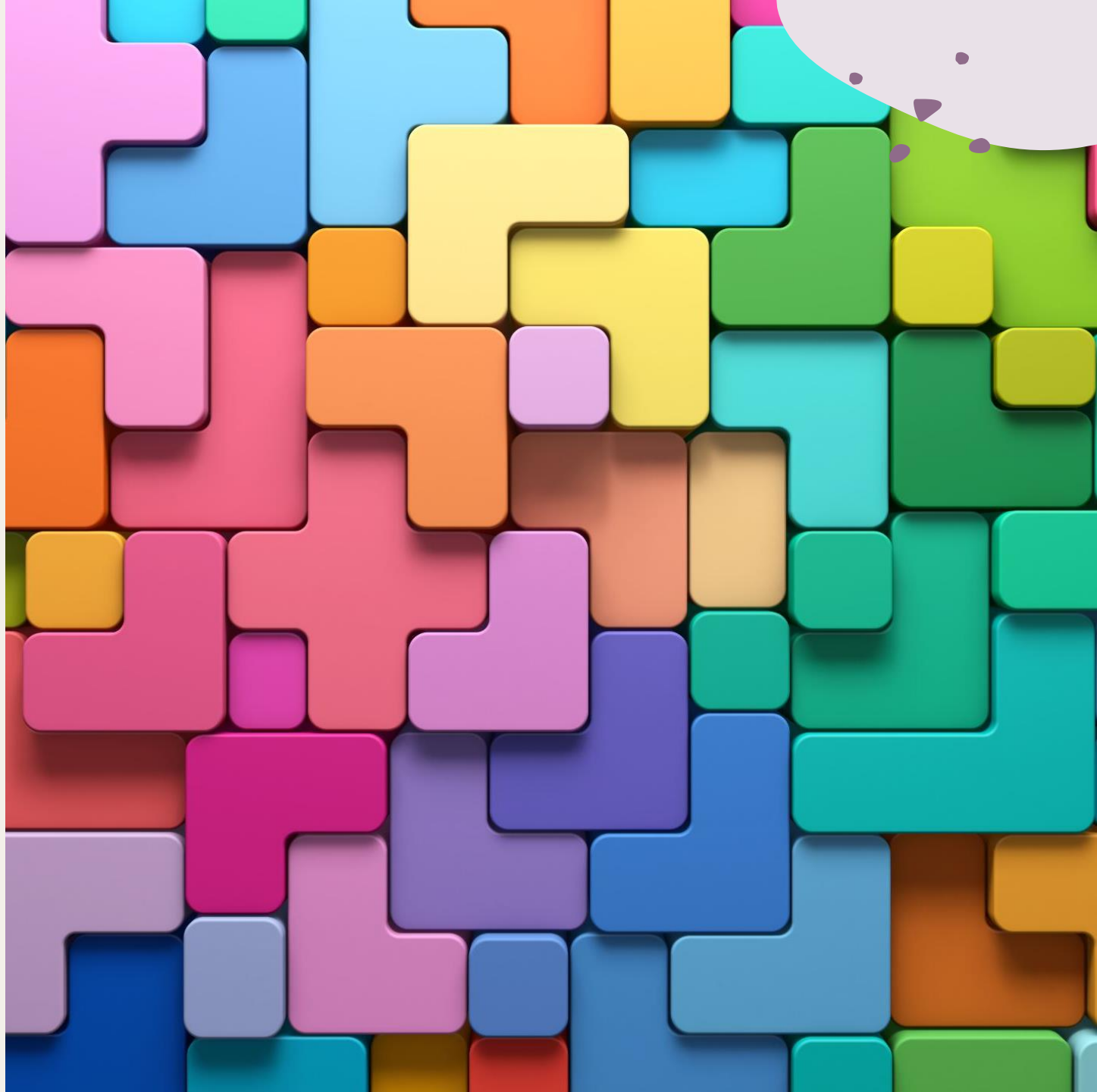
PRACTICE MAKES BETTER

Case studies in orthopedics



Disclosures

I have no personal, financial or commercial relationships or messages to disclose. All relevant financial relationships have been mitigated.

