Orthopedics MiniOSCE

ملف تلخيص من أسئلة السنوات السابقة للأورثو، لتسهيل المراجعة وتقليل التكرار.
إن أصبت فمن الله، وإن أخطأت فمن نفسي، يرجى مراجعة المعلومات والتأكد من كل شيء

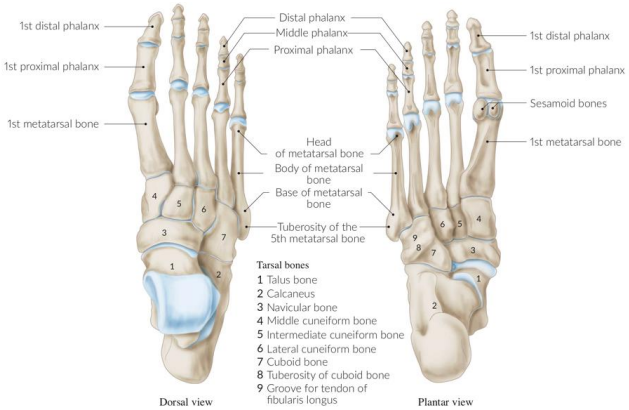
(do your own factual checks in case there were any mistakes)

هذا العمل مبني على مجهود سابق، وجميع الفضل لأصحابه، وأسأل الله أن ينفع به.

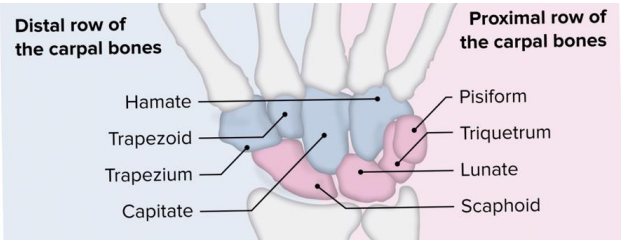
دعْوَةٌ صَالِحَةٌ مِنَ الْقَلْبِ لِي وَلِوَالِدَيَّ

1) ANATOMY

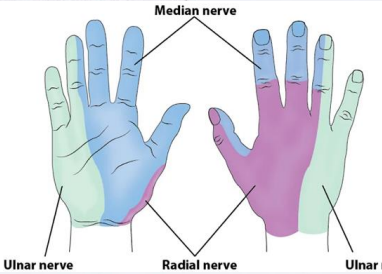
- **Name muscles:** pectoralis minor, latissimus dorsi, trapezius, serratus anterior
- **Name**: Iliopsoas. **Fx**: hip flexion & lateral/ext rotation. **Insertion**: lesser trochanter of femur. Origin: iliac fossa + transverse processes of T12-L4.
- Name labelled bones in the foot:



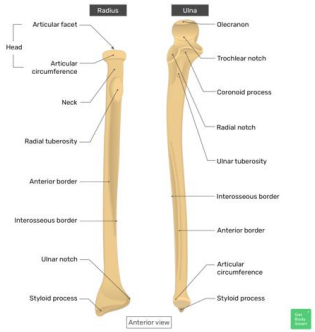
- **Against which bone we feel dorsalis pedis pulse?** navicular
- Carpal bones mnemonic: Sally Left The Party To Take Cathy Home



-picture of 3 sensation points over the hand, what nerves are they supplied by? (median ulnar radial)

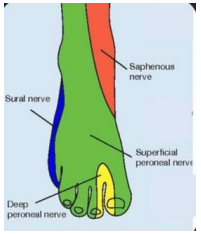


-picture of 2 points on radius and ulna, what are they called? radial head and olecranon process



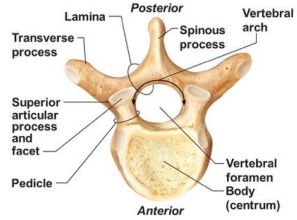
- Winging of scapula
- Long thoracic nerve injury
- Supplies serratus anterior

- Nerves for sensation in these areas?



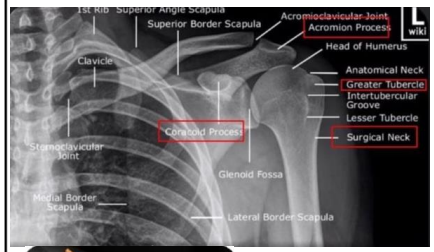
11- pedicles / spinous process

3-Lamina and pedicle



- Names: A) Quadriceps tendon, patella, C) patellar tendon

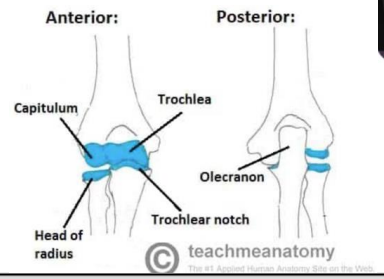
1) ANATOMY



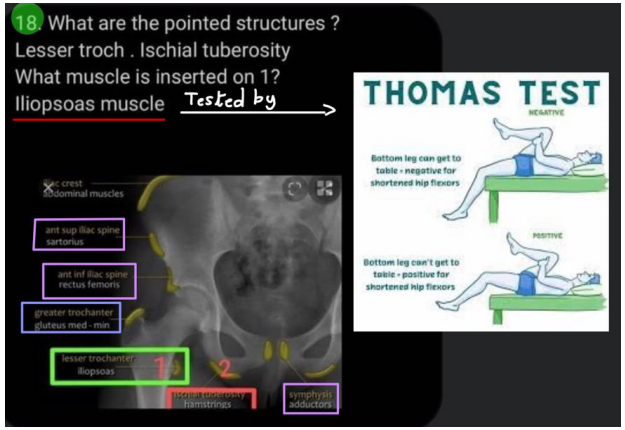
- Clavicle, coracoid, acromion (or acromioclavicular space/joint)
- In another Q: glenoid arrow

- Which nerve supplies extensor hallucis longus? Deep peroneal nerve
- Psoas major. Action: flexion of the hip. Nerve supply: anterior rami of L1-L3.

- Name: Olecranon, capitulum, radial head/neck
  - Some say its trochlea not olecranon



- Name structures in red box



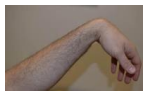
- The tendon of which muscle inserts to the base of the 5th metatarsal? Peroneus brevis tendon

2) NERVES

- Axillar nerve supplies → deltoid, teres minor
- Erb's Palsy → Upper trunk (C5-C6) of BP injury; lateral traction of neck trauma
- Muscles: BIRDS (biceps, infraspinatus, wRist extensors, Deltoid, Supraspinatus)
- Dx: XR?????
- Tx (double check)
  - Observe biceps function within 6w-2months → neurapraxia = good prognosis
  - If no → tendon transfer at 7-10 years

Radial n.: motor (extension of wrist & of MCPs), sensory (first web space)
Median n.: motor. (OK sign), sensory (pulp of index finger)
Ulnar n.: motor (abduction & adduction of fingers), sensory (pulp of little finger)
Musculocutaneous n.: motor (flexion of elbow joint)

- Humeral shaft fracture; can't extend wrists or fingers → radial nerve injury → wrist drop
- Numbness and pain upon tapping medial epicondyle → Ulnar nerve compression → cubital tunnel syndrome



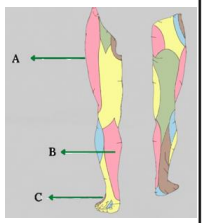
- Tx of CTS: immobilize, steroids, physiotherapy or surgical release of the transverse carpal ligament

- Nerve for plantar flexion → common peroneal nerve

	MUSCULOCUTANEOUS	AXILLARY	RADIAL	MEDIAN	ULNAR
ORIGIN	C5/C6/C7 anterior divisions of superior and middle trunks ↓ lateral cord	C5/C6 posterior division of superior trunk ↓ posterior cord	C5/C6/C7/C8/T1 posterior divisions of superior, middle and inferior trunks ↓ posterior cord	C5/C6/C7/C8/T1 lateral root from anterior divisions of superior and middle trunks → lateral cord medial root from anterior division of inferior trunk → medial cord	C8/T1 anterior division of inferior trunk ↓ medial cord
COURSE	pierces coracobrachialis and passes down anterior compartment of arm beneath biceps muscle, then becomes **lateral cutaneous nerve of forearm**	passes beneath shoulder joint into posterior compartment of arm and wraps around surgical neck of humerus	winds around spiral groove of humerus, passes through ACF into forearm then divides into two terminal branches (**superficial** and **deep/posterior interosseous**)	runs down arm with brachial artery, passes through ACF into forearm then divides into three terminal branches (**anterior interosseous, deep** and **superficial/palmar cutaneous**)	runs down arm with brachial artery, passes behind medial epicondyle into forearm, then travels down anterior compartment with ulnar artery to enter palm of hand via Guyon's canal
SUPPLIES SENSORY	lateral forearm	"sergeant's patch" over lower deltoid	lower posterior arm posterior forearm lateral 2/3 dorsum of hand proximal dorsal aspect of lateral 3½ fingers	thenar eminence lateral 2/3 palm of hand palmar aspect lateral 3½ fingers distal dorsal aspect of lateral 3½ fingers	hypothenar eminence medial 1/3 palm of hand palmar aspect medial 1½ fingers whole dorsal aspect of medial 1½ fingers medial 1/3 dorsum of hand
MOTOR	**anterior compartment of arm** **B** biceps brachii **B** brachialis **C** coracobrachialis	◊ deltoid ◊ teres minor	**posterior compartment of arm** ◊ triceps brachii **posterior compartment of forearm** ◊ wrist extensors ◊ finger extensors ◊ brachioradialis ◊ supinator	all muscles of **anterior compartment of forearm** EXCEPT flexor carpi ulnaris and medial two parts of flexor digitorum profundus ◊ wrist flexors ◊ finger flexors ◊ pronator teres + quadratus **LOAF muscles of hand** **L** lateral two lumbricals **O** opponens pollicis **A** abductor pollicis brevis **F** flexor pollicis brevis	two muscles of **anterior compartment of forearm** ◊ flexor carpi ulnaris ◊ medial two parts of flexor digitorum profundus **HILA muscles of hand** **H** hypothenar eminence **I** interossei **L** lumbricals (medial two) **A** adductor pollicis
COMMON INJURIES	NB// injuries are rare as protected by bulk of biceps muscle stab wounds to upper arm	fracture of surgical neck of humerus stab wounds to posterior shoulder compression by shoulder dislocation or pressure of crutches on armpits	fracture of proximal humerus, humeral shaft or proximal radius stab wounds to ACF/forearm/wrist compression by pressure of crutches on armpits, falling asleep/lying on arm, tight plaster cast or prolonged tourniquet use	supracondylar fracture of humerus stab wounds to ACF/forearm/wrist, or wrist lacerations in deliberate self-harm compression at carpal tunnel in wrist	supracondylar fracture of humerus, medial epicondylar fracture or injury stab wounds to forearm/wrist compression at cubital tunnel in elbow or Guyon's canal in wrist
RESULTS OF INJURY SENSORY LOSS	numb lateral forearm	numb sergeant's patch	numb posterior arm and forearm numb radial distribution of hand	numb thenar eminence numb median distribution of hand	numb hypothenar eminence numb ulnar distribution of hand
MOTOR DEFICIT	weak elbow flexion weak forearm supination absent biceps reflex	very weak shoulder abduction from 15-90° weak shoulder flexion weak shoulder extension weak shoulder external rotation	weak elbow extension absent triceps reflex weak wrist extension weak finger MCPJ extension absent supinator reflex	weak forearm pronation weak wrist flexion weak wrist abduction weak finger flexion; flexion of ring and little finger DIPJs preserved weak grip strength and opposition	weak wrist flexion weak wrist adduction weak flexion of ring and little finger MCPJs and DIPJs, and weak extension at their IPJs weak finger abduction, adduction and opposition
DEFORMITY	wasting of biceps GEEKY MEDICS © LJ WATSON 2015	wasting of deltoid	wasting of triceps and posterior compartment of forearm **WRIST DROP** on attempted wrist extension	wasting of anterior forearm and thenar eminence **HAND OF BENEDICTION** on attempted finger flexion	wasting of hypothenar eminence and intrinsic muscles of hand **CLAW HAND** on attempted finger extension

