



**Transverse**



**Linear**



**Oblique,  
nondisplaced**



**Oblique,  
displaced**



**Spiral**



**Greenstick**



**Comminuted**

# Definition

- **Fracture** :a break in the
- continuity of a bone
- A fracture is present when there is loss of continuity in the substance of a bone.
- The term covers all bony disruptions, ranging
- from the situation when a **bone is** broken into one or many fragments



# Types of Bone Fractures



Transverse    Linear    Oblique, nondisplaced    Oblique, displaced



Spiral    Greenstick    Comminuted

Metatarsals

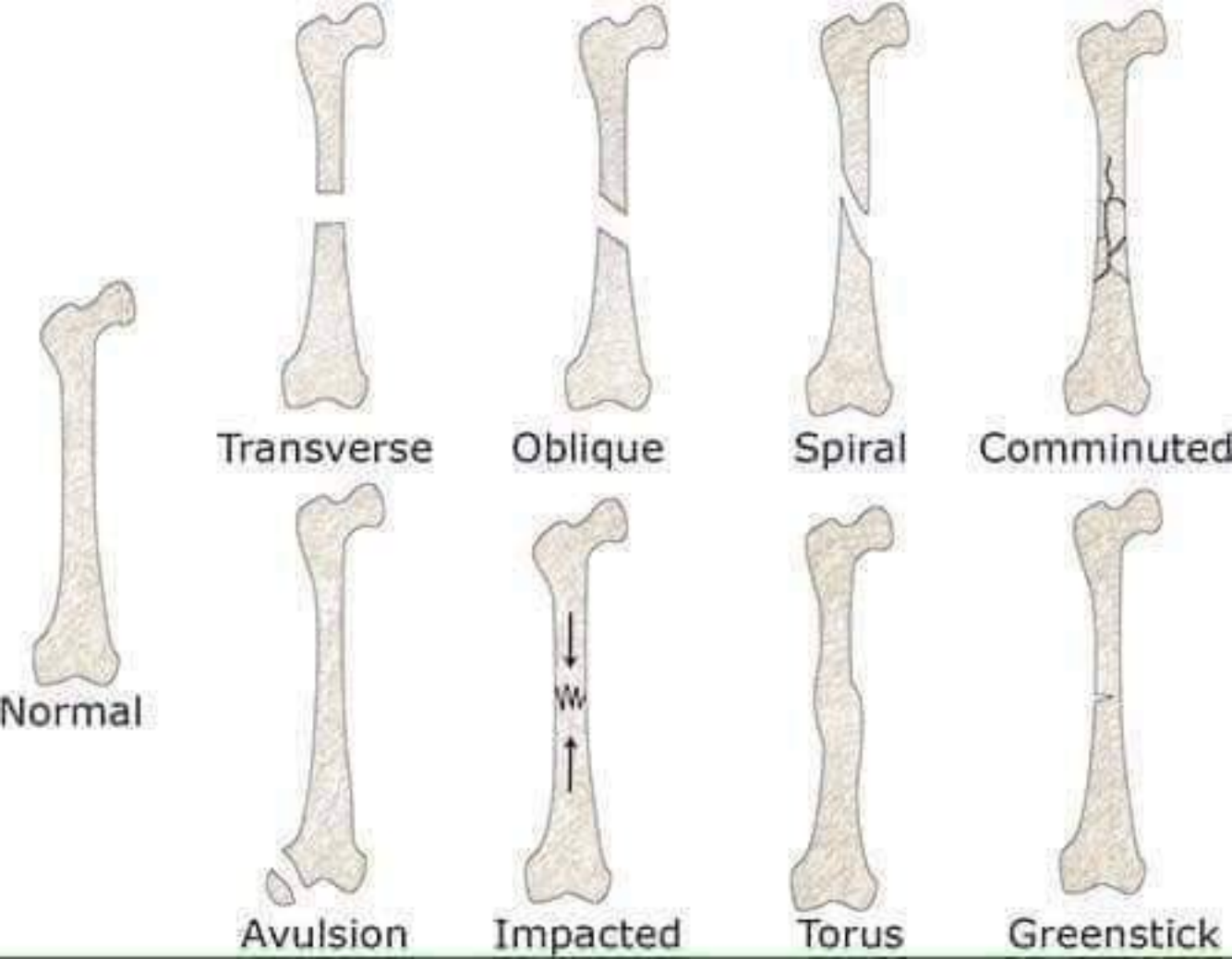
Phalanges

Tarsals



**Stress Fracture**

5th Metatarsal Fracture



# Fracture Clavicle

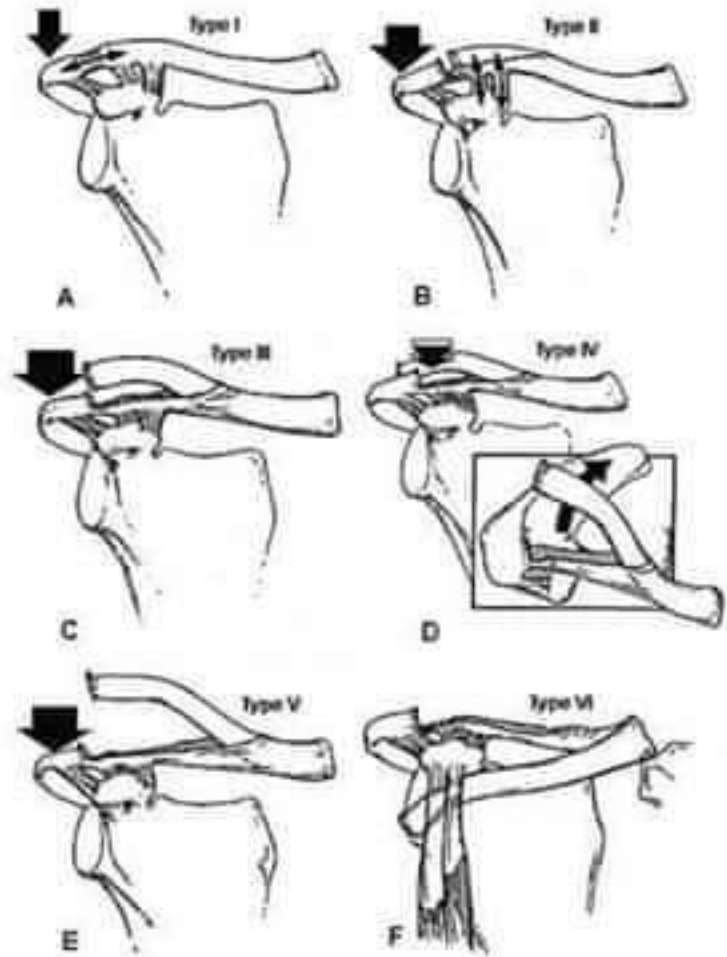
