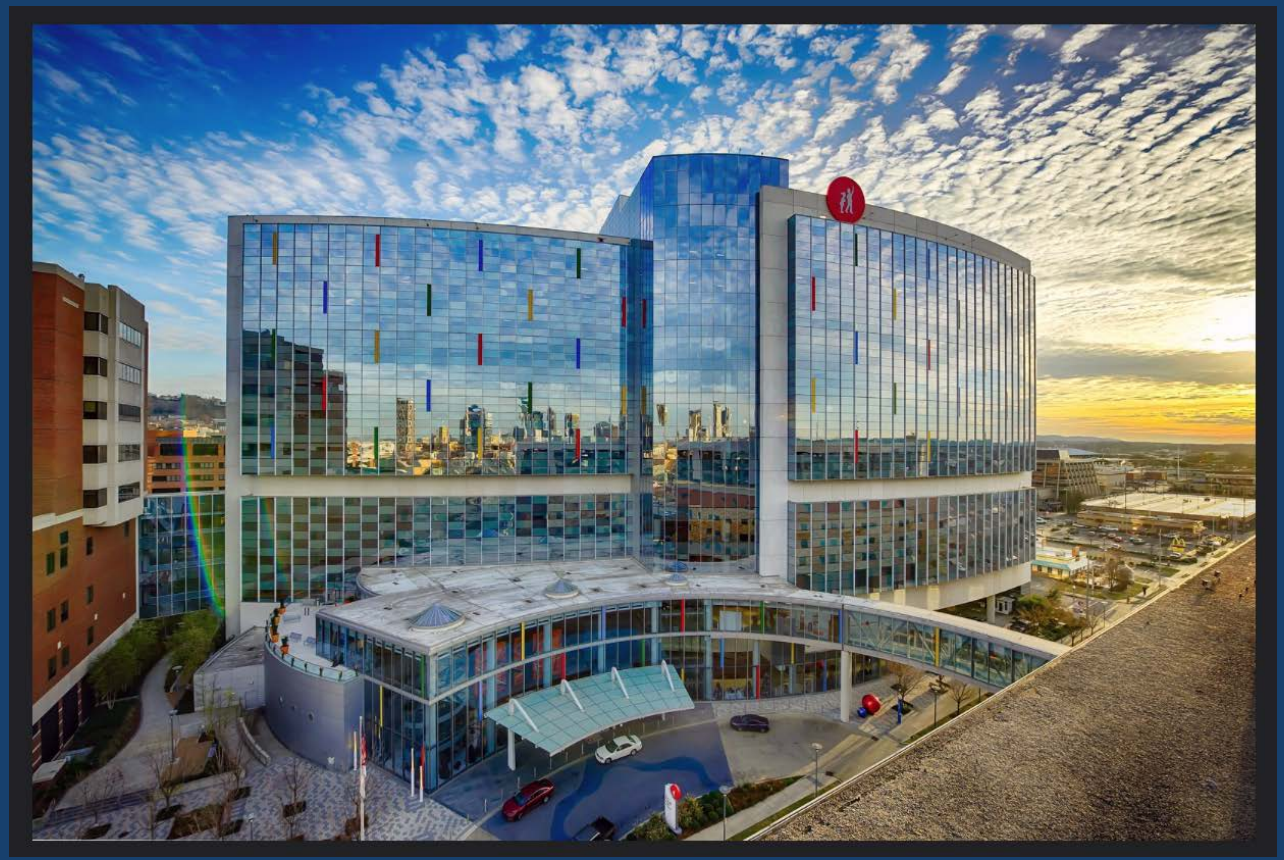
Common Pediatric MSK Complaints – when to keep, when to refer

Michael J Conklin, MD

I have no disclosures



Content

- Low risk wrist fx's
- Finger fractures
- Limping child
- Ankle sprains/fractures
- Back Pain

Low risk wrist injuries

- Boutis randomized 96 kids 5-12 yoa into cast or splint group
- Transverse or greenstick fx's of distal radius with <15 deg angulation
- Splint or cast 4 weeks and activity modification for 2 more weeks
- No difference in outcomes

CMAJ·JAMC
Medical knowledge that matters — Des connaissances médicales d'envergure
Journal Home Page
Information for Authors

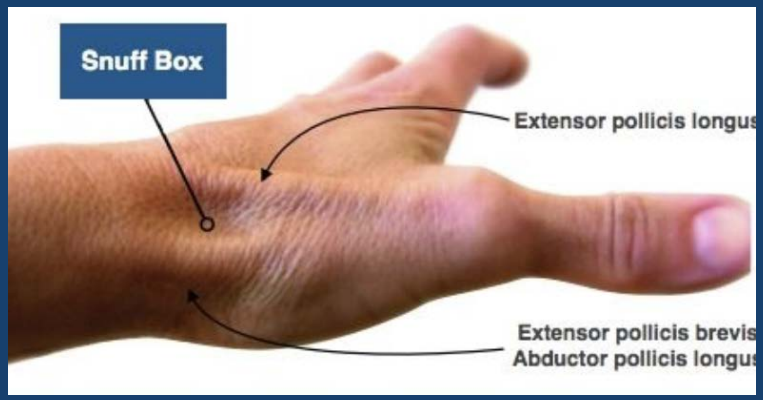
CMAJ. 2010 Oct 5; 182(14): 1507–1512.
doi: 10.1503/cmaj.100119
PMCID: PMC2950182
PMID: 20823169

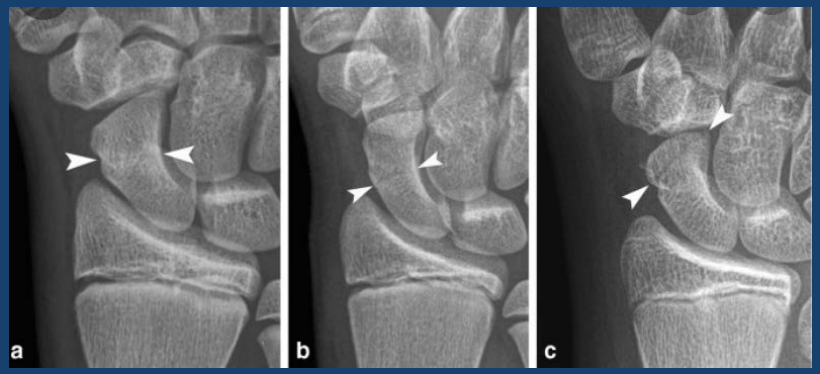
Cast versus splint in children with minimally angulated fractures of the distal radius: a randomized controlled trial

Kathy Boutis, MD, Andrew Willan, PhD, Paul Babyn, MD, Ron Goeree, MA, and Andrew Howard, MD