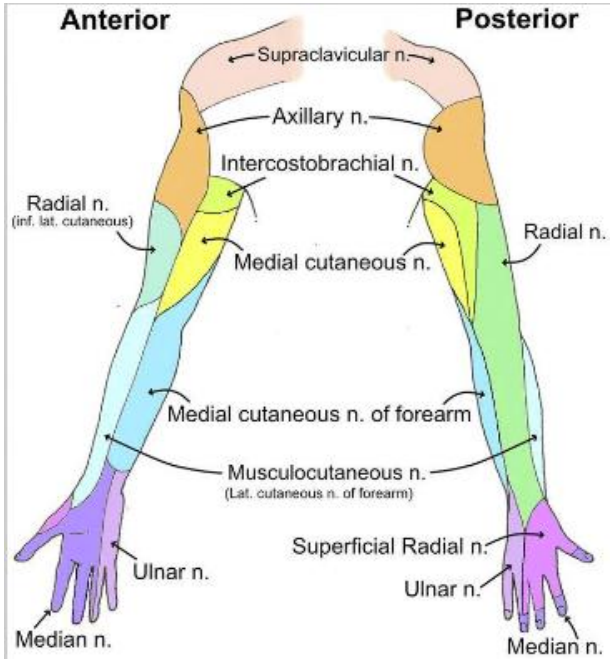
2) NERVES

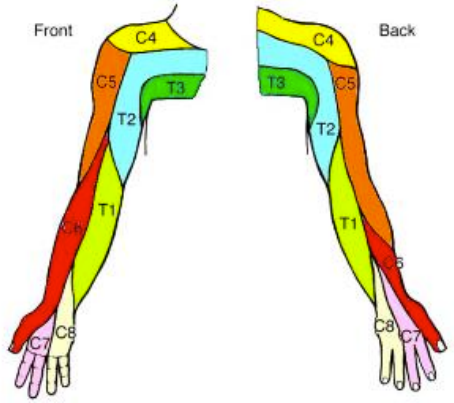
- A → lateral cutaneous nerve of the thigh
- B → saphenous nerve
- C → superficial peroneal nerve

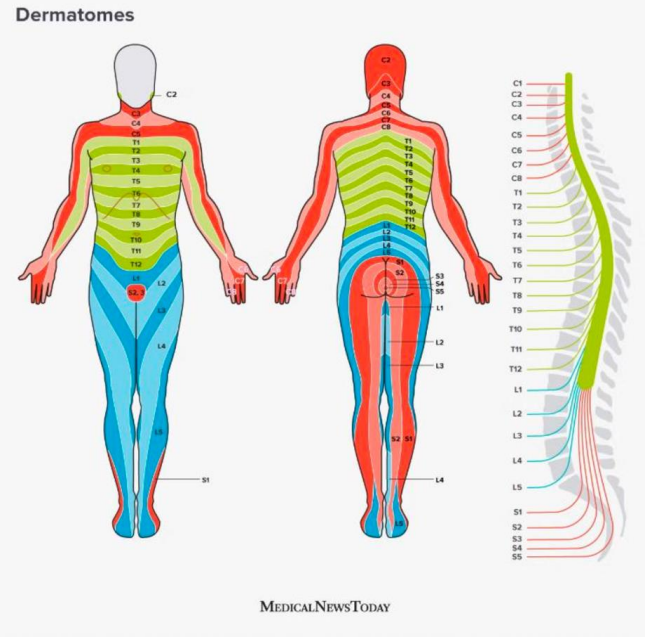


58.
1) What muscle causes this action?
2) Nerve innervation?

ANSWER : 1) Lumbricals 2) median and ulnar nerve

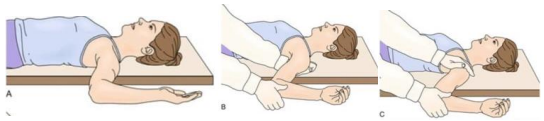






3) PHYSICAL EXAM

- FABER test
  - Unilateral tarbee3 position, if pain is ispilateral anterior → hip joint pathology, if contralateral posterior → sacroiliac
  - Also called figure four test, Patrick test

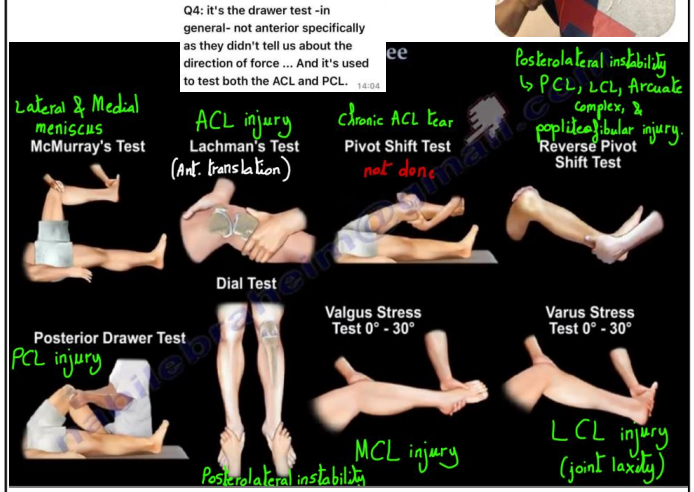


- Apprehension and Relocation tests → test for anterior instability of the shoulder joint

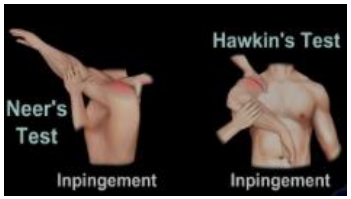
- Thomas Test → to check for hip flexor tightness, especially the iliopsoas and rectus femoris muscles
- Assesses hip extension range of motion.
- Identifies tightness contributing to lower back pain, patellofemoral pain, poor posture, and reduced athletic performance

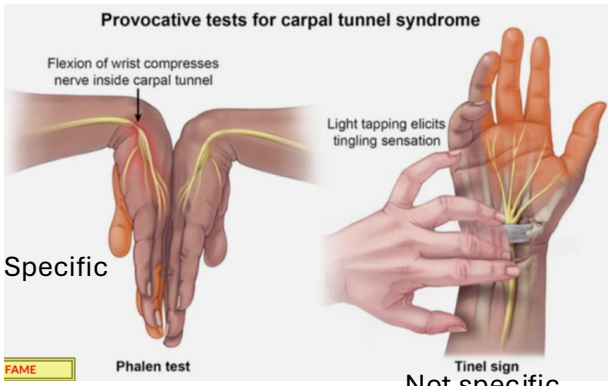
- Jobe's Test (empty can test) → to check supraspinatus impingment (rotator cuff tear/tendinopathy)
- Positive if → pain or weakness

- This tests for → vulgus stress test → MCL



- Lift-off test.
- Subscapularis / tests for internal rotation





Not specific

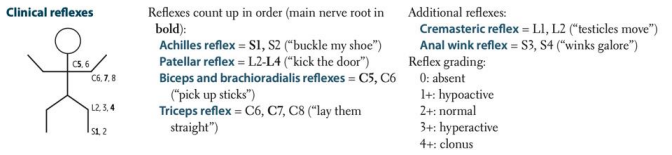
- Calf Squeeze (Thompson) Test → Achilles tendon rupture → cant plantarflex

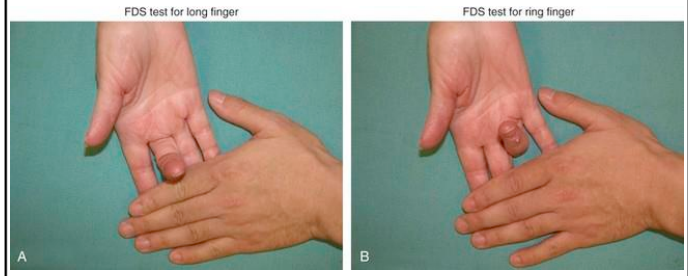
- Finkelstein test → DeQuarvain Tenosynovitis (non-inflammatory thickening of APL and EPB due to myxoid degeneration
- Affected → abductor pollicis longus and extensor pollicis brevis
- First extensor compartment
- Tx: NSAIDs, local steroid injx

