Common Fractures

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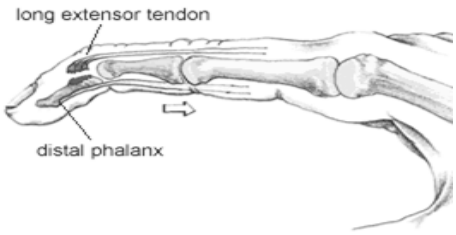
Common Fractures

- **Distal Upper Extremity**
  - **Fingers, Hand, Wrist**
- **Proximal Upper Extremity**
  - **Humerus, Shoulder, Clavicle**
- **Proximal Lower Extremity**
  - **Hip, Femur**
- **Distal Lower extremity**
  - **Knees, Ankle, Feet**

Finger

MALLET FINGER(Baseball Finger)



- Avulsion of Extensor Digitorum Communis (EDC) Tendon from DIP joint
  PITFALL – get the films
  - Can be associated with Avulsion Fracture

Finger

MALLET FINGER

- Mechanism of Injury:
  - Direct jam
  - Forced flexion
  - Dorsal dislocation of PIP
  - Laceration
- Splint
  - Slight hyperextension for 6 weeks
  - Night splint for additional 6 weeks
  - Best results if treated early

Jersey Finger

Jersey Finger

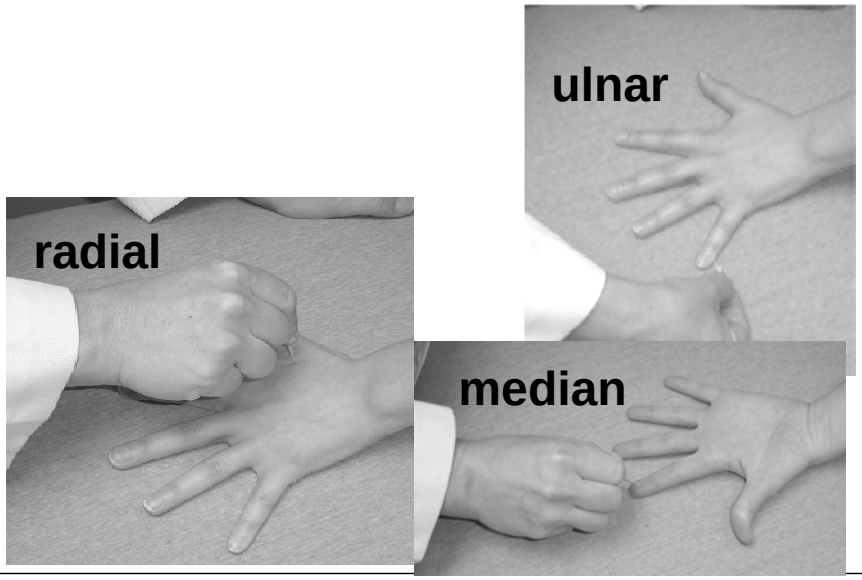
- **A pop or rip felt in the finger at the time of the injury**
- **- <u>Pain</u> when moving the injured finger and the inability to bend the last joint**
- **- Tenderness, swelling and warmth of the injured finger**
- **- <u>Bruising</u> after 48 hours**
- **- Occasionally a lump felt in the palm of the finger**

Finger

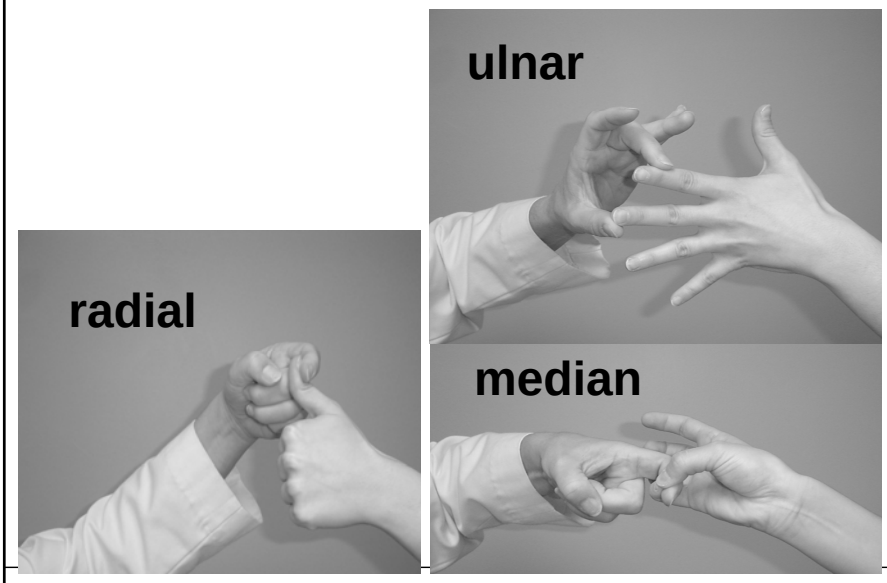
JERSEY FINGER

- **Avulsion injury of Flexor Digitorum Profundus (FDP) from volar base of distal phalanx**
- **Examination:**
  - **FDP test - blocked flexion of DIP**
- **Treatment - early surgical repair**
- **Permanent disability if missed**