Scaphoid fx

- Before 15 yoa, 0.4% of pediatric fractures
- 0.45% of peds upper extremity fx's
- 0.6/10,000 per year
- Snuff Box tenderness
- Initial films may be negative
- Most tx'd non-op with thumb spica cast





Scaphoid – what to do

- If Snuff-box tender, place thumb spica splint and **refer**

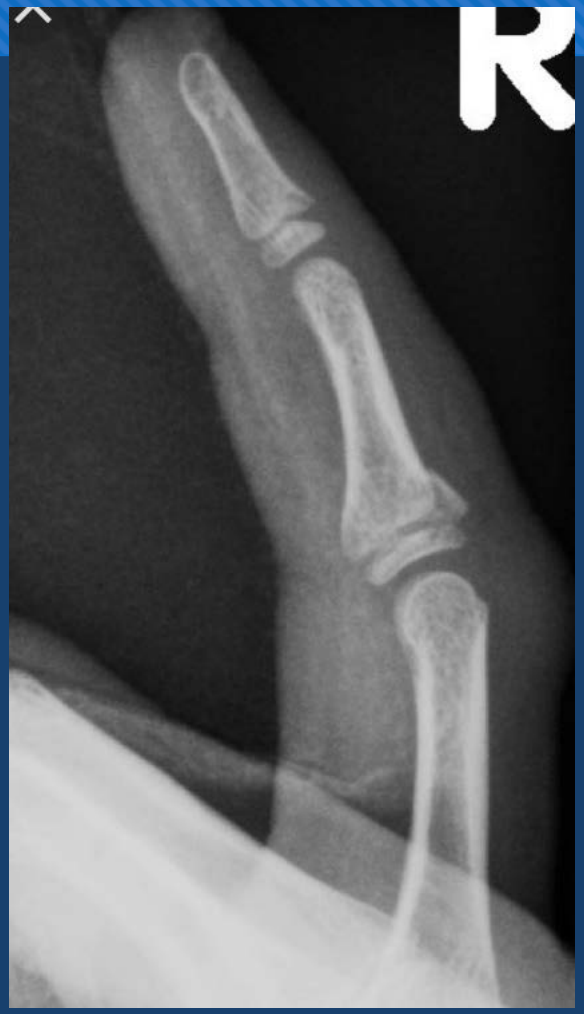
Finger fractures - Evaluation

- Tenderness/ swelling
- Deformity – coronal or rotational
- Resting cascade of digits
- Flexor and extensor tendon function
- Order **xray of finger** not hand

Cornwall R1. Pediatric finger fractures: which ones turn ugly? J Pediatr Orthop. 2012 Jun;32 Suppl 1:S25-31. PMID: 22588100. [PubMed] [Read by QxMD]

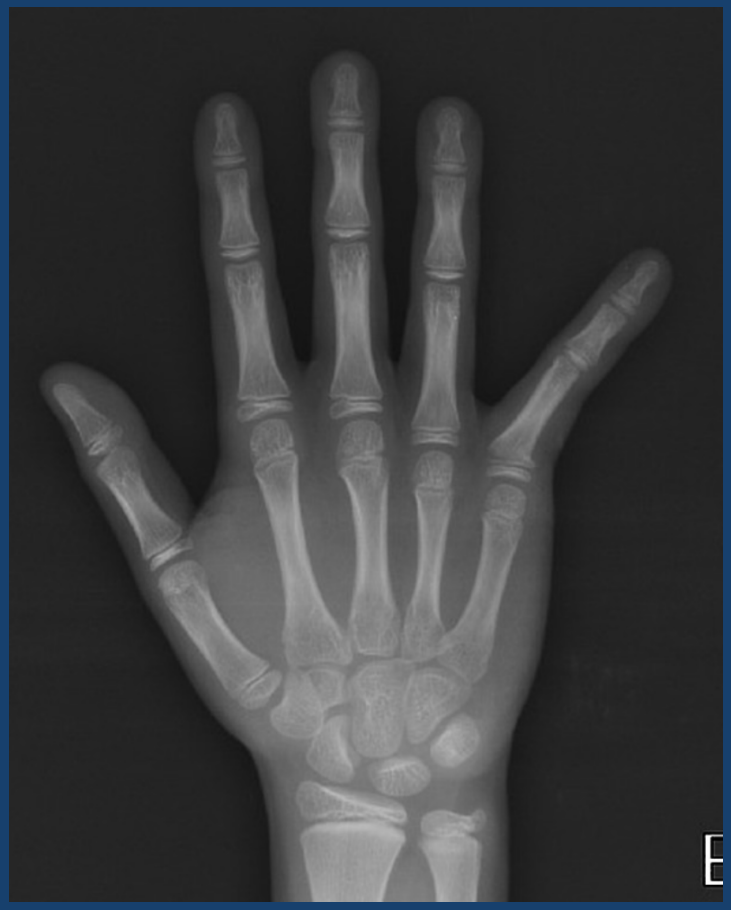
Salter II phalanx fxs

- Minimally displaced Salter II of Phalanx – buddy tape or splint
- **No need to refer**



