



Subtle Fractures

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No disclosures to report

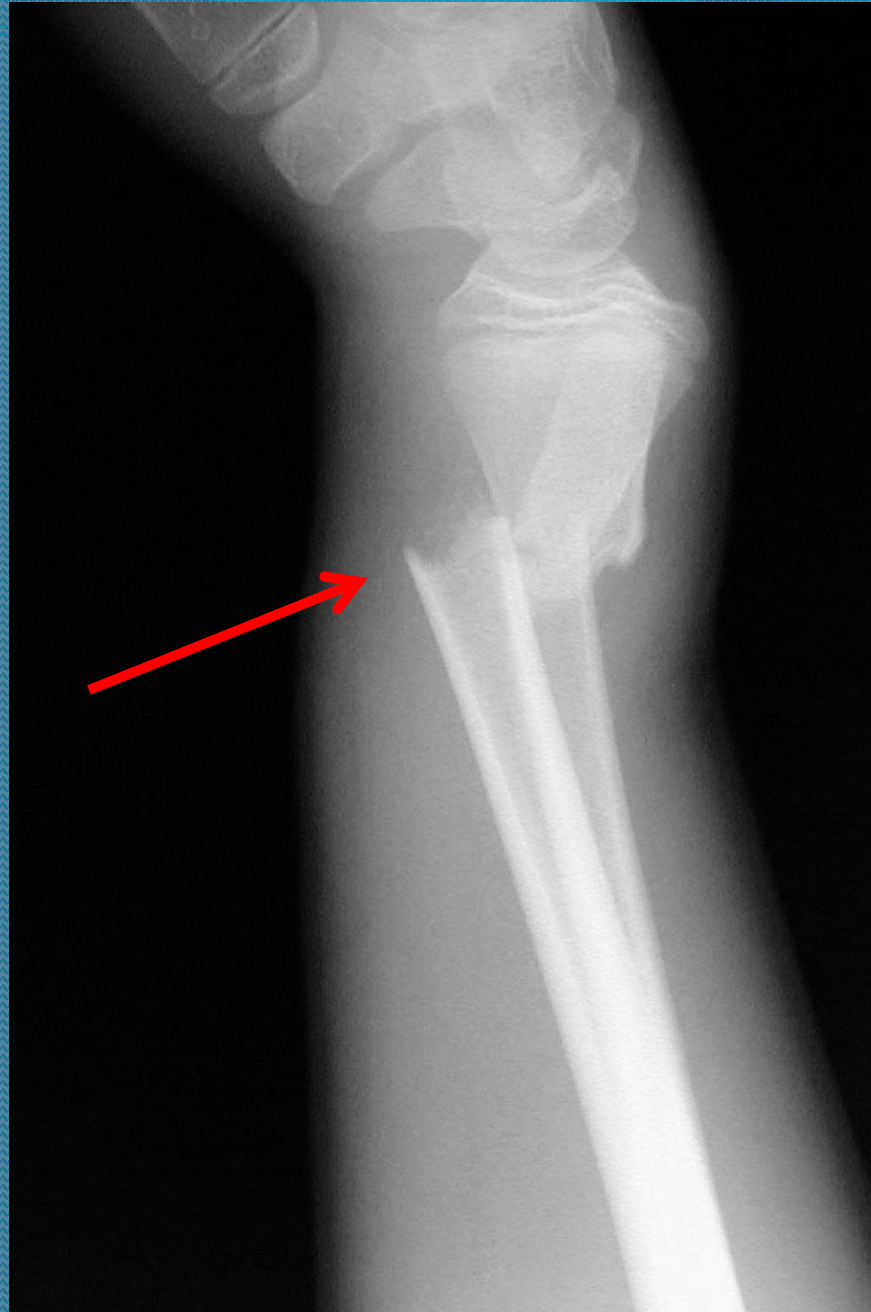


Objectives

- Become familiar with and apply a systematic approach to avoid commonly missed fractures
- Increase diagnostic accuracy for subtle but important MSK x-ray findings that are often missed by primary care clinicians
- Become more comfortable with general principles regarding the treatment of these injuries

X-ray Basics

- Can't describe a fracture without at least an AP and Lateral
- Consider oblique view if defect can only be seen in one view
- Consider comparison view when dealing with growth plate injuries
- Weightbearing views can be more helpful when evaluating joint spaces

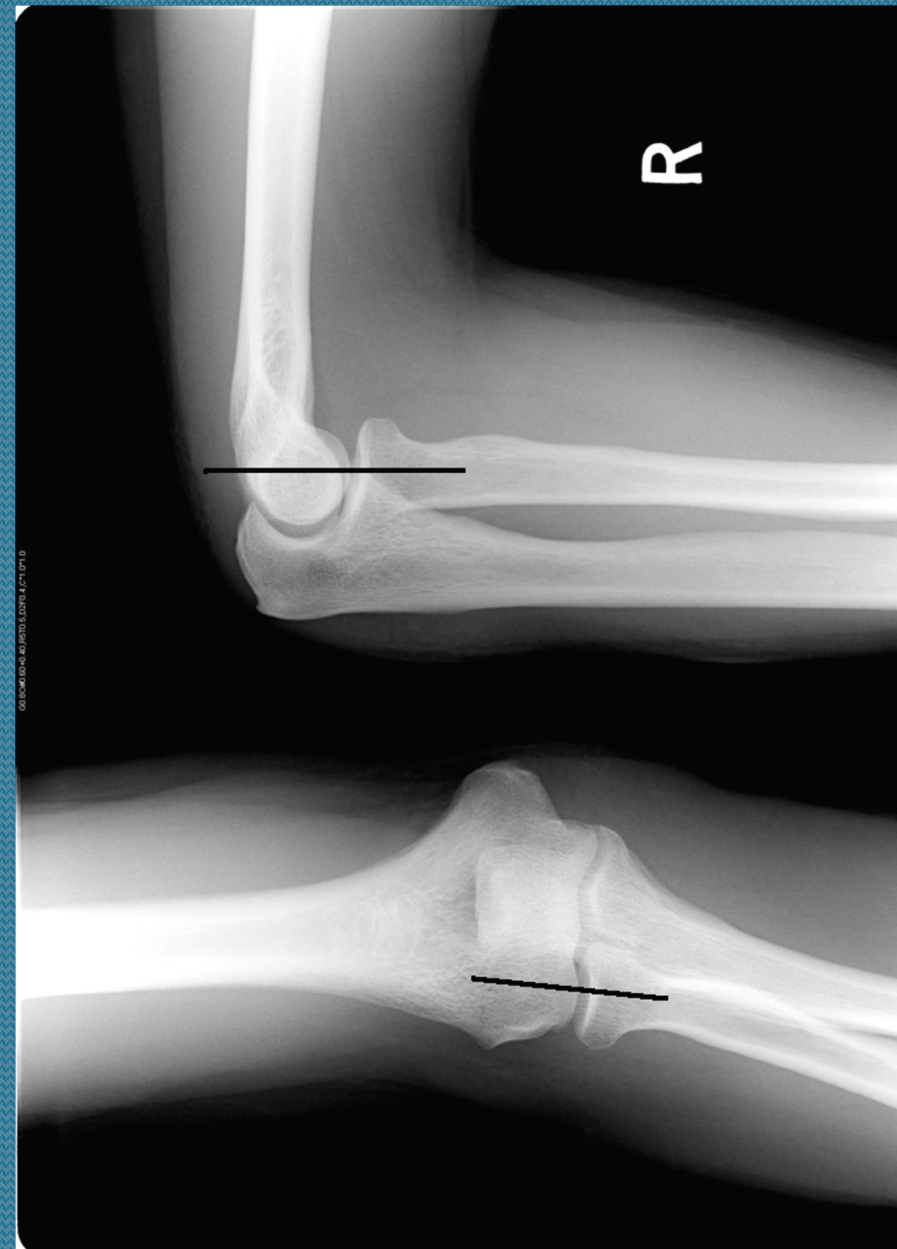


Elbow Fractures

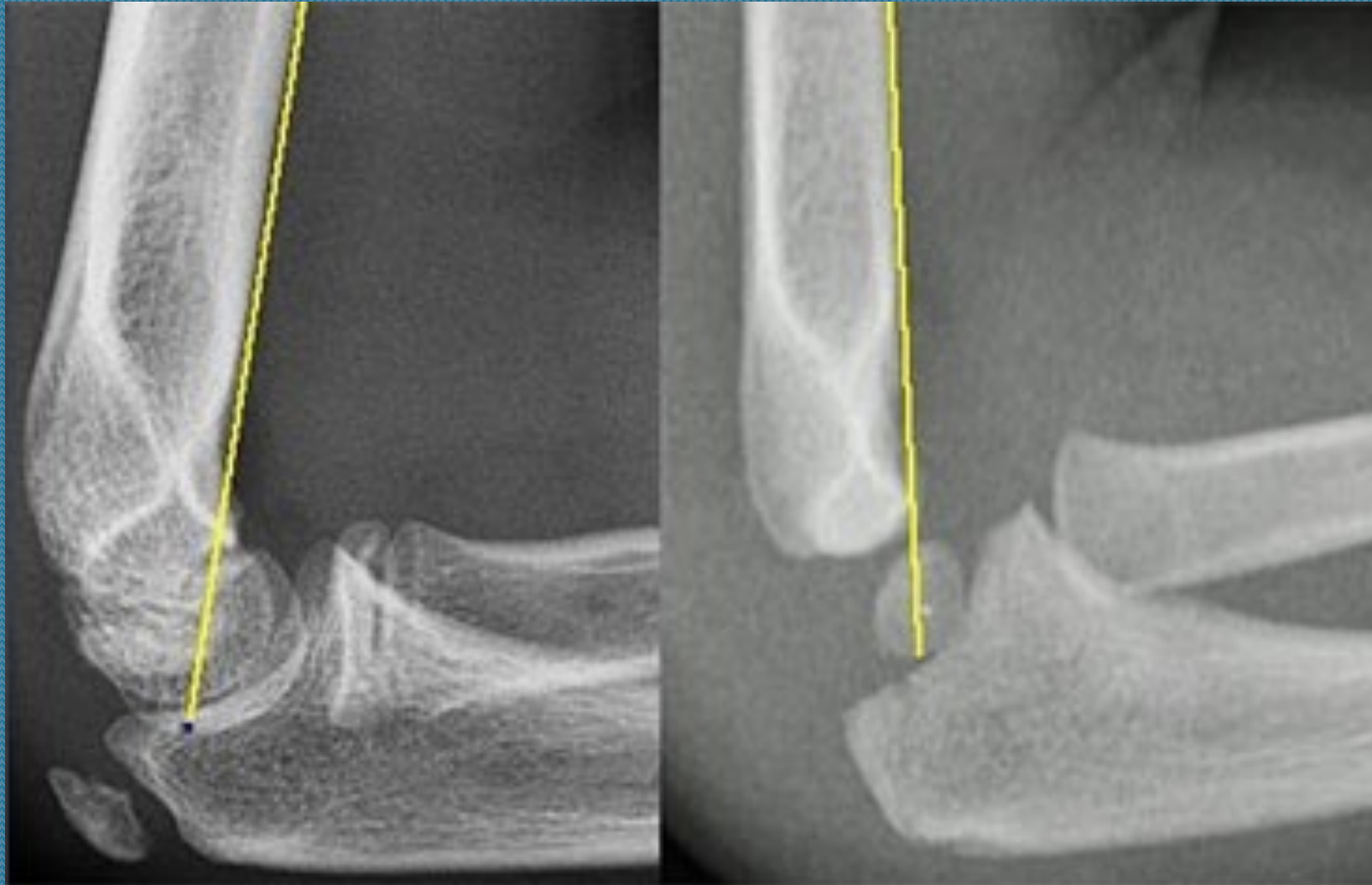
- Supracondylar fractures
- Radial head fractures
- Radial head dislocation
- Coronoid fractures