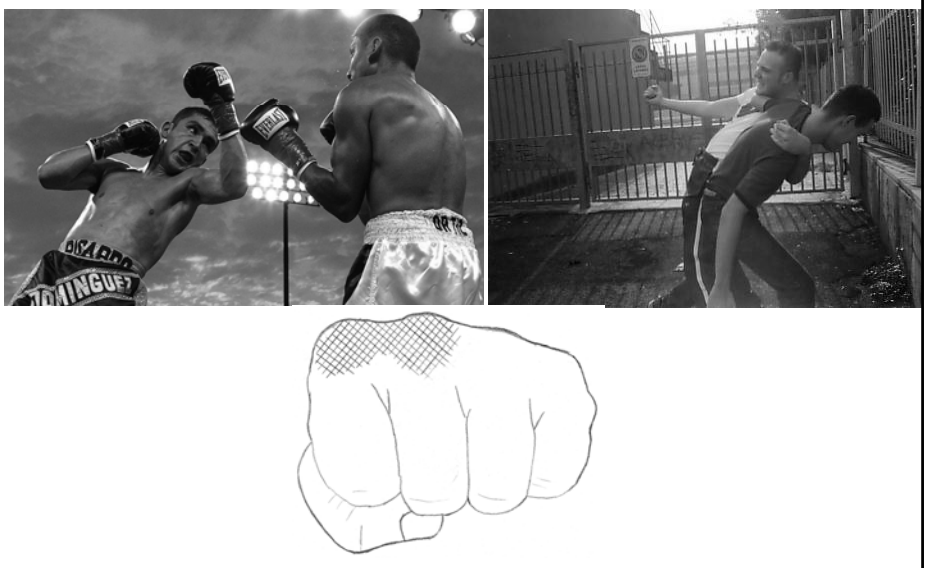
Neuro Hand Sensation



Neuro Hand Strength



Boxer's Fracture



Boxer's Fracture

DEFINITION

- **Distal neck fx of 5th metacarpal**
  - **Volar displacement acceptable to 45 degrees for office casting +/- closed reduction**
  - **Rotation deformity**
    - **Referral**
  - **More than minimal valgus or varus displacement**
    - **Referral**
  - **PITFALLS – missing a fight bite**

Boxer's Fracture

Metacarpal Bones

BENNETT'S FRACTURE

- **Intra-articular fx at base of 1st metacarpal**
- **Wide displacement due to pull of FPL**
- **Fragment held in place by strong ligament**

Thumb Immobilization

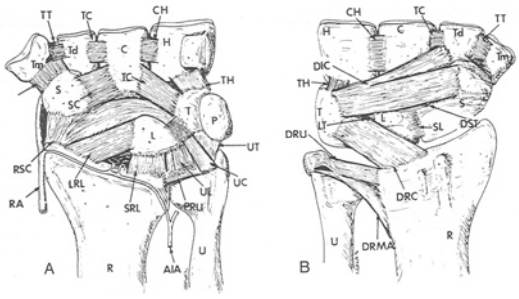
- **Thumb Spica Splinting**

Wrist & Hand Injuries

- **Scapholunate Ligament Injury**
  - Most common and most crucial ligament injury of wrist.
  - Often leads to chronic pain and/or functional instability.

  PITFALL – Only looking for fractures

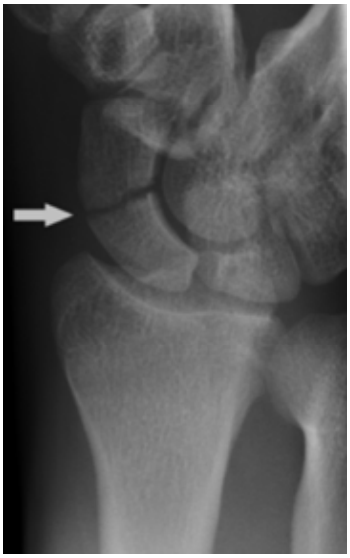
Scapholunate Ligament Injury



Terry Thomas/David Letterman

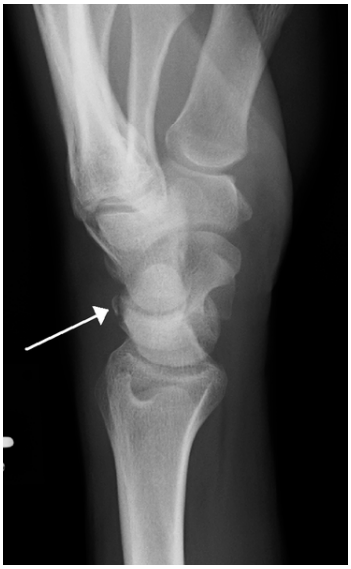
Wrist Injuries

- **Scaphoid fractures**
  - **Most common carpal bone injury of wrist.**
  - **Can be radiographically occult – PITFALL - splint**
  - **Can lead to avascular necrosis of scaphoid if unrecognized.**



Wrist Injuries

- **Triquetral Fractures**
  - **Second most common fracture**
  - **PITFALL – not looking at Lateral film**

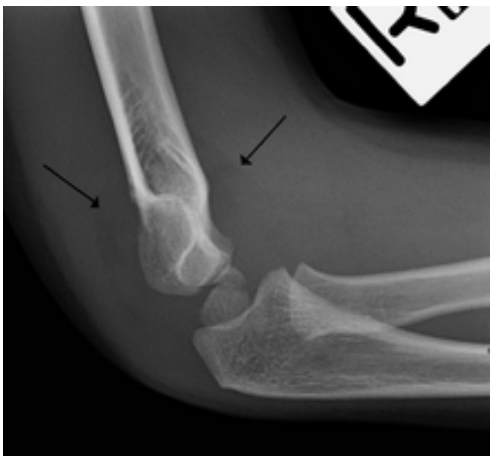


“Wrist” Injuries

- Distal radius/ulna injury patterns
  - Colle’s fractures
  - Smith’s fractures (reverse Colle’s)
  - PITFALL- R,M,U disruption 8%