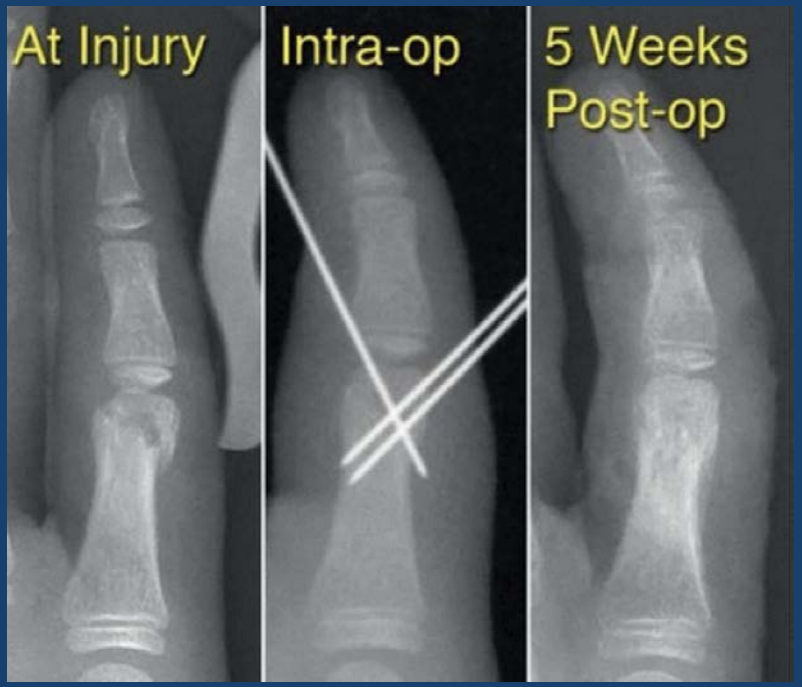
Salter II phalanx fxs

- When more displaced, reduction is necessary. Then buddy tape



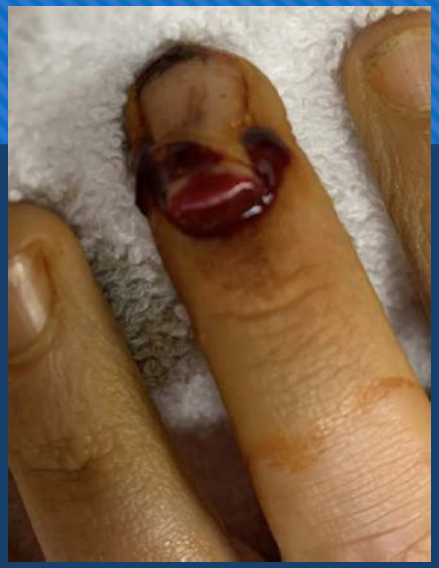
Phalangeal neck fx

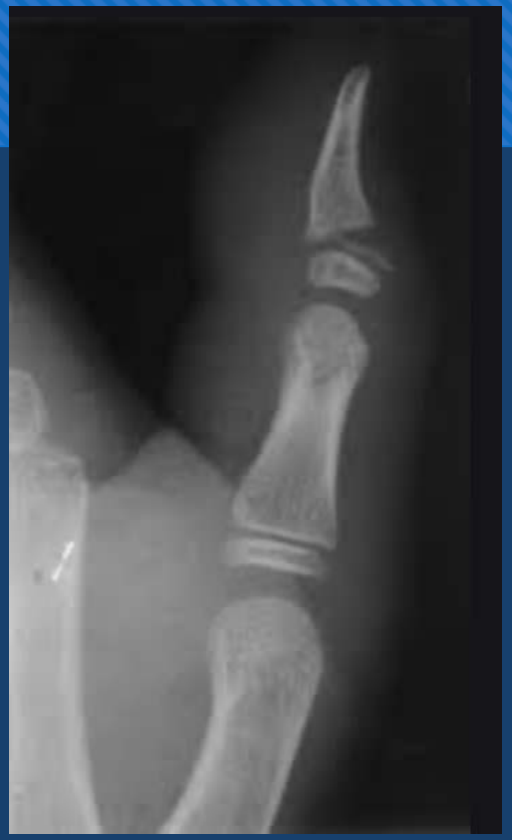
- Phalangeal neck fracture – can be unstable - Refer

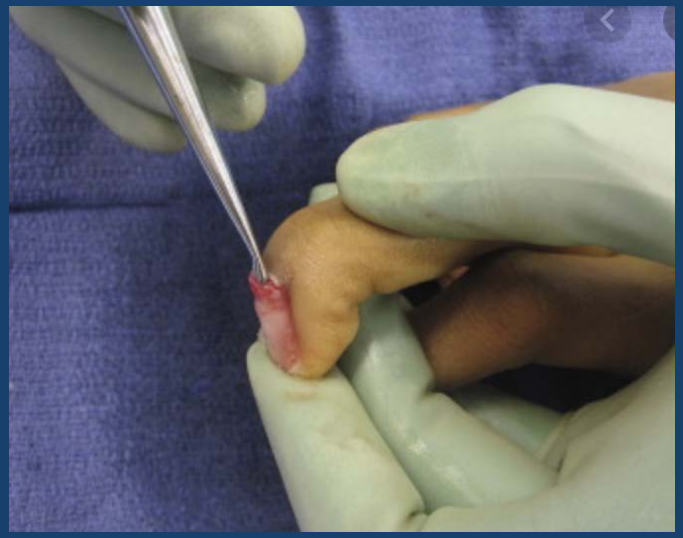


Seymour fx

- Seymour fx – Occult open fx – blood under nail plate or cuticle
- Needs local washout, nailbed repair and abx (Keflex)
- **Refer**

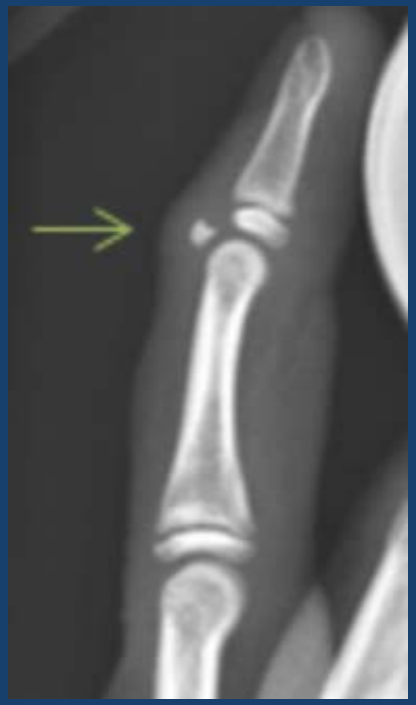






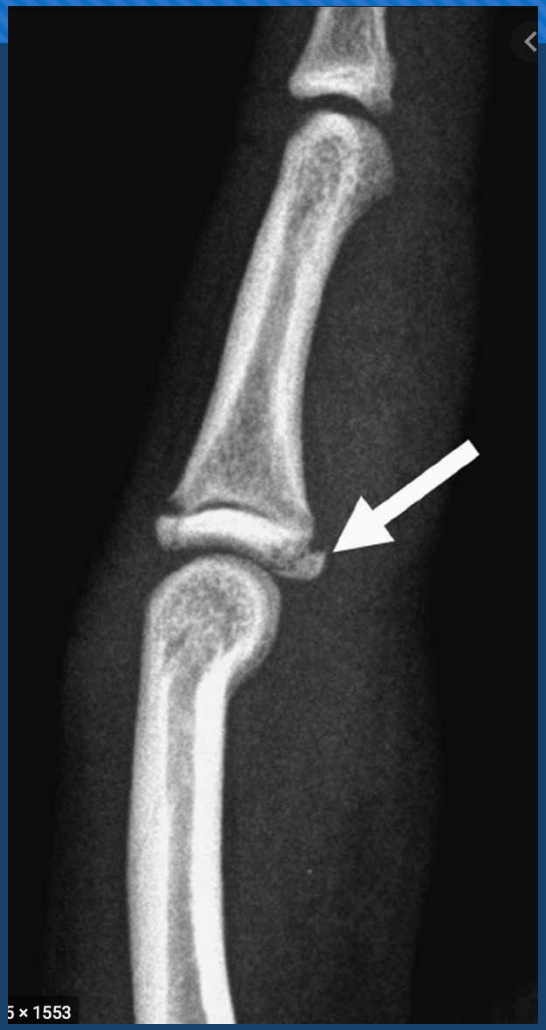
Mallet finger

- Avulsion of extensor tendon from distal phalanx
- **Refer**



Volar plate avulsion fx

- “Jammed finger”
- Hyperextension
- Dorsal extension block splint for 1 week then buddy tape
- **No need to refer**