## Allman classification:

- Type I:  
Medial third
- Type II:  
Middle third (most common)
- Type III:  
Lateral third



# Distal Clavicle Fractures- Classification

- similar to adults
- based on amount & direction of displacement



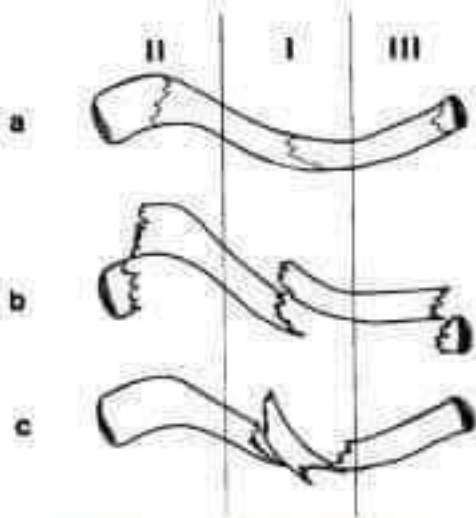


Fig. 1a-c showing schematic drawings of fractures of the clavicle classified according to the Allman and Neer classification depending on fracture localization and kind of fracture into Allman Group I, II and III, respectively Neer Type I, II and III. (a) Undisplaced, (b) displaced and (c) comminuted clavicular fractures. Neer also classified lateral clavicle fractures. Further classifications for medial clavicle injuries exist according to Allman. (From Nordqvist et al. (31)).

