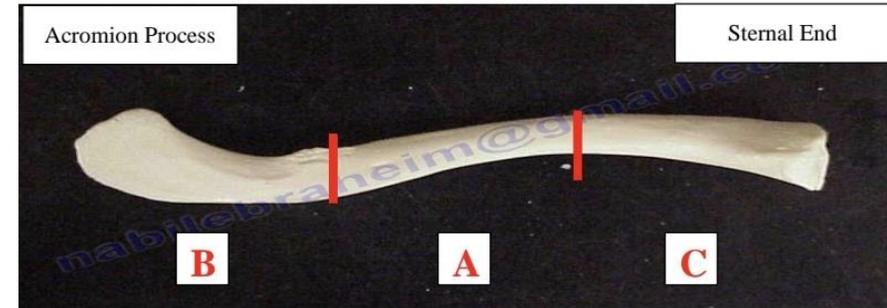
Compartment syndrome

- **Definition:** Increased pressure within one of the body's anatomical compartments results in insufficient blood supply to tissue (stop tissue perfusion) within that space contained in its fascia.
- **Clinical:** Acute Pain out of proportion, Paresthesia, Paralysis, Pallor and Pulselessness is the end.
- **Investigation:** Intracompartment pressure higher than 30 mmHg of the diastolic pressure.
- **Treatment:** Removal of the external compression + **Scheme**

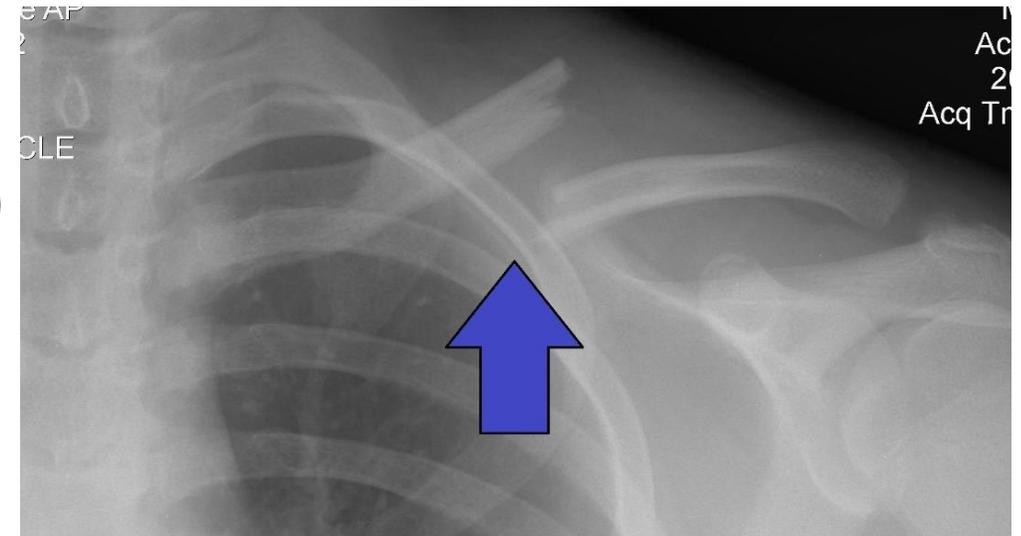
Surgical decompress the compartments (fasciotomy urgent).



Clavicle fracture



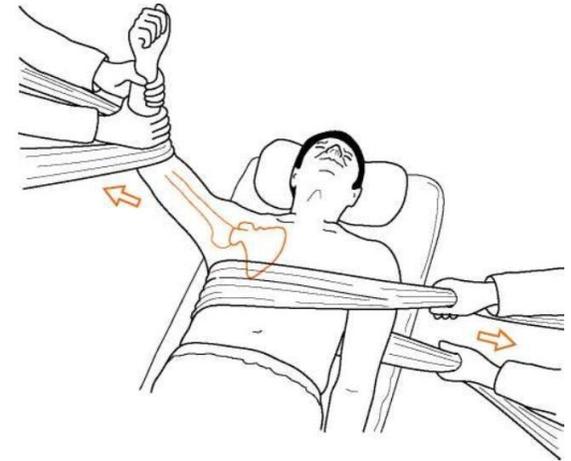
- **Definition:** Discontinuity clavicle bone surface.
- **Classification and Incidence:** A. Group I: Middle third (80%) Most common,
B. Group II: Distal Third (10-15%) , C. Group III: Medial Third (5%).
- **Mechanism injury:** FOOSH
- **Clinical:** **Scheme**
- **Management :** **Scheme+**
 - >> **Conservative** treatment 90% (arm sling + RICE protocol)
 - >> **Operative** treatment for PVONU + skin tenting (ORIF)
- NB. **Neurovascular injury** associated >> Brachial plexus
Subclavian artery
- NB. Most common **complication** is malunion ,
other in **Scheme**



Shoulder dislocation

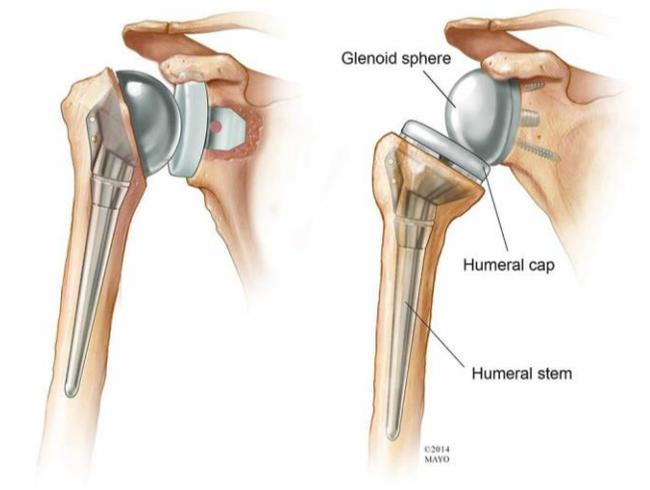
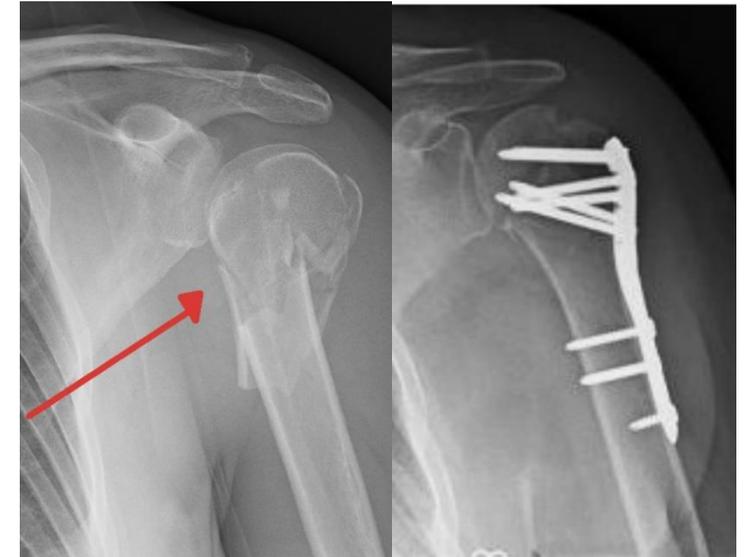
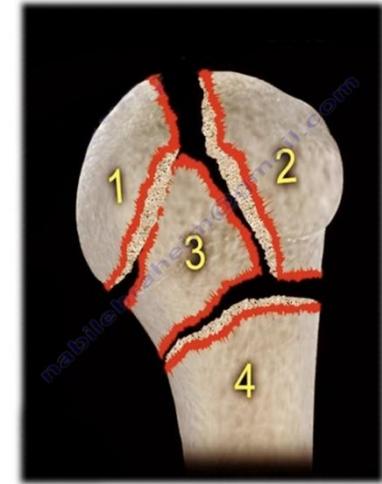


- **Definition:** Discontinuity in gleno-humeral articulation
- **Classification and Incidence:** Anterior Dislocation, Posterior Dislocation
- **Mechanism injury:** FOOSH
- **Clinical:** Scheme
- **Management :** Scheme+ urgent reduction (by traction and counter traction)
 - >> **Conservative** treatment 90% (arm sling + RICE protocol)
 - >> **Operative** treatment for recurrent shoulder dislocation arthroscopy منظار
- NB. **Neurovascular injury** associated >> Axillary nerve injury
- NB. Most common **complication** is recurrent shoulder dislocation, other in Scheme.



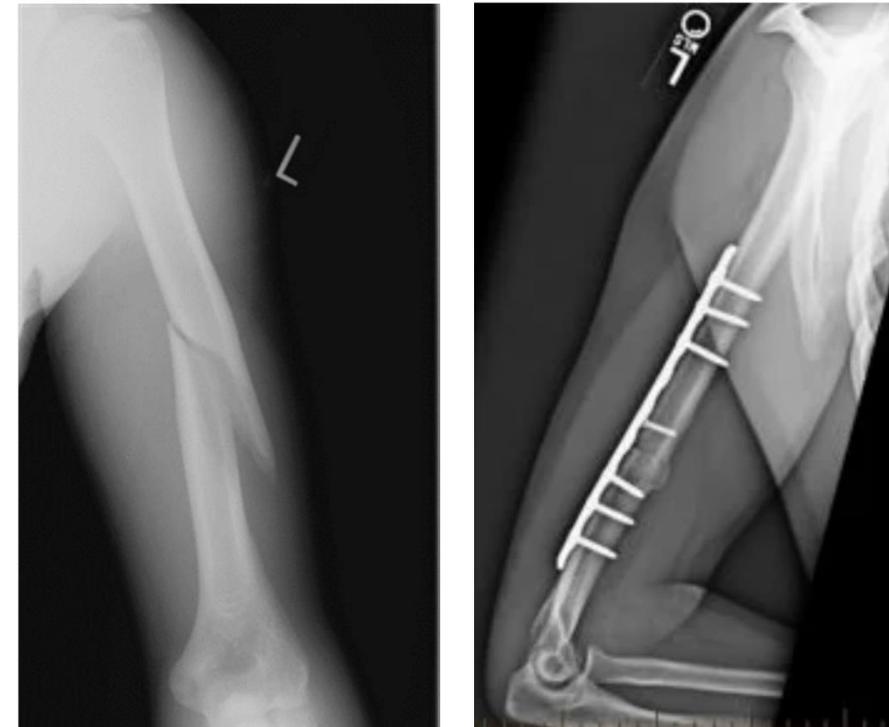
Proximal Humerus fracture

- **Definition:** Discontinuity in bone surface of head humerus.
- **Classification and Incidence:** Articular and Tuberosities in old age
- **Mechanism injury:** FOOSH
- **Clinical:** Scheme
- **Management :** Scheme+
 - >> **Conservative** treatment 90% (arm sling + RICE protocol)
 - >> **Operative** for Displaced # (ORIF),
Comminuted Articular (arthroplasty)
- **NB. Neurovascular injury**
 - >> Axillary nerve injury