Limping

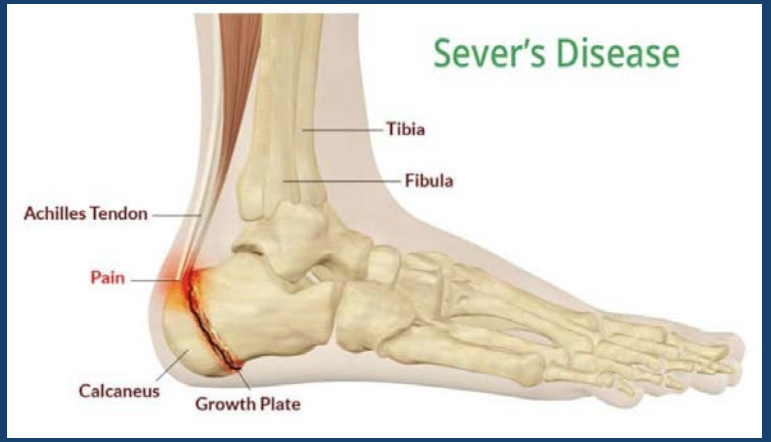
- Osteochondroses – Sever's, Osgood-Schlatters
- Fractures that may be difficult to see on xray: Toddler's fracture (tibia), Calcaneal tuberosity, lst Metatarsal, Cuboid
- SCFE
- Transient synovitis
- Osteomyelitis/septic arthritis

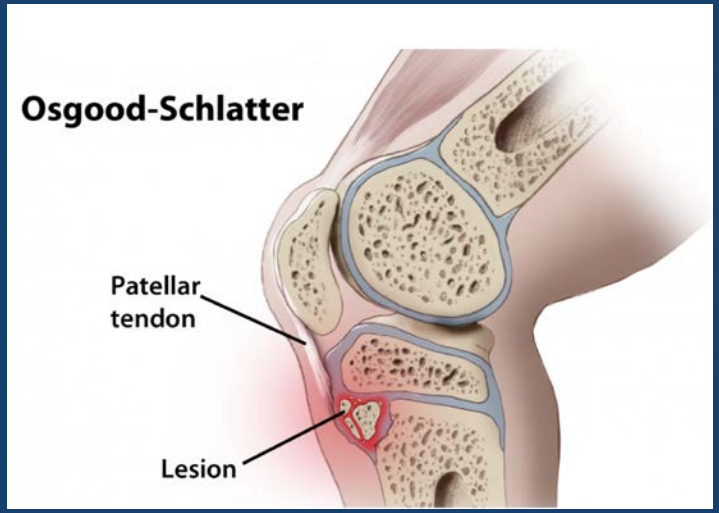
Evaluation

- History – Where is the pain? Duration? Fevers? Injury?
- Exam – gait evaluation, Trendelenberg gait vs. Antalgic gait
- Exam – TTP, pain to ROM
- Imaging – start with Xray

Osteochondroses

- Inflammatory conditions of growing bones at tendon insertions
- Sever's disease – Achilles insertion into calcaneal apophysis
- Osgood-Schlatters – Patellar tendon insertion into tibial tubercle
- Sindig-Larsen – Patellar tendon at inferior pole of patella





Osteochondroses

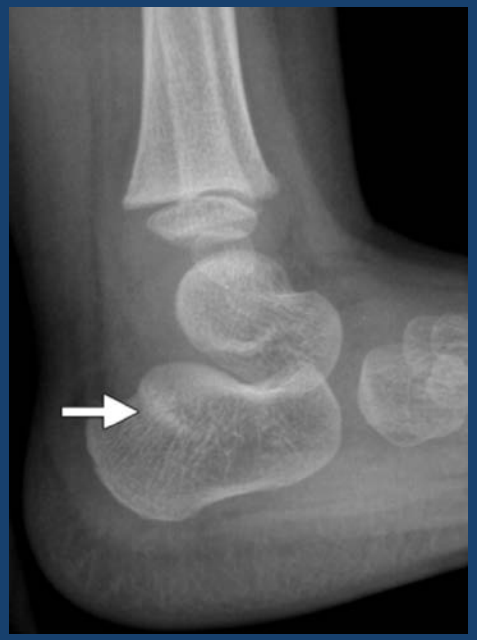
- None are emergent
- Little or no sequalae
- NSAIDS, activity modification
- Bracing and/or othotics
- PT
- Referral not necessary