Normal Elbow



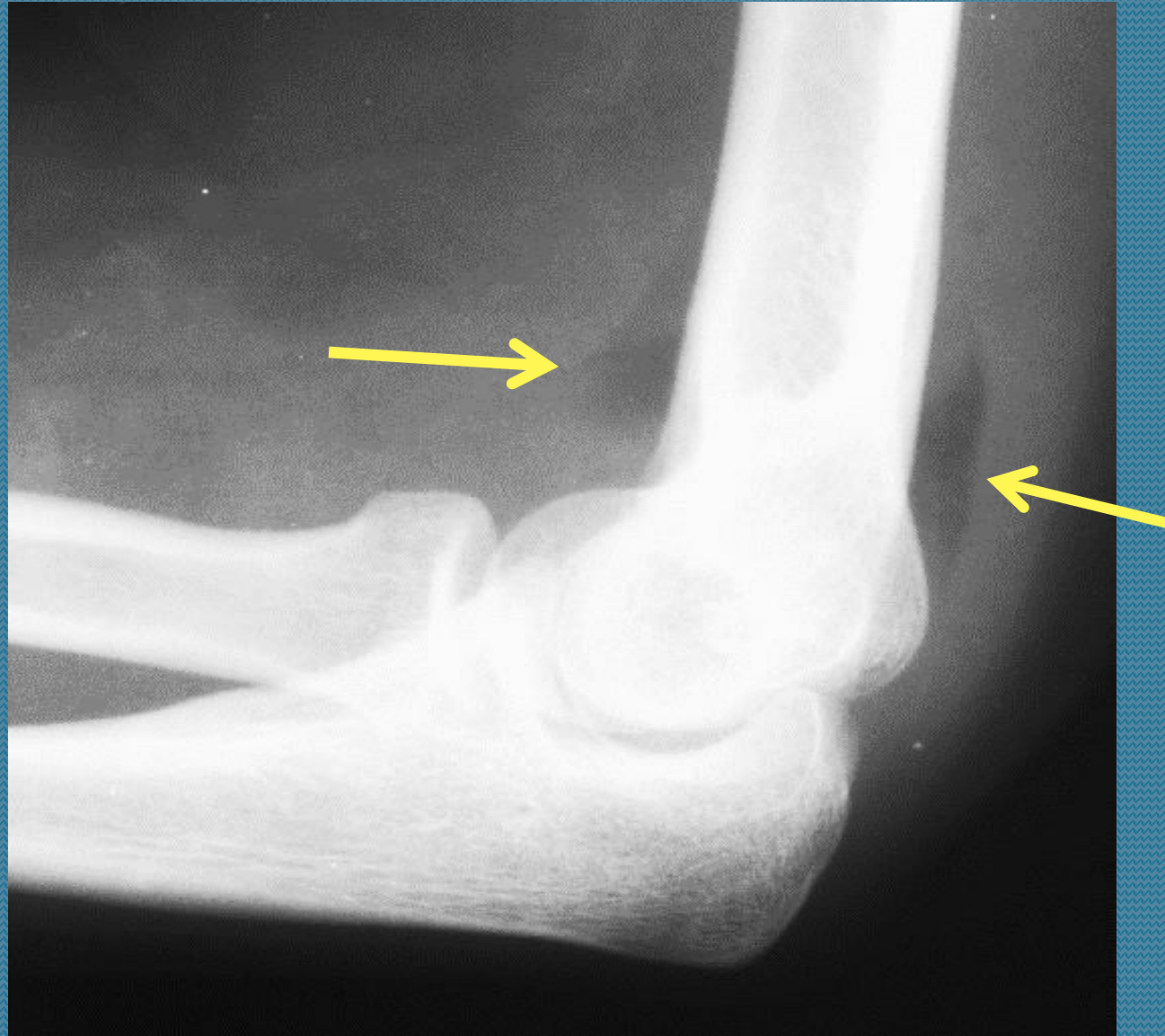
Normal Elbow Alignment



Elbow: abnormal anterior humeral lines



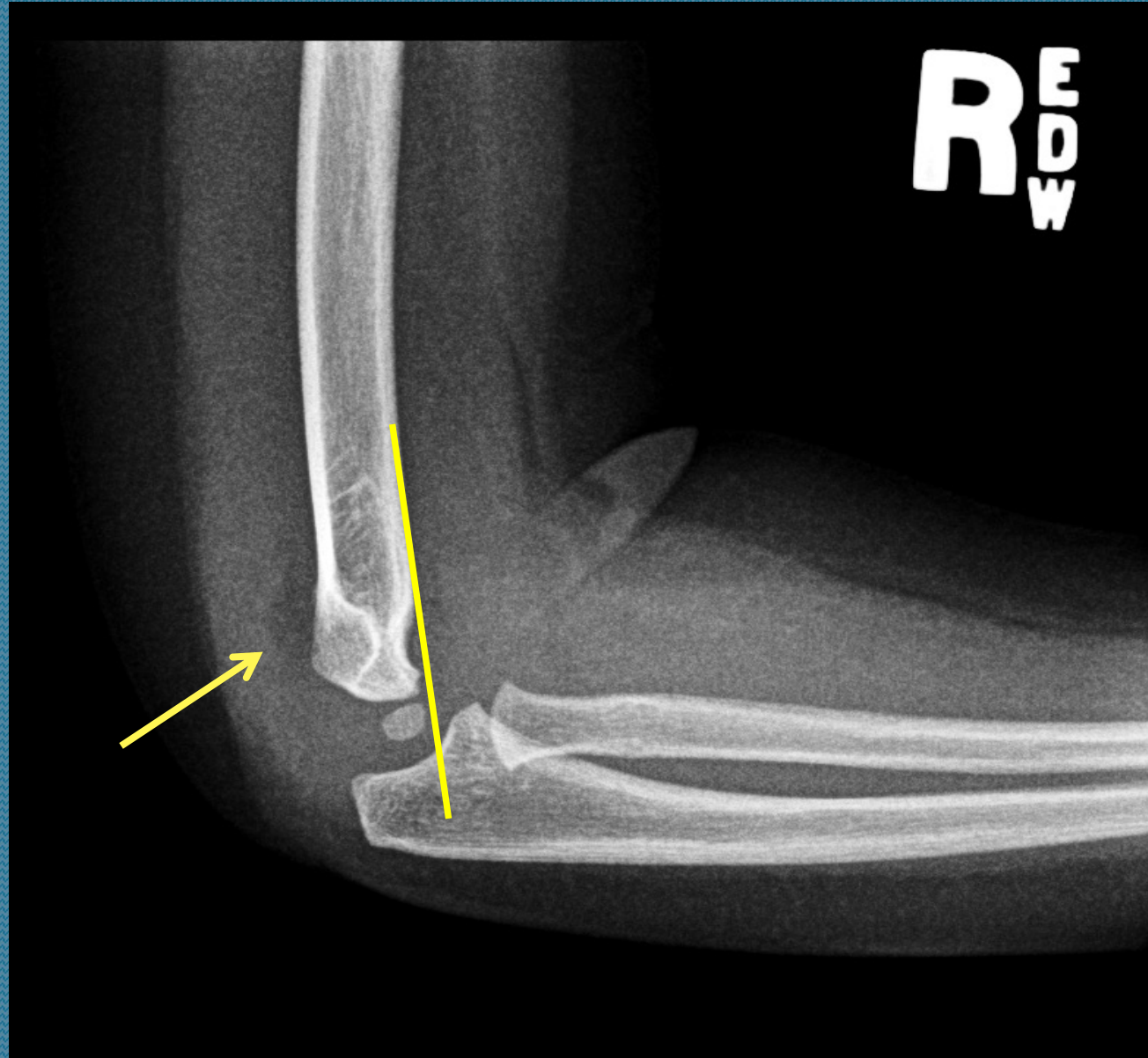
Elbow Fracture – fat pad



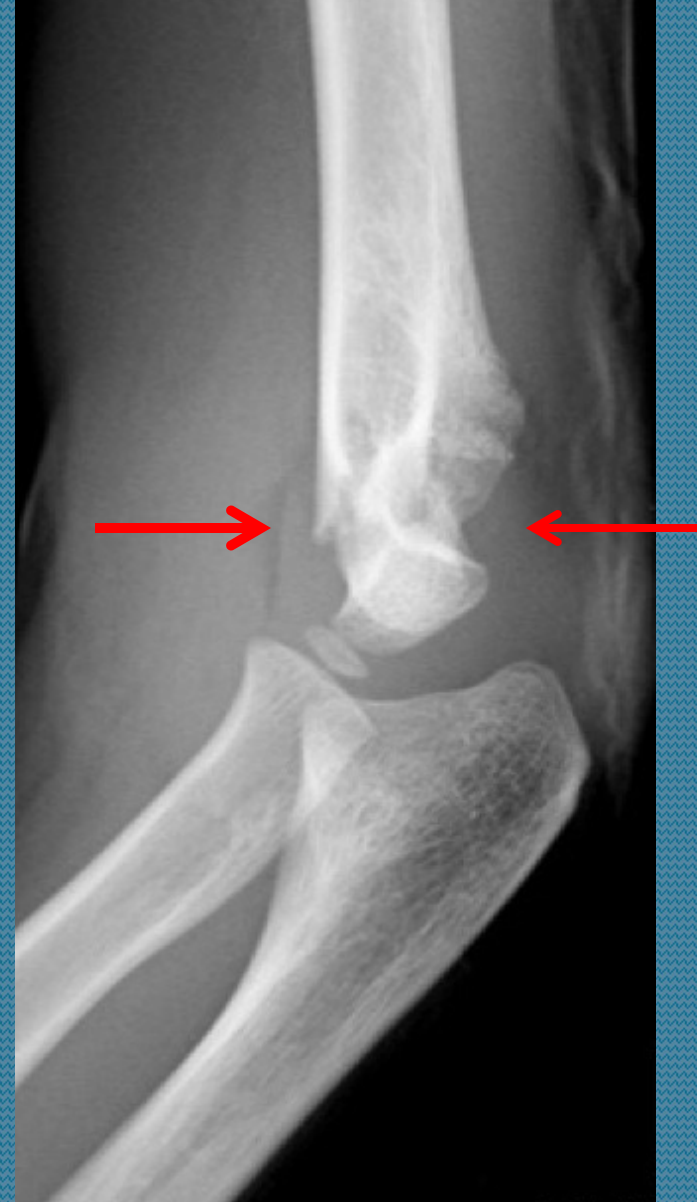
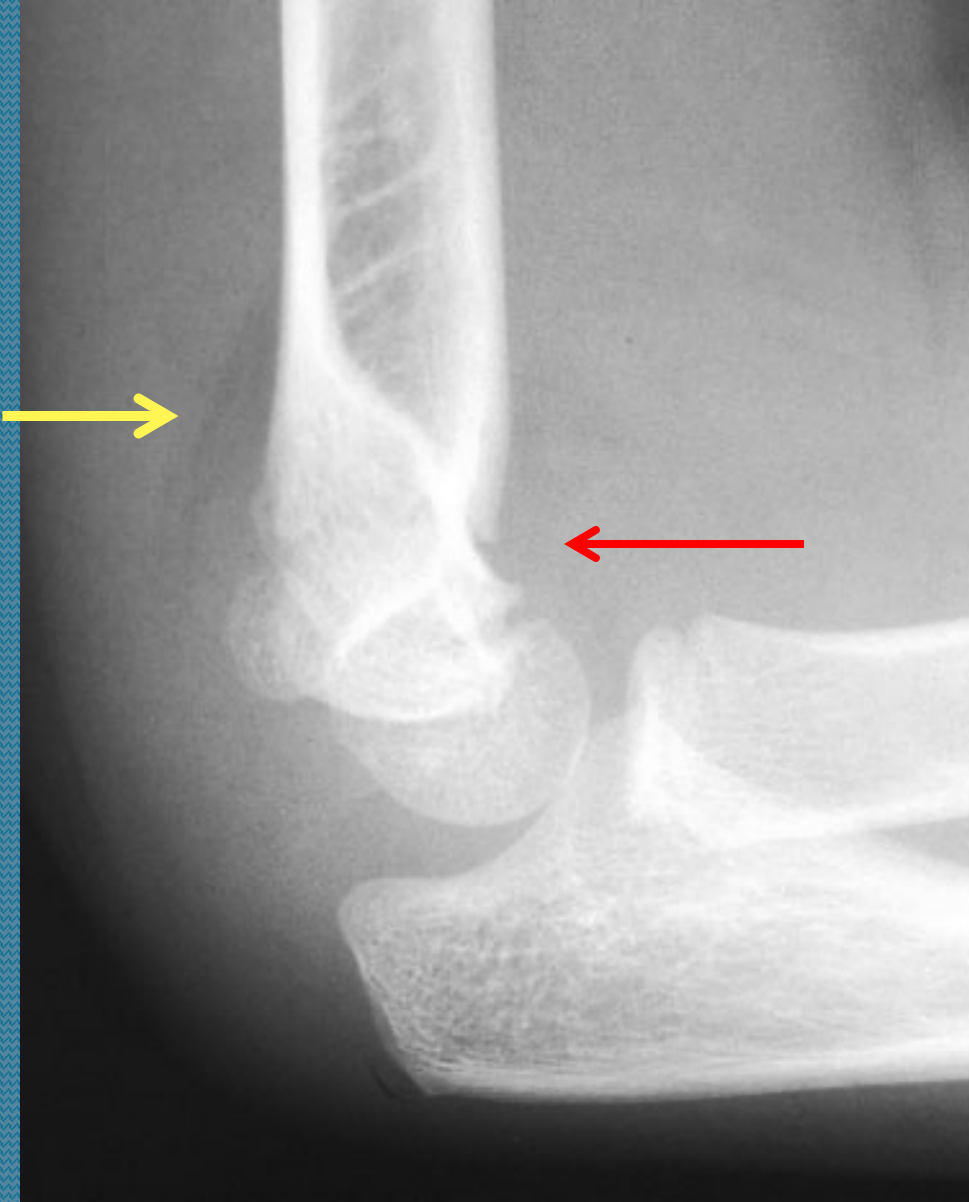
Supracondylar Fracture