- Sign name? hyperextension due to PCL tear

3) PHYSICAL EXAM

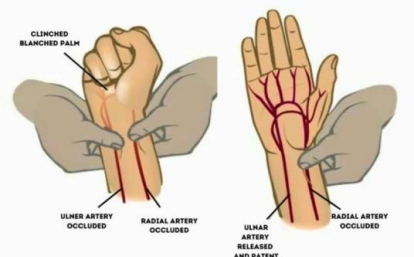
- Belly Press Test → subscapularis
- Confirm dx w/? MRI shoulder



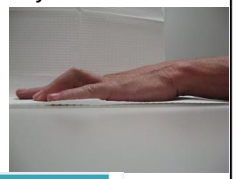


- FDS test (Median nerve)
- FDS: → All 4 tendons (index–little finger) are supplied by the median nerve (There is no FDS to the thumb.)
- FDP
  - Lateral half (index & middle fingers) → Median nerve (anterior interosseous branch)
  - Medial half (ring & little fingers) → Ulnar nerve

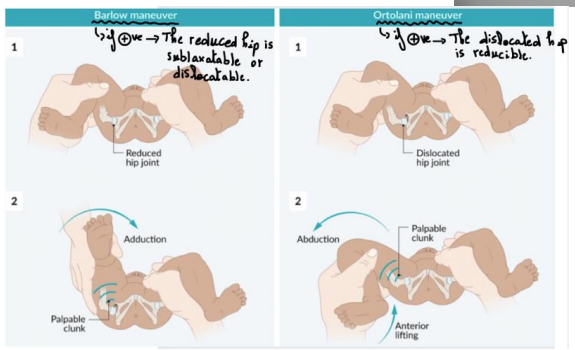
- FDP test → PIP fixed

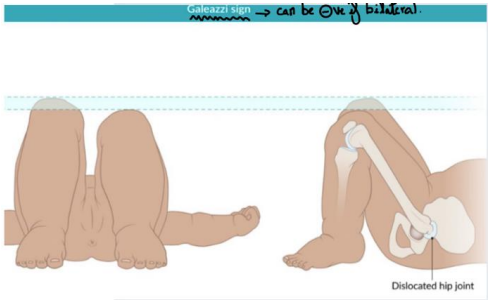


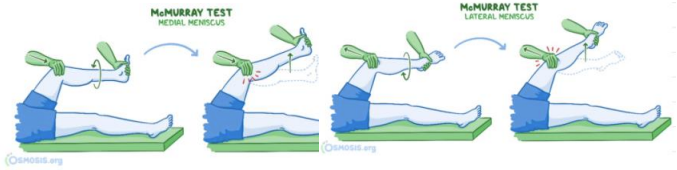
- Allen's test; to assess the adequacy of collateral circulation to the hands via ulnar artery

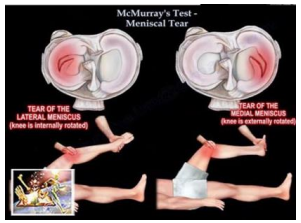


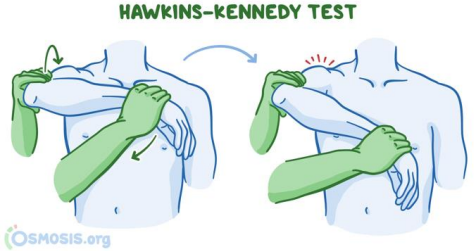
- Tabletop test for Dupuytren's



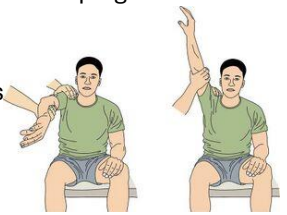








- Hawkins test → another impingement test
- Positive indicates subacromial impingement or rotator cuff tendonitis



- Neer test → supraspinatus muscle and tendon
- If positive → supraspinatus tendonitis / subacromial bursitis

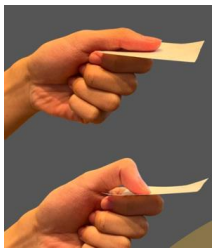
- Adam's forward bending test
- Structural IAS

3) PHYSICAL EXAM

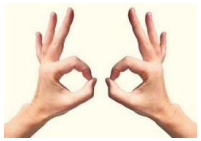
Varus stress test → LCL

Vulgus → MCL

Finger abduction
Ulnar nerve

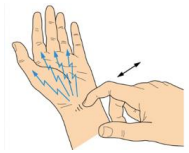


Froment's test
Ulnar nerve



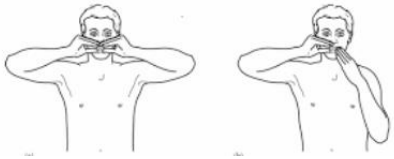
OK Sign
Median nerve

Compression/Durkan test → Median nerve



Tinel's test →
Median nerve

Thompson test →
Achilles tendon rupture



- Hornblower's test → infraspinatus and teres minor

4) BONE HEALING, TRAUMA, & FRACTURES

- pseudoarthrosis-type nonunion
- CAUSES:
- Inadequate immobilization
- Excessive motion
- Poor fracture alignment
- Poor blood supply

13)A patient who was involved in a road traffic accident presented to the emergency department.
A. What is your initial trauma management for this patient?
- Advanced trauma life support (ATLS) (ABCDE approach - check airway, breathing, circulation, disability and exposure) (? Not sure of the answer)
B. How would you manage the injury shown in the image?
- Analgesia, irrigation, IV antibiotics, tetanus toxoid vaccine

- Tibial shaft open fracture + weak pulses → what is the GA classification? Type IIIC
- Warm IV fluids, stop the bleeding, xABCDE

- Tibial fracture, follow up Xray after couple of months → Atrophic non-union
- Causes: vascular (PAD or DM) or smoking

- Hypertrophic non-union

A picture of an open, bleeding wound of a patient following a trauma.

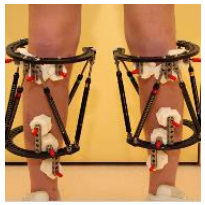
1. What's the first step of management for this patient? Give warm IV fluids (namely Ringer's lactate) & stop the bleeding
2. How would you manage this patient? My answer was "ATLS; analgesia; antibiotics; anti-tetanus toxoid; adequate irrigation"

3. A 30-year-old male presents with severe pain out of proportion to injury, unresponsive to analgesia, tightness, and numbness in the lower leg following a tibial fracture.
1) Diagnosis?
2) Management?
3) Signs and symptoms?

ANSWER : 1) Compartment syndrome 2) Fasciotomy
3) Extreme pain, increased on passive extension, swollen tense limb, etc...

- Atrophic non-union
- Debridement of the necrotic bone; bone grafting and fixation

- Torniquet to prevent excessive bleeding

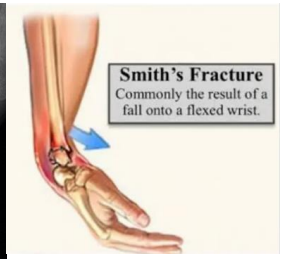


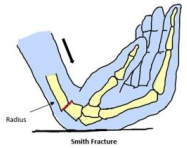
- Name? Ilizarov external fixator
- Indications? Fixation of complex fractures / limb lengthening
- Complication? Pin tract infection / delayed or failed bone healing / neurovascular injury

5) UL

- Pathological fracture of humerus due to bone tumor

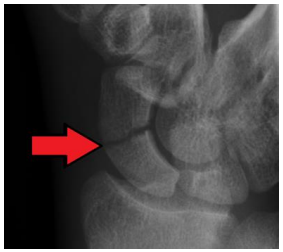
- XR: humeral shaft fracture
- Nerve at risk: radial
- If injured: wrist drop w/ loss of sensation at the dorsal aspect of the first webspace of the hand
- Mx: functional reduction and relative stabilization



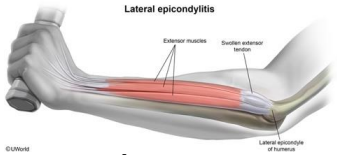


- Smith fracture (reverse Colle's fracture)
- If elderly, could be due to Osteoporosis if low impact fall

- Scaphoid fracture
- Risk of AVN and nonunion



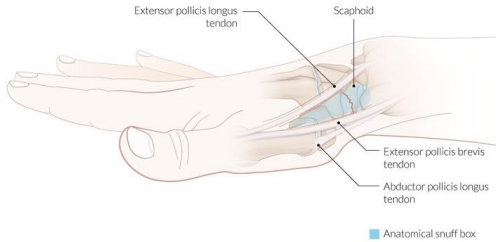
- Monteggia Fracture
- Proximal ulna fracture with proximal radial dislocation
- Mx: Anatomical reduction + absolute fixation
- Nerve injured? Radial (Posterior interosseous nerve)
- Clinical presentation?



- Lateral elbow pain → Tennis Elbow

- Deformity = cubitus varus
- Causes: malunion of old fracture (supracondylar)

- Olecranon avulsion fracture
- Avulsion by triceps



- Snuffbox tenderness → Scaphoid fracture
- Boundaries: EPB + APL and EPL

- Colle's fracture / Dinner fork deformity
- Describe: Extra-articular fracture of the distal radius ~2–3 cm from the wrist with dorsal displacement of the distal fragment, producing a dinner-fork deformity.
- Nerve at risk? median

- chauffeur fracture

5) UL

- MS: Right wrist AP and lateral X-Ray showing distal radial metaphyseal fracture, comminuted, no shortening, rotation or translation. Slight dorsal angulation is noted.
- Principles: Reduction, immobilization, rehab
- GPT: This is an AP and lateral wrist radiograph demonstrating a distal radius fracture with dorsal displacement and dorsal angulation of the distal fracture fragment, consistent with a Colles fracture. On the lateral view, the distal radius fragment is tilted dorsally relative to the shaft, with loss of the normal volar tilt. On the AP view, there is radial shortening with possible mild radial displacement of the distal fragment, while the ulna remains intact without a clear ulnar styloid fracture. The carpal bones remain aligned with the distal fragment, and there is no obvious radiocarpal dislocation. Overall, the findings are typical of an extra-articular dorsally angulated distal radius fracture.