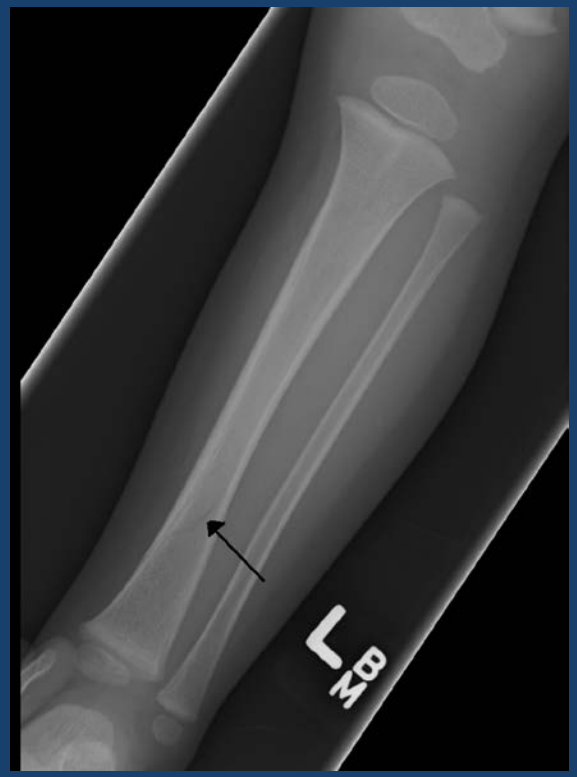
Fractures

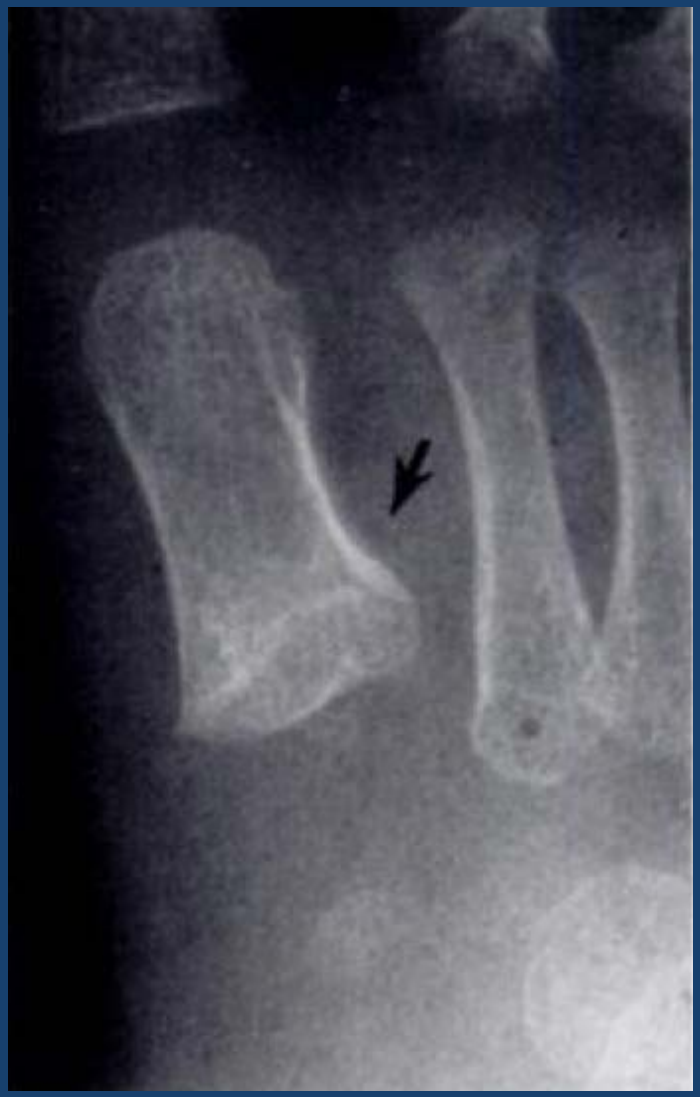
Expanding the Concept of the Toddler's Fracture[1]

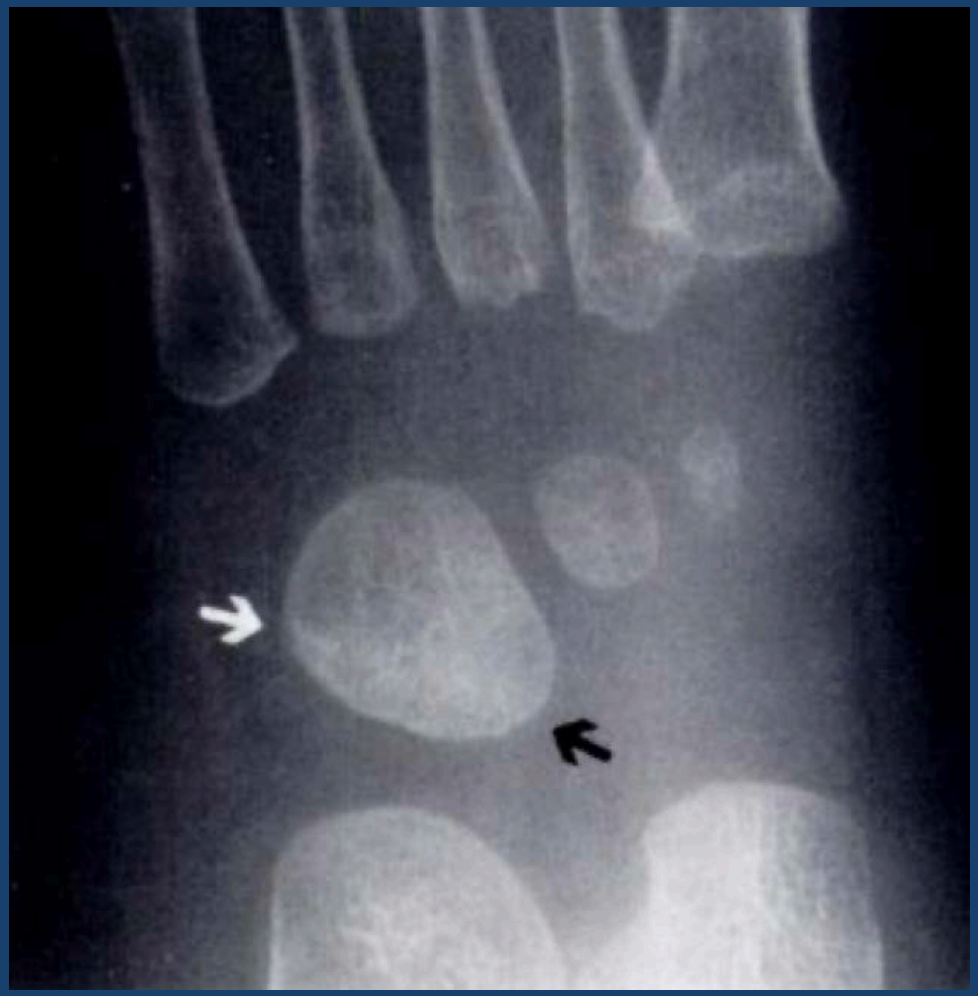
Susan D. John, MD
Chetan S. Moorthy, MD
Leonard E. Swischuk, MD

- Difficult to see on xray
- Toddler's fx – Non-displaced spiral fx of tibia
- !st Metatarsal fx
- Calcaneal fx
- Cuboid fx





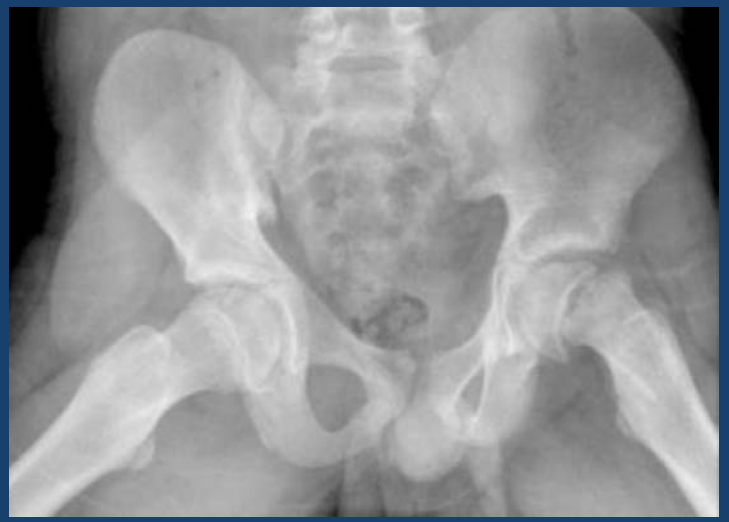




Slipped Capital Femoral Epiphysis

SCFE

- Incidence: 2-10 per 100,000
- Most common hip disorder in adolescents
- Boys aged 9-16 (13.5) and girls aged 8-15 (12)
- Male:Female 3:1
- More common in African Americans
- Obese: > 50% above 95th % for weight
- Hip or knee pain