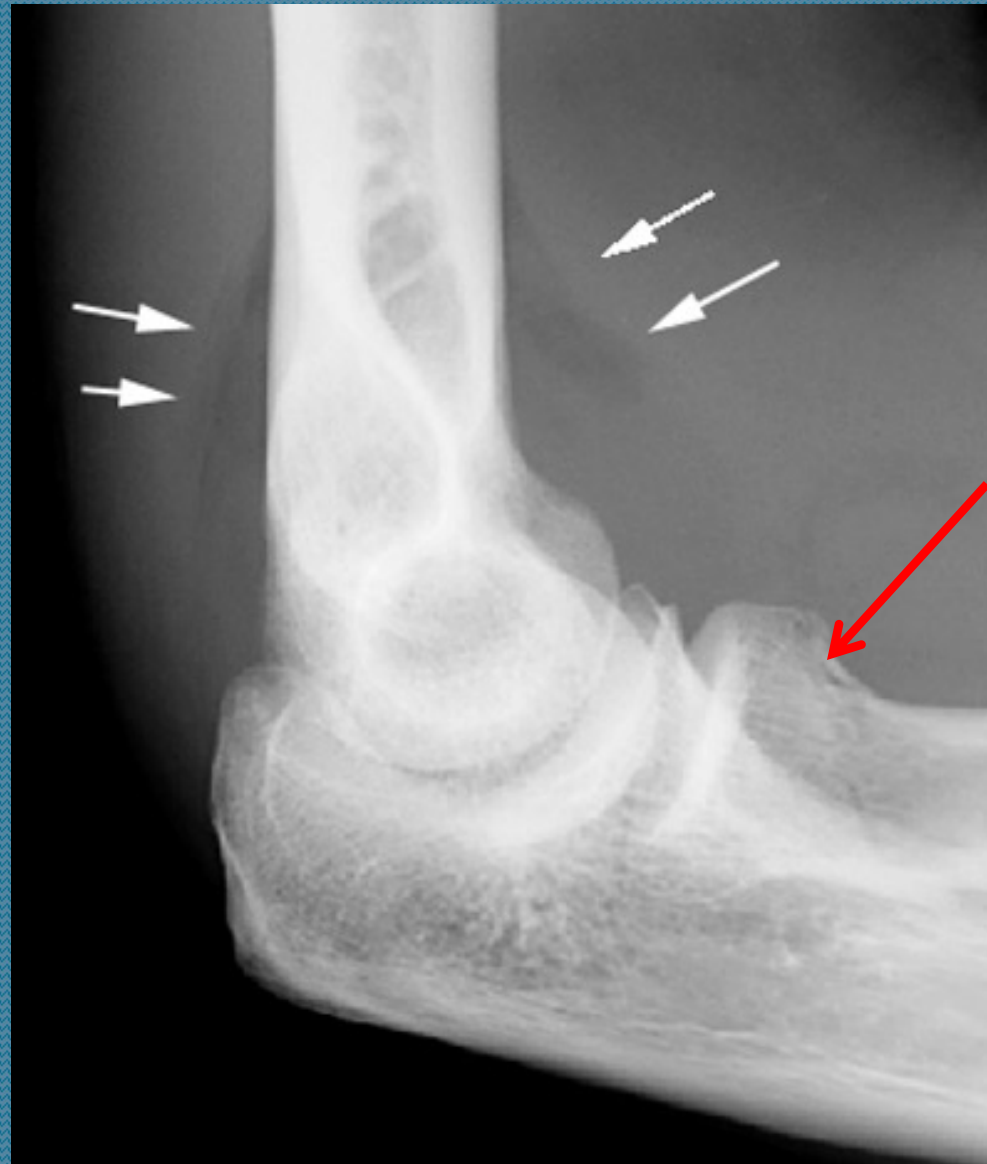
Supracondylar Fracture



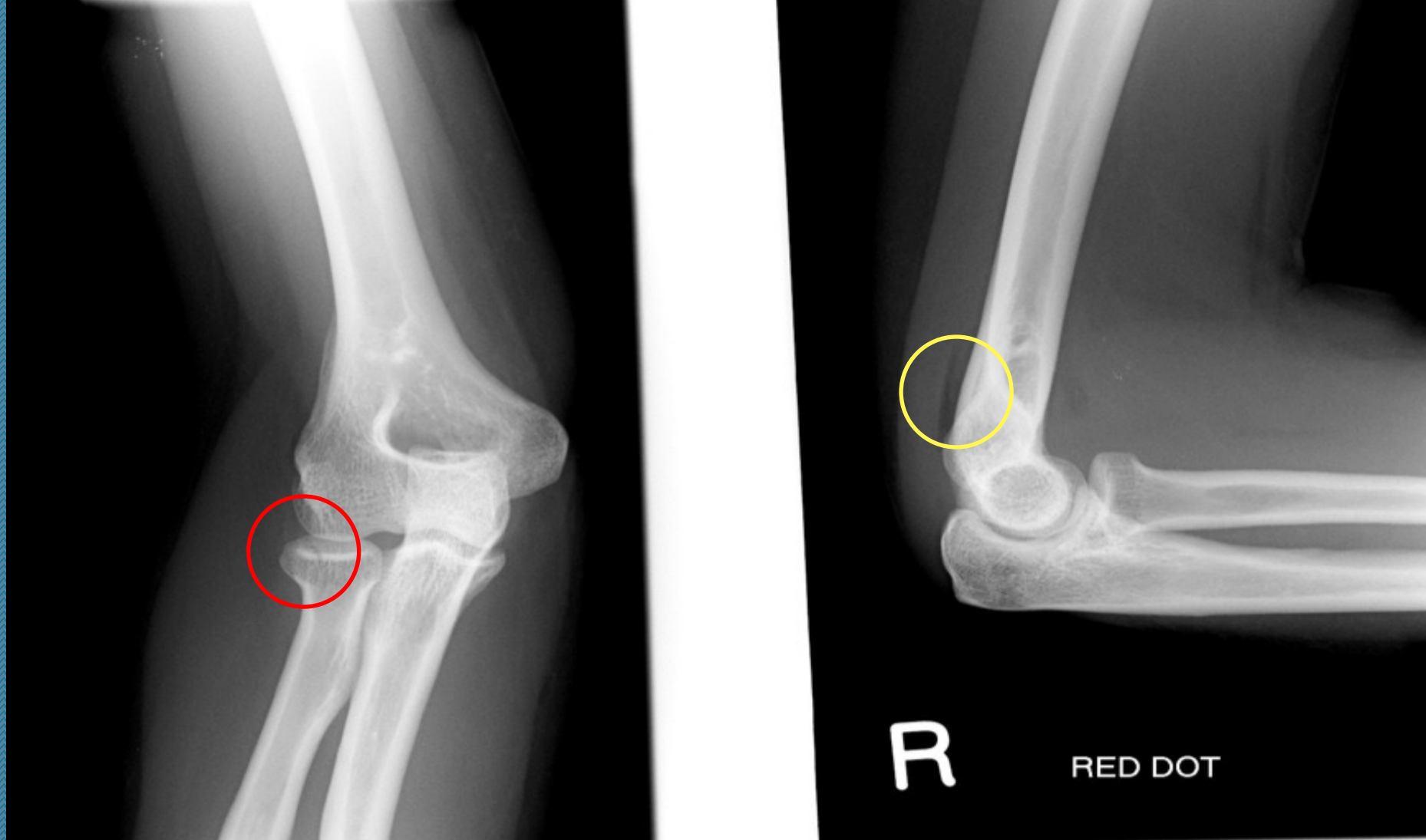
Supracondylar Fracture



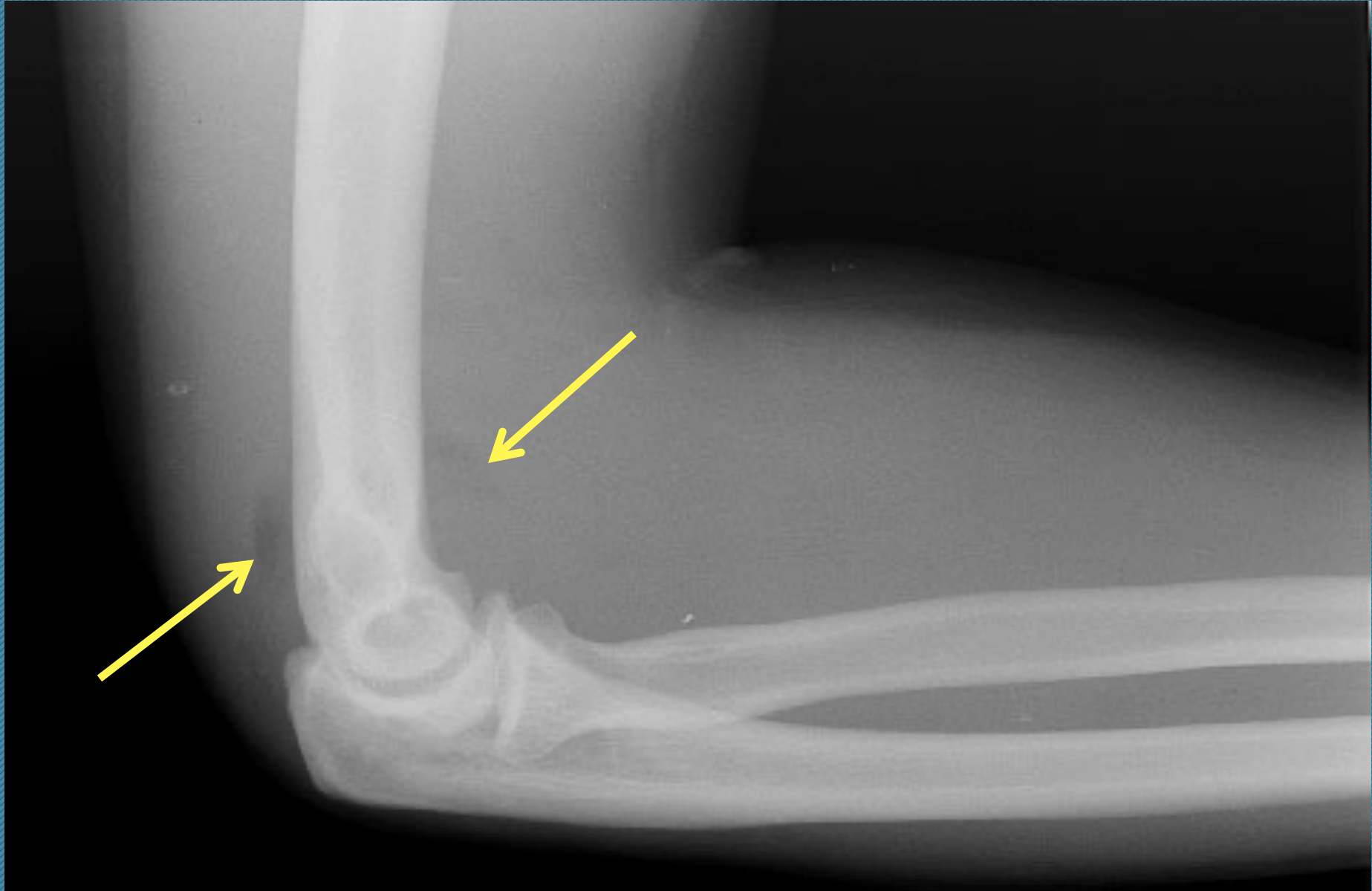
Radial Head Fracture



Radial Head Fracture



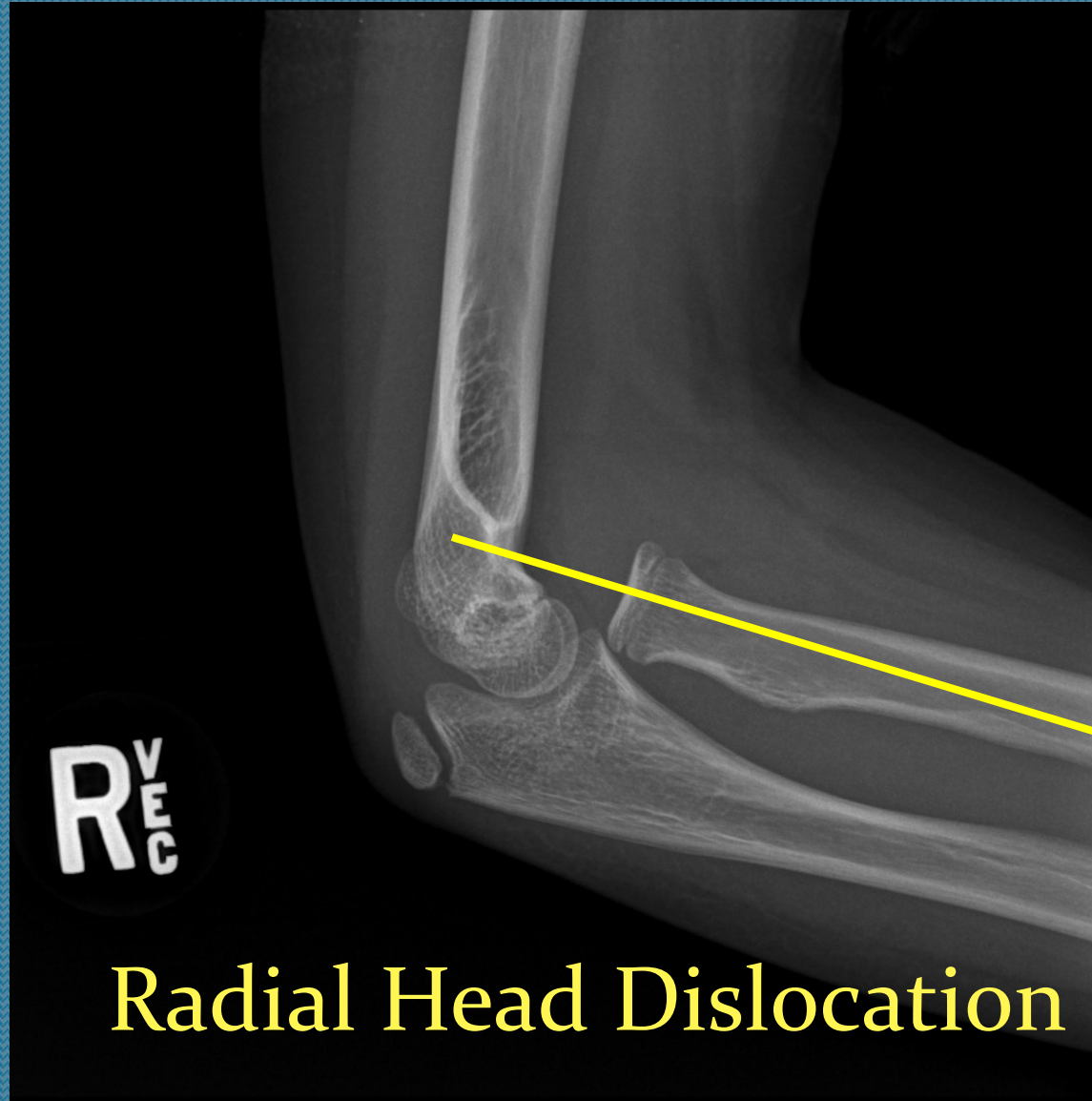
What do you see?