- Popeye sign; biceps tendon tear

- Case: 13yo M fell down, arm pain
- Dx (as per MS): pathologic fracture (background lytic lesion)

- Transverse fracture of the forearm involving both the radius and ulna with displacement. Reduction = anatomical. Fixation = ?.

- Galeazzi fracture

- Anatomical reduction and absolute fixation

6) HAND

Swan neck deformity

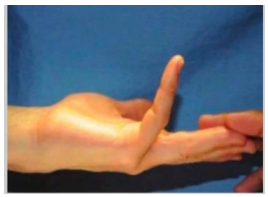
Syndactyl

- Dupuytren's Contracture (M>F; fibroproliferation of palmar fascia)
- Often bilateral
- 2 risk factors? Smoking, DM

Tx: - Conservative
(observe, PhysioTx, Splint)
- Intralesional injections
(Steroids \ collagenase)
- Surgery (fasciotomy \ ectomy)

- Trigger finger (Stenosing tenosynovitis) usually involves: thumb/ring fingers → FDS

- Gnaglion cyst; lipoma



- What muscles flex these joints?
- PIP → PDS
- DIP → PDP

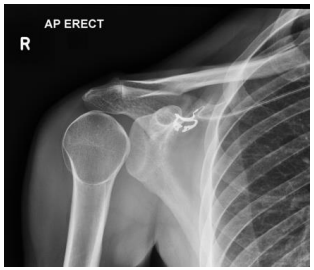
Boutonniere deformity

Boxers (5th MCP) #

7) SHOULDER



- Squared off shoulder → RIGHT anterior dislocation
- First step → analgesia + XR to r/o fractures (if 1st time)
- Mx: closed reduction (traction-countertraction), then repeat XR, immobilize, NSAIDs
- Nerve at risk: axillary



- Posterior shoulder dislocation
- Stem would mention a convulsing patient
- Mx: reduction under anaesthesia, (traction-countertraction), then repeat XR, immobilize, NSAIDs

8) LL

- 22yo M distal knee pain when playing sport
- Avulsion Osgoodfracture of tibial tuberosity
  → Schlatter
- **Mx**: conservative (ice, rest, analgesia)

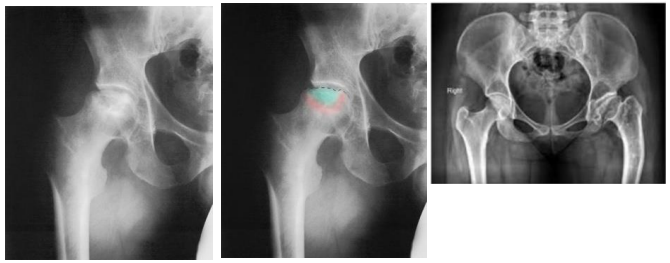
- congenital absence of fibula with valgus deformity
- usually unilateral.
- The most common congenital limb deficiency (long bone)

- Ballet dancer with pain in second meta-tarsal. XR shows March (Stress) Fracture.
- March fracture classically involves the 2nd metatarsal

7-Motor Vehicle accident:
comminuted tibial and fibular shaft fracture
management: ABC, then open reduction internal fixation after stabilization

Rahaf Muwalla
Ankle comminuted fracture
Anatomical + absolute

-picture of spiral femur fracture in a young adult, do you use relative stability or absolute, and do you use functional reduction or anatomical



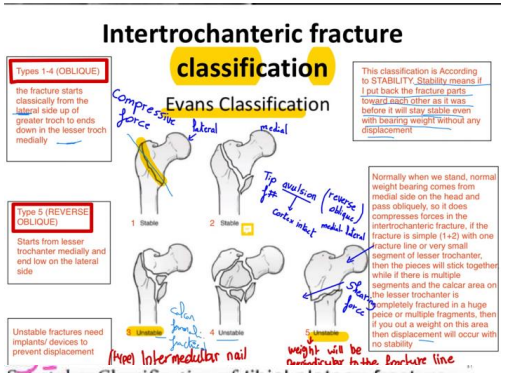
- Case: Sickle cell disease, hip pain
- Dx: AVN of femoral head (Perthes disease if child)

RF:
- Boy
- Poor social class
- Short stature
- Thin & active

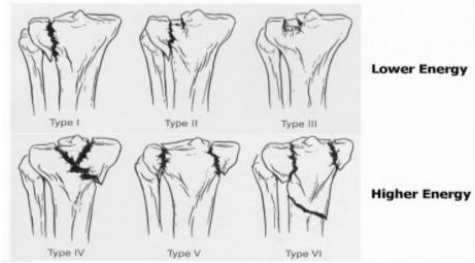
Tx:
- ↳ head in acetabulum
  - ↳ conservative (NSAID's, Physiotherapy, Bed rest)
- ↳ Dislocated
  - ↳ reduce

- Complications following head of femur fracture? Secondary osteoarthritis, AVN of femoral head, non-union (intra-capsular)
- Femoral neck fracture

Xray of proximal shaft of tibia fracture+ distal fibula
Both trasverse fracture and displaced(describe the displacement)
4 step mgt? 1 ATLS
2 reduction
3 immobilization
4 rehabilitation



Schatzker Classification of tibial plateau fracture



8) LL

- Open book fracture, symphysis pubis disruption,
- Mx: ABCDE then pelvic binder and surgical fixation

- Knee pain following trauma
- Intra-articular fracture
- Anatomical reduction and absolute stability

- 22yo F c/o ankle pain first thing in the morning; decreases with walking
- Dx: Plantar fasciitis
- Mx: conservative (ice, rest, analgesia), physiotherapy, steroid injections
- Can lead to bony spur formation

- 46yo F c/o limping and right hip pain
- Dx: right hip OA
- Definitive tx: THR

- Diabetic patient
- Charcot's neuroosteo-arthropathy w/ rocker bottom deformity
- Other differentials: chronic osteomyelitis; inflammatory osteoarthritis, flat foot, septic arthritis
- The tarus and tarsometatarsal joints are the most affected
- Presentation:
  - Acute stage: swelling, warmth, erythema, mild-moderate pain
  - Chronic stage: painless bony deformities, midfoot collapse, osteolysis, fractures
- Dx: XR (first line) & MRI
- Tx: offloading, control DM, surgery if refractory

Jones fracture

Spiral fracture

Tibial plateau #

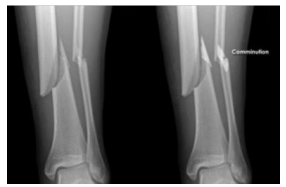
Subtroch fracture

Subcapital? #

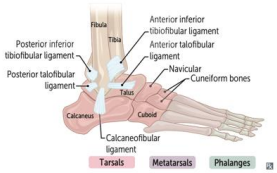
intertroch fracture

Transcervical femoral neck #

- Commionuted, extra-articular, closed
- Pain despite analgesia? compartment syndrome

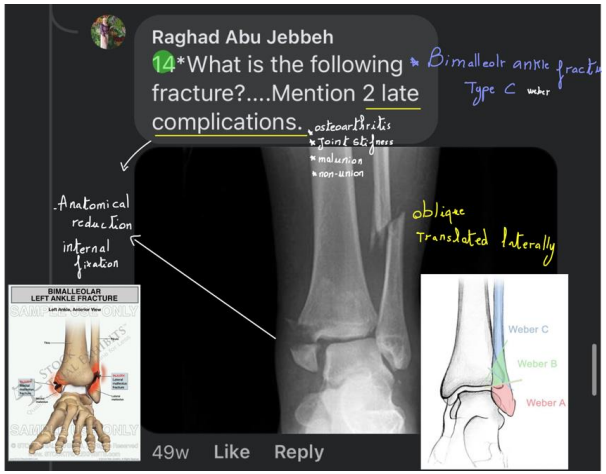


Anterior talofibular ligament—most common ankle sprain overall, classified as a low ankle sprain. Due to overinversion/supination of foot.
Anterior inferior tibiofibular ligament—most common high ankle sprain. High tide.



- Ankle sprain / anterior talofibular ligament / RICE

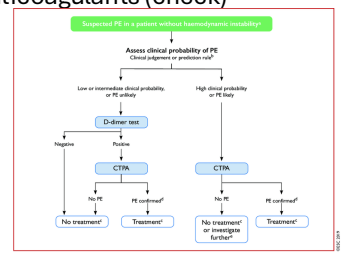
8) LL



2) Bimalleolar

9) KNEE CONDITIONS

- Case: this clinical picture in patient after THR.
- Dx: DVT
- Best test: DopplerUS
- Tx: anticoagulants
- This patient then develops dyspnea, hypoxia and tachycardia
  - Dx: PE
  - How to diagnose? D-dimer or CTPA
  - Tx: anticoagulants (check)



- Deformity? Genu vulgum

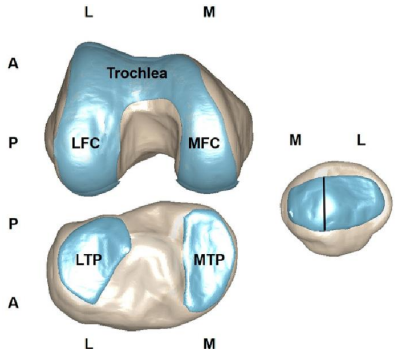
- Manifestation of patellar tendon rupture?
- Complications of arthroplasty? DVT, infection
- Indications to TKR? Pain, affected daily function??