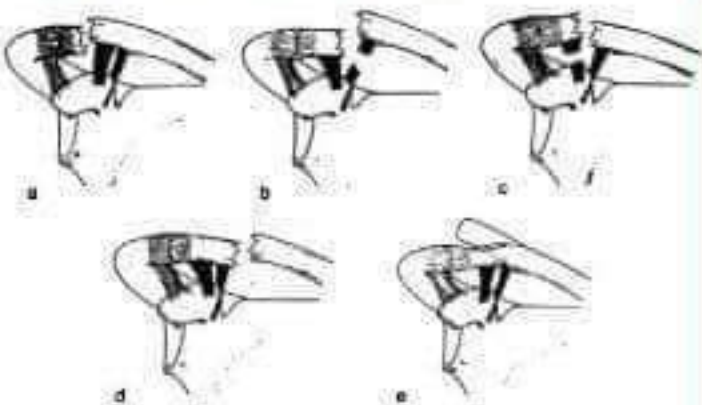


Fig. 2. Classification of lateral clavicular fractures according to Jager and Breitner. Type I (a), Type IIa (b), Type IIb (c), Type III (d), Type IV (e) (16).

# Colles' Fracture



- **XR:** Forearm XR AP/Lat + wrist PA/Lat +/- elbow AP/Lat.
- **Mx:** Can be generally managed with closed reduction with well molded cast/splint.
  - Significant angulation and deformity may require an open reduction and internal fixation.
  - An open fracture will always require surgical intervention.
- **Consider Osteoporosis evaluation and management.**
- **Complications of Colles'/ DDX:**
  - Galeazzi Fracture: highly associated with distal 1/3 radial shaft fractures
  - Ulnar styloid fracture
  - DRUJ Instability
  - Compartment syndrome @1%
  - Median nerve injury
  - Tendon injury, attritional EPL rupture.
  - Scapholunate ligament tear.
  - TFCC injury, up to 50% when ulnar styloid fx also present
  - Carpal ligament injury.







# Galeazzi

- **GFR: Galeazzi Fractured Radius**
- **Definition:** Fracture of the radial shaft (usually distal 1/3) with dislocation of the distal radioulnar joint
- **Clinically:** Pain and swelling in forearm and wrist. Forearm rotation very painful.
  - NV exam, evaluate for compartment syndrome, evaluate soft-tissue envelope, wrist evaluation.





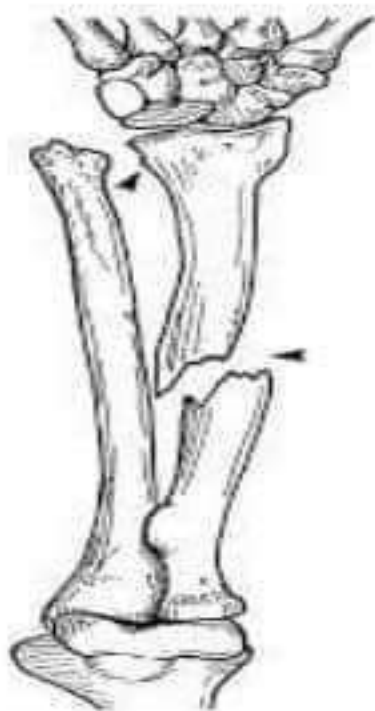
# Galeazzi part 2

- **Radiologically:** A/P and Lateral of forearm +/- elbow, wrist.
- **Mx:** ORIF of the radius is indicated in all cases.
  - Further Mx depending on stability of distal radioulnar joint.
- **Associated injuries/DDx:**
  - Ulnar Styloid Fracture
  - TFCC Tear
  - DRUJ Instability



## **2. Galeazzi Fracture:**

A fracture of the **lower third of radius** with dislocation or subluxation of the **distal radio-ulnar joint**.