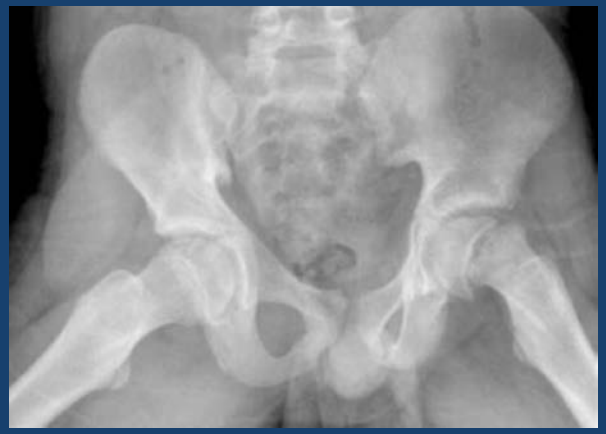


SCFE - Exam

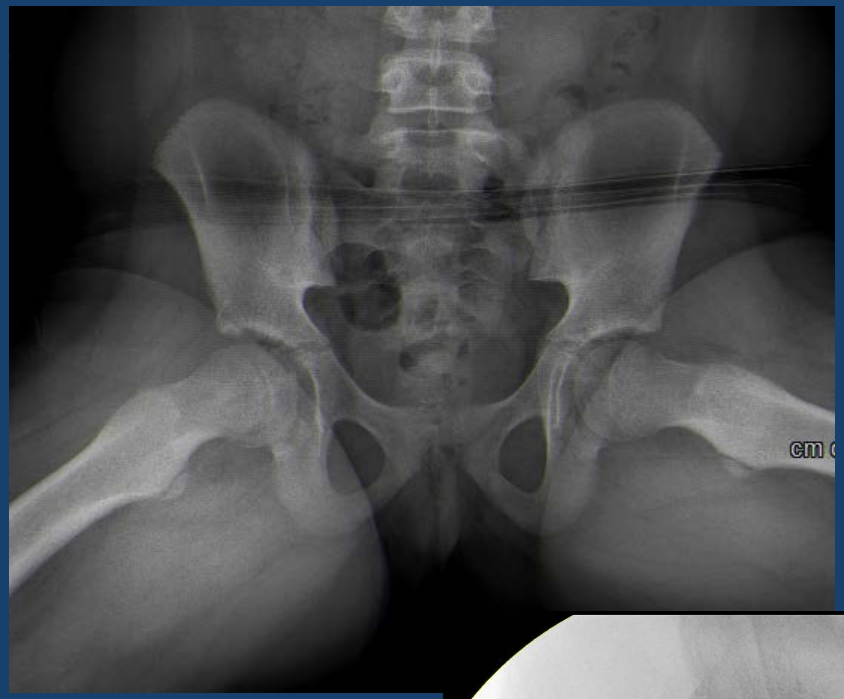
- Mandatory External Rotation with hip flexion
- Trendelenberg gait

SCFE – Stable vs. Unstable

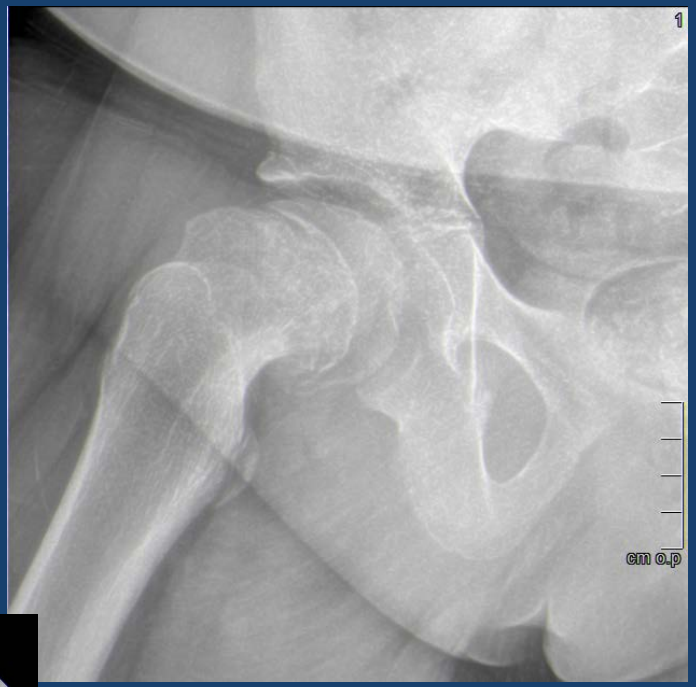
- Stable – able to bear wt – **Refer soon**
- Unstable – unable to bear wt – **refer emergently** – high risk of AVN

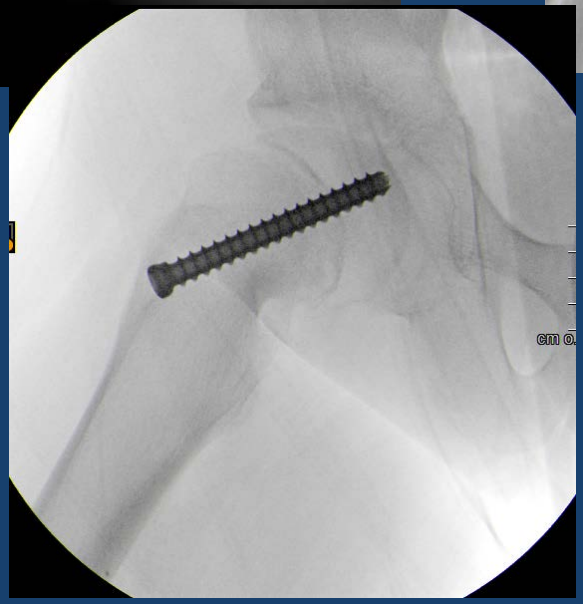


9 yoa – refused tx



10 yoa – slip progressed





Percutaneous screw fixation

When to be worried about limpers

- Fever,
- Inability to bear wt,
- Obese adolescent with hip or knee pain

A child with bone pain and fever should be assumed to have osteomyelitis until a definitive diagnosis is made.