Elbow Fractures

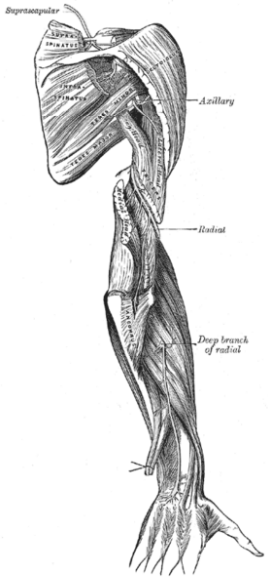
- **Radial Head Fracture**
  - **Sail Sign**
  - **PITFALL-**
  - **No boney abnormality, no fracture**



Supracondylar Fracture

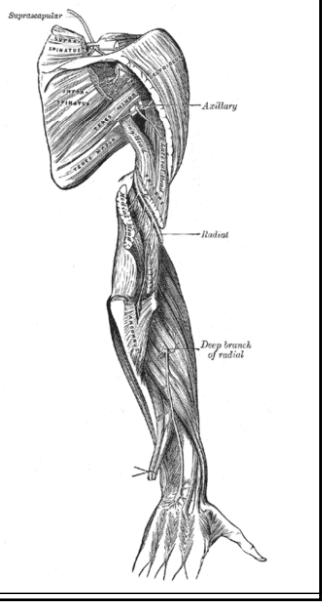
- **Mechanism: fall on flexed elbow**
- **PITFALL;**
  - **median nerve injury**
  - **Brachial artery injury**

Humerus Fractures

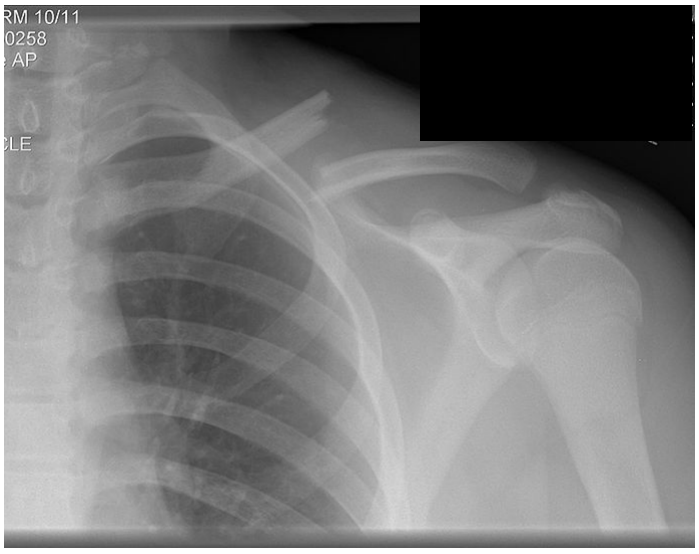


Humerus Fractures

- **PITFALL - Radial Nerve**
- **Transection**
- **Neuropraxia**



Clavicle Fracture



Clavicle Fracture

- **PITFALLS**
  - **CHECKING FOR VASCULAR INTEGRITY**
  - **ASSOCIATED INJURIES**
  - **SKIN TENTING**

Shoulder Dislocations

Shoulder Dislocations

- Anterior
  - Most common
    - Scaphoid deformity
    - Flexed and adducted
- Posterior
  - Seizures
  - PITFALL – not controlling seizures
- Inferior/Thoracic

Hip Fractures

- PITFALLS
  - Recognizing Occult fractures
  - Addressing high morbidity

Knee Injuries

Knee Injuries

- Patella Alta - PITFALL
- Patellar fractures – PITFALL – check extensor mechanism

Common Knee Fractures

Mechanism of Ankle Injuury

- Inversion + Plantarflexion= 80% sprains
  - Most commonly involve the Anterior Talofibular Ligament.
- Inversion or Eversion alone
- Landing on unsteady object
- Change of Direction
  - Deceleration associated
- Manual Twisting
  - Wrestling injury

Ankle Fractures

- **Bi and Tri malleolar fractures**
- **Mortis disruption**

Ankle Fractures

- **PITFALL**
  - **Examining the joint above and below**

Proximal 5th Metatarsal Palpation

- Test of 5th Metatarsal Avulsion
  - Occurs most commonly with inversion
  - Peroneus Brevis pulls styloid off of 5th Metatarsal
  - PITFALL - Palpate at styloid for pain.
    - If positive for pain should X-ray.

5th Metatarsal Fractures

- Jones versus pseudo Jones
  - PITFALL – nonreferal of Jones

Common Fractures in Orthopedics

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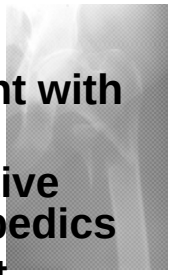
Assistant Professor Orthopaedic Trauma
Ohio State University Medical Center

Adult Common Fractures Objectives



1. Recommend an approach to the evaluation of patients who present with a fracture
2. Identify operative and non-operative injuries commonly seen in orthopedics
3. Describe basic surgical treatment options for fractures
4. Understand goals of surgery and what your patients can expect during post operative period

Evaluation

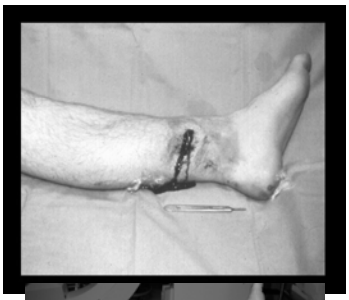
- Patients age
- History
  - ***Time of injury***
  - ***Mechanism of injury***
  - ***"What hurts"***
- Medical History
- Surgical History
- Social Hx ***(occupation)***
- Medications ***(anticoagulation)***
- Smoking/Alcohol history

Physical Examination

- Look for deformity
- Palpate areas of tenderness
- Examine the joint above and below
- Detailed neurologic and vascular examination

Clinical Evaluation

- Need to closely exam the soft tissues around the fracture
- Look for openings in the skin – which may indicate an “open” fracture
- Abrasions? Amount of swelling? Presence of fracture blisters?