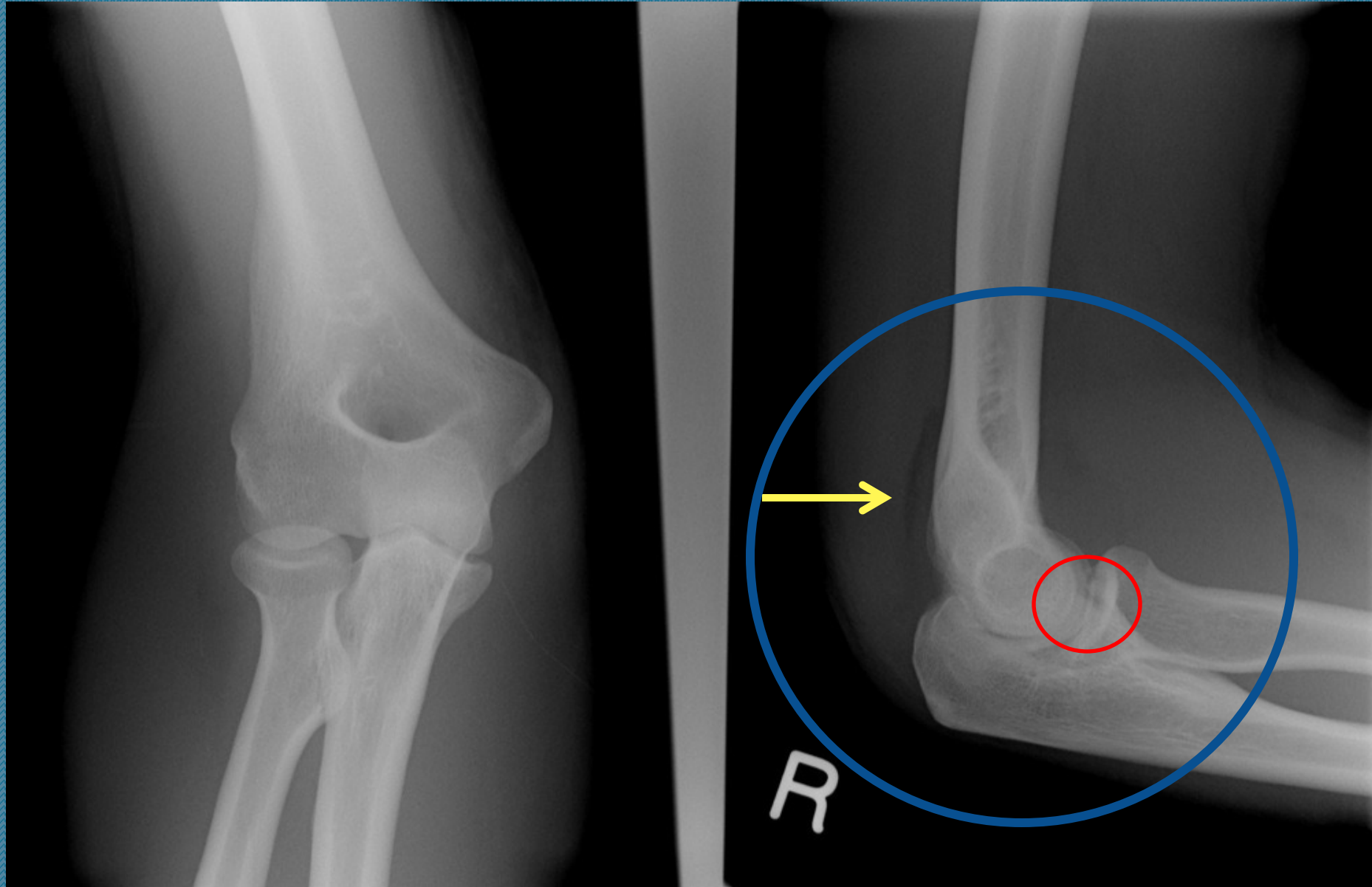
Radial Head Fracture

- Look for posterior fat pad in the absence of other findings in the elbow
- Sometimes a faint lucency or fracture line in the radial head can be seen
- Tenderness at the radial head
- DO NOT OVER-IMMOBILIZE!
- EARLY R.O.M. IS IMPORTANT!

Normal Elbow?



Do you see a fracture?



Coronoid Fracture

- Immobilize for two weeks if not displaced
- Immobilize for four weeks if minimally displaced (<3mm)
- Long-arm splint at 90 degrees of flexion
- Early R.O.M. after immobilization

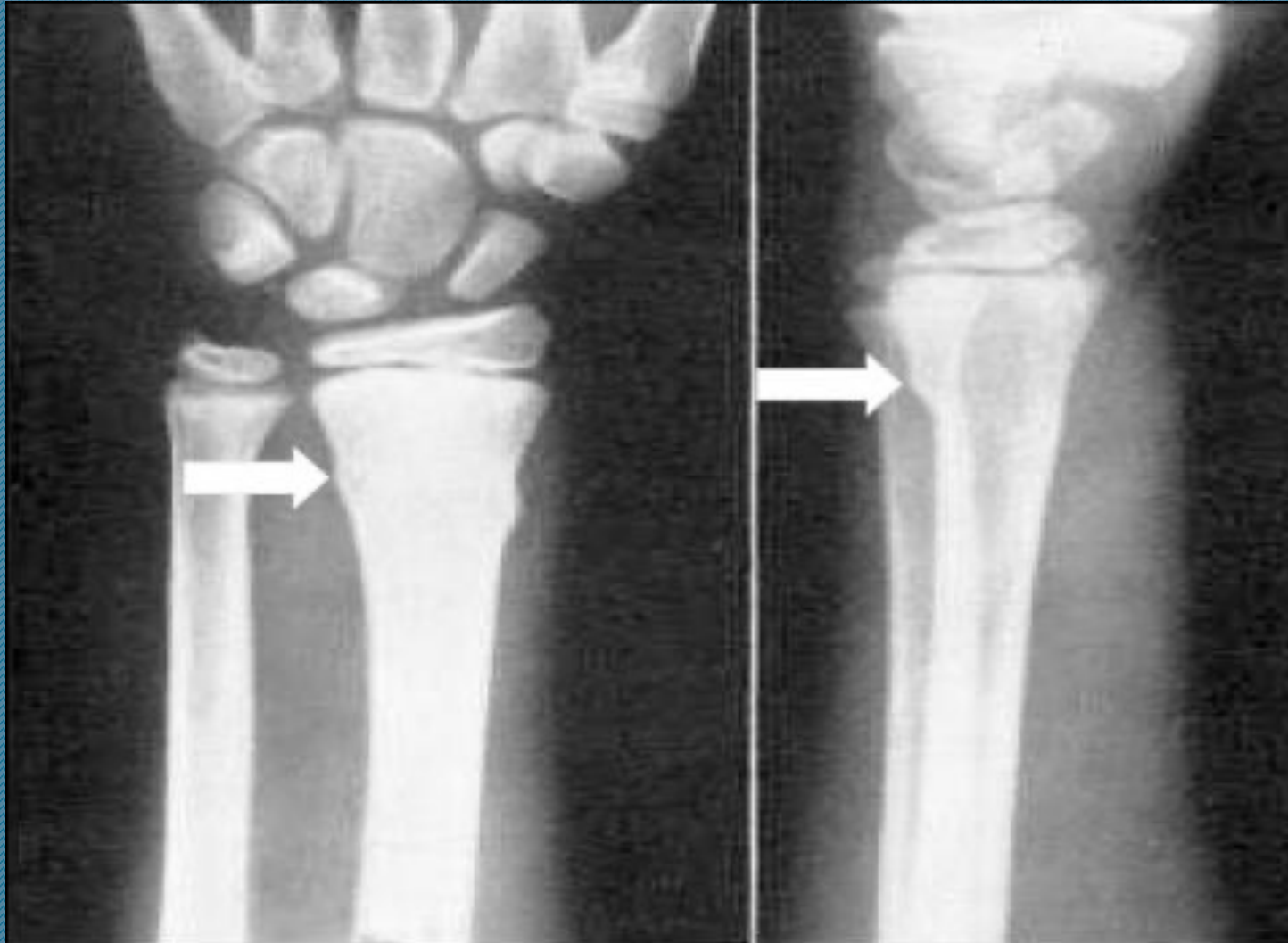
Wrist Fractures



- Distal Radius
- Scaphoid
- Scapholunate Dissociation

Distal Radius Fracture

Buckle Fracture



Distal Radius Fracture

Buckle Fracture

- Pay close attention to the lateral view

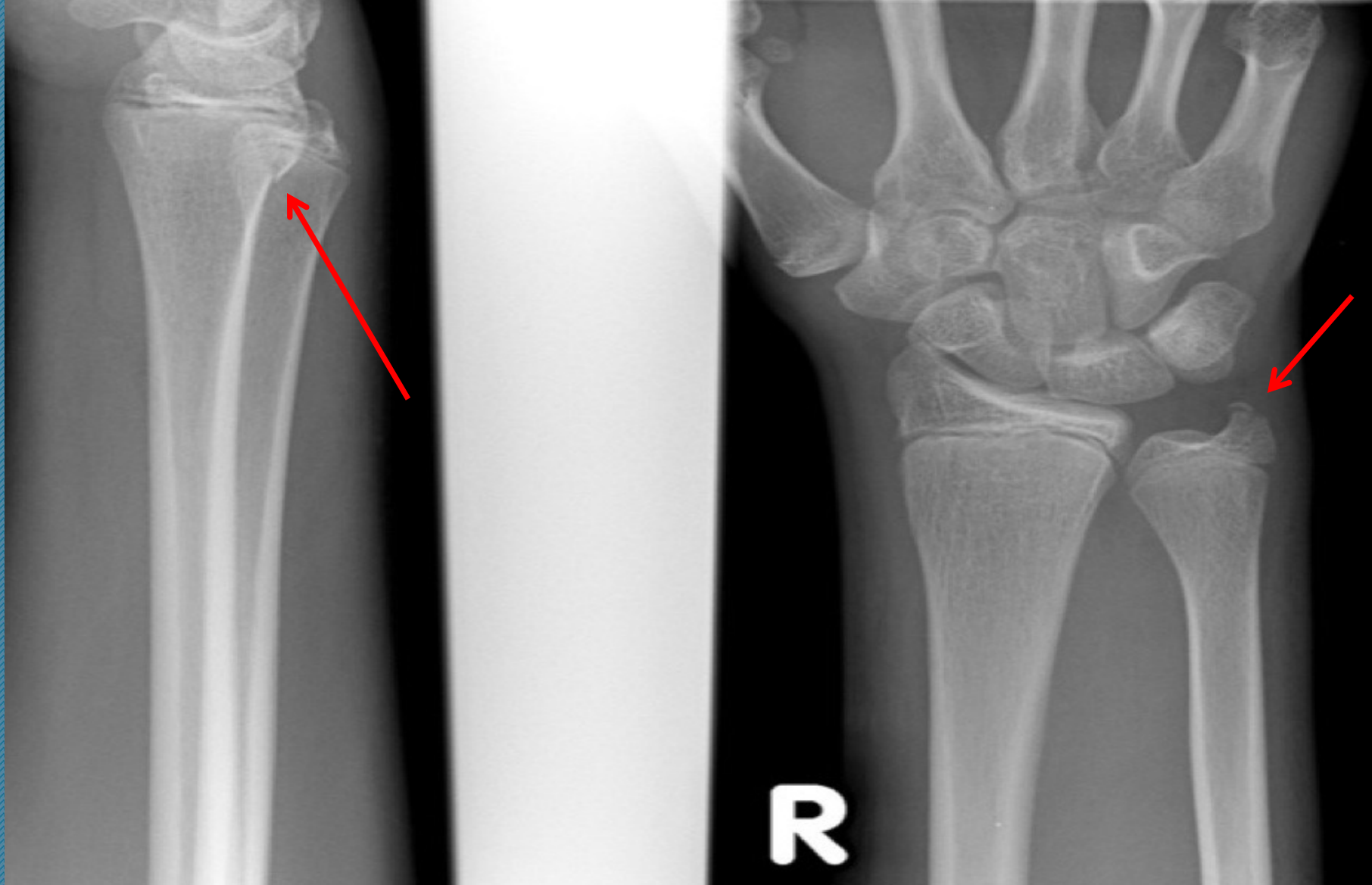


Distal Radius Fracture

Buckle Fracture



Distal Radius Fracture



Distal Radius Fracture

Buckle Fracture



Buckle Fracture Treatment

- Volar splint initially for 3-5 days if swollen
- Short-arm cast for 4 weeks
- OK to start with long-arm immobilization for 1-2 weeks if there is significant pain with pronation/supination

Distal Radius Fracture

Transverse Fracture



Scaphoid Fracture



Get a scaphoid view

Scaphoid Fracture



Scaphoid Fracture



Scaphoid Fracture: Initial management

- Suspected Fracture
 - Short-arm thumb spica cast or splint and re-check in 2 weeks
- Non-displaced Fracture:
 - Distal 1/3: short arm thumb spica cast/splint
 - Middle/proximal 1/3: long arm thumb spica cast/splint
 - may change to short arm later (at 6 weeks); should be pain-free with pronation and supination

Scaphoid Fracture: Definitive treatment

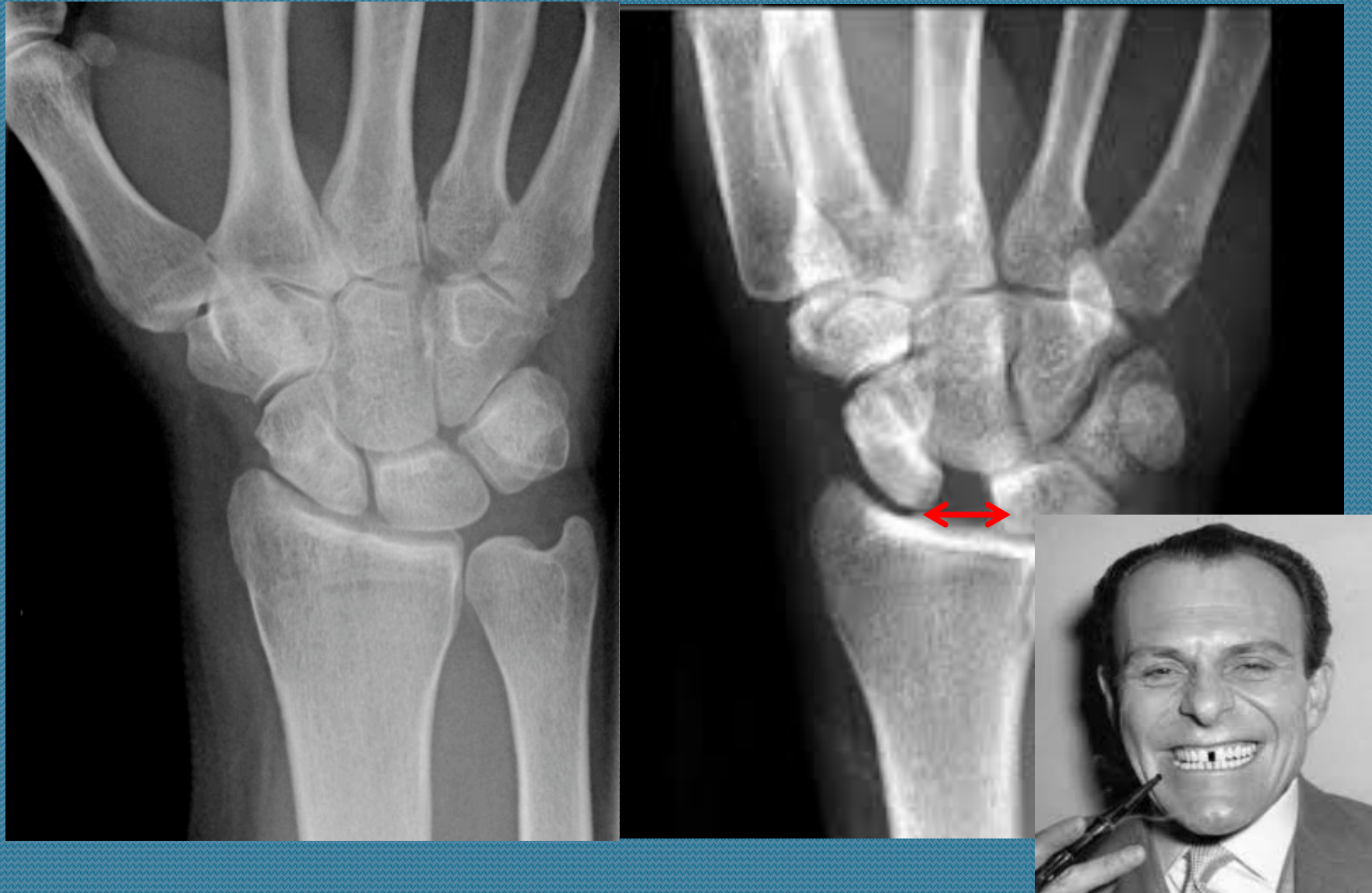
- Distal 1/3:
 - 4-6 weeks* immobilization
 - 6-8 weeks* to heal
- Middle 1/3:
 - 10-12 weeks* immobilization
 - 12-14 weeks* to heal
- Proximal 1/3:
 - 12-20 weeks* immobilization
 - 18-24 weeks* to heal