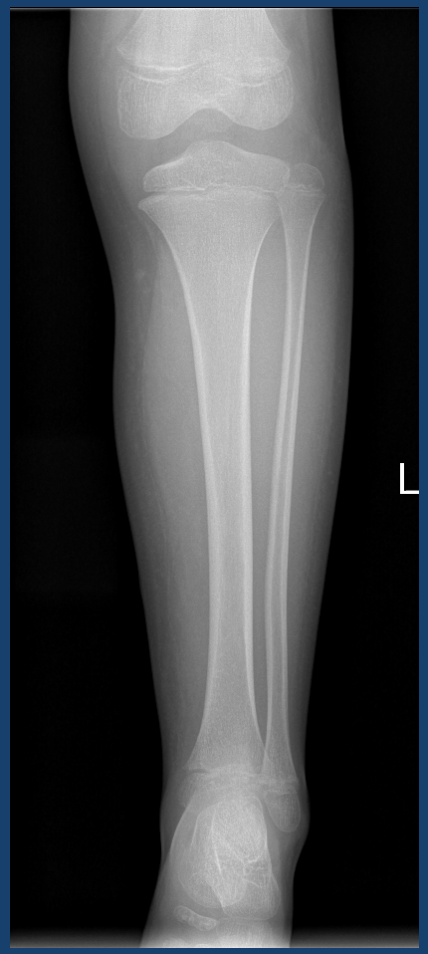
Joint pain + Fever = Septic Arthritis until proven otherwise

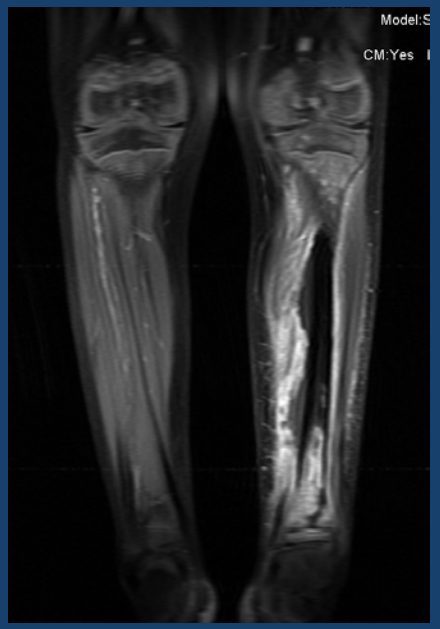
Ddx Septic Hip & Transient Synovitis – THE KOCHER CRITERIA

- Inability to bear wt
- oral temp > 38.5C
- ESR >40
- WBC > 12K
- .2%, 3%, 40%, 93%, 99.6% likelihood of septic hip for 0 thru 4 criteria

Osteomyelitis

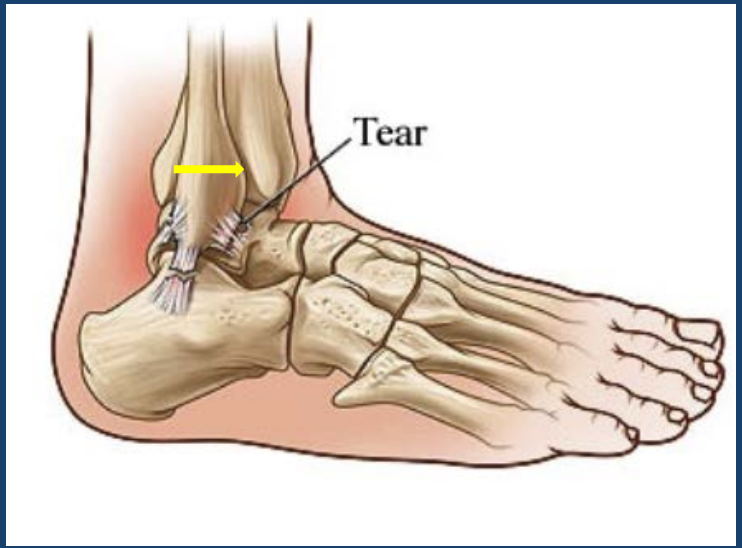
- Usually Hematogenous
- Most commonly the long bones of the lower extremity
- Bone pain + fever = workup for osteomyelitis
- May bear weight until more advanced disease
- CBC, ESR, CRP
- Xrays normal first 1-2 weeks
- MRI is diagnostic
- Staph most common





Ankle Injuries

- Children different than adults presence of growth plates
- Sprains in children can be physeal fractures
- When non-displaced – still can be considered ankle sprain equivalent and can be treated in boot
- Important to palpate for area of maximal tenderness
- Xray to r/o operative fracture



Low risk pediatric ankle fractures

- Boutis K, Willan A, Babyn P, Narayanan U, Alman B, Schuh S. A randomized, controlled trial of a removable brace versus casting in children with low-risk ankle fractures. *Pediatrics*. 2007;119(6):e1256-63.

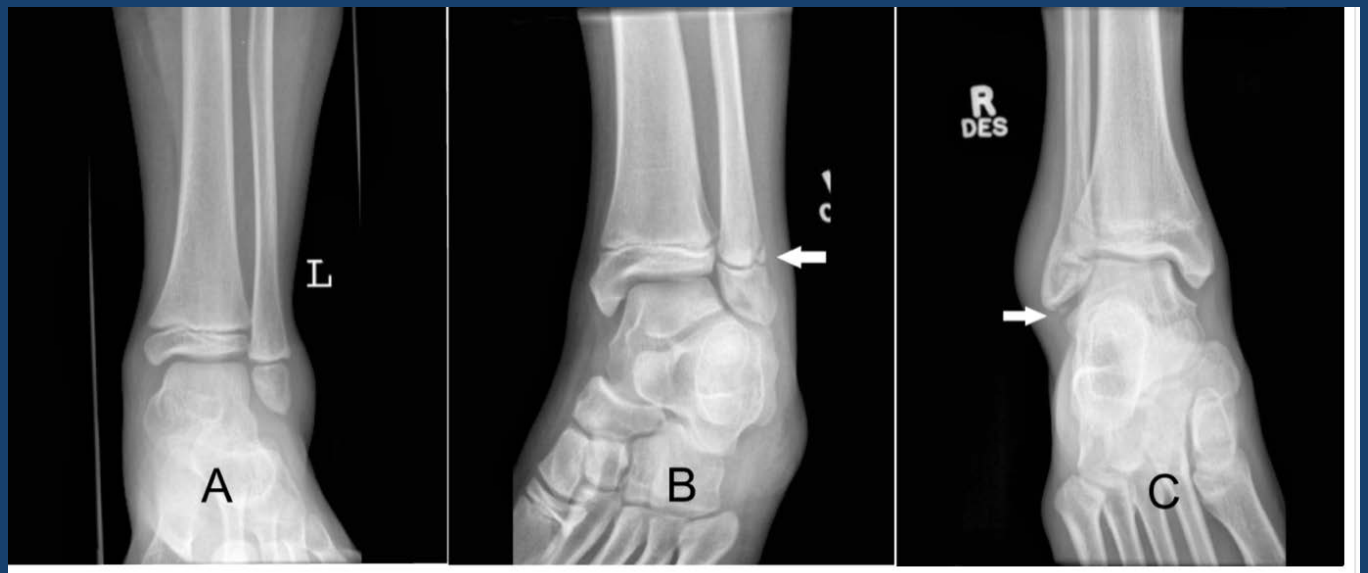


FIGURE 1: LOW RISK ANKLE FRACTURES (A) PRESUMED DISTAL FIBULAR SALTER-HARRIS I PHYSEAL FRACTURE (B) DISTAL FIBULAR SALTER-HARRIS II PHYSEAL FRACTURE (C) DISTAL FIBULAR AVULSION FRACTURE

Low risk ankle fractures and sprains

- Can be tx'd by Primary care
- Removable ankle brace
- Self-regulated return to activities
- **Refer if fail to improve**

Back Pain

> Spine (Phila Pa 1976). 2020 Aug 15;45(16):1135-1142. doi: 10.1097/BRS.0000000000003461.