Objectives

- Demonstrate the ability to systematically evaluate and present an orthopedic patient case
- Understand and describe treatment options for at least 1-2 orthopedic cases from the presentation
- Increase the speed of recognition and treatment planning for patients in need of orthopedic care

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Functional Dry Needling

Suboxone certified through the ASAM

Husband to Krista

DNP University of Kansas 2021

Father (Max 7, Mia 4, Avi 2)

Pets Murphy (Musky) 10, Millie (Great Dane) 9

Orthopedics:

- 7 years 1st assist with total joints, trauma, sports injury.

Pain Management “chronic non-operative orthopedics”:

- 6 years pharmacological and interventional

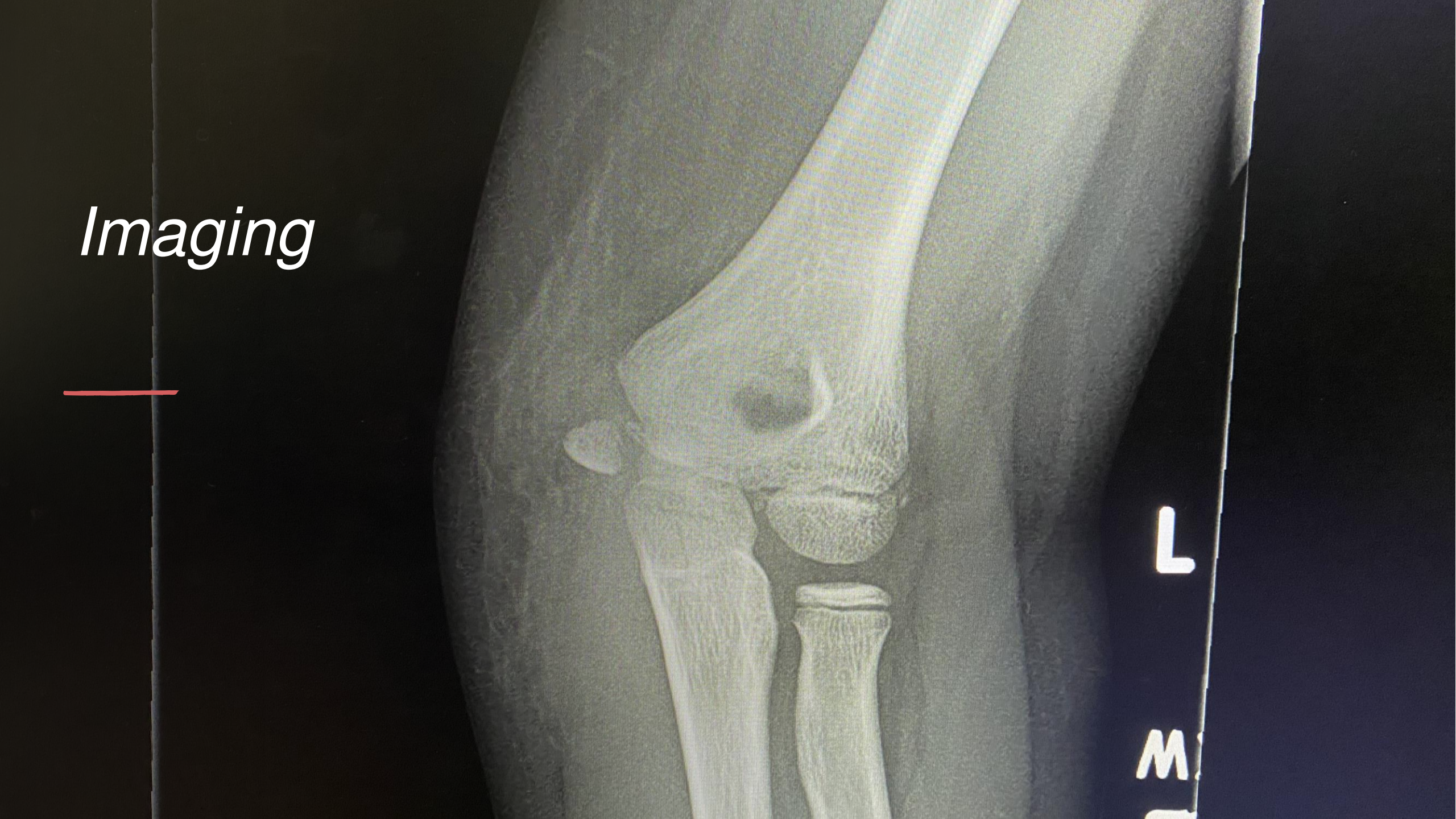
Case study 1

- 6-year-old female who presents with acute left medial elbow pain.
  - The pain started in the AM prior to her visit when she was performing a cartwheel at school and felt a ”pop.” There was no initial swelling but when her mom picked her up from school 2-3 hours after the injury there was swelling present. The patient was given ibuprofen which did help. She was taken to a general urgent care where she had radiographs and was diagnosed with a possible apophyseal fracture of the medial epicondyle. She was put in a splint and sling. Her mom, who is a nurse, wanted to bring her to ortho urgent care for a more advanced evaluation.

Exam

- Medications
  - Albuterol, cetirizine hcl, ammonium lactate, diphenhydramine hcl, ferrous sulfate, fluticasone propionate.