Clinical Evaluation

- Soft tissue care
  - Primary goal is to halt continuing trauma to the tissues
  - Treatment of fractures first begins with “reducing” the fracture or dislocation
  - Immobilizing the fracture with a splint or external fixation

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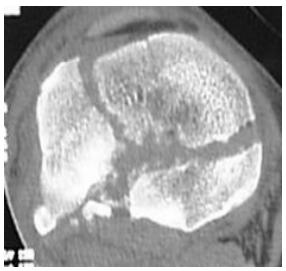
Imaging studies

- Radiographic assessment of fractures
- Begins with plain x-rays
  - 2 views at least
  - AP (anteroposterior) and lateral views
  - Joints above and below as some of the energy can be absorbed at a site away from the injury

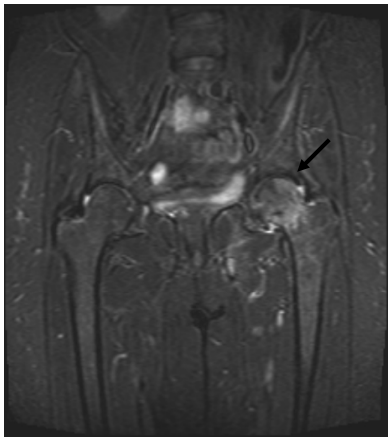
Imaging Studies

- Some instances plain x-rays do not define the fracture well
  - Joint injuries with multiple fragment => CT scan
  - Occult fractures