The Epidemiology of Back Pain in American Children and Adolescents

Peter D Fabricant [1], Madison R Heath [1], Jonathan M Schachne [1 2], Shevaun M Doyle [1], Daniel W Green [1], Roger F Widmann [1]

- Common
- Cross sectional survey of 10 and 18 yr olds: 33.7% back pain within last year, 8.9% severe
- Incidence increased with age
- Females > Males (P<0.001)
- 41% sought treatment- PT most common
- Only 1.6% had invasive tx – injections or surgery

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Article

Back Pain in Children and Adolescents

Micah Lamb and Joel S. Brenner

Pediatrics in Review November 2020, 41 (11) 557-569; DOI: https://doi.org/10.1542/pir.2019-0051

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[§]*Eastern Virginia Medical School, Norfolk, VA*

History, Physical, Labs

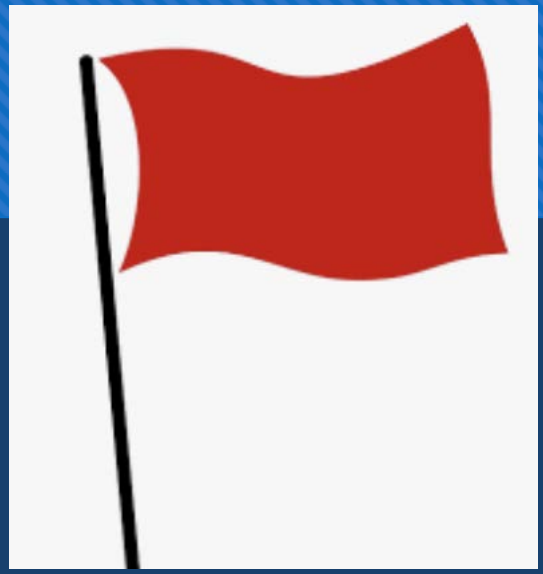
- Numbness/Weakness
- **Loss of Bowel/Bladder - Cauda Equina**
- Weight loss, Fever, Night sweats
- Neuro exam
- CBC, ESR, CRP for constitutional symptoms

When to image?

Review > J Am Coll Radiol. 2017 May;14(5S):S13-S24. doi: 10.1016/j.jacr.2017.01.039.

ACR Appropriateness Criteria ® Back Pain–Child

Expert Panel on Pediatric Imaging:; Timothy N Booth [1], Ramesh S Iyer [2], Richard A Falcone Jr [3], Laura L Hayes [4], Jeremy Y Jones [5], Nadja Kadom [6], Abhaya V Kulkarni [7], John S Myseros [8], Sonia Partap [9], Charles Reitman [10], Richard L Robertson [11], Maura E Ryan [12], Gaurav Saigal [13], Bruno P Soares [14], Aylin Tekes-Brady [15], Andrew T Trout [16], Nicholas A Zumberge [17], Brian D Coley [18], Susan Palasis [19]

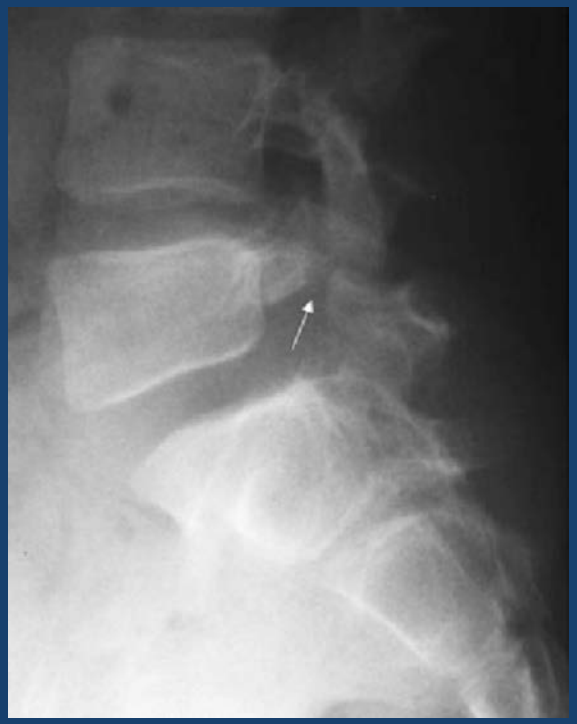


- Red Flags
- Constant pain, Night pain, Radicular pain lasting 4 weeks
- Abnormal neuro exam
- Clinical or Lab findings c/w infection or neoplasm
- Xray area of interest
- MRI if further eval indicated

I found this online:

Back Pain - Causes

- Muscular or Non-specific – most common
- Spondylolysis or Spondylolisthesis
- Infection – Discitis/Osteomyelitis, Epidural abscess
- Neoplasm
- Rheumatologic



Unspecified (Mechanical) Back Pain

- Other causes ruled out
- Common cause
- Hamstring tightness, weak core, central obesity, ligamentous strain
- Initiate PT or Core exercises
- **Refer** if fail to improve

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Article | Figures & Data | Supplemental | Info & Metrics | Comments | Quiz

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Core exercises can be initiated as described at HealthyChildren.org (https://www.healthychildren.org/English/healthy-living/fitness/ Pages/Core-Exercises-Guidelines-and-Examples.aspx).

Questions

- Snuffbox tenderness is concerning for a fracture of what bone?
- A physeal fracture of the distal phalanx with avulsion of the nail plate requires: a. irrigation b. antiobiotic c. both
- An obese adolescent with hip, thigh or knee pain should be evaluated with: a. knee MRI b. AP pelvis and lateral of hips
- Name 2 of the 4 Kocher criteria
- An example of a low risk pediatric ankle fracture is a. Displaced medial malleolus fx b. Distal tibial Salter-Harris II fracture c. Non-displaced distal fibular Salter-Harris I or II fx.

Thank You


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