Scapholunate Dissociation

- Ligamentous injury to wrist, usually from a fall
- Exam shows focal tenderness, often with only minimal swelling
- Pain with dorsiflexion of the wrist
- May present days or weeks after injury
- Widenening of scapholunate interval (Terry-Thomas sign)



Scapholunate Dissociation



Scapholunate Dissociation

- Treatment typically requires surgery to prevent long-term complications



Lower Extremity

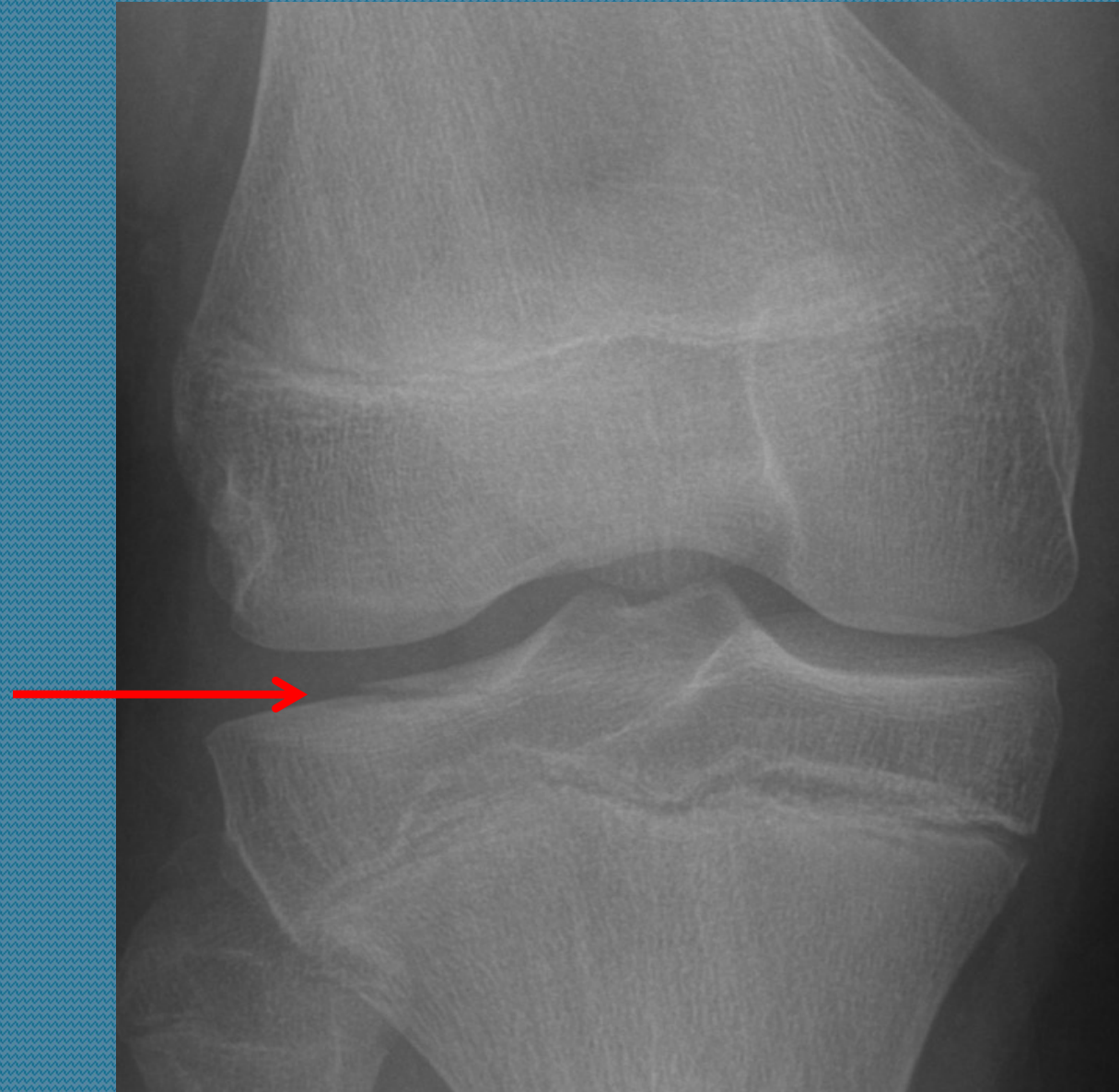
- Tibial Plateau Fracture
- Toddler's Fracture
- Ankle Fractures
- Lisfranc Injury
- 5th Metatarsal Fractures