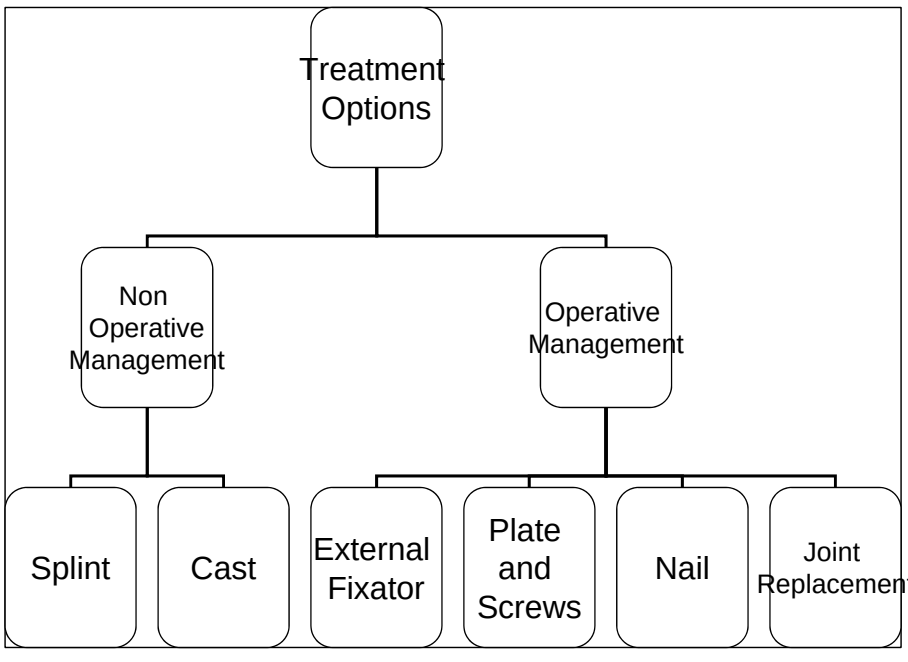



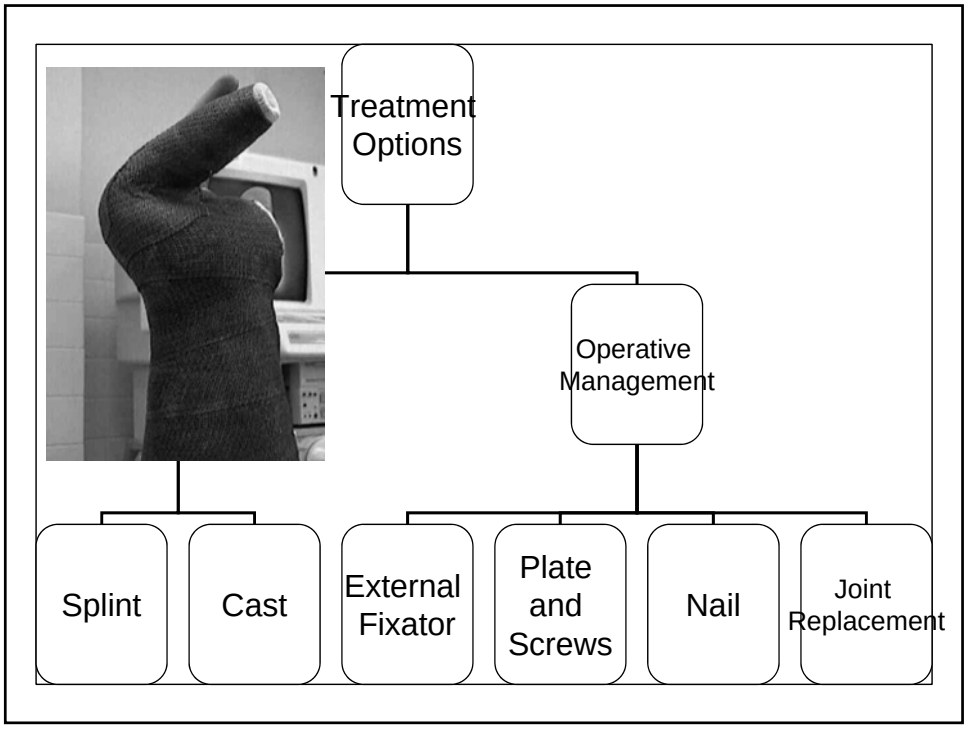

Special Studies

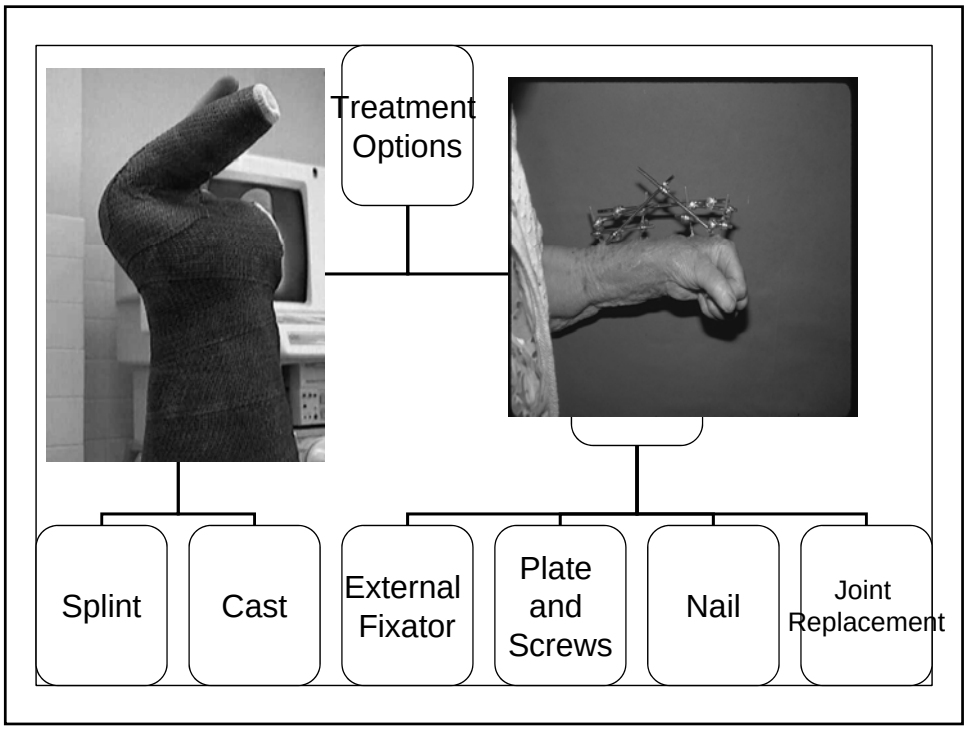
- Elderly patients with hip pain => MRI can diagnose an occult hip fracture
- Occult Fractures
  - Bone Scan
    - Sensitivity 100% @ 72hrs
  - MRI
    - Sensitive in first 24 hrs



Now that we have a diagnosis, where do we go from here?