- 24YO F volleyball player c/o knee pain, tenderness over superior patellar border.
- Xray → patella alta (elevation of pat)
- Dx: quadriceps tendon inflammation? Or patellar tendon rupture? (google: an abnormally long patellar tendon).
- Mx: RICE, analgesia
- Patella baja (infera) → patella too low (often after surgery or tendon shortening)

- Bilateral knee OA
- The 4 radio findings
- 60 yo F with OA X-ray unresponsive to analgesia, what do you recommend? TKR
- What complications you should tell her? DVT/PE/Infection/prosthesis wear or failure

- Early postoperative complications
  - Infection
  - Injury to surrounding structures (tendons, nerves, vessels)
  - Venous thromboembolism
  - Hemorrhage
  - Compartment syndrome
- Late postoperative complications
  - Posttraumatic osteoarthritis
  - Malalignment/dysfunction
  - Nonunion
  - Material fracture, bone fracture
  - Loosening of prostheses
  - Persistent pain
  - Joint stiffness

-I dont remember the exact words but a question asked how do we fix the new joint to both tibia and femur in total knee replacement. Sement



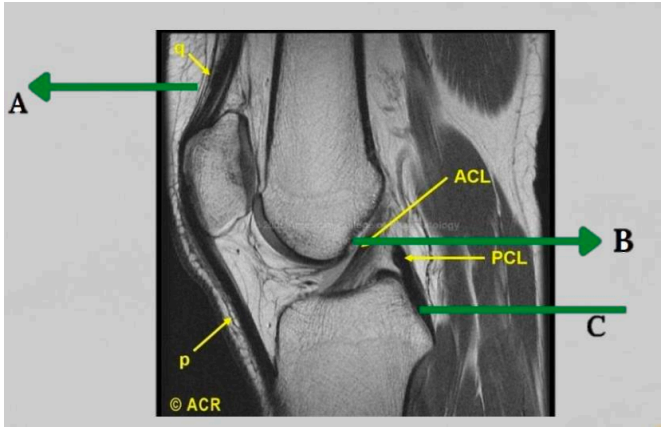
- Athroscopy view, pic showed LFC and LTP, whats between them? Lateral meniscus.
- 2 functions of the lateral meniscus?
  - Shock absorption
  - Load transmission
  - Joint stability

- 3 weks post TKR developed fever, redness, hotness
- Dx? Prosthetic Joint Infection, which is a type of Organ/Space SSI, which can occur up to 90-days-1year if an implant is placed (vs 30 days if none).
- Dx: CBC, CRP, ESR, blood/wound culture

This one the answer is surgical site infection, made sure with the doctor Cause the patient has no synovium to have septic arthritis and no bone (cause he has prosthesis) so he can't have osteomyelitis

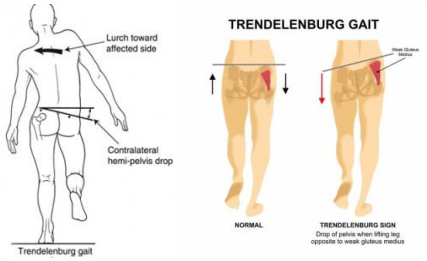
9) KNEE CONDITIONS

- 30 yo female, pain on prolonged sitting and stairs
- Dx: patellofemoral syndrome
- Conservative management



- A → quariceps tendon; B → ACL; C → PCL

10) GAIT

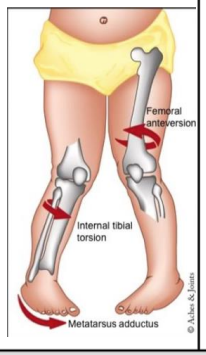


- Higher hip side = ipsilateral weak hip abductor muscles (gluteus medius/minimus) that can't stabilize the hip
- the pelvis drops to the unsupported side when standing on one leg, caused by
- Tilt of head and shoulder towards the weaker side

Common causes of a Trendelenburg gait are:

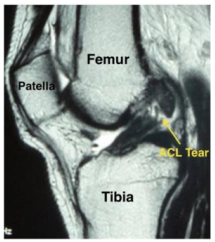
- painful hip joint problems, as in osteoarthritis
- weak hip abductors, as in poliomyelitis or after hip replacement
- structural hip joint problems, as in congenital dislocation.

*8. What the gait pattern and mention other causes can cause it...in toeing gait, metatarsus adductus, iternal tibial torsion and high anteversion angle.

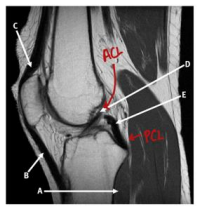


11) SPORT INJURIES





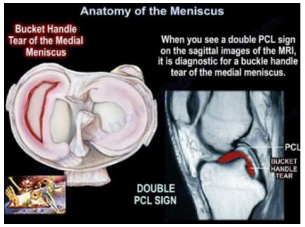
- MRI showing torn ACL → hyperintensity in area of ACL
- ACL → normally resists anterior translation
- Arterial supply → middle genicular artery (branch of popliteal artery)
- Clue: immediate pain, swelling and instability
- Best test: Lachman's

* generally can't see both clearly in one sagital plane
← notice here that PCL is more prominent
* Both should be ↳ Thin hyperdense

- Most common structure to be injured in football players?
  - 2 MS's said ACL (not convinced)

Feature	Association Football (Soccer)	American Football
Most Common Region	Lower Limb (Ankle/Thigh)	Lower Limb (Knee/Ankle)
Most Common Joint	**Ankle**	**Knee**
Most Common Muscle	**Hamstring**	**Hamstring**
Most Common Ligament	**ATFL** (Ankle)	**MCL** (Knee)

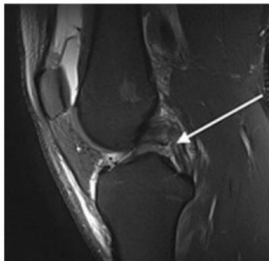


- Hx of knee twisting and popping sound
- Name of sign? Double PCL sign (bucket handle)
- Dx? Medial meniscal tear
- Special test? Mcmuray's
- Mx: RICE + analgesics

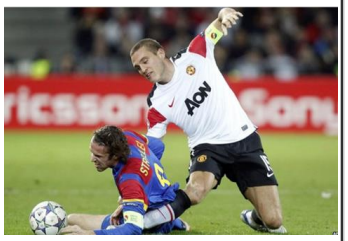
- Achilles tendon rupture
- Positive thompsons test
- Cant plantarflex

MRI image of a normal PCL (white arrow)

MRI image of a PCL tear (white arrow)



- Contact injury, vulgus stress → MCL tear
- Best modality? MRI
- +ve McMurray test



Shaimaa Zaben
ACL VS PCL injury ON MRI بس تأكدوا برضو تميزوا
لانه اجت صورة برضو

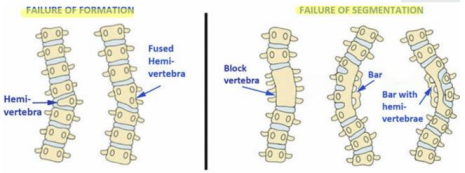
12) SPINE

- M.c. form → idiopathic scoliosis
- Other investigations? CT/MRI
- Dx if pt is 19 yo? Structural AIS
- Further investigations? Spine CT or MRI
- Tx: based on the Cobb angle
  - < 10°: per definition not scoliosis, and therefore not monitored
  - 10–19°: continual monitoring for progression
  - 20–29°: monitoring or bracing
  - 30–39°: bracing
  - > 40° or rapidly progressing scoliosis: surgery

According to age

- **≥ 10 years:** *adolescent idiopathic scoliosis*
  → Right convex thoracic curvature
- **4–9 years:** *juvenile idiopathic scoliosis*
  → M > F
  → Left convex thoracic curvature
  → Deteriorates progressively
- **0–3 years:** *infantile idiopathic scoliosis*
  → M = F
  → Convex thoracic curvature with bending to the left
- **Special type:** *congenital functional scoliosis*
  → A functional (nonstructural) type that may occur during the first months of life
  → C-shaped, elongated thoracolumbar curvature with bending to the left, showing only a small degree of rotation
  → Usually heals spontaneously

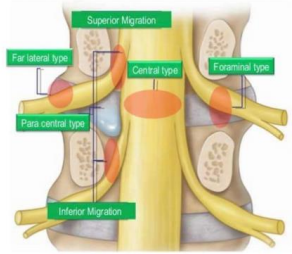
- 1yo Girl w/ spine deformity
- Hemivertebra → congenital scoliosis



12-Case of neurogenic claudication (back pain with bilateral lower limb pain decreased with flexion of the back...)with MRI showing spinal stenosis, what is the diagnosis? Spinal canal stenosis

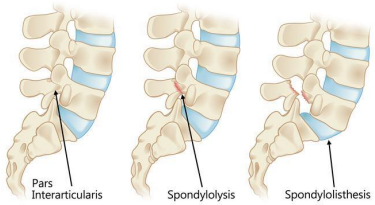
L4-L5 disc herniation paracentral
The nerve root affecetd ? L5

Various types of lumbar disc herniation

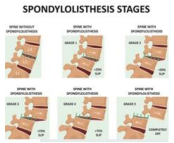


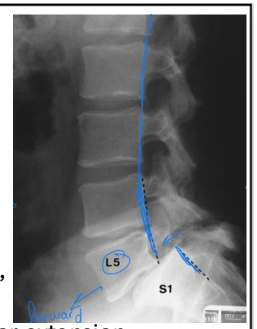
Affected muscle group? Foot extensors (Extensor hallucis longus, tibialis anterior, extensor digitorum longus) → weakness of great toe extension and possibly foot drop

- Anatomically → protrusion of nucleus pulposus; annulus fibrosus tear and disc bulge
- Mx: Analgesics, physiotherapy, back exercises, discectomy, sequestrectomy