- Review of systems
  - WNL, Non-contributory
- Physical exam (Left elbow)
  - 129.5cm 4’3”: 48.1kg 106#: BMI 28.6
  - No obvious S&S of infection, NVI
  - Swelling around the medial epicondyle
  - Pain with palpation of the medial epicondyle
  - ROM ~ 5-120 deg
  - Grip strength 4/5 in comparison with 5/5 of the contralateral hand.
  - Full pronation and supination
  - Valgus stress testing very painful (gentle)

Imaging



Imaging

Plan

- Dx: Medial epicondyle apophyseal fracture
- Re-splint
  - 90 degrees and immobile
- Acetaminophen and NSAIDS and ice for comfort and swelling
  - Acetaminophen 10-15mg/kg/dose
  - Ibuprofen 10mg/kg/dose
- STAT referral to upper extremity specialist
  - Apophyseal (growth plate) injury that needs surgery.

Imaging

Case study 2

14-year-old male

- Right parascapular pain that has been present for several weeks. He reports it started after he was at a baseball throwing camp where he was throwing hard as well as throwing from far away. Currently it hurts whenever he is throwing as well as whenever he is doing any sort of overhead lifting during weights. He is a high-level pitcher who does participate in a local throwing group to prep for college. While he has not done any formal physical therapy, His mom is a physical therapist and has a TENS at home which has provided some degree of temporary relief. They want to get him back to pain free throwing in time for the baseball season.