Treatment Options
Operative Management
Splint
Cast
External Fixator
Plate and Screws
Nail
Joint Replacement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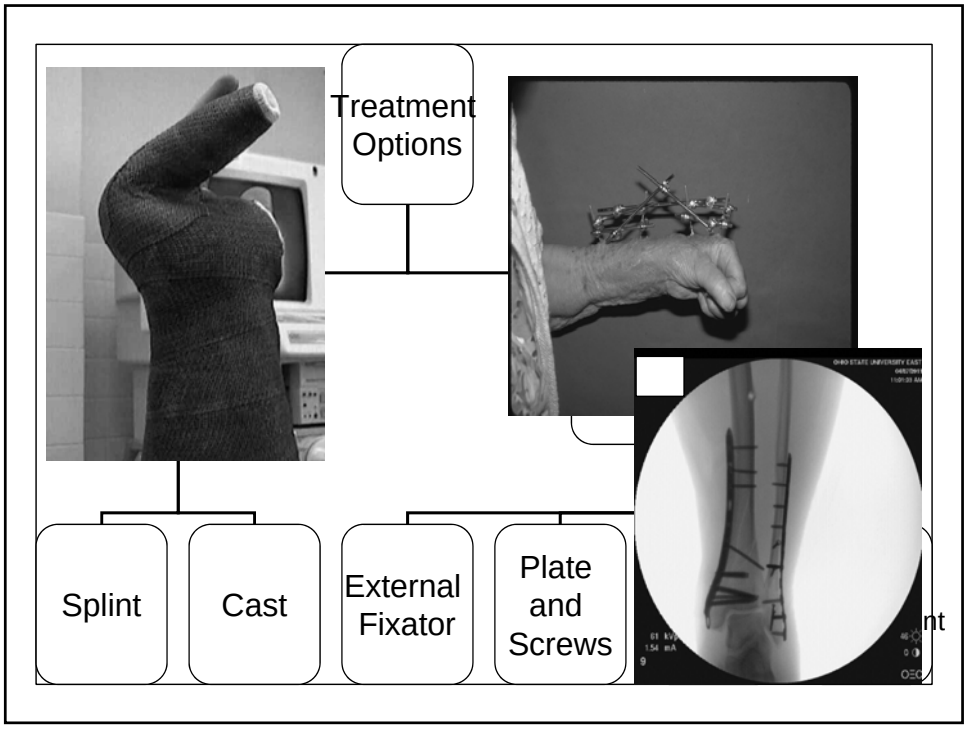
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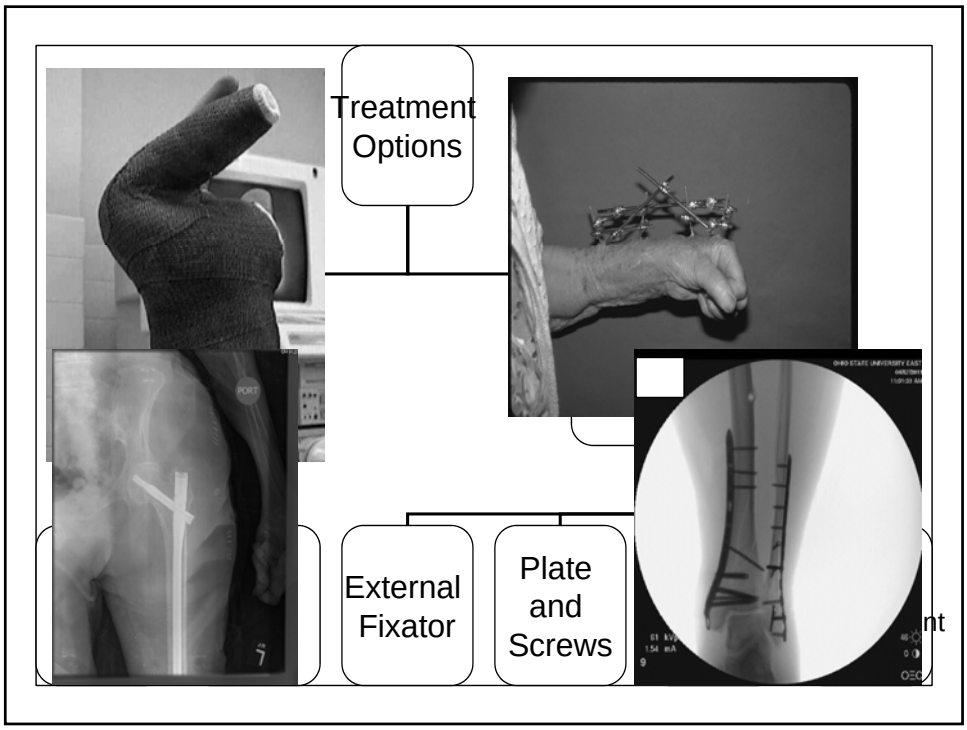
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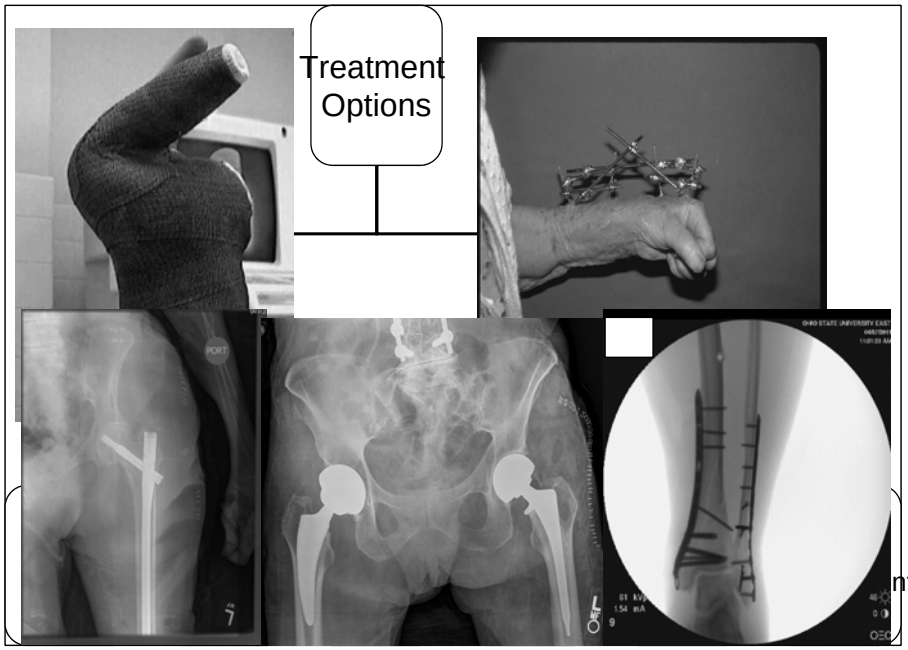


Fractures that require surgical intervention

- **“Open” fractures**
- **Irreducible fractures or dislocations**
- **Displaced intra-articular fractures**

Fracture Healing

- In general all adult fractures take 6-8 weeks to heal with or without surgical intervention
- Some fractures have longer healing times
  - Open fractures
  - Fractures in patients with diabetes
  - Intra-articular (joint) fractures
  - Fractures in bones with poor blood supply (scaphoid, talus, tibia)

Primary Goals

- Immobilize (let soft tissues relax)
- Pain control
- Ice and elevation
- Upper extremity – sling
- Lower extremity – crutches/walker
- Urgent orthopedic follow up

Goals of Surgery

- Decrease pain
- Fix fracture/Replace with prosthesis
- Early return to function
- Early mobility – PT/Strengthening/ROM
- Return to work
- Return to life

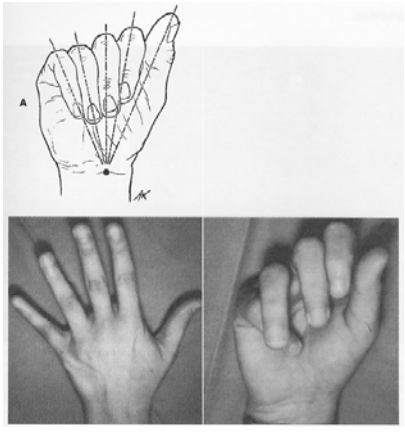
Examples of Common Fractures

Metacarpal Fractures

- ~3% of all fractures
- >50% work related
- Less frequent, MVC, recreation, household injuries
- Border digits most common