# Monteggia

Anterior dislocation of the radial head with a fracture of the ulna, usually angulated dorsally

Dislocation at the head

Fracture of the proximal third

Fall on an outstretched hand with the forearm in excessive pronation

Direct blow on back of upper forearm in self-defense (night-stick injury)

ORIF

Nonunion

Limitation of motion at elbow

Giovanni Battista Monteggia



# Galeazzi

Fracture of the radius with shortening and dislocation of the distal ulna

Isolated fracture at the junction of the distal and middle third

Subluxation or dislocation of the distal radio-ulnar joint

Fall on an outstretched arm with elbow flexed

Open reduction in adults

Closed reduction in children

Malunion/Nonunion

Limitation of pronation or supination

Anterior interosseous nerve palsy

Ricardo Galeazzi

Description

Radius

Ulna

Mechanism

Management

Complications

Credit goes to...



# Smith's Fracture

- **Definition:** Distal radial fragment is tilted into a posterior angulation and may be displaced ventrally (volar). (Reverse Colles's)
- **Mechanism:** Direct blow to the dorsal forearm or falling onto **flexed** wrists,
  - (as opposed to a Colles' fracture = falling onto wrists in extension.)
  - Smith's fractures are less common than Colles' fractures.
- **Mx:**
  - **Undisplaced fracture = cast alone.**
  - **Mild angulation and displacement may require closed reduction.**
  - Significant angulation and deformity may require an open reduction and internal fixation.
  - An open fracture will always require surgical intervention.
- **Consider Osteoporosis evaluation and management**



# Greenstick fracture

A fracture in which one side of a bone is broken while the other is bent (like a green stick).



Fracture types



Greenstick  
(incomplete)



Transverse



Simple

# SIGNS AND SYMPTOMS OF A FRACTURE

- ❖ Pain at or near the fracture
- ❖ Tenderness or discomfort when there is pressure applied to the fractured area
- ❖ Swelling
- ❖ Loss of power
- ❖ Deformity or irregularity
- ❖ Crepitus (bony grating) may be heard or felt
- ❖ Unnatural movement



## DIAGNOSIS :

**Symptoms** include

- history of trauma is present
- pain and swelling in and around the elbow joint
- tenderness is present at the fracture site
- Crepitus or a gap may be present between the fragments

TESTS: to check...

- disruption of extensor mechanism, patient should be asked to attempt extension against gravity.
- Unstable fracture is confirmed by inability to extend the elbow.
- Stability of elbow (+MCL) after operative fixation: varus+valgus stress in full extension & moderate flexion.