Special testing

Empty Can

Hawkins

Obriens

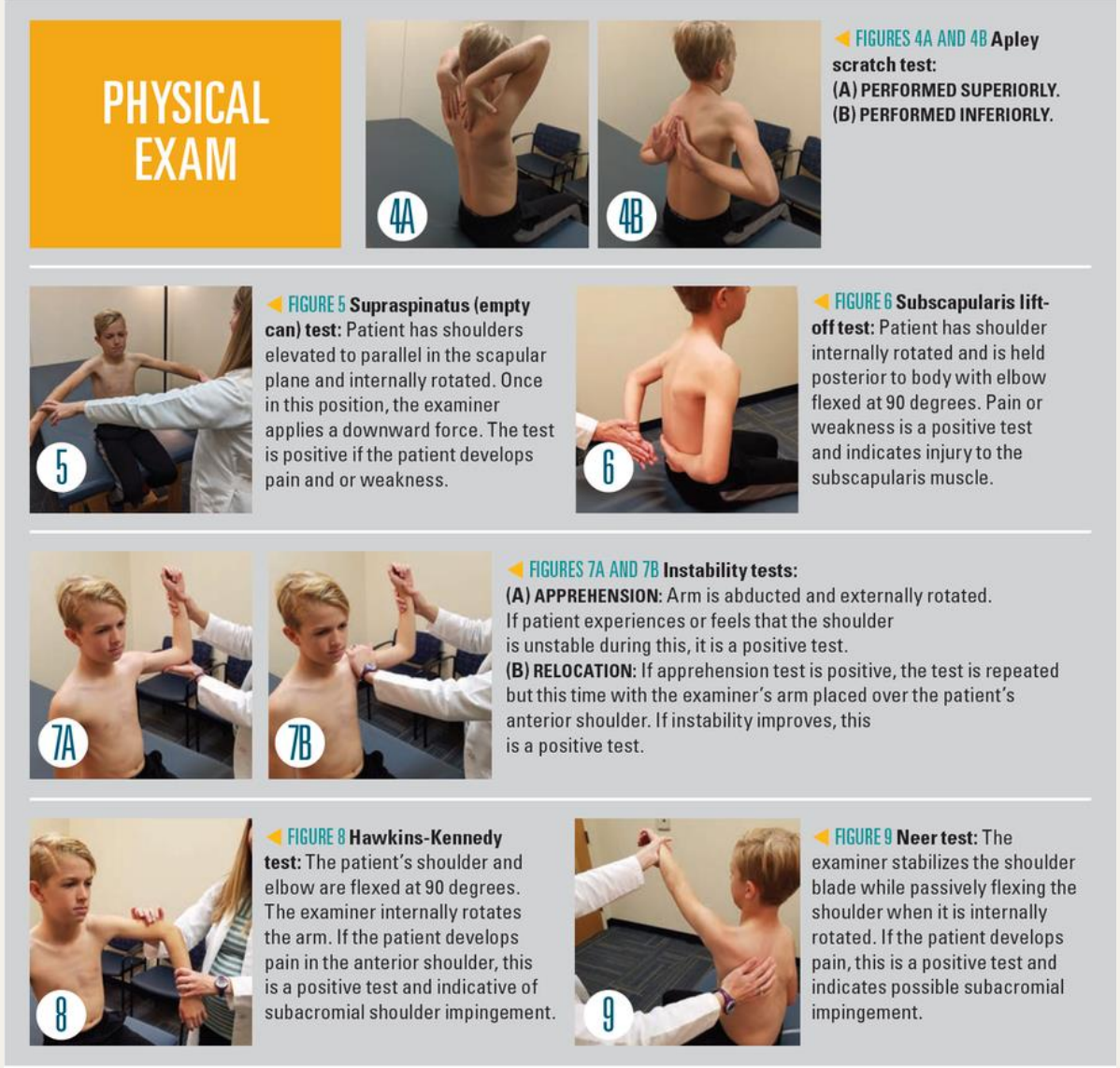
Neers

Speeds

Apprehension

Lift off

Scratch



Ichesco, (2020).

Exam

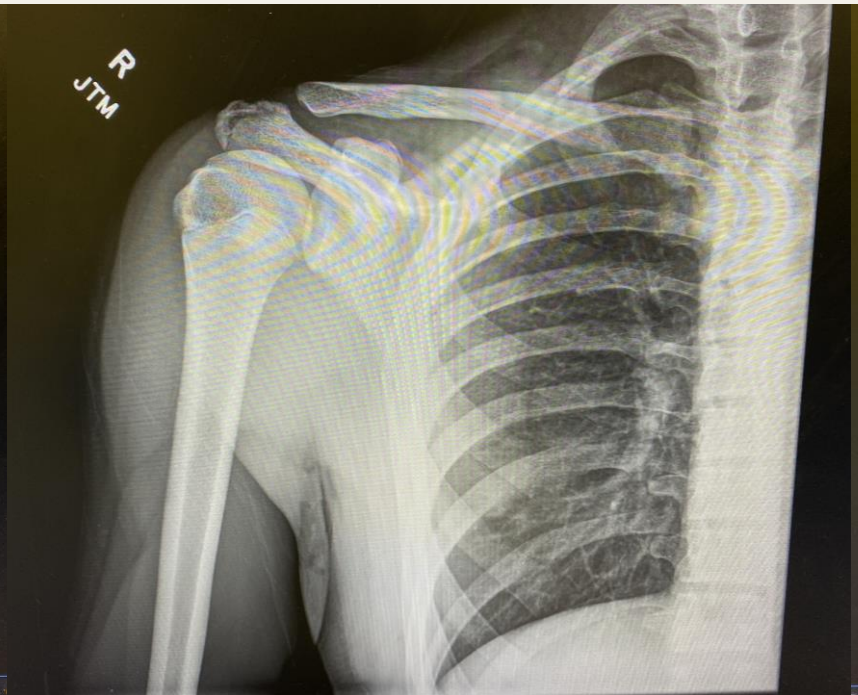
Shoulder ROM:

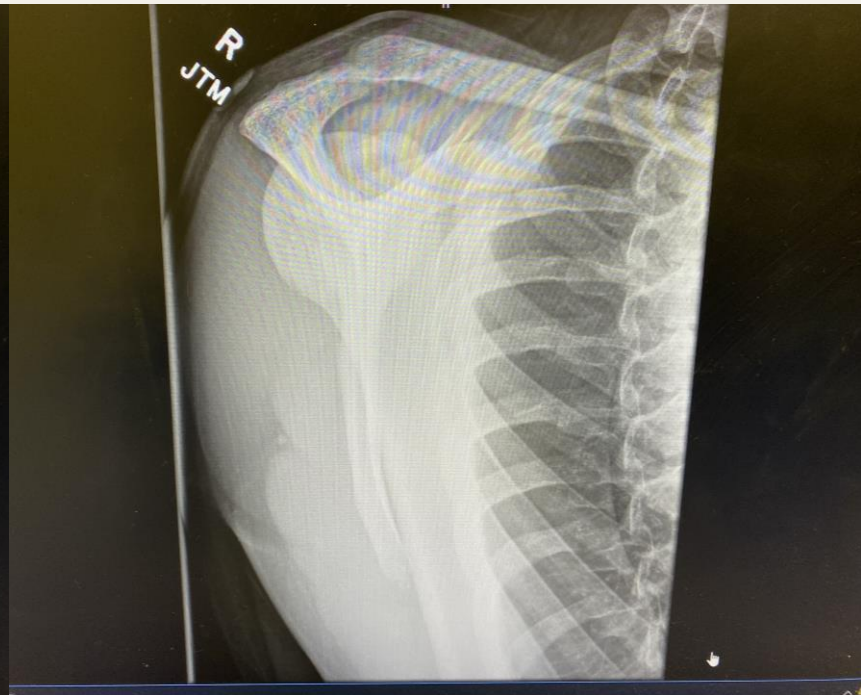
- Flexion 180
- Abduction 180
- External/Internal rotation 90
- Extension 45

Exam

- Medications/Allergies:
  - None
- History:
  - noncontributory
- Review of Symptoms
  - WNL/Noncontributory
- Physical Exam (Right Shoulder and Scapula)
  - NVI
  - Pain with palpation of the thoracic paraspinal and parascapular muscles
  - Delay with activation of the right scapula with right vs left shoulder flexion
  - Full ROM of the right shoulder.
  - Mild parascapular pain with empty can testing otherwise provocative testing is negative.

Imaging





DIfferentials

- Scapular Dyskinesia
- Glenoid Labrum tear
- Rotator cuff tendonitis/bursitis
- Hypermobile shoulder
- Thoracic muscle strain

Plan

- Dx: Scapular Dyskinesia w/ associated throwing pain
- Continue with normal activity as tolerated
- Shut down throwing for 4 weeks minimum
- Formal physical therapy with a specialized return to throwing plan
- Follow up with orthopedic sports specialist

Case study 3

53-year-old female

- She presents with right ankle pain. The pain started this morning when she was walking downstairs, inverted, and plantar hyperflexed. She felt immediate pain followed by significant swelling. She did not take any medications or ice as her priority was to get into ortho clinic for a quick evaluation to make sure there is nothing significant. She is a medical assistant and is concerned she will not be able to work.