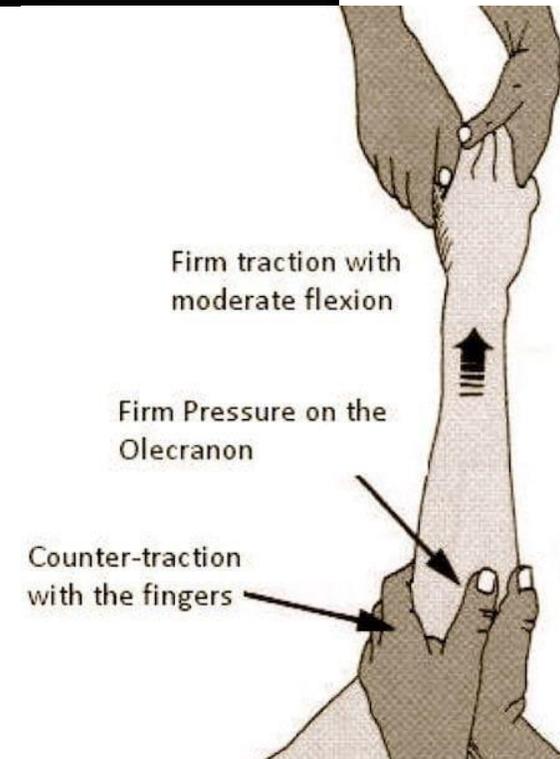
Humerus shaft fracture

- **Definition:** Discontinuity in humeral shaft surface .
- **Classification and Incidence:** Proximal, Mid shaft, Distal
- **Mechanism injury:** Direct (Car window seat injury)
- **Clinical:** **Scheme**
- **Management :** **Scheme+ Neurovascular**
 - >> **Conservative** treatment 90% (arm brace + RICE protocol)
 - >> **Operative** treatment for PVONU (ORIF)
- NB. **Neurovascular injury** associated >> radial nerve injury
- NB. Most common **complication** is malunion, other iScheme



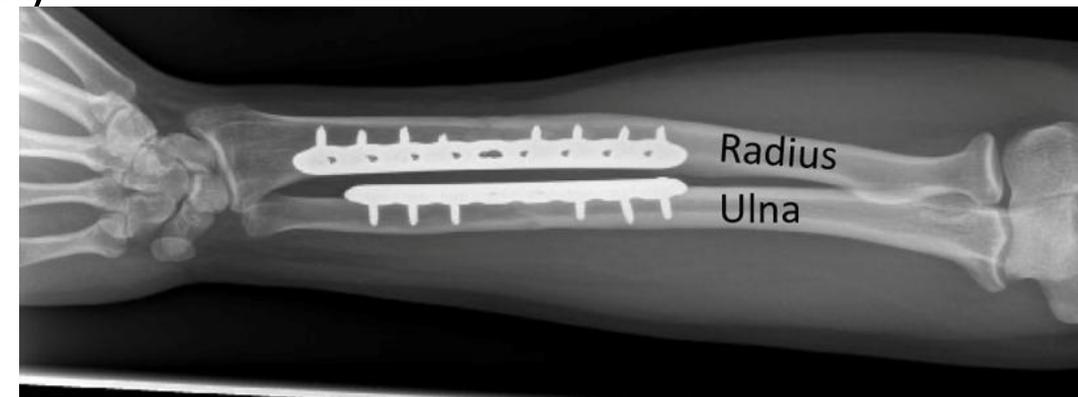
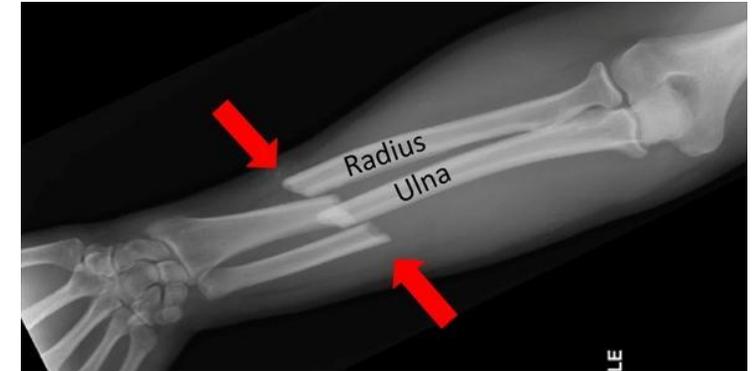
Elbow dislocation

- **Definition:** Discontinuity in humero-ulnar articulation.
- **Classification and Incidence:** Anterior dislocation, Posterior dislocation
- **Mechanism injury:** FOOSH
- **Clinical:** Scheme
- **Management :** Scheme+ urgent reduction (by traction and counter traction)
 - >> **Conservative** treatment 90% (above elbow splint + RICE protocol)
 - >> **Operative** treatment for recurrent elbow dislocation arthroscopy **منظار**
- NB. **Neurovascular injury** associated >> median, ulnar nerve injury, Brachial a.
- NB. Most common **complication** is recurrent dislocation, other Schemeee.



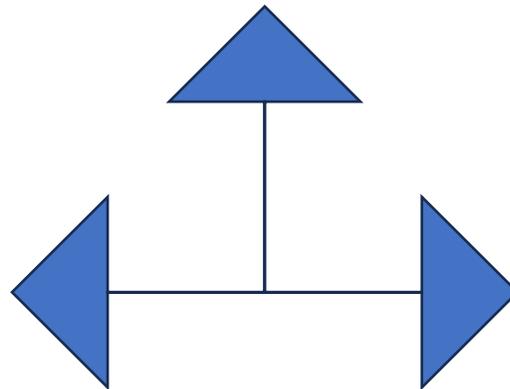
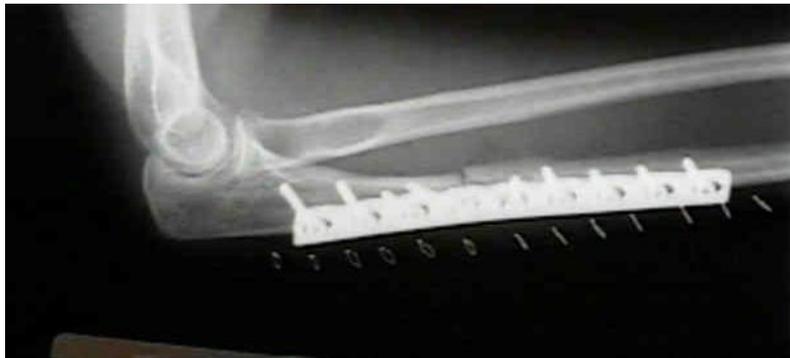
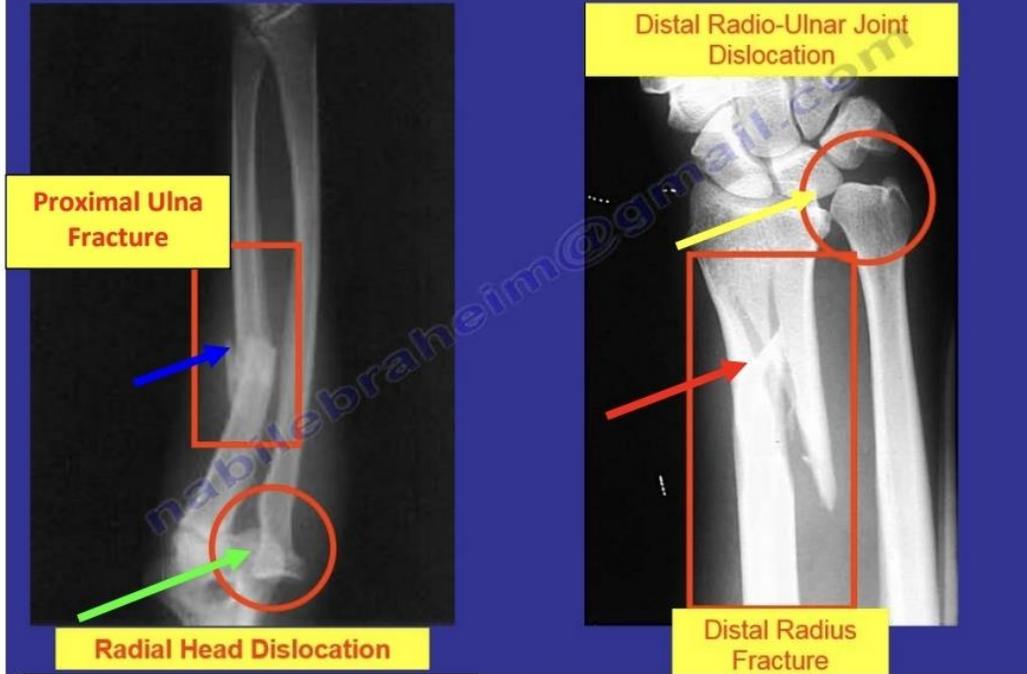
Fracture Ulna and Radius

- **Definition:** Discontinuity in bone surface of radius and ulna.
- **Classification and Incidence:** Proximal, Mid, Distal
- **Mechanism injury:** Direct trauma (Night stick fracture)
- **Clinical:** Scheme
- **Management :** Scheme+
 - >> **Conservative** only for fissures (above elbow cast)
 - >> **Operative** for Displaced # (ORIF),
- **NB. Neurovascular injury**
 - >> Posterior interosseous nerve injury



Moon & Ground

Monteggia Fracture VS Galeazzi Fracture

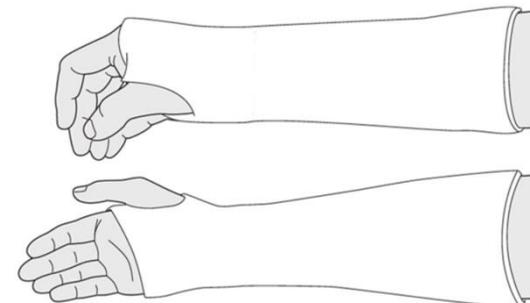
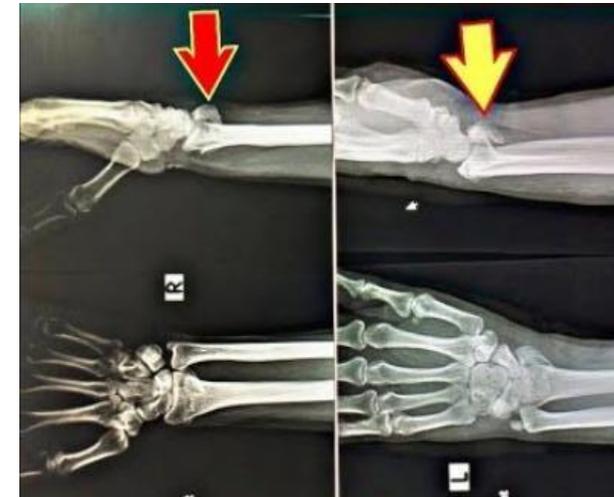
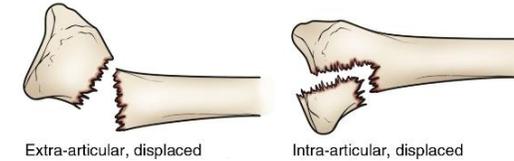


Distal end radius fracture

- **Definition:** Discontinuity in bone surface of distal radius.
- **Classification :** Posterior (Colles), Anterior (Smith)
- **Incidence:** Common in old age osteoporosis
- **Mechanism injury:** FOOSH
- **Clinical:** Scheme
- **Management :** Scheme+
 - >> **Conservative** Colles (below elbow cast)
 - >> **Operative** for Displaced #, Smith (unstable)(ORIF),
- **NB. Neurovascular injury**
 - >> Median nerve injury



Dinner Fork Deformity



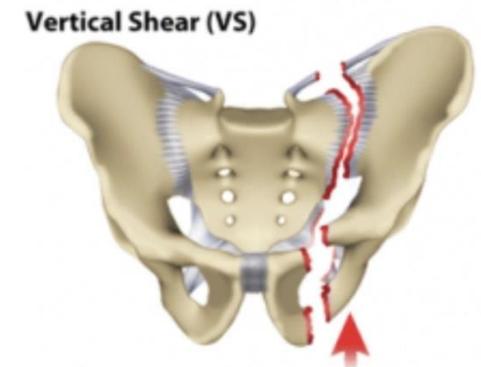
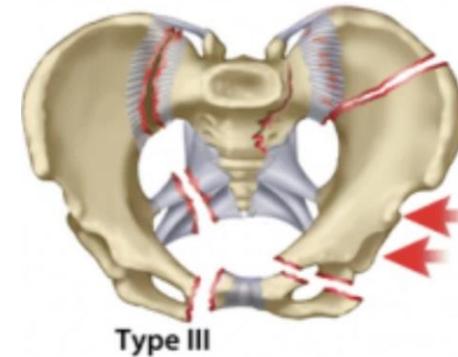
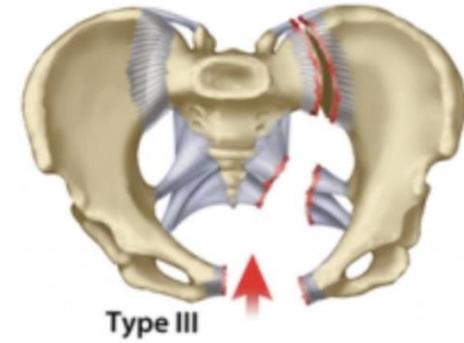
Scaphoid fracture

- **Definition:** Discontinuity in bone surface of scaphoid bone.
- **Classification :** Non displaced, Displaced
- **Incidence:** Common in young age
- **Mechanism injury:** FOOSH
- **Clinical:** Scheme
- **Management :** Scheme+
 - >> **Conservative** non displaced (scaphoid below elbow cast)
 - >> **Operative** for Displaced # (ORIF >> Screw)
- NB. Common **complication** is Non union then Avascular necrosis due to relevant poor blood supply.