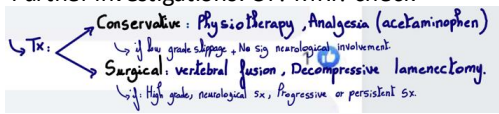


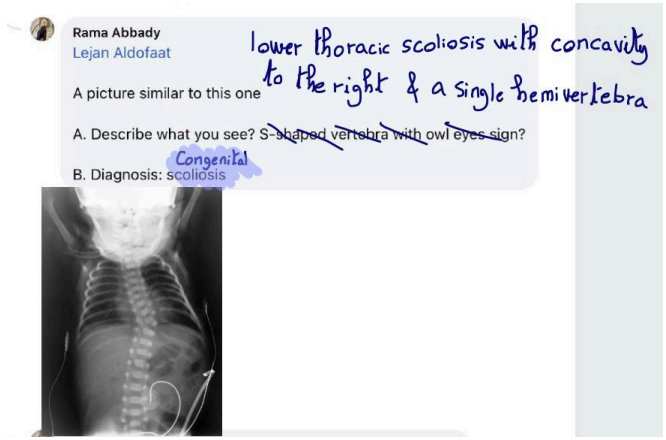
- Spondylolysis = pars interarticularis stress fracture (facet joint area)





- Spondylolisthesis of L5
- Grade 2
- Types: traumatic, iatrogenic, degenerative, dysplastic, isthmic, pathologic
- Classically pain worsens with lumbar extension.
- Further investigations: CT? MRI? check



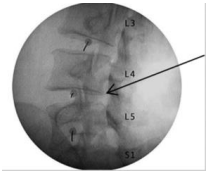


- 56yo F w/ back pain relieved upon flexion, exacerbates on extension
- Dx: (degenerative/adult) scoliosis with lumbar canal stenosis
- Other investigations? LS MRI
- Describe pain: pressure, fatigue, or tightness, dull, aching

12) SPINE

- Degenerative Scoliosis
- Investigations? Spinal MRI

- Name some types of spinal fractures
  - Burst fracture
  - Wedge compression
  - Seatbelt fracture



- What nerve is affected?
- L5 nerve root

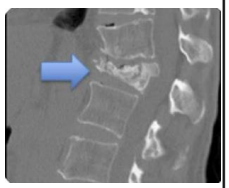
- Spondylolysis
- Pars interacularis (facet joint area) fracture

13) METABOLIC BONE D

- **Pic**: wedge vertebral compression fracture in an osteoporotic female
- **Mx**: conservative or surgery

- **Pic**: DEXA of -3
- **Dx:** Osteoporosis
- **2 Risk factors**: aging, female sex

- 14y M w/ bilateral genu varum, hand X Ray shows: fraying/cupping + absence of carpal bones
- Dx: rickets
- Labs? VitD, Ca, PO43-, ALP, PTH
- Mx?
  - VitD, Calcium, Phosphate replacement, may need corrective surgery



- Compression fracture
- Associated with osteoporosis
- Mx: NSAIDs, bisphosphonates, calcitonin

- Common osteoporotic fractures:
  - Femoral neck fracture
  - vertebral compression fracture,
  - distal radius fracture (Colles fracture)

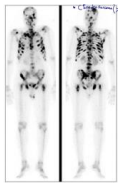
14) BONE TUMORS

- **Case: osteoid osteoma**
- **Clue**: night pain responsive to NSAIDs

+ Eccentric metaphyseal well defined mixed lytic & sclerotic lesion with a sclerotic rim.

Tx: reassure & observe

-picture of Histiocytic fibroma, describe the findings? is it most likely benign of malignant?

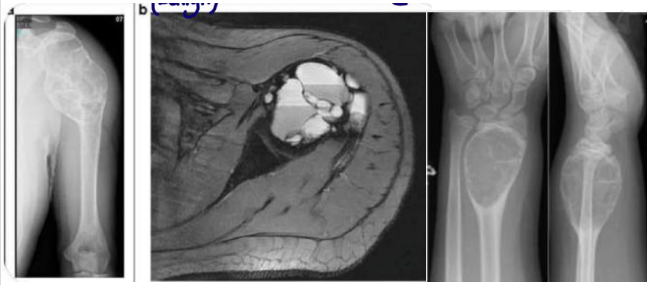


- **Test name:** bone scan
- **Dx**: 2º bone CA
- **M.c. malignant** : osteosarcoma

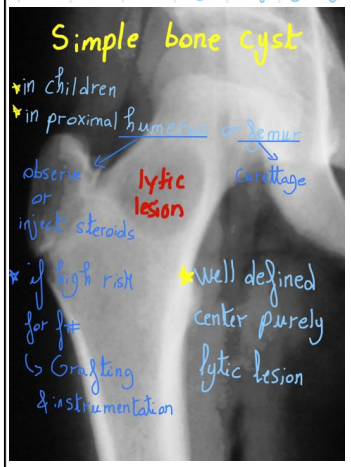
- Osteochodroma (pedunculated; well defined)
- Observe if asymptomatic, otherwise resect
  - Some Q say resect after full skeletal maturity, check

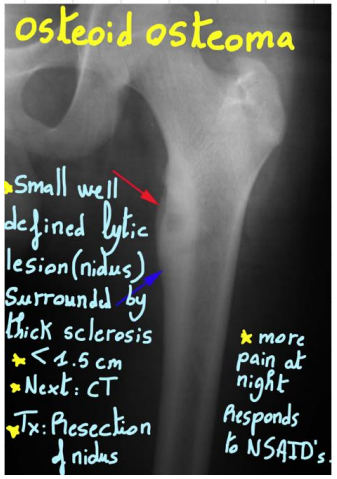
- Osteosarcoma
- Describe findings?

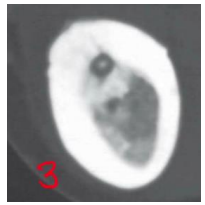
ill defined lesion with sunray appearance & codman's triangle.



- Pt presented with arm pain.
- Xray → multiloculated lytic lesion with thinning and ballooning of the cortex, well defined no periosteal reaction or cortical destruction
- MRI: fluid-fluid level (fluid filled cysts)
- Dx: aneurysmal bone cyst (benign)
- Tx: curettage and grafting





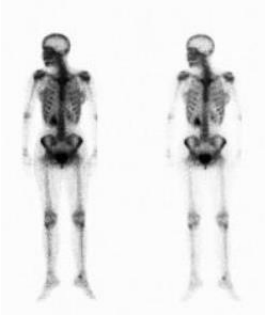


- Osteoid osteoma

- Simple bone cyst

14) BONE TUMORS

- Well, defined mixed lytic and sclerotic lesion with a sclerotic rim seen. No cortical destruction or periosteal reaction



Bone scan for 2º tumors

Histiocytic fibroma (benign), eccentric metaphyseal well defined mixed lytic and sclerotic lesion. A sclerotic rim is seen. No cortical destruction or periosteal reaction are seen.

15) PEDIATRIC HIP

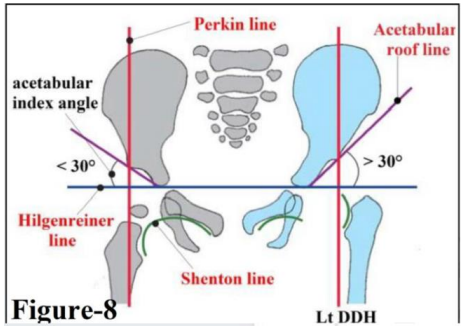


Figure-8

- 20 yo F c/o hip pain
- Dx: SCFE
- Mx: minimal weight bearing & screw fixation
- RF: obese, male, hypothyroidism

108. An x-ray of the hip joint of a newborn
1) Diagnosis?
2) Mention 2 measurements used to assess DDH on x-ray?
3) Mention 2 risk factors?

ANSWER : 1) DDH with dislocation
2) Hilgenreiner line, Shenton line, Perkin line & acetabular index angle
3) Family history, frank breech,first born, etc...

102.
1) What's the name of this device?
2) Mention two complications for inappropriate use of it?

ANSWER : 1) Pavlik harness
2) AVN of femur head / femoral nerve palsy

1) Acetabular index angle
2) <30

147. This a pelvis X-ray for a 7 y/o boy with hip pain and limping of 5 months. He has a hx of sickle cell disease.
1) What is the diagnosis.
2) Mention 2 possible future complications.

ANSWER : 1) AVN on the left side
2) Premature degeneration (early osteoarthrosis) / Trendelenburg gait

: 1) radiolucency of the femoral head

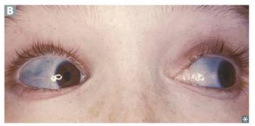
- Osteogenesis imperfecta
- Mutations in COL1A1 / COL1A2 (for type I collagen)

Osteogenesis imperfecta	Mutation in *COL1A1* and *COL1A2* genes → Type 1 collagen defect → inability to form triple helices

Osteogenesis imperfecta

Genetic bone disorder (brittle bone disease) caused by a variety of gene defects (most commonly *COL1A1* and *COL1A2*).
Most common form is autosomal dominant with ↓ production of otherwise normal type I collagen (altered triple helix formation).
Manifestations include:
- Multiple fractures and bone deformities (arrows in A) after minimal trauma (eg, during birth)
- Blue sclerae B due to thin, translucent scleral collagen revealing choroidal veins
- Some forms have tooth abnormalities, including opalescent teeth that wear easily due to lack of dentin (dentinogenesis imperfecta)
- Hearing loss (abnormal ossicles)

May be confused with child abuse.
Treat with bisphosphonates to ↓ fracture risk.
Patients can't **BITE**:
Bones = multiple fractures
I (eye) = blue sclerae
Teeth = dental imperfections
Ear = hearing loss



15) PED HIP - DIDN'T CHECK

Leen Hajeer

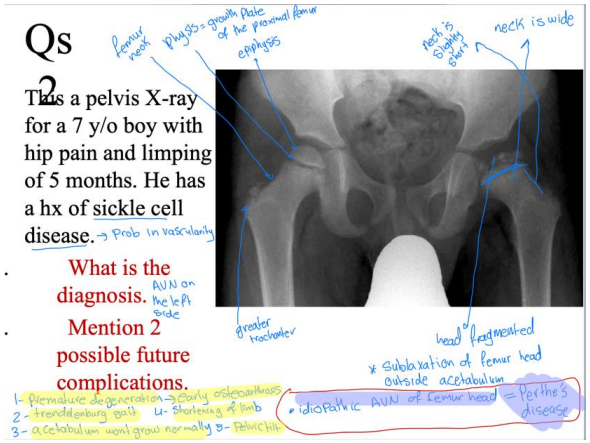
11)A child who is being examined for hip pathology. X-rays of both hips were shown.
A. Diagnosis?
- Developmental dysplasia of the hip (right hip)
B. Mention 2 risk factors?
- breech presentation, first born infant, Family Hx, Oligohydramnios...
C. Mention two radiological measurements that can help establish diagnosis?
- Shenton line, acetabular index angle (also: Hilgenreiner and Perkins lines)

-picture of typical DDH on xray (no lines) what is the diagnosis and what screening modality do u use for a 6 weeks old infant? US

Qs 2

This a pelvis X-ray for a 7 y/o boy with hip pain and limping of 5 months. He has a hx of sickle cell disease. → Prob in vascularity

- What is the diagnosis. AVN on the left side
- Mention 2 possible future complications.