Tibial Plateau Fracture



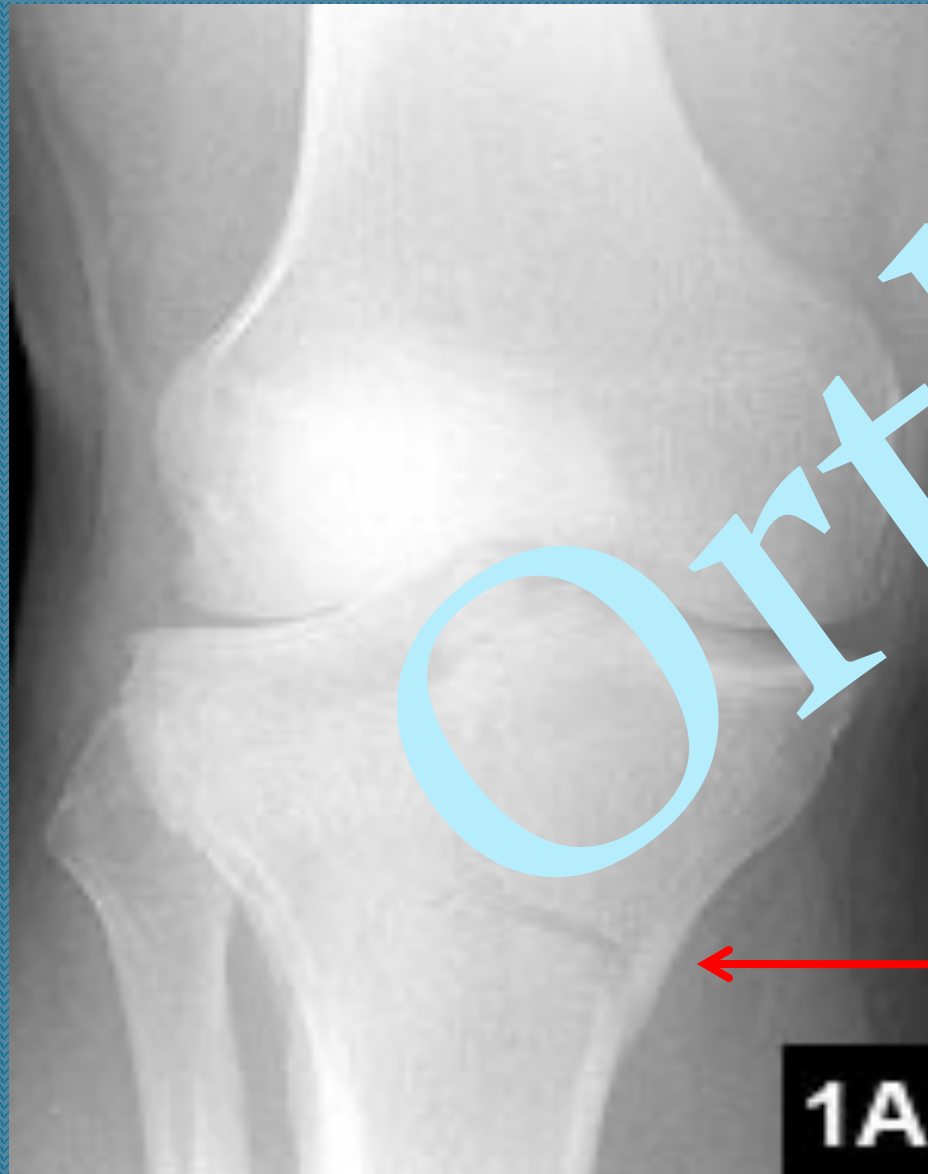
Tibial Plateau Fracture



Tibial Plateau Fracture



Tibial Plateau Fracture



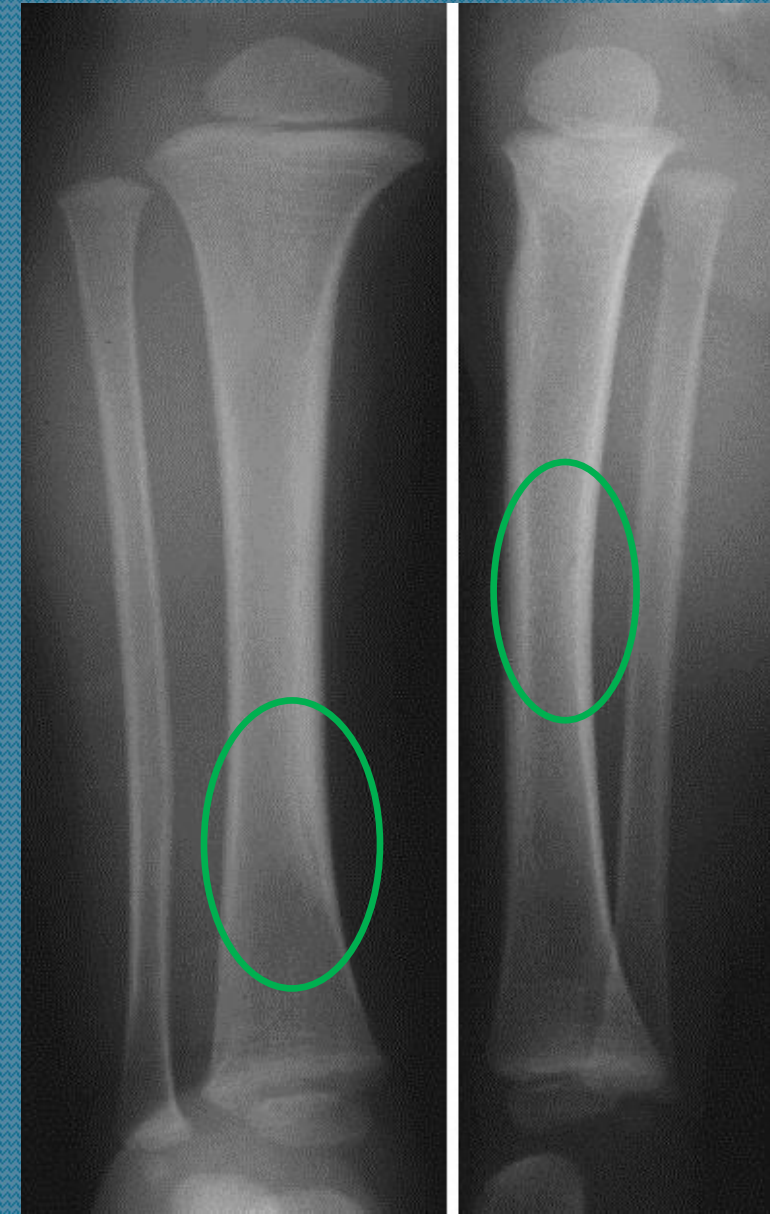
Toddler's Fractures



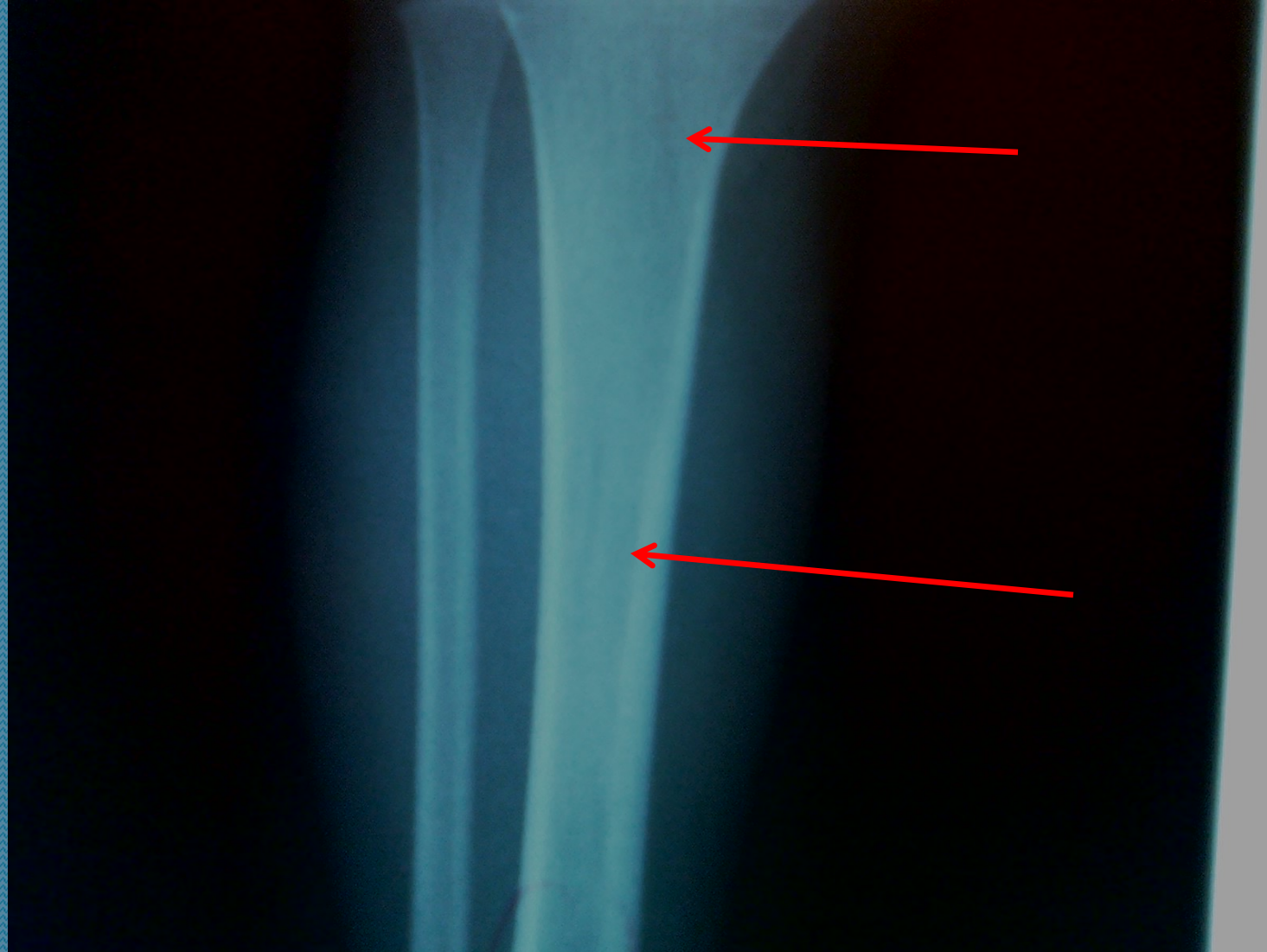
Toddler's Fractures

- Somewhat common in 2-3 year-old children who are learning to walk
- Frequently occur as a result of a torsional load at the foot
- Often present without history of distinct injury, and simply with a reluctance to bear weight
- Don't forget to examine the hip, thigh, and knee

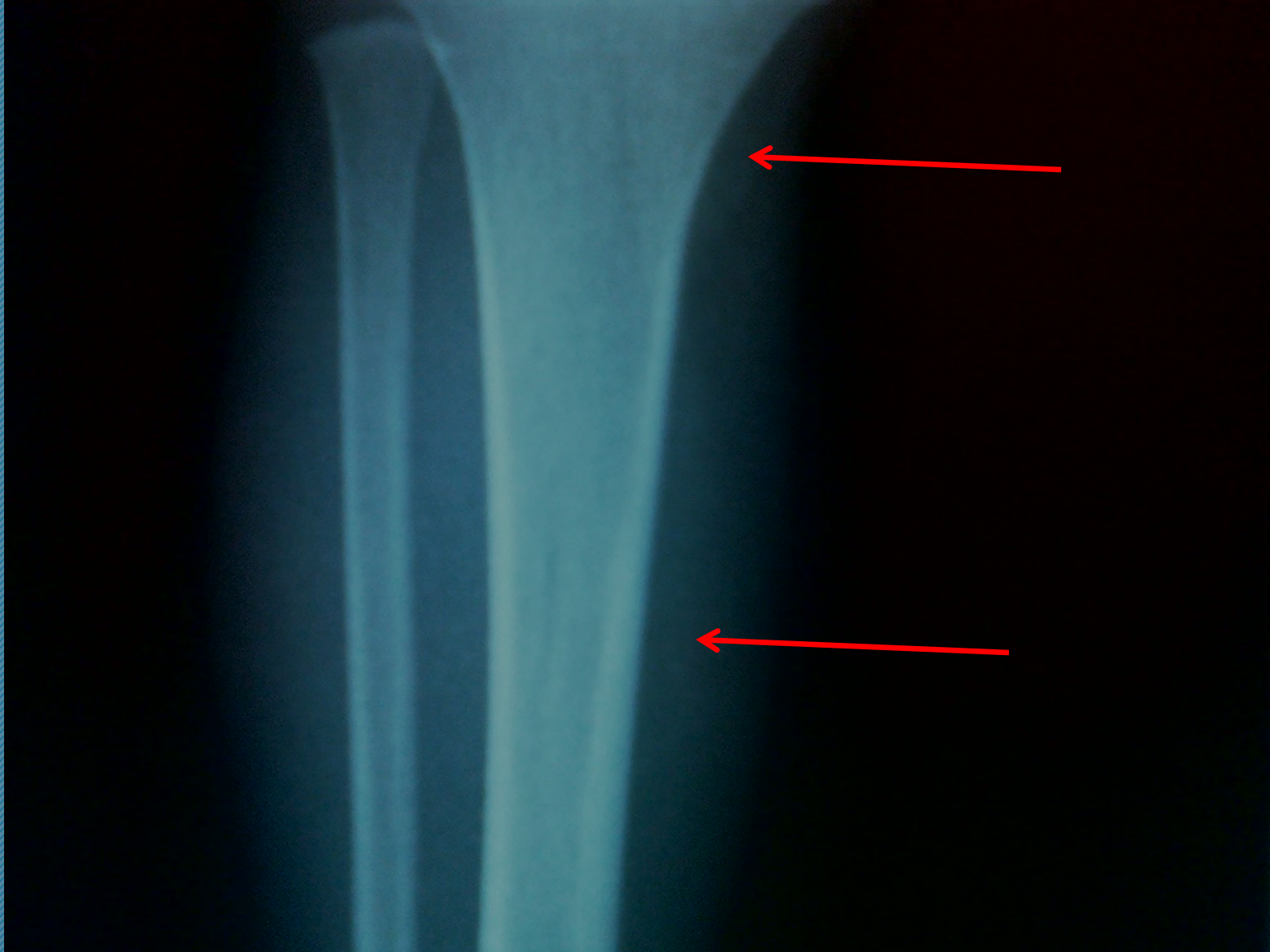
Toddler's Fractures



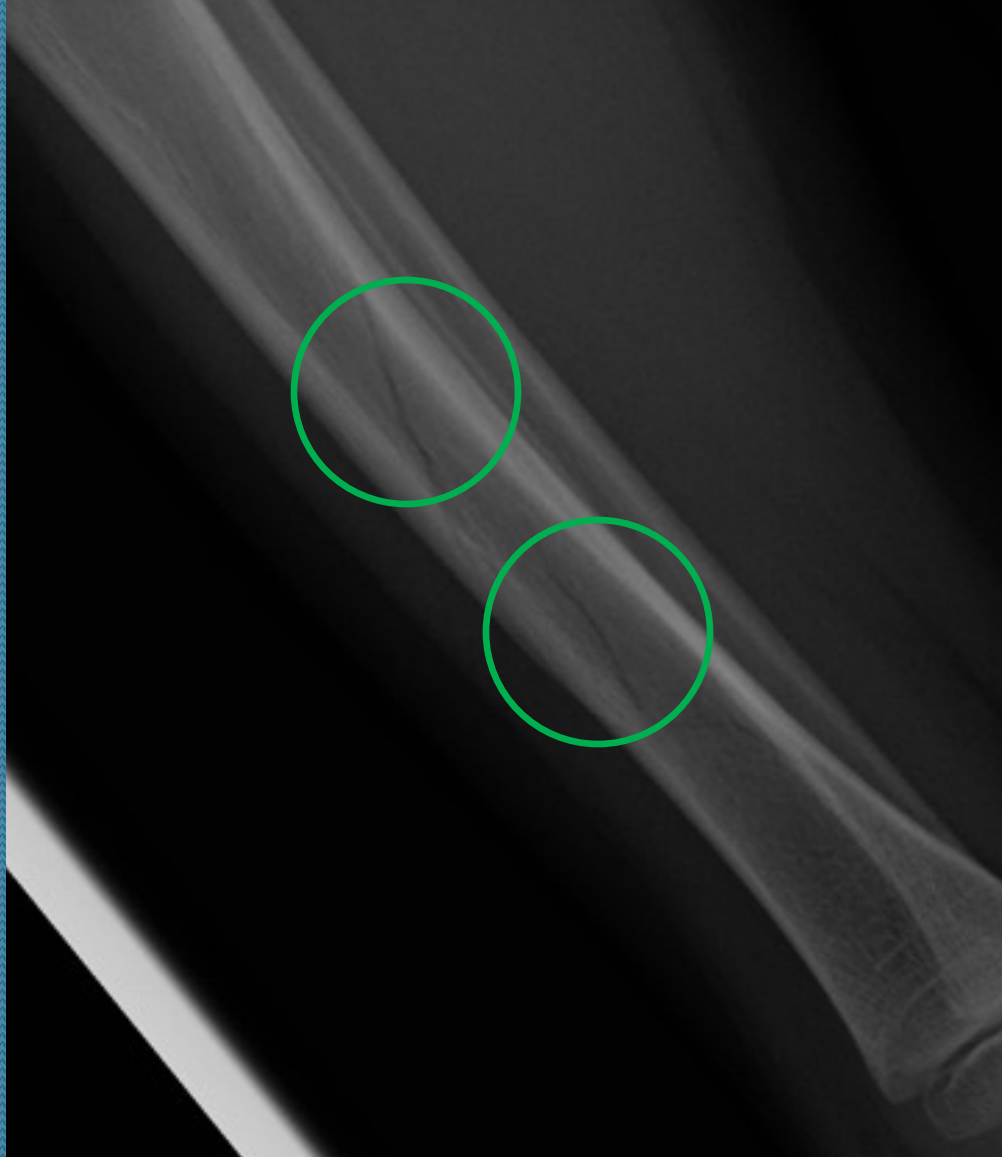
Toddler's Fracture



Toddler's Fracture

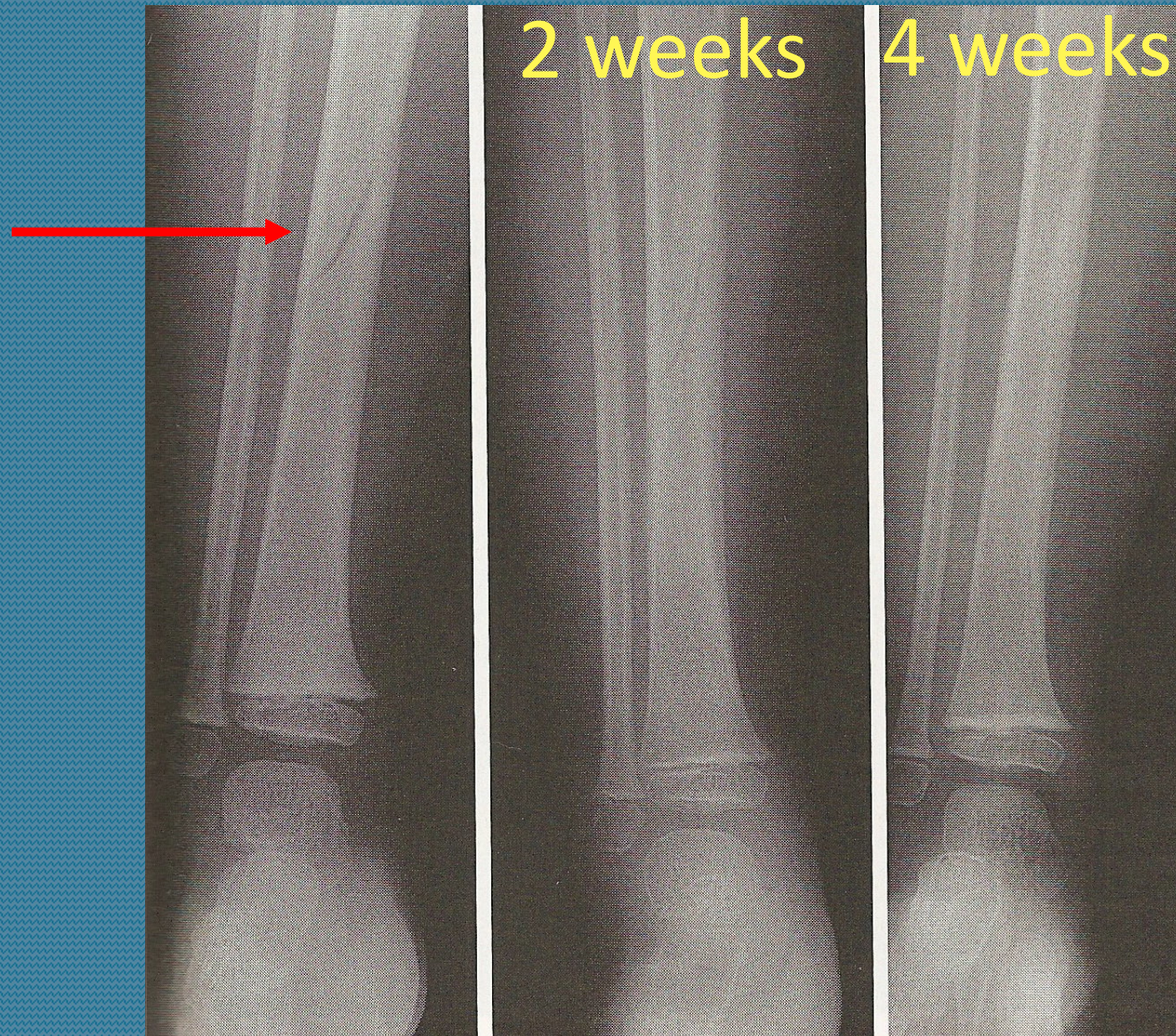


Toddler's Fractures



- Immobilize in a long-leg cast for 4 weeks
- Re-check with XIP at 2 weeks
- Weightbearing as tolerated subsequently