Pelvic fracture

- **Definition:** Discontinuity in bone surface of pelvic bones.
 - **Classification:** Compression>> AP or lateral..Shear
 - **Incidence:** Common in young age accidents
 - **Mechanism injury:** High energy trauma
 - **Clinical:** Scheme +shock
 - **Management :** Scheme+ ABCDE
- >> Emergency Pelvic binder
- >> **Conservative** non displaced
- >> **Operative** for Displaced #
(ORIF >> Plate & Screw)



Hip dislocation

- **Definition:** Discontinuity in acetabulum and head femur articulation.
- **Classification :** Anterior dislocation, Posterior dislocation
- **Incidence:** Common posterior dislocation
- **Mechanism injury:** High energy trauma (Car dash board injury)
- **Clinical:** **Scheme**
- **Management :** **Scheme+ urgent reduction** (by traction and counter traction)
 - >> **Conservative** treatment 90% (+ RICE protocol)
 - >> **Operative** treatment for associated acetabulum fractures
- **NB. Neurovascular injury** associated >> Sciatica nerve injury



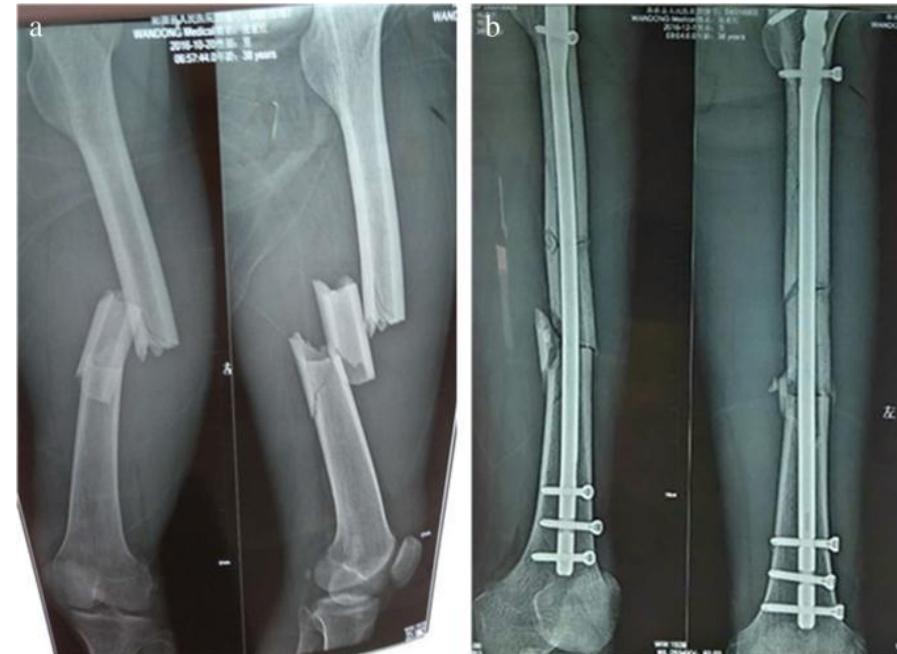
Proximal Femur fracture

- **Definition:** Discontinuity in bone surface of proximal femur
- **Classification :** Neck femur..Intertrochanteric..Subtrochantric
- **Incidence:** Common in old age osteoporosis
- **Mechanism injury:** falling down ground
- **Clinical:** Scheme
- **Management :** Scheme+
- **>> Operative** for all >> young ..ORIF Old...arthroplasty
- NB. Common **complication** is non union then Avascular necrosis due to relevant poor blood supply cut with the fracture.



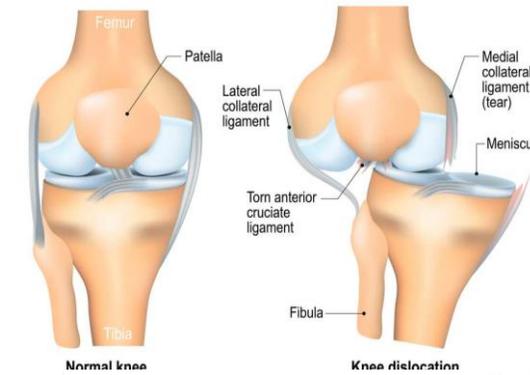
Femoral shaft fracture

- **Definition:** Discontinuity in bone surface of shaft femur.
- **Classification :** Proximal, middle, Distal
- **Incidence:** Common in young age accidents
- **Mechanism injury:** High energy trauma
- **Clinical:** Scheme + shock
- **Management :** Scheme+ ABCDE
>> **Operative** for all..ORIF
- NB. Common use of intramedullary nail



Knee Dislocation

- **Definition:** Discontinuity in tibial and femur articulation.
- **Classification :** Anterior dislocation, Posterior dislocation
- **Incidence:** Common posterior dislocation
- **Mechanism injury:** High energy trauma (car dash board)
- **Clinical:** **Scheme**
- **Management :** **Scheme+ urgent reduction** (by traction and counter traction)
 - >> **Conservative** treatment 90% (+ RICE protocol) + knee brace
 - >> **Operative** treatment for associated fractures ORIF, ligaments injury arthroscopie
- **NB. Neurovascular injury** associated >> sciatica nerve injury, popliteal artery



Tibia fracture

- **Definition:** Discontinuity in bone surface of shaft tibia.
- **Classification :** Open or Closed fracture
- **Incidence:** Common in young age accidents
- **Mechanism injury:** High energy trauma
- **Clinical:** **Scheme** + shock + open fracture
- **Management :** **Scheme+ ABCDE**
>> Operative for all >> closed ..ORIF open .. Ex fix
- NB. Common use of intramedullary nail
- Complications :Scheme + **compartment syndrome**



Ankle fracture

- **Definition:** Discontinuity in bone surface of lateral malleolus.
- **Classification :** At, Below, Above joint line
- **Incidence:** Common in young age Sport
- **Mechanism injury:** Low energy trauma
- **Clinical:** Scheme
- **Management :** Scheme

>> **Operative** for above and at joint line ..ORIF

below..Conservative below knee cast

NB. Common use of plate and screws



Ankle sprain

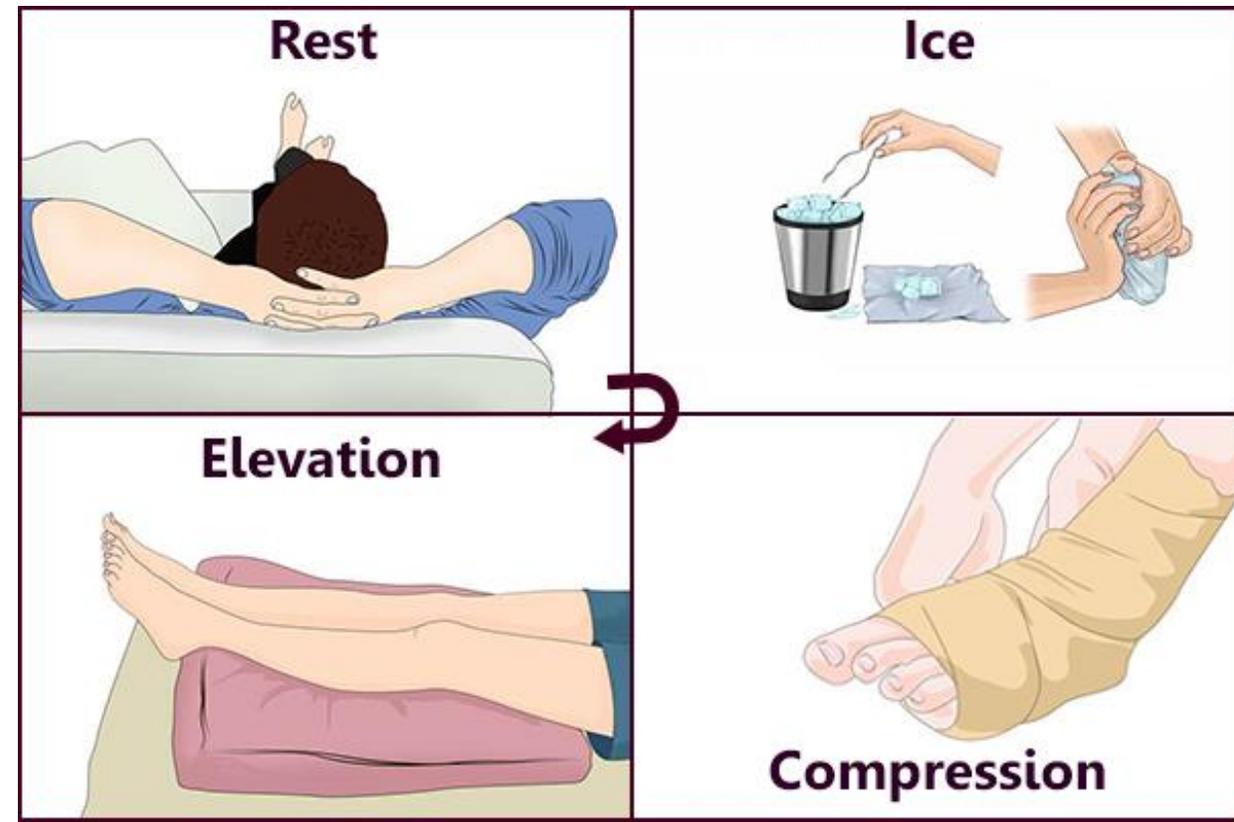
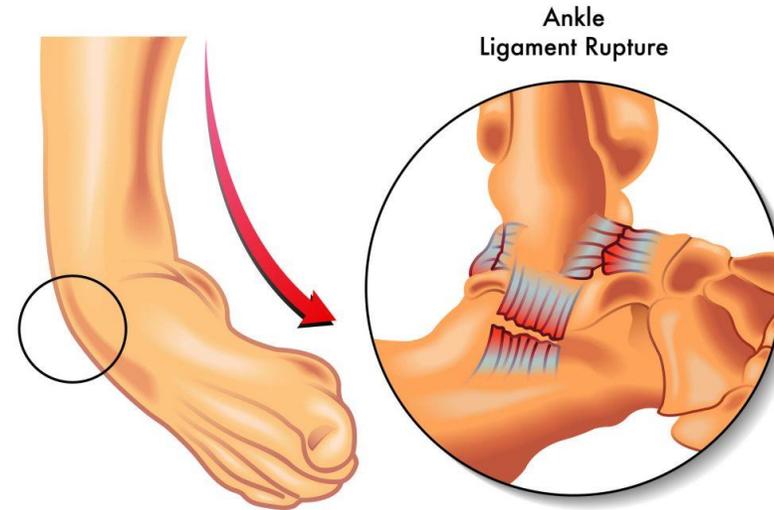
- **Definition:** Twisting injury to ankle ligament .
- **Classification :** Medial and lateral injury
 - >> **Grade I** one side, **II** two sides, **III** three sides + foot
- **Incidence:** Common in young age Sport
- **Mechanism injury:** Low energy trauma twist
- **Clinical:** **Scheme**
- **Management :** **Scheme**