1- Premature degeneration → early osteoarthrosis
2- Trendelenburg gait
3- acetabulum won't grow normally
4- Shortening of limb
5- Pelvic tilt

Ahmad Adel

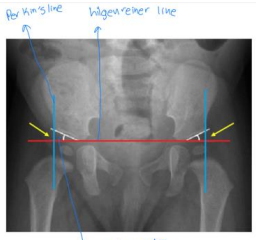
An x-ray of the hip joint of a 20YO female patient who's complaining of hip pain(?) .. was it SCFE? Correct me if I'm wrong

1. Diagnosis? I answered "SCFE" Slipped Capital Femoral Epiphysis
2. What would you do to relieve her pain & treat her? Stabilization to prevent further progression & screw fixation

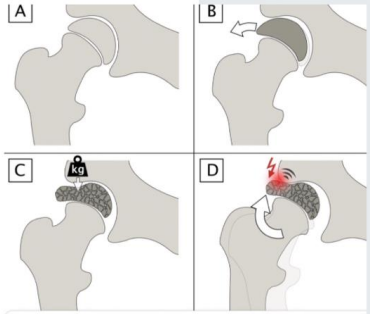
SCFE: displacement through the growth plate of the immature hip, during the rapid growth period, in the hypertrophic zone of physis: (more in male \10-14 yo \Unilateral)
* RF: obesity, Family Hx, Endocrine\hormonal (ex: hypothyroid ...), Trauma.
* Sx: - Pain (medial thigh, knee, groin, hip)
- Limping
- LAOM (↓ Internal rotation + Abduction)
* Complications: · AVN · osteoarthritis
* Tx: · Avoid wt-bearing · Surgery (Internal fixation + pinning of femoral head + Prophylactic fixation of contralateral hip.

Qs 6

- This is an xray for a 4 month old child.
- Mention:
  - The Red line.
  - The Blue line.
  - If the angle marked is 35 on both sides what is the diagnosis and management?



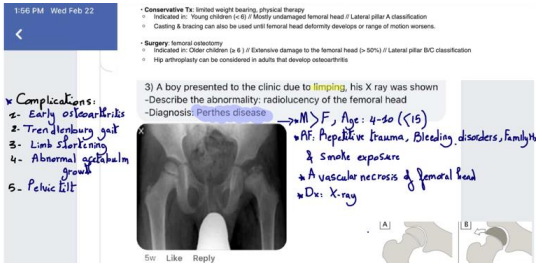
acetabular dysplasia, tx → bracing (Pavlik harness)

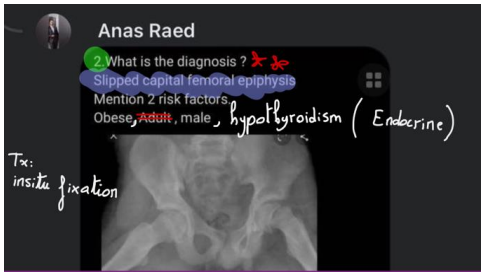


Displacement of femoral head and hinge abduction in Legg-Calvé-Perthes disease

(A) Normal anatomy: the femoral head is located in the centre of the acetabulum.
(B) Femoral head necrosis leads to lateral subluxation and displacement of the femoral head in the acetabulum.
(C) Fractures and subsequent bone resorption result in an instabile femoral head. Lateral displacement puts a pathological strain on the femoral head when weight-bearing, which leads to deformities.
(D) Hinge abduction: the lateral femoral head bumps into the ventrolateral acetabulum when the leg is abducted, possibly involving pain, a palpable clunk, and restriction in the range of movement.

3-what's the name of this device? Pavlik harness
Mention two complications for inappropriate use of it ? AVN of femur head / femoral nerve palsy





11-DDH, 2 risk factors ✓
برضه في خيار بحكي عن ال imaging مش متذكرة شو كان بالضبط

16) DEFORMITIES

- Clubfoot deformity (CAVE)
- Mx: serial Ponsetti cast; correcting the deformities in the following order → Cavus, adductus, varus, equinus

Hallux vulgus

- Pes cavus
- Associated with: NMD → CMT, MS, CP

- Cubitus varus / Gunstock deform
- Most likely due to malunited supracondylar # of the humerus

- Pes planovulgus (flat foot)
- Types: flexible and rigid → ask the patient to stand on toes to tell them apart

1) What is the name of this sign?

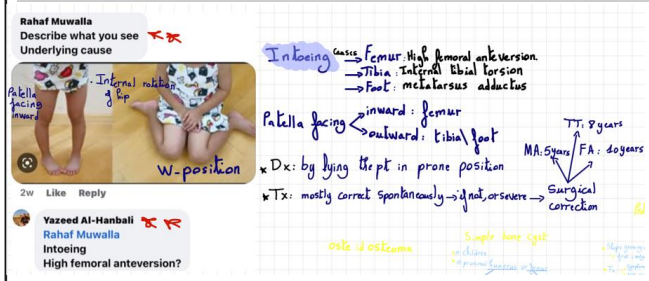
Chronic Knee Hyperextension (Genu Recurvatum)

2) structure is injured in such case?

PCL Rupture

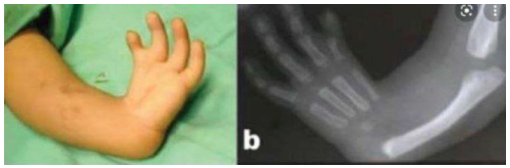
150. A 7 y/o child presented by her mother for the posture shown in the picture.
What is the name of the posture and the most cause?

ANSWER : W-sitting posture / Femoral Anteversion



97.
1) Deformity?
2) Mention other 2 extra-skeletal abnormalities associated with this deformity?

ANSWER : 1) Club hand
2) Holt-Oram syndrome, TAR syndrome, Fanconi's anaemia and VATER/VACTERL syndrome?**

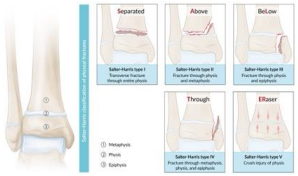


- Pic of Congenital Talipes Equinovarus
- **Mx**: Ponseti method
- **4 components of the deformity**: ankle flexed, hindfoot varus, midfoot caves, forefoot adductus

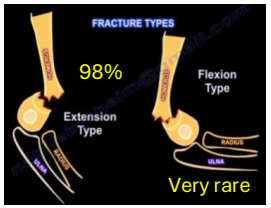
*6. A picture of foot, what you see and mention 3 other fracture could caused by the same mechanism (axial).. Calcaneuos fracture and any 3 fracture on the gravity line.

17) PEDIATRIC FRACTURES

- SH type 3 fracture
- 2 complications?



- Supracondylar humerus fracture.
- Injured nerve: median
- Type of fracture? Extension



- SH type 2 fracture

- SH type IV fracture

- Most common fractures in peds
  - 1st: distal radius fracture (buckle or greenstick)
  - 2nd : Supracondylar fractures or clavicle

- Q on complications of SH fractures?

SH4

SH3 (extension to epiphysis)

Torus fracture (buckle fracture)

18) INFECTIONS


- Presented to the ER due to fever, irritability & refusal to bear weight on limb
- Diagnosis: septic arthritis
- Labs: CBC (leukocytosis), CRP, ESR, blood culture, joint aspiration
- Imaging: XR, MRI, bone scane
- Treatment: drainage, IV antibiotics (augemntin, ceftriaxone [3rd gen cephalosporin])
- Mc causative agent: S. aureus
- Peds → hip
- Adults → knee
- Complications: dislocation, epiphyseal destruction, growth disturbance, ankyliosis, osteomyelitis, destruction of cartilage

Kocher Criteria to differentiate between septic arthritis and reactive arthritis

- Groin pain with

1- inability to bear weight (most important)

2-T > 37.8

3-ESR > 40 or CRP > 20

4- White Blood Cell Count > 11.8

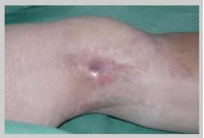
Parvovirus 5th disease
RA like pic in Pediatric age group

If all ..... More than 90 % septic arthritis

If nil ..... Less than 10% septic arthritis

If in doubt ..... Deal as septic

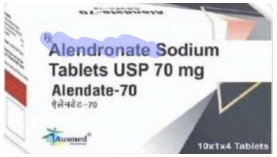
25. Q36. A patient with history of diabetes and distal femur fracture 6 months ago presented with discharge.
1) Diagnosis?
2) Most common causative organisms?
3) Management?
4) Investigations?