Evaluation

- Physical exam
  - Range of motion
  - Rotational deformity
  - Associated soft-tissue injury
  - Neurovascular examination



Metacarpal neck fractures

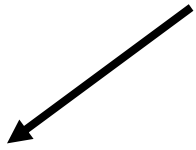
- Extra-articular fxs
  - Some angulation, shortening accepted (more in little/ring, less w/ index/long fingers), but rotation need to be corrected
- "Boxer's fracture"
  - ulnar gutter splint 10-14 days

Distal Radius Fractures

- Common sites of injuries
- Most common fx of the UE
- 8-17% all bony injuries

Classification
Fracture Pattern

Classification
Fracture Pattern



Stable

Amenable to closed reduction and casting treatment

Classification
Fracture Pattern

Stable

Amenable to closed reduction and casting treatment

Unstable

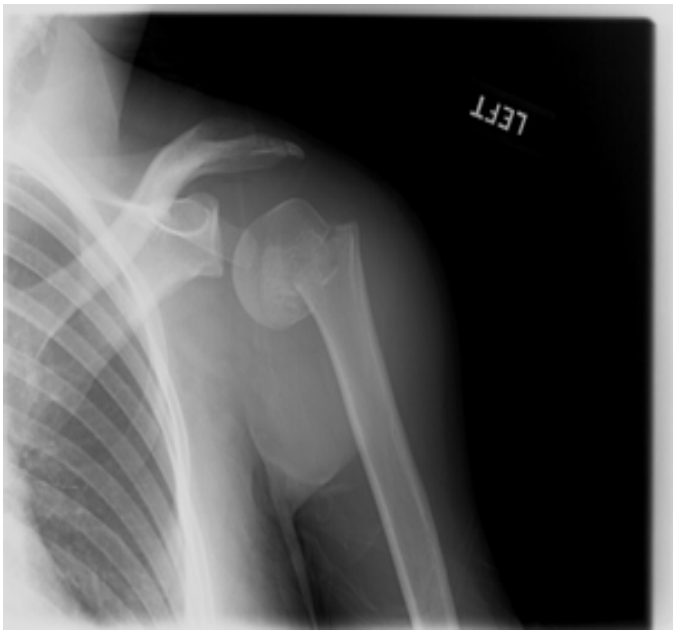
Requires definitive fixation to achieve/maintain Radiographic parameters

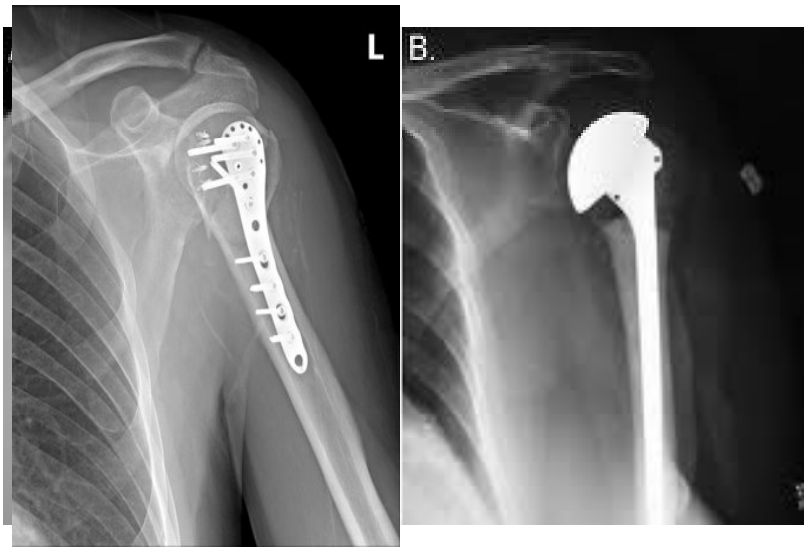
Common Fractures

- **Clavicle fractures**
  - **Vast majority heal with simple immobilization with sling for comfort**
  - **Begin early range of motion (1-2 weeks)**
  - **6-8 weeks back to full activities**

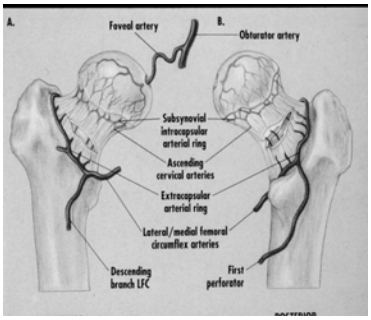
Proximal humerus fractures

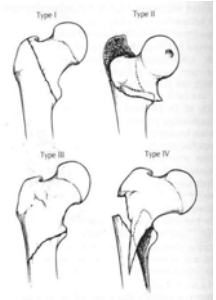
- 4-5% of all fractures
- Most fxs (80-85%) min displaced
- Bimodal distribution
  - Young high energy injury
  - Older pt, low energy injury, osteoporotic bone