Toddler's Fracture



Ankle Fracture

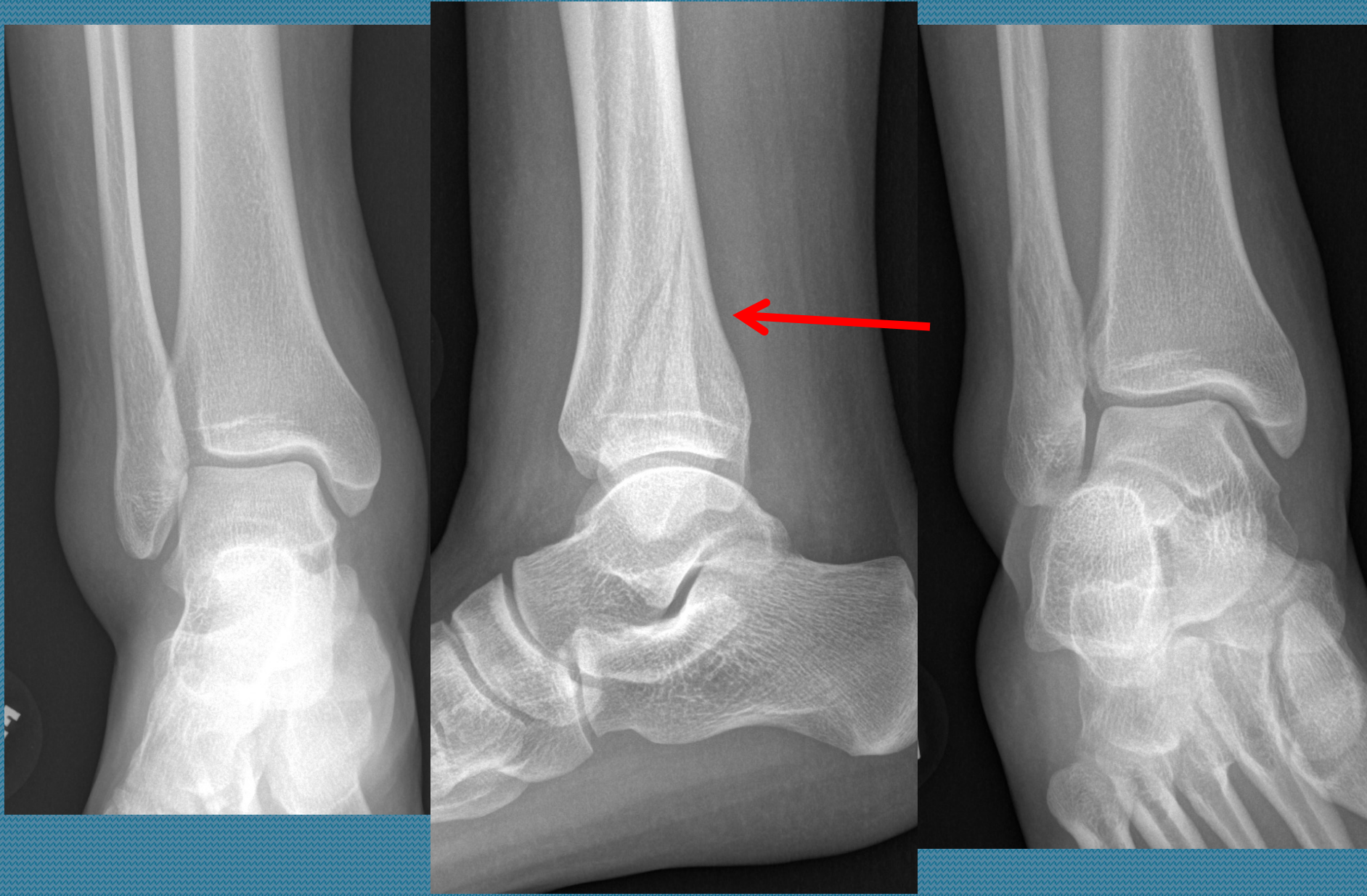
- AP, lateral, and mortise views are necessary



Mortise View



Ankle Fracture

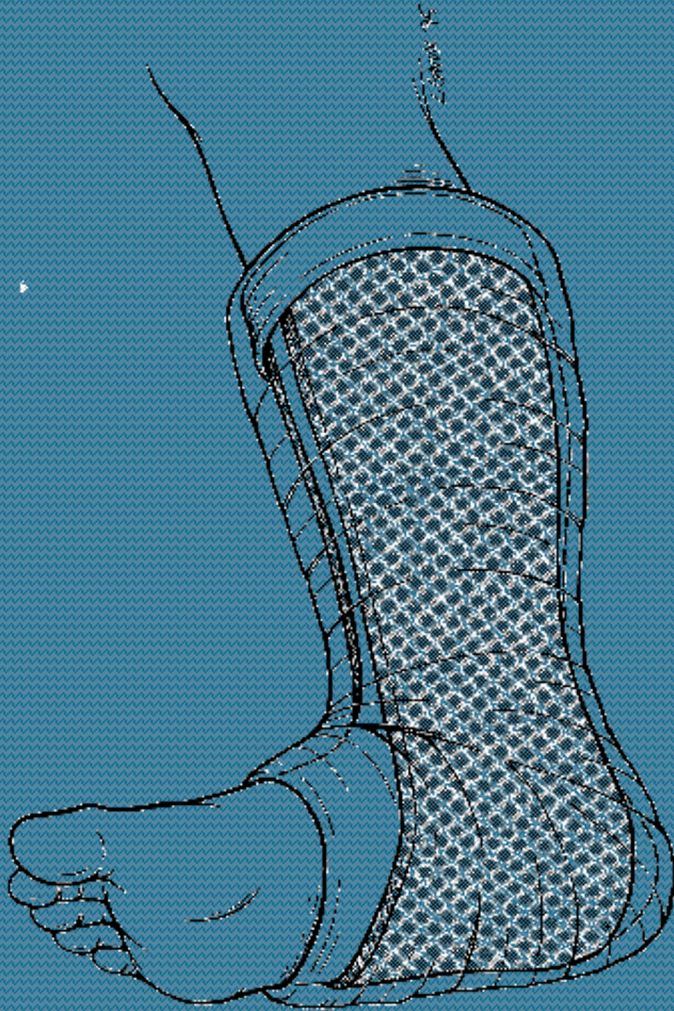


Ankle Fracture

Treatment

- Stable fractures (isolated malleolar, minimally displaced)
 - Stirrup splint and crutches for 5-7 days
 - Short-leg cast walking cast for 4-6 weeks
 - **Elevation**
- Unstable fractures (>1 malleolus, widened mortise, significant displacement)
 - Orthopedics consult