Conservative treatment RISE protocol

>> Grade I ..Bandage 1 week رباط ضاغط

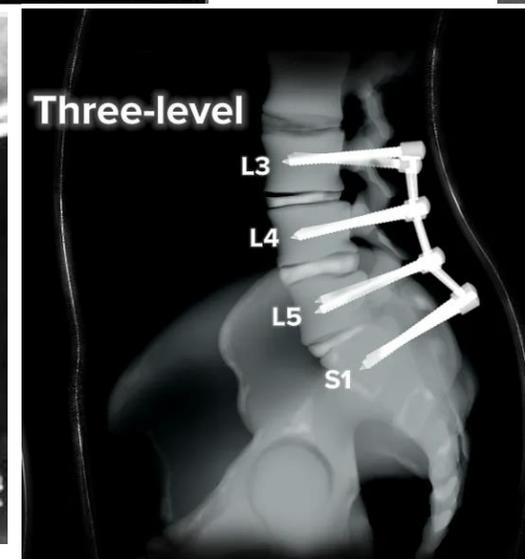
>> Grade II...Below knee splint 2 weeks

>> Grade III...Below knee cast 4 weeks



Spine fractures: Cervical and Lumbar

- **Definition:** Discontinuity in bone surface of vertebrae,
- **Classification :** 3 Column ..Anterior Middle Posterior
- **Incidence:** Common in young age accidents
- **Mechanism injury:** High energy trauma
- **Clinical:** **Scheme** + Neurovascular
- **Management :** **Scheme+**
 - >> **Conservative** for one column
without neurologic insult (brace or collar)
 - >> **Operative** for Displaced # or 2 columns
decompression and fixation
- NB >>



NB, Notes on Spine fractures

Primary survey This follows the **ABCDE +**

Airway: Don't do head tilt chin lift airway compromise may be caused by the development of a retropharyngeal haematoma.

Breathing: Impaired after a cervical or thoracic spine injury.

Circulation: Neurogenic / spinal shock assessment.

Disability: Rapid assessment of central neurological function is made using AVPU and the Glasgow Coma Scale.

Exposure: Patients should be completely exposed to allow examination. This involves cutting their clothing free whilst preserving warmth and dignity.

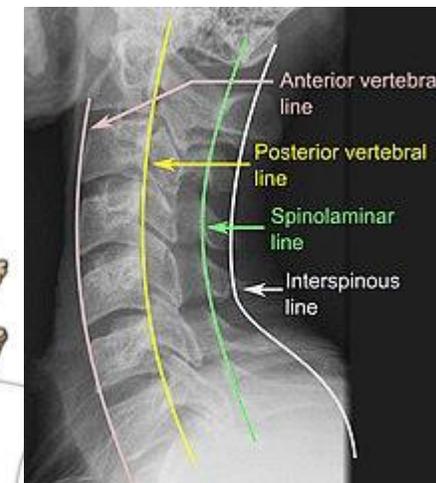
1. Assumed to have an unstable spinal injury.

- Logroll the patient to allow inspection of the back and to remove debris and clothing.



Clinical Clearance Criteria

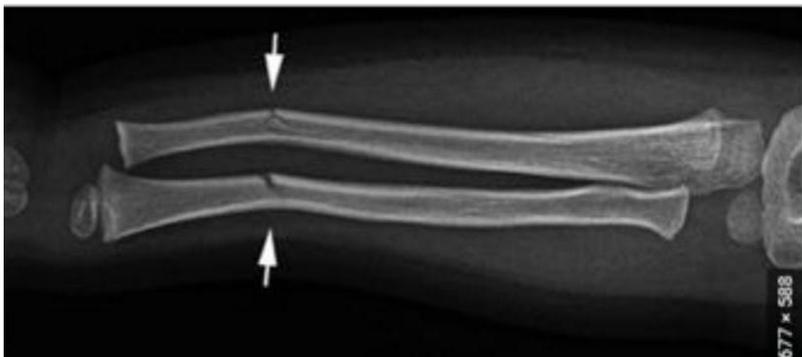
- Alert, Awake: GCS = 15
- NO intoxication
- NO neck pain
- NO neurologic deficit
- NO distracting injury (ex. Long bone fracture, large burn, clinical judgment)
- Age 18-65



Pediatric fractures

Shaft

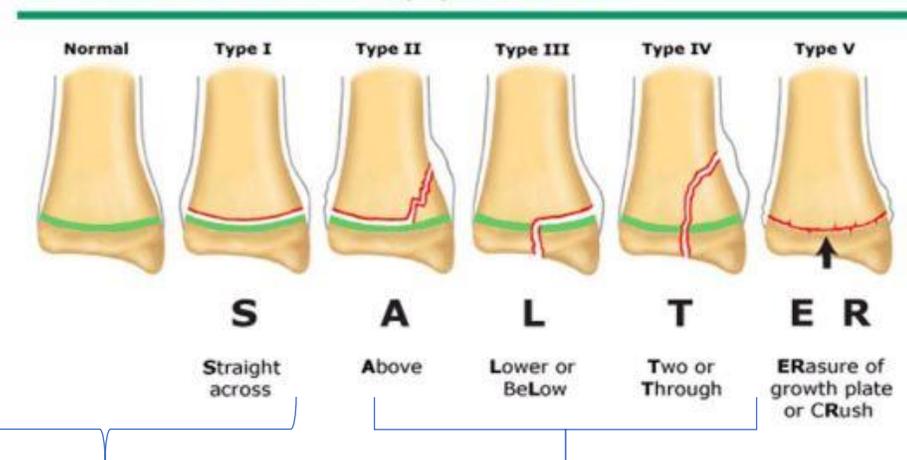
- Usually incomplete fractures ?
- Distinct fracture patterns due to the unique properties of growing bones. The periosteum in growing bones is thicker and stronger than in adult bones, which is why children are more prone to more incomplete fractures eg. greenstick and torus or buckle .



Growth plate

- Dangerous Fracture that involves the epiphyseal plate or growth plate that may cause deformity

Salter-Harris classification of physel fractures



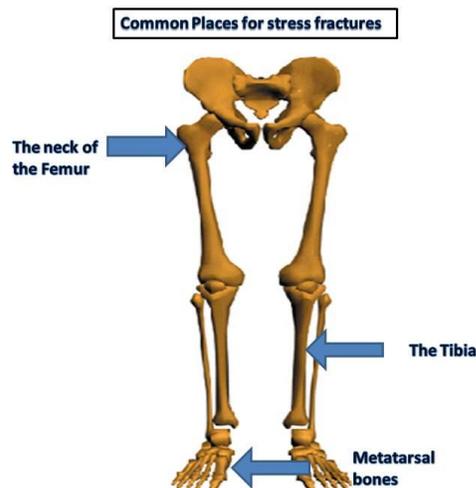
Conservative
Cast

Operative reduction and
fixation by K wire

Fissure fracture شرح

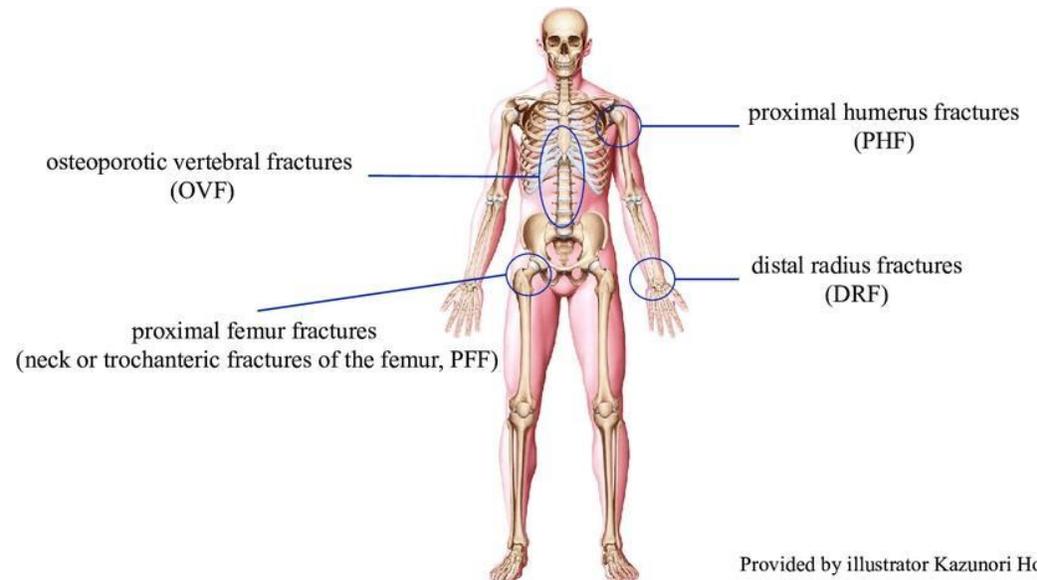
Stress fracture

- Tiny cracks in a bone. They're caused by repetitive force, often from overuse — such as repeatedly jumping up and down or running long distances
- Treatment conservative cast.



Fatigue fracture

- Develop from normal use of a bone that's weakened by a condition such as osteoporosis, tumor, infection
- Treatment underlying cause.



Undergraduate Congenital bone diseases

Congenital bone diseases

- Congenital bone disorders are a group of various types of diseases that affect regular bone growth.
- **Aetiology** could be idiopathic, genetic, medication, viral induced.
- **Symptoms** usually deformity.
- **Management** usually needs multidisciplinary team of orthopedic surgeon, physiotherapist, neurologist, family support .
 - >> Surgical treatment age dependant includes ideally one procedure in order to stabilize the bone and therefore increase the level of mobility.

Upperlimb Congenital

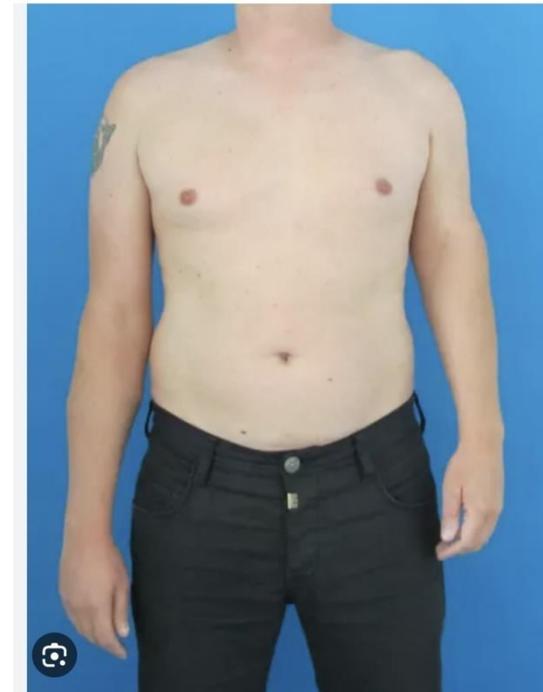
Winging scapula

- Usually due to damage or impaired innervation to the serratus anterior muscle.