ANSWER : 1) Chronic osteomyelitis 2) Staphylococcus aureus
3) IV antibiotics, surgical debridement
4) Blood culture, CBC, bone biopsy, culture and MRI

- Dx: Felon
- Complications if untreated: OM, necrosis of finger pad

19) DRUGS



- Bisphosphonates → anti-resorptive agents;
- MOA?
- SE?
  - Pill induced esophagitis → must drink a lot of water and stay erect for 30 minutes
  - Osteonecrosis (of jaw)
  - Atypical femoral fracture
  - N, heartburn, constipation or diarrhea
- Other indications of bisphosphonates?
  - Osteoporosis
  - Paget's disease
  - Control hypercalcemia in bone mets

- Diclofenac → NSAID
- SE: GI disturbance, renal impairment

- Paracetamol → reversible central CNS COX-3 inhibitor
- Antipyretic; analgesic
- Paracetamol hepatotoxicity → tx <4hr activated charcoal; >4hr N-Acetylcestiene
- Max single dose 1000
- Max daily dose 8000
- CONTRAINDICATED: liver impairment

- Celecoxib / celebrex → NSAID COX-2 inhibitor
- No antiplatelet activity, minimal GI SE

Aspirin

MECHANISM	NSAID that irreversibly (aspirin) inhibits cyclooxygenase (both COX-1 and COX-2) by covalent acetylation → ↓ synthesis of TXA_2 and prostaglandins. ↑ bleeding time. No effect on PT, PTT. Effect lasts until new platelets are produced.
CLINICAL USE	Low dose (< 300 mg/day): ↓ platelet aggregation. Intermediate dose (300–2400 mg/day): antipyretic and analgesic. High dose (2400–4000 mg/day): anti-inflammatory.
ADVERSE EFFECTS	Gastric ulceration, tinnitus (CN VIII), allergic reactions (especially in patients with asthma or nasal polyps). Chronic use can lead to acute kidney injury, interstitial nephritis, GI bleeding. Risk of Reye syndrome in children treated for viral infection. Toxic doses cause respiratory alkalosis early, but transitions to mixed metabolic acidosis-respiratory alkalosis. Overdose treatment: $NaHCO_3$.

Celecoxib

MECHANISM	Reversibly and selectively inhibits the cyclooxygenase (COX) isoform 2 ("Selecoxib"), which is found in inflammatory cells and vascular endothelium and mediates inflammation and pain; spares COX-1, which helps maintain gastric mucosa. Thus, does not have the corrosive effects of other NSAIDs on the GI lining. Spares platelet function as TXA_2 production is dependent on COX-1.
CLINICAL USE	Rheumatoid arthritis, osteoarthritis.
ADVERSE EFFECTS	↑ risk of thrombosis, sulfa allergy.

Nonsteroidal anti-inflammatory drugs	Ibuprofen, naproxen, indomethacin, ketorolac, diclofenac, meloxicam, piroxicam.
MECHANISM	Reversibly inhibit cyclooxygenase (both COX-1 and COX-2). Block prostaglandin synthesis.
CLINICAL USE	Antipyretic, analgesic, anti-inflammatory. Indomethacin is used to close a PDA.
ADVERSE EFFECTS	Interstitial nephritis, gastric ulcer (prostaglandins protect gastric mucosa), renal ischemia (prostaglandins vasodilate afferent arteriole), aplastic anemia.

Bisphosphonates	Alendronate, ibandronate, risedronate, zoledronate.
MECHANISM	Pyrophosphate analogs; bind hydroxyapatite in bone, inhibiting osteoclast activity and promoting osteoclast apoptosis.
CLINICAL USE	Osteoporosis, hypercalcemia, Paget disease of bone, metastatic bone disease, osteogenesis imperfecta.
ADVERSE EFFECTS	Esophagitis, osteonecrosis of jaw, atypical femoral stress fractures.
Recombinant parathyroid hormone	Teriparatide, abaloparatide.
MECHANISM	Recombinant PTH analog. ↑ osteoblastic activity when administered in pulsatile fashion.
CLINICAL USE	Osteoporosis. Causes ↑ bone growth compared to antiresorptive therapies (eg, bisphosphonates).
ADVERSE EFFECTS	Dizziness, tachycardia, transient hypercalcemia, muscle spasms.

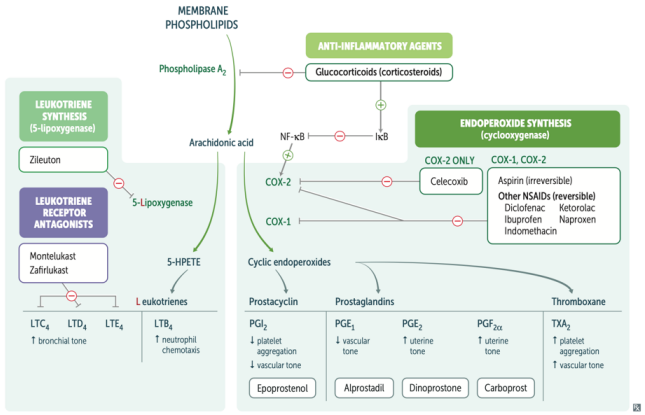
Acetaminophen

MECHANISM	Reversibly inhibits cyclooxygenase, mostly in CNS. Inactivated peripherally.
CLINICAL USE	Antipyretic, analgesic, but not anti-inflammatory. Used instead of aspirin to avoid Reye syndrome in children with viral infection.
ADVERSE EFFECTS	Overdose produces hepatic necrosis; acetaminophen metabolite (NAPQI) depletes glutathione and forms toxic tissue byproducts in liver. N-acetylcysteine is antidote—regenerates glutathione.

- MOA: COX1/2 inhibitors
- AE: N/V; GI

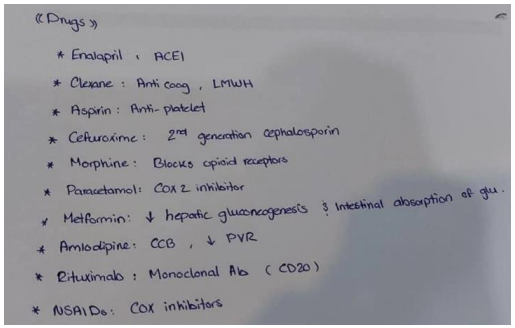
- VitD → increases Ca absorption from the gut

Arachidonic acid pathways



LTB_4 is a neutrophil chemotactic agent.
PGI_2 is a vasodilator and platelet aggregation inhibitor.

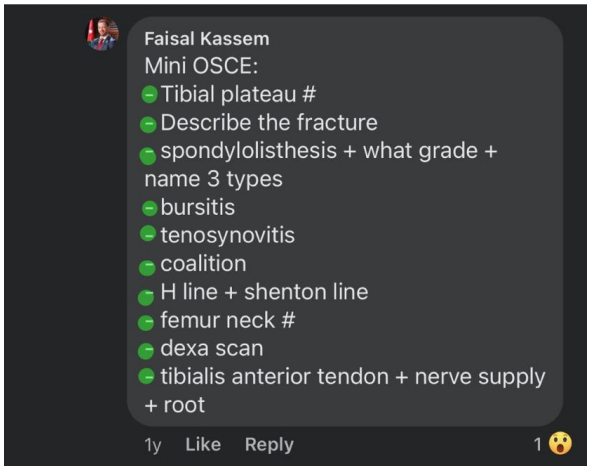
Neutrophils arrive "B4" others.
Platelet-Gathering Inhibitor.

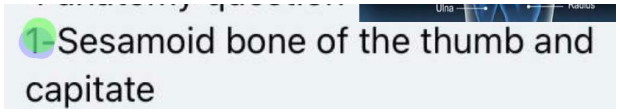


Ibuprofen, Diclofenac, Naproxen...
Reversibly ⊖ COX 1 & 2 → ↓ PG synthesis.
› Antipyretic, Analgesic, Anti-inflammatory, Antiplatelet
› max daily dose: 3.2 g
› SE: GI & duodenal ulcers, Renal function impairment, Aplastic Anemia...
› Contraindications: Pregnancy, Renal failure, Gastroduodenal ulcers...

Celecoxib: Celebr
↳ Reversibl ⊖ COX-2
↳ minor Anti inflammatory, Analgesic
↳ SE: Sulfa drug Allergic rxn, Renal SE, ↑ risk of thrombosis - MI - Stroke
↳ Contraindications: Severe HF, Recent MI, GI bleeding, Sulfa drug allergy.

Collagen	Most abundant protein in the human body. Extensively modified by posttranslational modification. Organizes and strengthens extracellular matrix. Types I to IV are the most common types in humans.	Type I: Skeleton Type II: Cartilage Type III: Arteries Type IV: Basement membrane SCAB
Type I	Most common (90%)—bone (made by osteoblasts), skin, tendon, dentin, fascia, cornea, **late** wound repair.	Type I: bone, tendone. ↓ production in osteogenesis imperfecta type I.
Type II	Cartilage (including hyaline), vitreous body, nucleus pulposus.	Type II: cartwolage.
Type III	Reticulin—skin, blood vessels, uterus, fetal tissue, **early** wound repair.	Type III: deficient in vascular type of Ehlers-Danlos syndrome (threE D). Myofibroblasts are responsible for secretion (proliferative stage) and wound contraction.
Type IV	Basement membrane/basal lamina (glomerulus, cochlea), lens.	Type IV: under the floor (basement membrane). Defective in Alport syndrome; targeted by autoantibodies in Goodpasture syndrome.





143.

1) What's the material used in this cast?

2) two instructions to the patient before he leaves the ER?

ANSWER : 1) Plaster of Paris / Fiberglass
2) Keep it Dry / Avoid Weight-Bearing

157. Comparing orthopedic cast, which one is better in terms of: (Hand is A, Leg is B)

1) Weight?

2) Strength?

3) Molding ability?

ANSWER : 1) B more than A
2) A more than B
3) A more than B

MISC

Hip flexion l2
Knee extention l3
Ankle dorsi flexion l4
Toes extention l5
ankle planter flexion s1

Finger jerk c8
Plantar response s1-2
Abdomenal reflex t8-l2
Biceps jerk c5
Triceps jerk c7
Supinator jerk c6
Ankle jerk s1
Knee jerk l3-4

11:52 AM

Sever's Disease (calcaneal apophysitis)