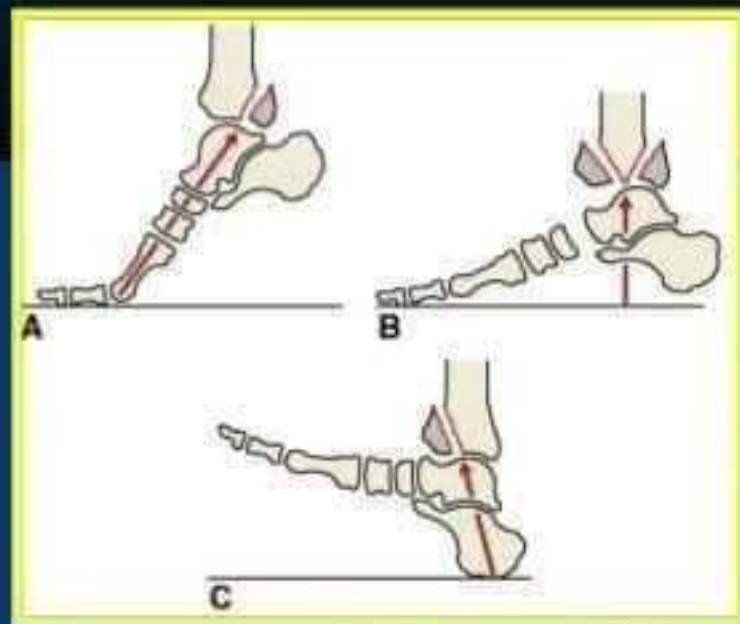


- CLINICAL EVALUATION

- Swelling and displacement.
- Normal relationship of the olecranon, medial, and lateral condyles should be maintained, roughly delineating an equilateral triangle.
- Crepitus with range of motion
- A careful neurovascular evaluation is essential because the sharp, fractured end of the proximal fragment may impale or contuse the brachial artery, median nerve, or radial nerve.
- Serial neurovascular examinations with compartment pressure monitoring may be necessary with massive swelling; cubital fossa swelling may result in vascular impairment or the development of a volar compartment syndrome.

# Mechanism of injury

- Fracture pattern is dictated by position of foot and talus at time of impact:
  - Plantar flexion injury: posterior lip fragment.
  - Neutral ankle: anterior and posterior fragments.
  - Dorsiflexion injury: anterior lip fragment.

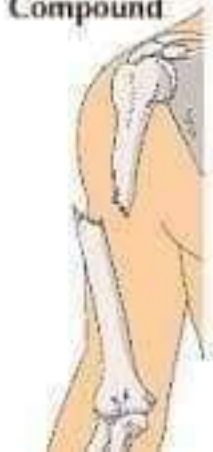


# Types of Fractures

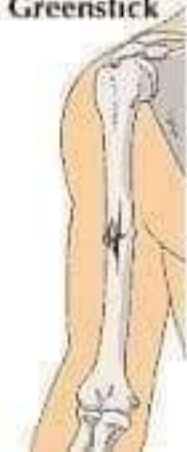
Simple



Compound



Greenstick



Comminuted



Impacted







**a) Closed**



**b) Open**



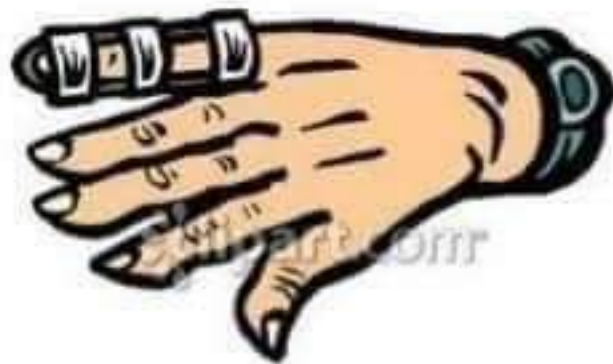
**c) Complicated**



# First Aid



- Initial treatment for fractures of the arms, legs, hands and feet in the field include splinting the extremity in the position it is found, elevation and ice. Immobilization will be very helpful with initial pain control.



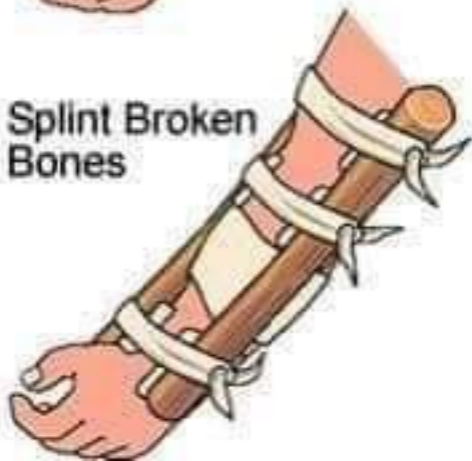
**Do Not  
Apply a  
Tourniquet**



**Apply Pressure  
if Bleeding**



**Splint Broken  
Bones**







**R** - Rest

**I** - Ice

**C** - Compression

**E** - Elevation

**R** - Referral

# FRACTURE TREATMENT

- ⊕ **Make The Patient Comfortable**
- ⊕ **Prevent Any Movement**
- ⊕ **Check Bleeding**
- ⊕ **Treat for Shock**
- ⊕ **Immobilize the Limb**
- ⊕ **Give Support**
- ⊕ **Transportation.**