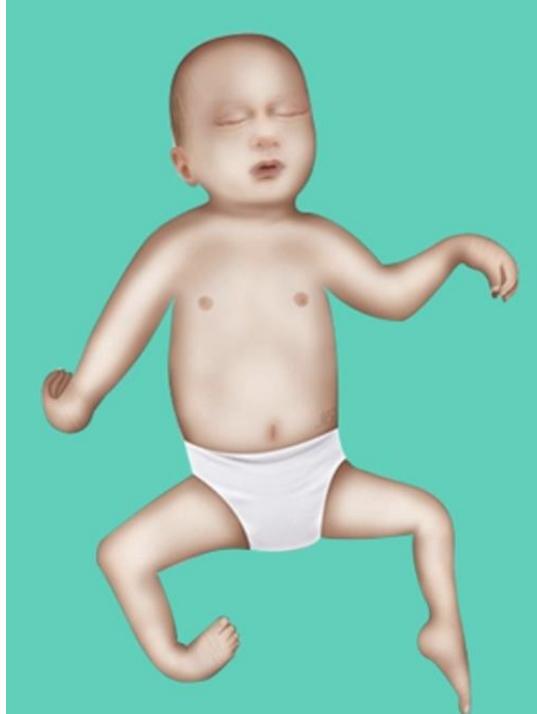
Arm shortening

- Limb-length discrepancy is when one leg or arm is shorter than the other leg or arm.



Elbow stiffness

- Congenital elbow contracture is a rare upper-extremity disorder. Arthrogryposis (multi joint stiffness) is the main etiology of congenital elbow stiffness.



Absent Radius or Ulna



Syndactyly

Fused skin of fingers

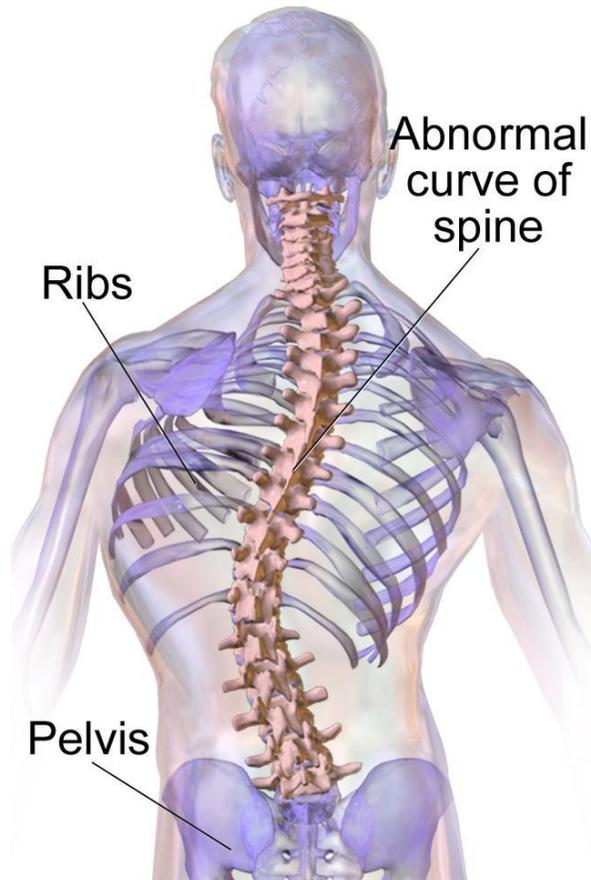


Polydactyly: extrafingers



Spine and Pelvis congenital

Scoliosis : S twist of spine



DDH

- Developmental dysplasia of the hip, means that the hip joint of a newborn baby is dislocated or about to dislocate.



Lower limb congenital

Femoral shortening



Varus knee



valgus knee



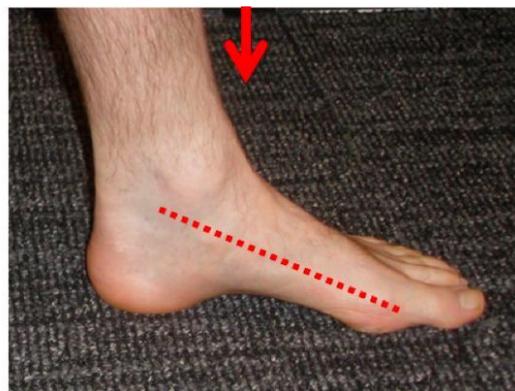
Intoe: internal rotation of the limb



Dwarf: short stature

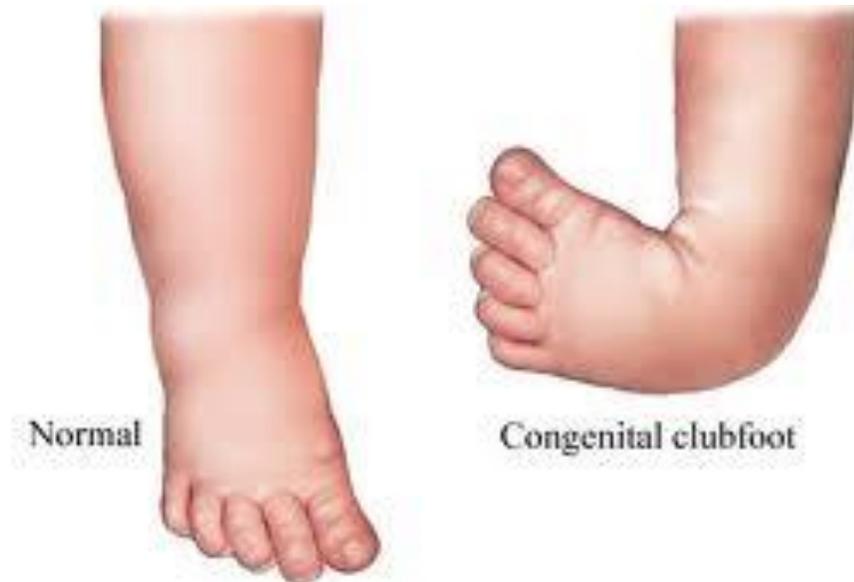


Flatfoot



Talipes equino varus

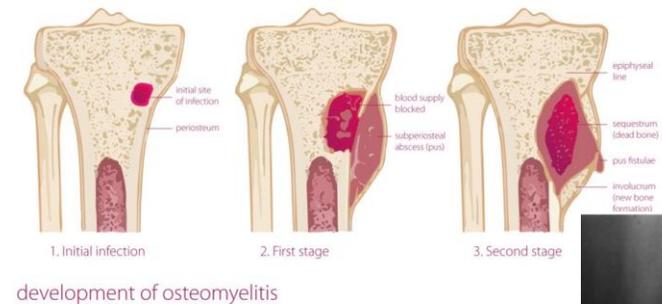
Foot planterflxion and internal rotation



Undergraduate Inflammatory bone diseases

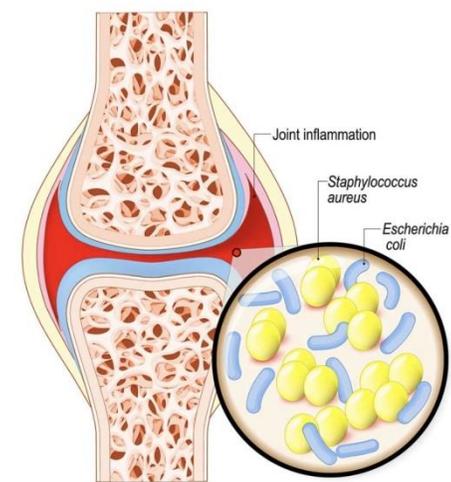
Osteomyelitis

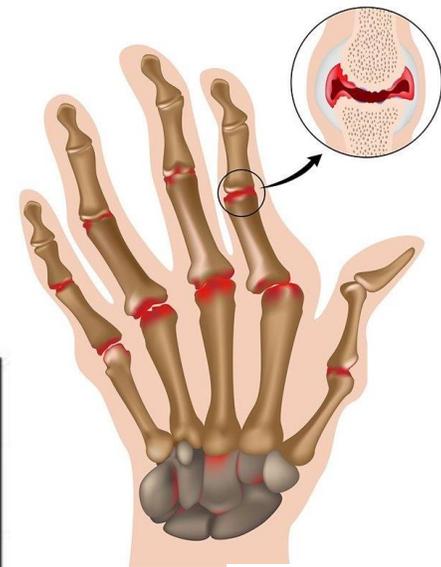
- **Definition:** infection of bone and bone marrow inside .
- **Classification :**Acute, Chronic
- **Incidence :** Common in children after trauma
- **Mostly by** staph aureus
- **Predisposing factors..**DM, HIV, immune compromise
- **Clinical:** General fever ...Local hot, red, tender, swollen
- **Investigation:** Lab high ESR, CRP, CBC..leukocytosis
 - >> X ray no changes early ..in chronic cavity with remnants
- **Management :** **Scheme+ Antibiotic** (by Aspirate C/S)
 - >> **Conservative** treatment 90% (+ RICE protocol) + brace
 - >> **Operative** treatment for evacuate acute abcess, debridment chronic



Septic arthritis

- **Definition:** Bacterial infection of synovial membrane and synovial fluid .
- **Classification:** Acute, Chronic
- **Incidence :** Common in drug abuser or post surgical
- **Mostly by** staph aureus
- **Predisposing factors..**DM, HIV, immune compromised
- **Clinical:** General fever ...Local hot, red, tender, swollen
- **Investigation:** Lab high ESR, CRP, CBC..leukocytosis, synovial fluid analysis
 - >> X ray no changes early ..in chronic cavity with remenants
- **Management :** **Scheme+ Antibiotic** (after aspirate C/S)
 - >> RICE protocol + brace
 - >> **Operative urgent** for evacuate pus from the joint
- **Complications** degeneration of articular cartilage with early osteoarthritis ...Stiff joint





DD. Synovial fluid aspirate

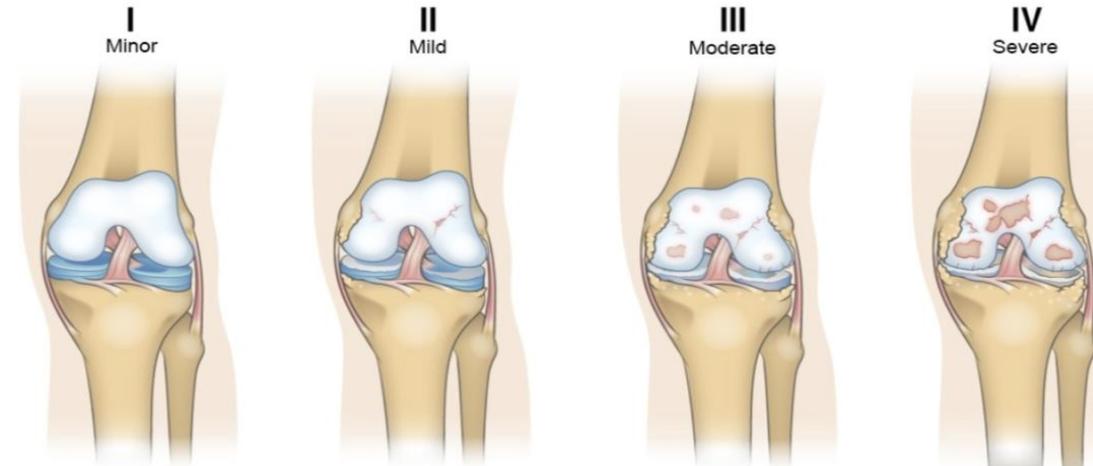
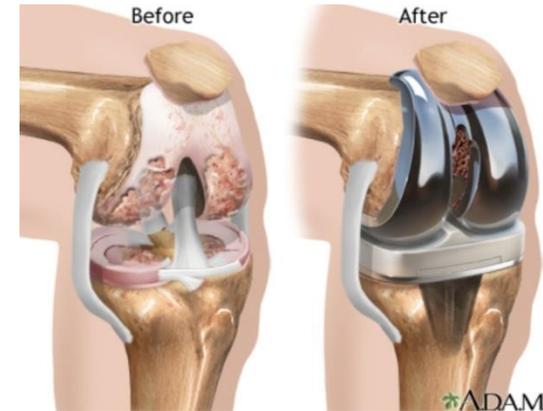
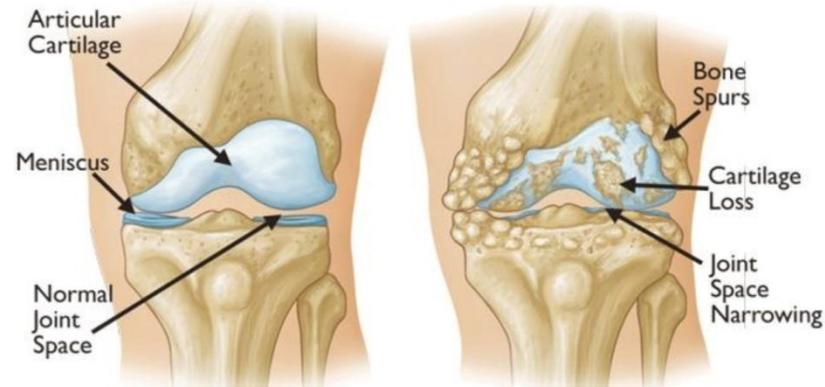
Synovial Fluid Analysis