Ankle Stirrup Splint

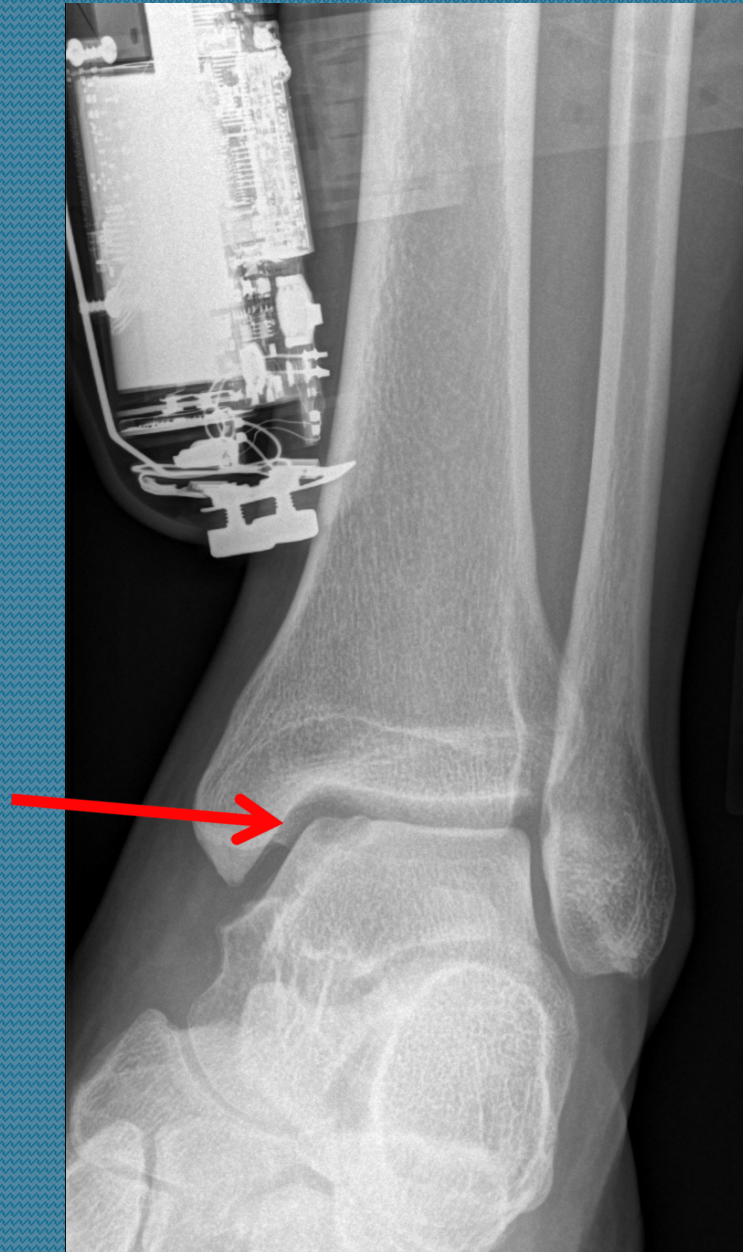


Bad Sprain or
Ankle
Fracture

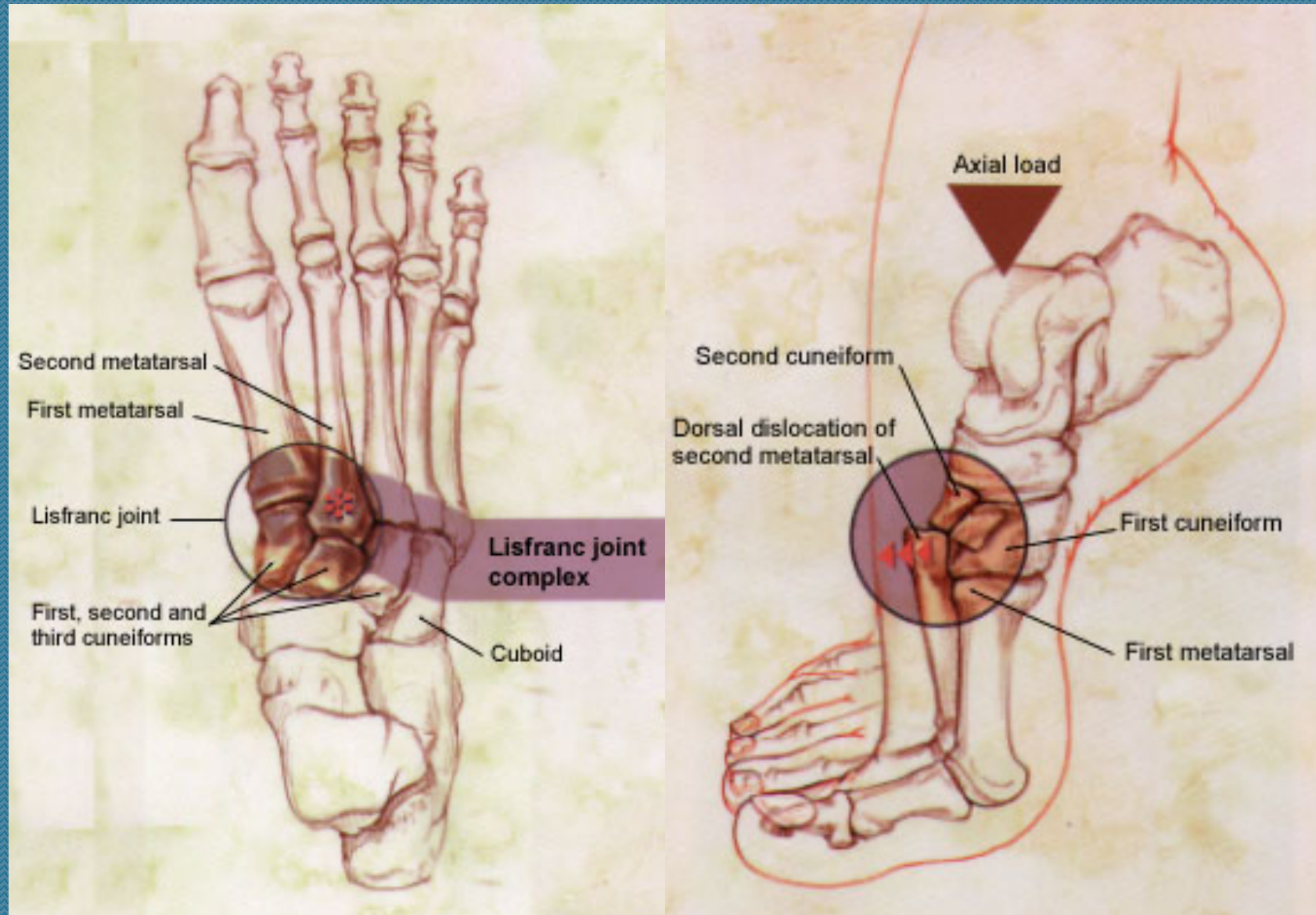
Talar Dome Fracture



Talar Dome

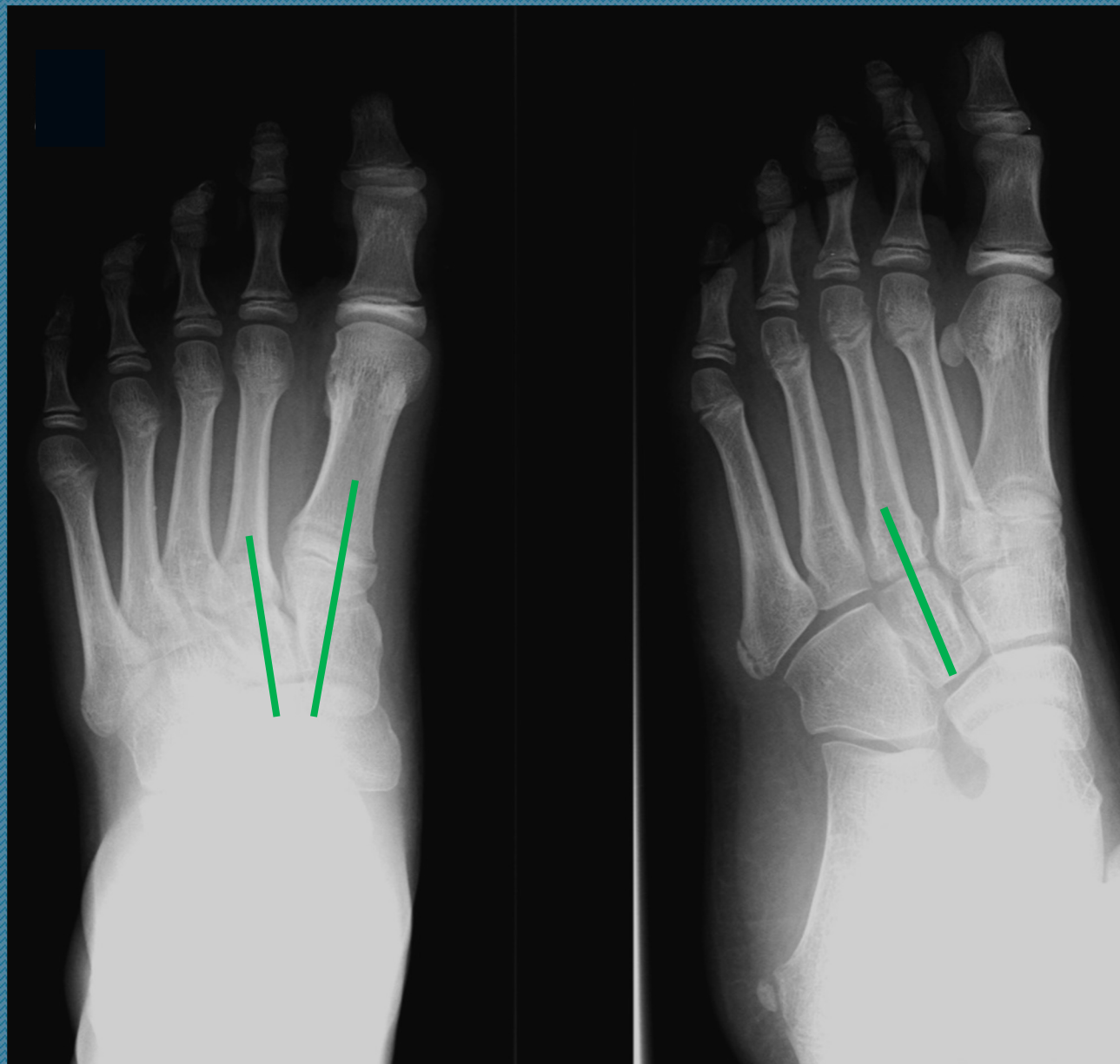


Lisfranc Injury



Burroughs, K. E., Reimer, C. D., & Fields, K. B. (1998). Lisfranc injury of the foot: a commonly missed diagnosis. *American family physician*, 58(1), 118-124.

Normal Foot – AP, Oblique



Normal Foot -- Lateral



Lisfranc Fracture Dislocation

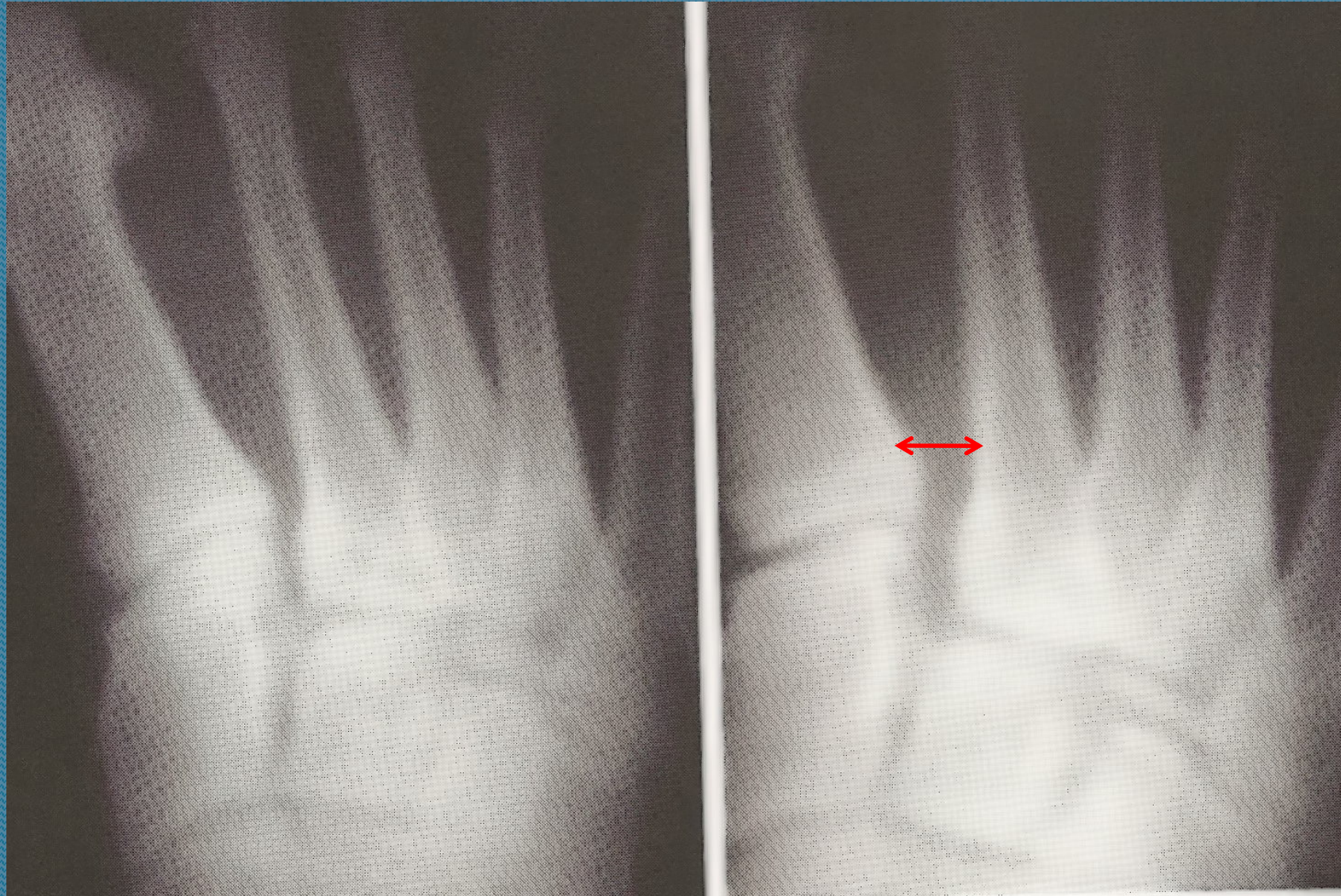


Lisfranc Injury

- Focus on tarsal-metatarsal alignment
- Compare:
 - weightbearing and nonweightbearing views*
 - injured and uninjured side
- Look closely at widening between the 1st and 2nd metatarsals (>2mm difference)

Lisfranc Injury

NWB vs. WB comparison



Lisfranc Injury:

bilateral comparison



Lisfranc Injury Treatment

- Almost always refer
- Most will require internal fixation to avoid long term deformity (below)



Proximal 5th MT Fractures

- 5th prox MT styloid avulsion fracture
 - Heal well
 - Cast shoe, CAM walker, or SLWC for 2wks
 - Consider referral if displaced > 3mm



The Fifth Metatarsal

- Jones' fracture
 - Occurs at junction of metaphysis and diaphysis
 - Very high rate of nonunion
 - “Conservative” treatment consists of short-leg non-weightbearing cast, usually for 8-12 weeks
 - Quicker return to play with surgical screw fixation

Jones' Fracture







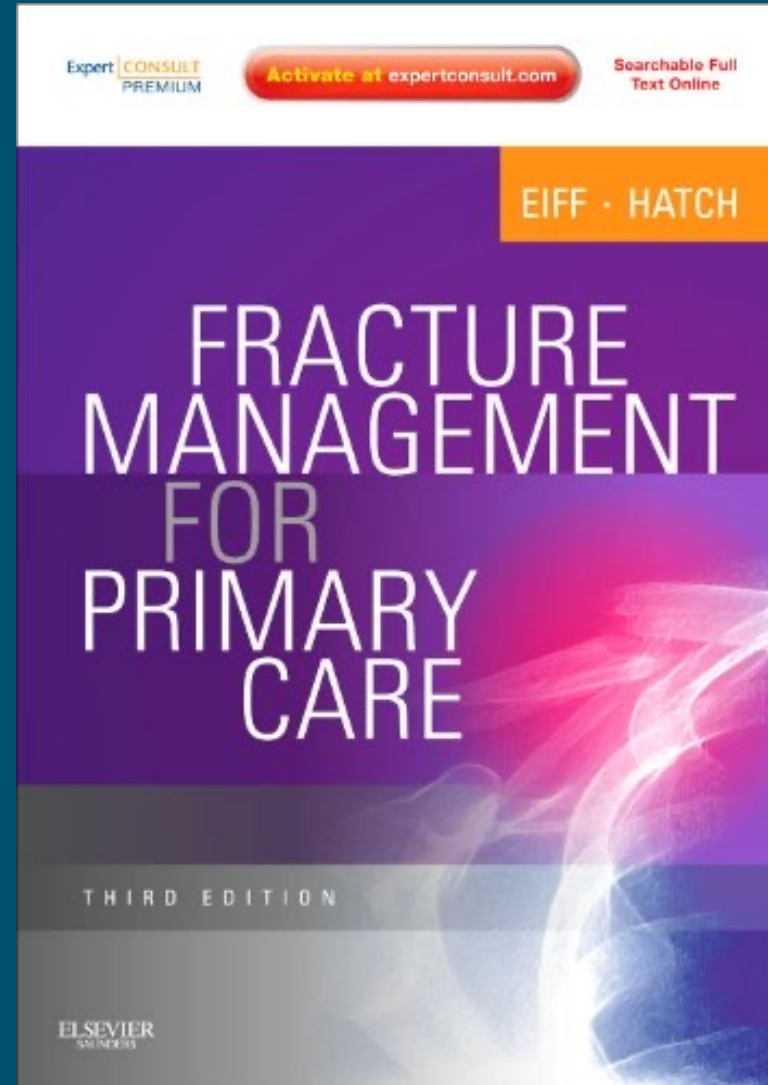
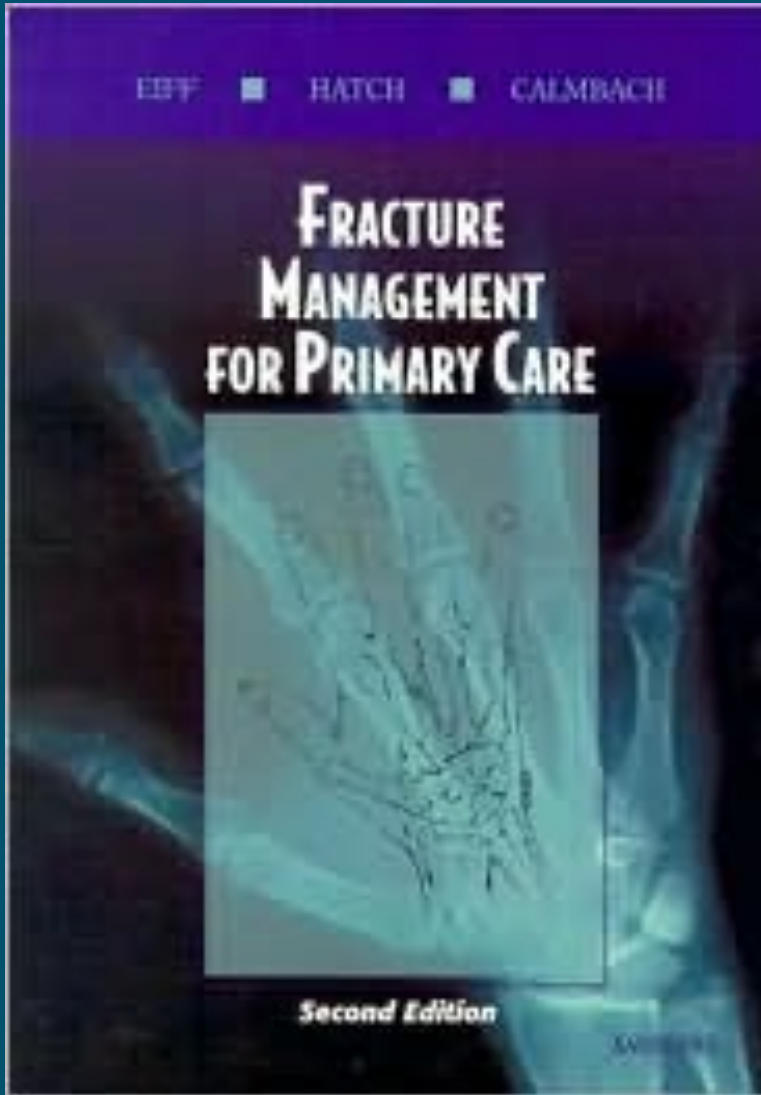


Pearls



- When in doubt, splint and bring them back in a week
- If it's crooked, call Orthopedics
- Pay close attention to the lateral view
- Look for ankle mortise widening for ankle injuries
- Elevate foot and ankle injuries
- Spiral tibial fractures are not fractures of abuse in toddlers, and do well with long-leg casting
- Don't over immobilize radial head fractures
- Beware of bones that don't heal well:
 - Jones area of the 5th metatarsal
 - Scaphoid of the wrist

Good Reference



Fracture Management for Primary Care : Expert Consult - Online and Print - 3rd Edition
by M. Patrice Eiff, Robert Hatch, Mariam K. Higgins

Questions