Common Fractures about the hip





Displaced or Non-displaced

Femoral neck fracture

Intertrochanteric

Hip fracture

Incidence

- 250,000 Hip Fractures/year
- Double by 2040 to 500,000

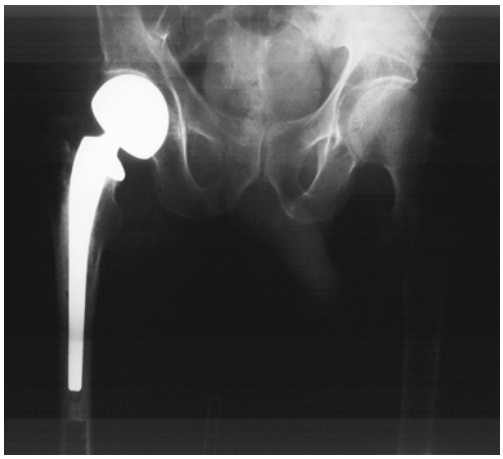
Etiology

- Osteoporosis
- Low energy fall
- 90% >65y/o
- Peak @ 80y/o
- F>M

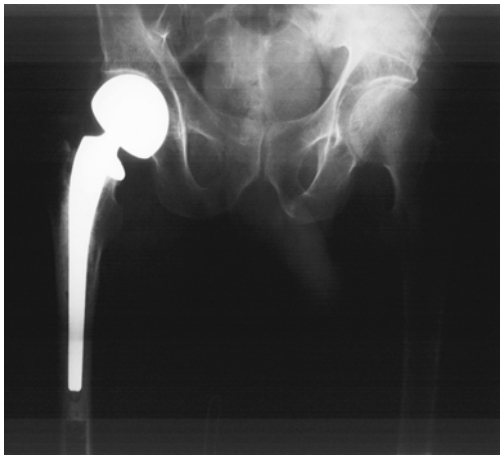
- High energy fxs
  - More rare

Femoral neck fractures

Femoral neck fractures

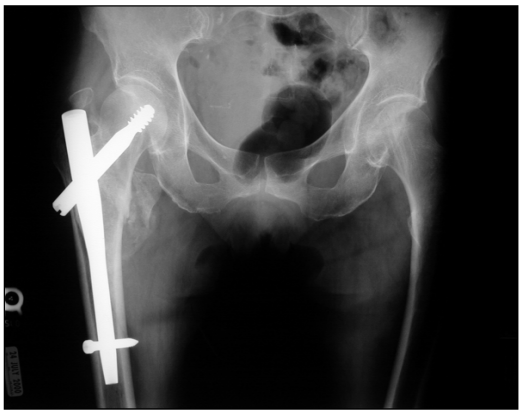


Femoral neck fractures



Intertrochateric Hip Fractures

Intertrochateric Hip Fractures



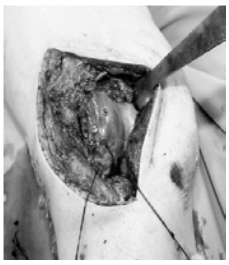
Why fix?

- Early mobilization
  - WBAT POD 1
  - Prevents prolonged bedrest
  - Decreased bed sores
  - Decreased pneumonia
  - Decreased pain
- Function
  - 40% Pre-Injury Ambulatory Status

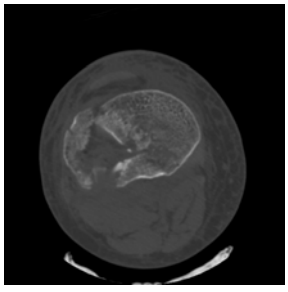
Osteoporos Int. 2000;11(12):1018-23
J Gerontol A Biol Sci Med Sci. 1999 Dec;54(12):M635-40

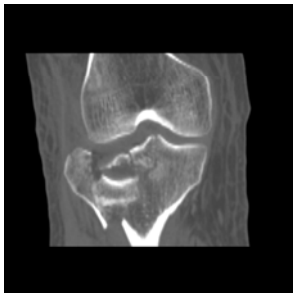
Fractures around the knee

- **Supracondylar / intracondylar distal femur fractures**
- **Tibial plateau fractures**
- **“Joint” or “intra-articular” fractures**
  - **Recommend surgical ORIF for majority of fractures due to joint involvement**



Fractures around the knee





Fractures around the knee

- Longer period of NWB (typically 3 months) postoperatively due to joint fixation
- Early range of motion to prevent knee contractures

Foot and Ankle Fractures

- Foot and ankle trauma is common
- 25% of all traumatic injuries
- Significant time loss from work
  - Foot required for walking

Nonoperative Treatment

- Indicated for some isolated lateral malleolus fractures
  - WBAT in fracture boot
  - Early ROM exercises / PT
  - Takes ~6-8 weeks to heal

Ankle fractures

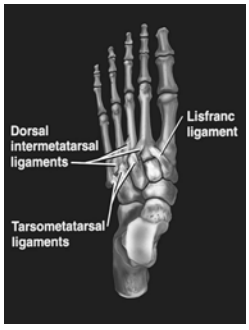
- Surgical intervention indicated for
  - Medial malleolus fractures
  - Bimalleolar and trimalleolar fractures
- Patients instructed to be non-weight bearing for 8 weeks after surgery (longer if associated ligmentous injury)
- 3-6 month recovery time

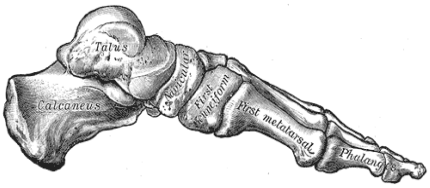
Metatarsal Fractures

- Treatment usually nonoperative
- Symptomatic:
  - Hard shoe
  - Walking cast
  - Elastic bandage

Lisfranc Injuries

- Up to 40% overlooked on initial radiographs
- High index of suspicion
- Xrays may show minimal displacement vs complete disruption





Take Home Points

- **Begin with thorough clinical evaluation**
- **Obtain appropriate radiographs**
- **Splint/Immobilize**
- **Patients should be prepared for a “long” recovery time**
- **Surgery provides early ROM, predictive healing, better functional outcome**