	WBC/mm ³	Color	Viscosity
Normal	< 150	Colorless/Straw	High
Noninflammatory	< 3,000	Straw/Yellow	High
Inflammatory	> 3,000	Yellow	Low
Septic (purulent)	> 50,000	Pus/Mixed	Mixed
Hemorrhagic	Similar to blood	Red	Low

- **Inflammatory**..like rheumatoid arthritis causing synovitis affect mainly hand.
- **Gout**..uric acid crystals deposited in joint cause synovitis affect commonly big toe.
- **Hemophilia**..bleeding disorder cause hemorrhage inside the joint affect commonly knee.

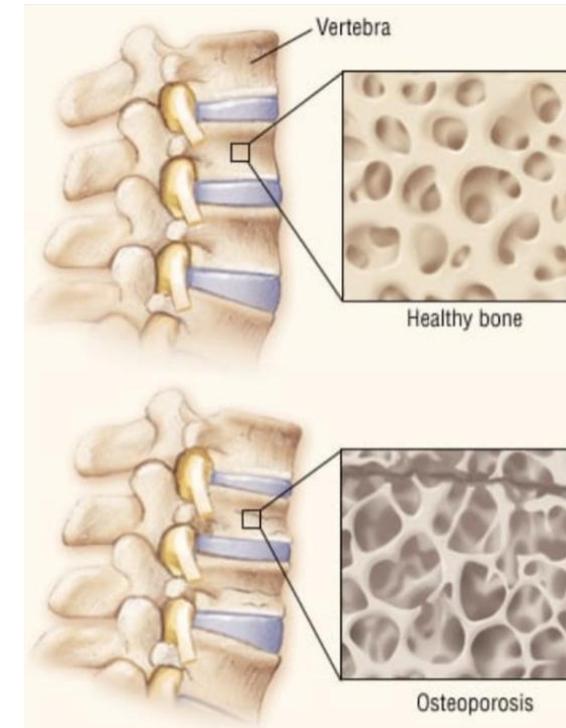
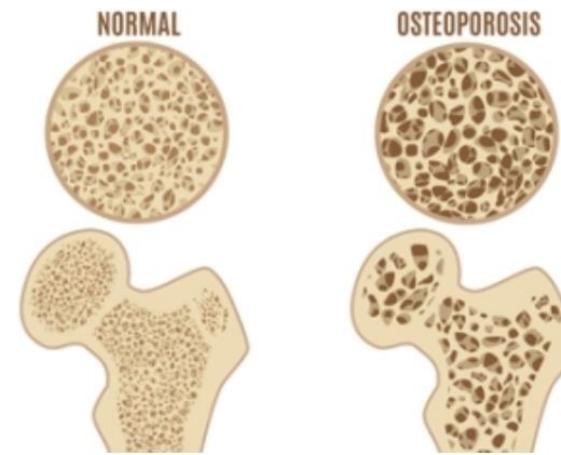
Osteoarthritis

- **Definition:** Degerative disease of the joints
- **Classification:** Stages
- **Incidence :** Common in old age in knee joints
- **Predisposing factors:** genetic, familial, racial, previous fracture
- **Clinical:** pain , swollen, stiffness
- **X ray Stages**
- **Management :** **Scheme+**
 - >> **Conservative** treatment 90% (+ RICE protocol) + brace
 - >> **Operative** treatment for advanced cases by arthroplasty



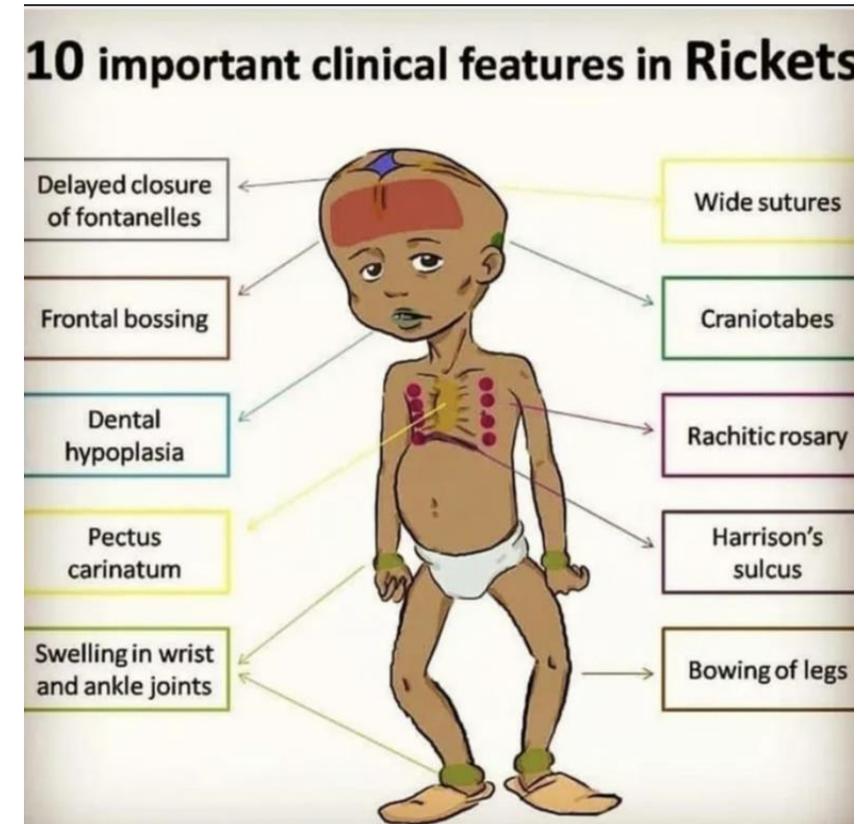
Osteoporosis

- **Definition:** Metabolic bone disease in old age causing decrease bone density.
- **Classification:** stages Osteopenia then early, late Osteoporosis
- **Incidence:** Common in old age, in spine, hip, end radius
- **Predisposing factors:** Decreases calcium and vitamin D intake
- **Clinical:** pain, fatigue fracture
- **X ray** rarefaction, best DEXA scan
- **Management** : **Scheme+** sport strengthening
 - >> **Conservative** treatment 90% (calcium + vit D)+ bone forming drugs + brace
 - >> **Operative** treatment for advanced deformity cases by correction osteotomy .



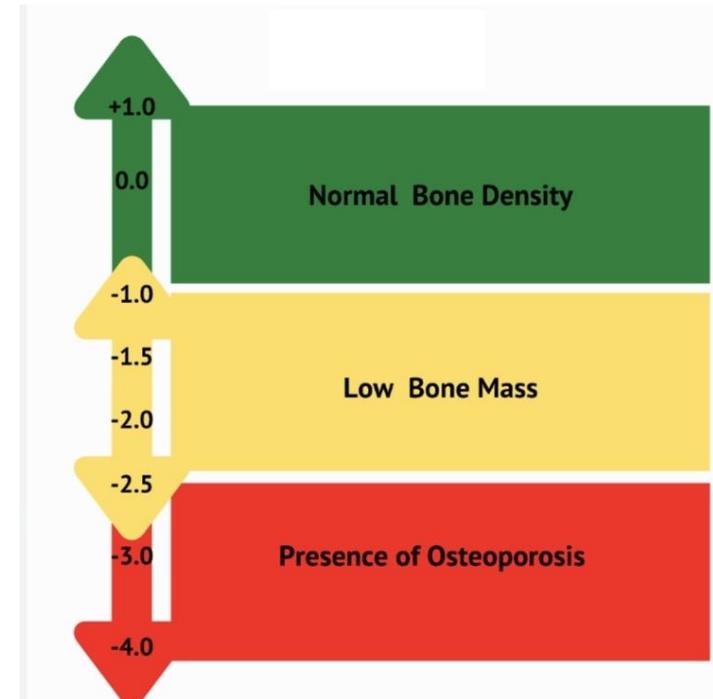
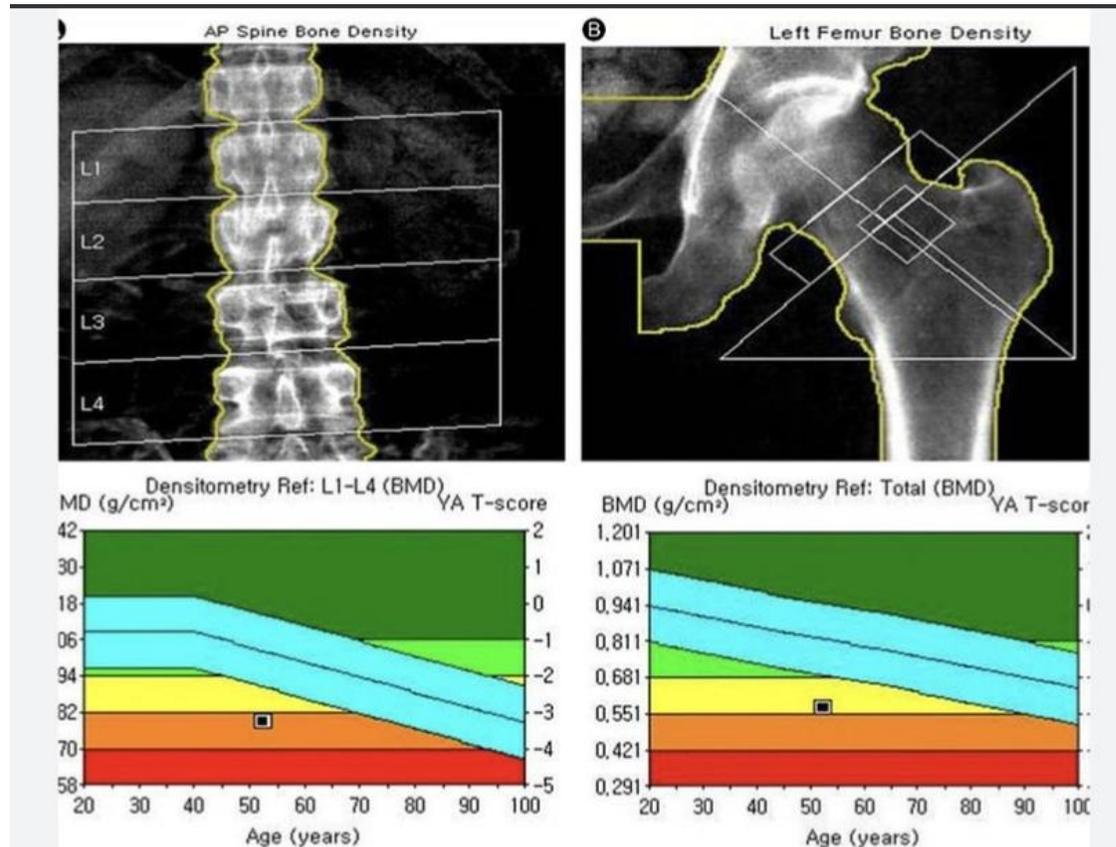
Rickets

- **Definition:** Metabolic bone disease in children soften the bone.
- **Classification:** Stages Active..Healing..Healed..Deformity
- **Incidence :** Common in children age , **no sun exposure**
- **Predisposing factors:** Decreases calcium and vitamin D intake
- **Clinical:** Deformity Genu valgus varus, bossing skull, rosary beades
- **X ray** stages Active..Healing..Healed..Deformity
- **Management :** **Scheme+**
 - >> **Conservative** treatment 90% (calcium + vit D) + brace
 - >> **Operative** treatment for advanced deformity cases by correction osteotomy .



DEXA scan

- The investigation of choice to diagnose osteoporosis by comparing bone density of the patient to bone intensity of normal person.

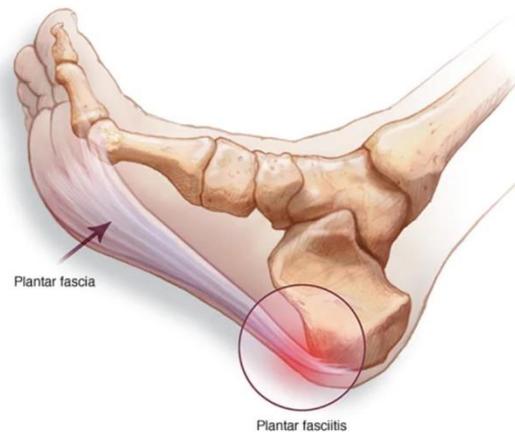
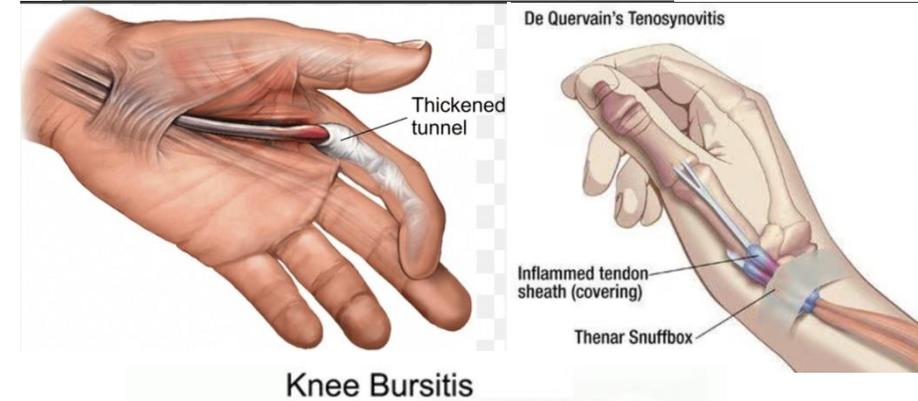
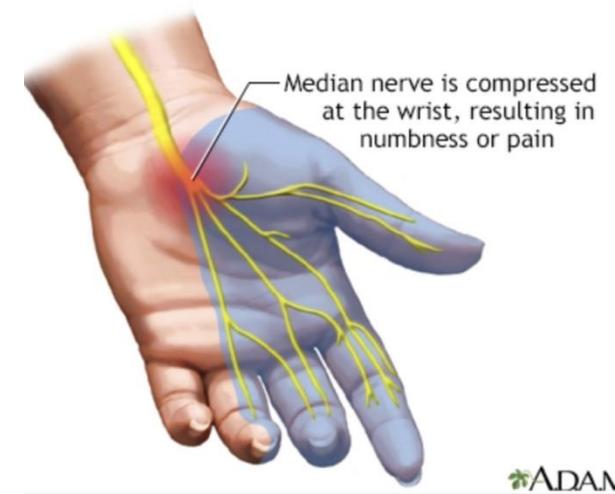


Painful Conditions

- **Carpal tunnel syndrome:** Compression on median nerve by wrist flexor retinaculum, causing pain and numbness at hand.
- **Trigger finger:** Chronic inflammatory tenosynovitis causing nodule restricting tendon movement.
- **Tenosynovitis:** Acute Inflammation of tendon sheath causing pain on movement .
- **Tennis & Golfer elbow:** Inflammation of the muscle origin.
- **Bursitis:** Inflammation of bursa sac cover outside joints.
- **Planter fasciitis:** Inflammation of planter fascia causing heel pain.

- **Treatment**

- >> **Conservative** mainly, RICE protocol
+ Local injection steroid
- >> **Operative** in resistance cases
release of compression

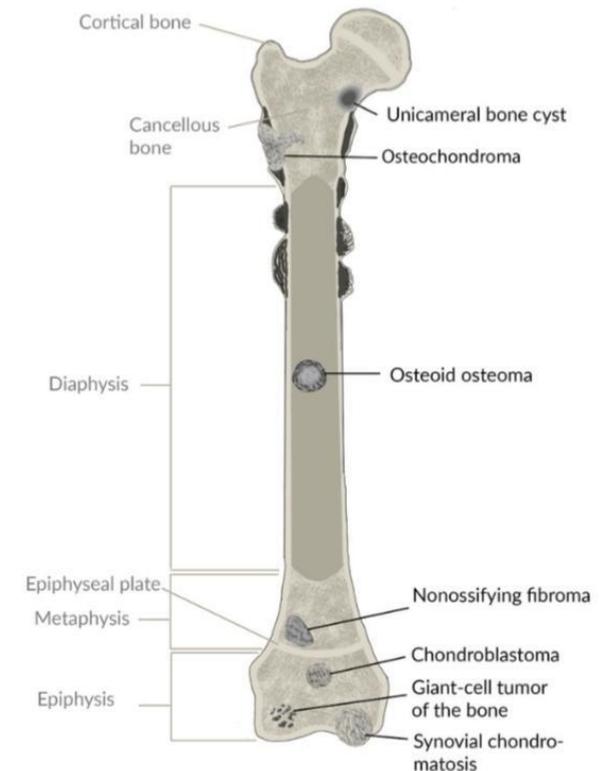


Undergraduate Musculoskeletal Tumors

Benign Msk Tumors

Histology Type	Benign
Hematopoietic	
Chondrogenic	Osteochondroma Chondroma Chondroblastoma Chondromyxoid fibroma
Osteogenic	Osteoid Osteoma Benign Osteoblastoma
Unknown Origin	Giant Cell Tumour
Fibrogenic	Fibroma Desmoplastic fibroma
Notochordal	
Vascular	Haemangioma
Lipogenic	Lipoma

- **Latent** ..No complaint, very slow growing , stop at adult
- **Active**..patient complaints with observed growing but stop at adult
- **Aggressive**... complaints with rapid growth even after adult

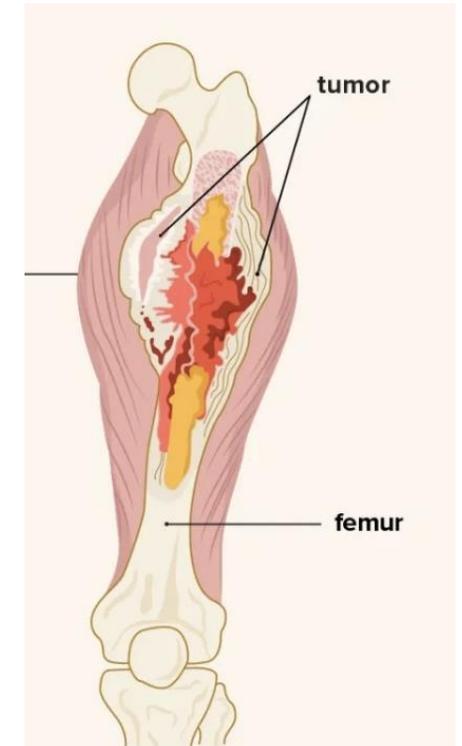


Malignant Msk Tumors

Histology Type	Malignant
Hematopoietic	Myeloma
Chondrogenic	Primary Chondrosarcoma Secondary Chondrosarcoma Dedifferentiated Chondrosarcoma Mesenchymal Chondrosarcoma
Osteogenic	Osteosarcoma Parosteal Osteogenic Sarcoma
Unknown Origin	Ewing Tumour Malignant Giant cell Tumour Adamantinoma
Fibrogenic	Fibrosarcoma
Notochordal	Chordoma
Vascular	Haemangioendothelioma Haemangiopericytoma
Lipogenic	Liposarcoma

- **Stages**
 - I.. Intracompartment
 - II.. Extracompartment
 - III.. Distant metastasis
- **Grades**

Low grade ..good
High grade..bad



Diagnostic

- **Patient complaints** of swelling or mass, pathological fracture

- **X-ray** most common is metastasis

- **A..age**

<30 (**a.e.i.o.u**) Anurismal bone cyst/Ewing Sarcoma/Infection/**O**steosarcoma/**U**nicameral bone cyst

>30 (**MACRO**) **M**etastases/**A**dult lymphoma/**C**hondrosarcoma/**R**ound cell multiplemyloma

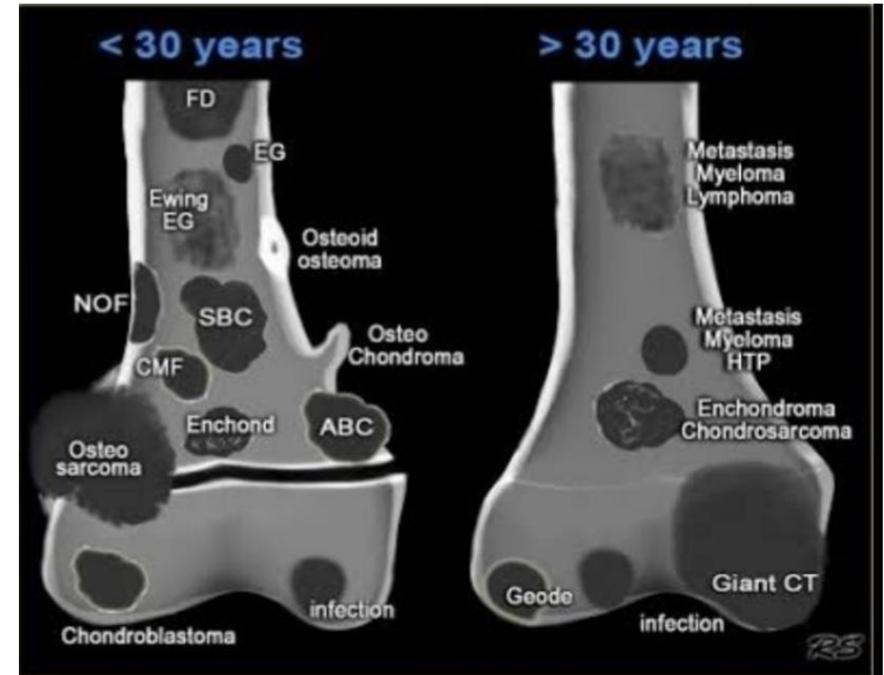
/**O**steosarcoma

- **B..bone**

Which bone? (Sacrum >> chordoma/ Hand >> Chondroma/.....)

Which part? Epiphysis>> Giant cell tumor كبير Chondroblastoma طفل

	<i>Central</i>	<i>Eccentric</i>
<i>Metaphysis</i>	<i>(SEF) SBC/enchondroma/FD</i>	<i>Ost.sar/ ch.sar</i>
<i>Diaphysis</i>	<i>(...)Ewing/MM/leukemia/lymphoma</i>	<i>O.o/NoF/admantinoma</i>

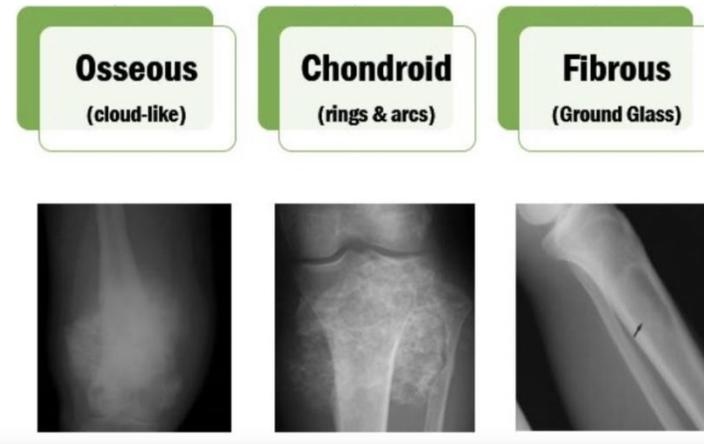


- **C..content = matrix**

Osteogenic (fluffy cotton)..

Chondrogenic (calcification)..

Fibrous (ground glass).

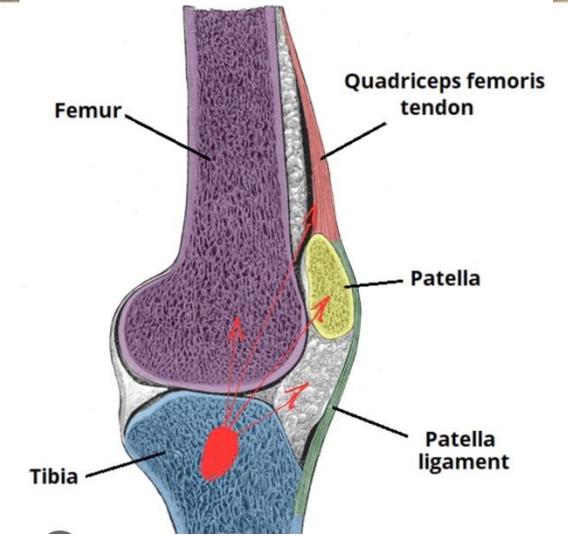


- **D..delineation**

<i>Detraction</i>	<i>Periost.reaction</i>
<i>Benign=Geographic</i>	<i>benign=sclerotic</i>
<i>Malignant =</i>	<i>Malignant =</i>
<i>Moth eaten/permeative</i>	<i>Lamillated(onion beel)</i>
	<i>Speculated(sun burst)</i>

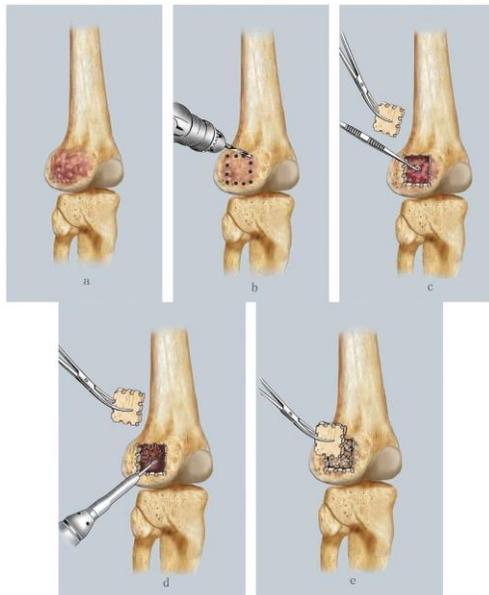


- **E..extension** to tissue surround infiltrates / Bone marrow/joint/ vasular invasion



Management

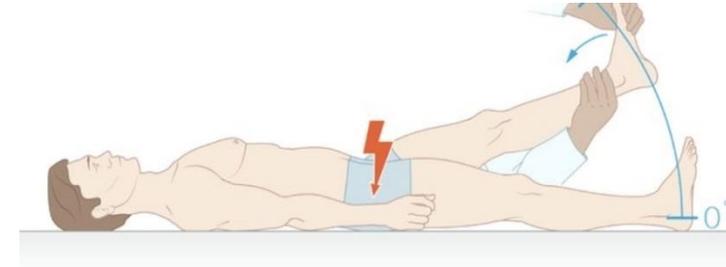
- If suspect tumor & pre-operative.... CT & MRI whole limb
- **Benign..**
 - >> Latent ..Conserve
 - >> Active... Currtage
 - >> Aggressive... Excision



Malignant Bone scan	
<p><i>Single focus (do biopsy)</i> <i>Biopsy (guided us or CT)</i></p> <p>B</p> <p>Front Back</p>	<p><i>Multiple foci (mets work up)</i> <i>Mets work up....</i> <i>CT chest/abd/pelvis</i> <i>Tumor markers</i> <i>Fecal occult blood</i> <i>LN</i></p>
	<p>Mets</p> <p><i>Fixation according Mirel criteria</i> <i>Radio ttt palliative</i> <i>Chemottt</i> <i>Hormonal ttt</i></p>

Undergraduate Examination

General



- **Identification** سلام عليكم انا د محمود
- **Excuse** استاذنك افحصك للامتحان
- **Exposure** Upper limb..bared till cervical spine , Lower limb..bared till cervical and lumbar spine

Local

Look; A S S (4D) متنساش تبص من جميع الاتجاهات

Alignment: position joint to body (normal, depressed, elevated)

Symmetrical: compare other side (muscles wasting)

Skin: scar, swelling, sinu, (site size, shape, surface, healed 1ry or 2nd, keloid)

Move; Rom

Range of motion flex, ext., abd., add., int.rot, ext, circumduction

Feel; T T Truck

Temperature بظهر ايدك

Tender points بصوابك bone, soft tissue

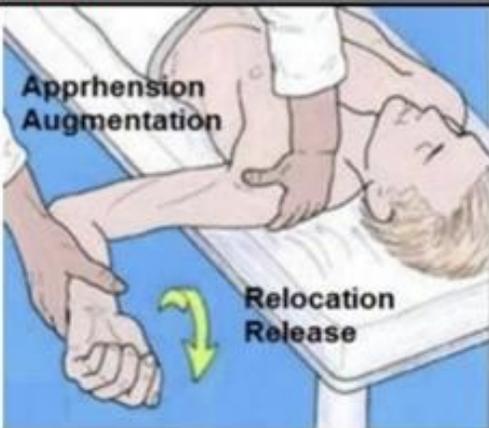
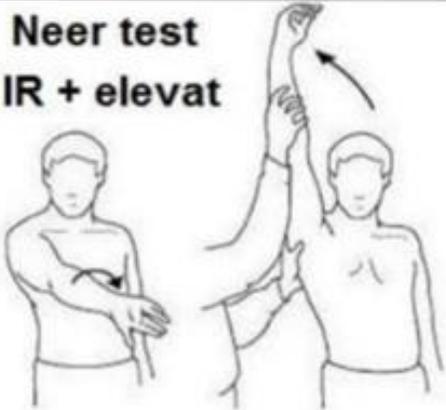
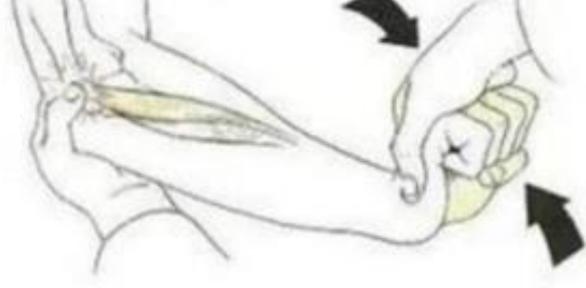
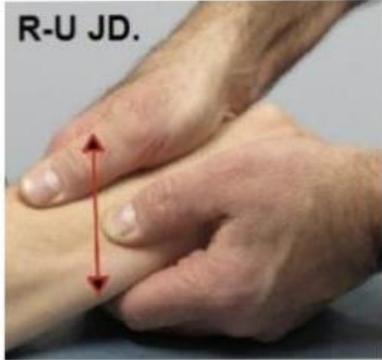
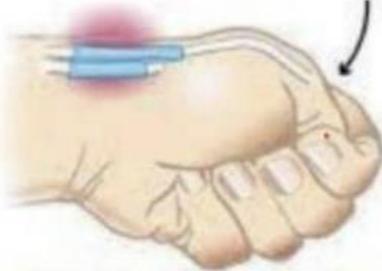
Truck crepitus طرقعه مع الحركة او تحت صوابك

● Neurovascular او عى تنساها

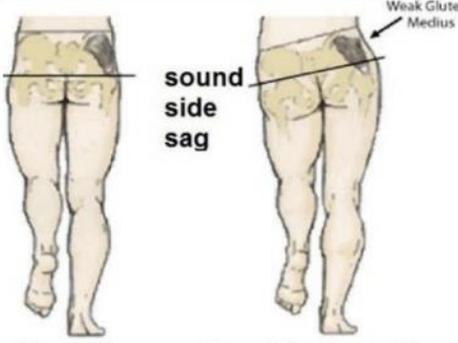
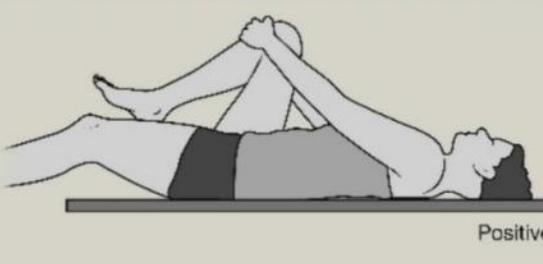
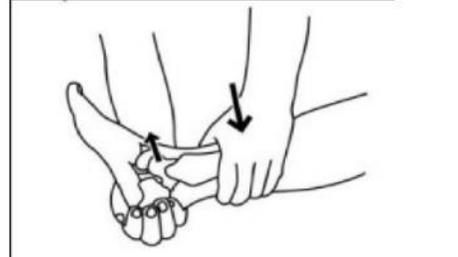
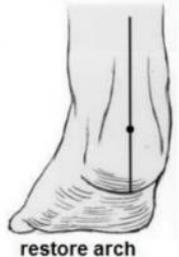
Neuro; sensory, motor, m.power 5 grades

Vascular; all arteries in the limb, capillary refill

Special Tests of Upper- limb

Joints	Trauma	Disease
Shoulder	 <p>Apprhesion Augmentation Relocation Release</p> <p>Sh dislocation</p>	<p>Neer test IR + elevat</p>  <p>Impingement syndrome</p>
Elbow	<p>stress varus / valgus at 0/30/90/moving</p>  <p>MCL LCL injuries</p>	 <p>Tennis elbow Golfer</p>
Wrist	<p>R-U JD.</p>  <p>piano sign inferior Radioulnar dislocation</p>	 <p>Finklestein test DeQuurvain</p> <p>APL, EPB inflammation</p>

Special Tests of Lower-limb

<p>Hip</p>	 <p>sound side sag</p> <p>Normal</p> <p>Trendelenburg Sign Drop of pelvis when lifting leg opposite to weak gluteus medius</p>	 <p>Positive</p> <p>Thomas test Fixed flexion deformity</p>
<p>Knee</p>	<p>Effusion mild(<15ml)..fluid shift moderate(15-30)..fluctuation sever(>30ml)..Ballotment</p>  <p>Location of wave of fluid</p>	<p>Stress valgus/varus 30°</p>  <p>MCL LCL</p> <p>Drawer 90°</p>  <p>ACL</p> <p>Join effusion</p> <p>Ligament Injuries</p>
<p>Ankle</p>	<p>Ankle: ADT</p>  <p>Ankle instability ATF #</p>	<p>Midfoot: FF Tip Toeing/</p>  <p>restore arch</p> <p>Flatfoot</p>

Simple as I can