Exam

Ankle ROM:

- Plantar flexion: 30-50
- Dorsiflexion: 20-30
- Supination (inversion): 45-60
- Pronation (eversion): 15-30

Special tests:

- Squeeze test: fracture or high ankle sprain
- Ankle drawer test: ligamentous instability
- Transverse drawer test: ligamentous instability
- Thompson: Achilles tendon

Exam

PMH:

- Noncontributory

Medications/allergies:

- Noncontributory

ROS:

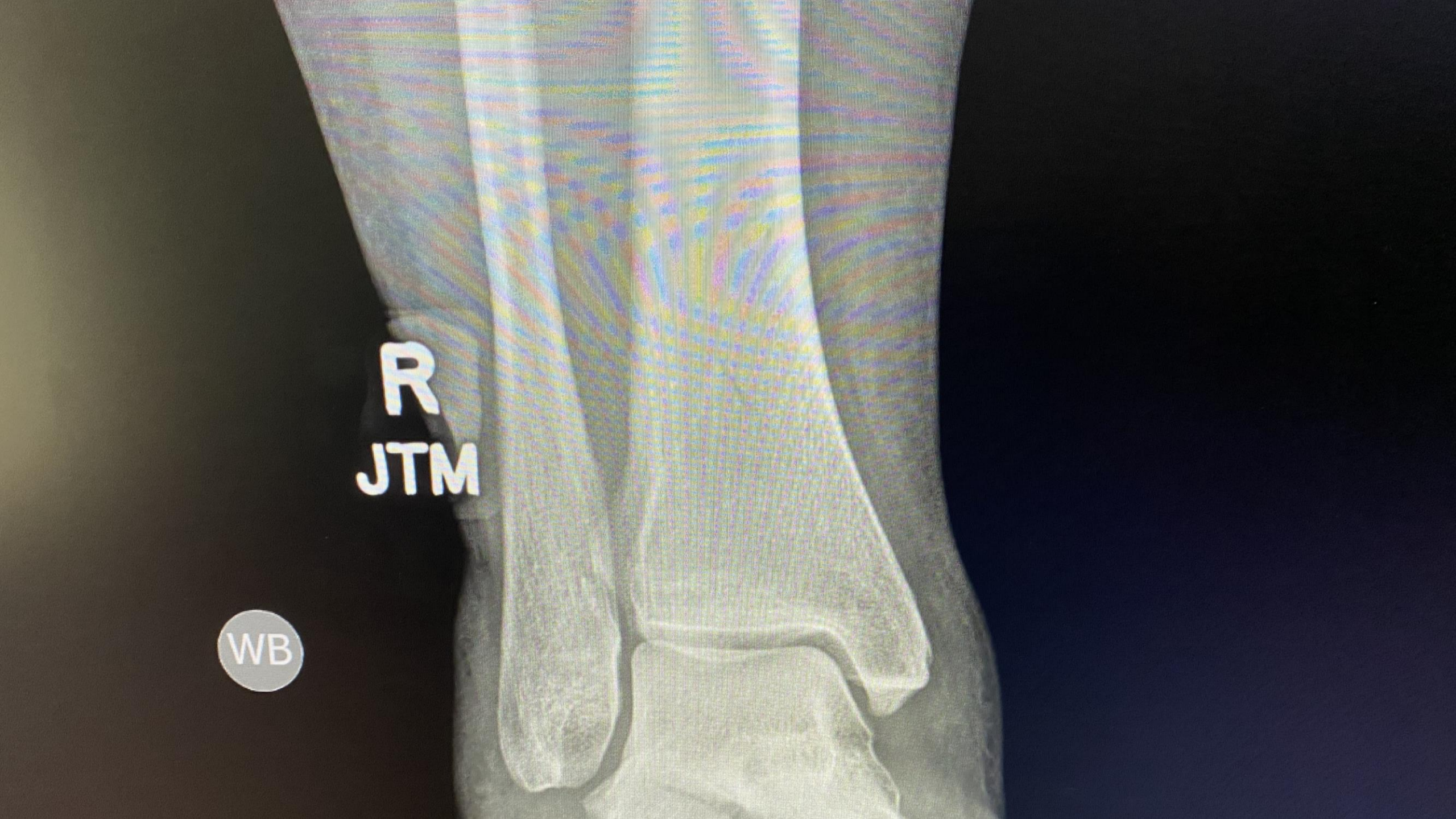
- WNL/Noncontributory

Physical Exam

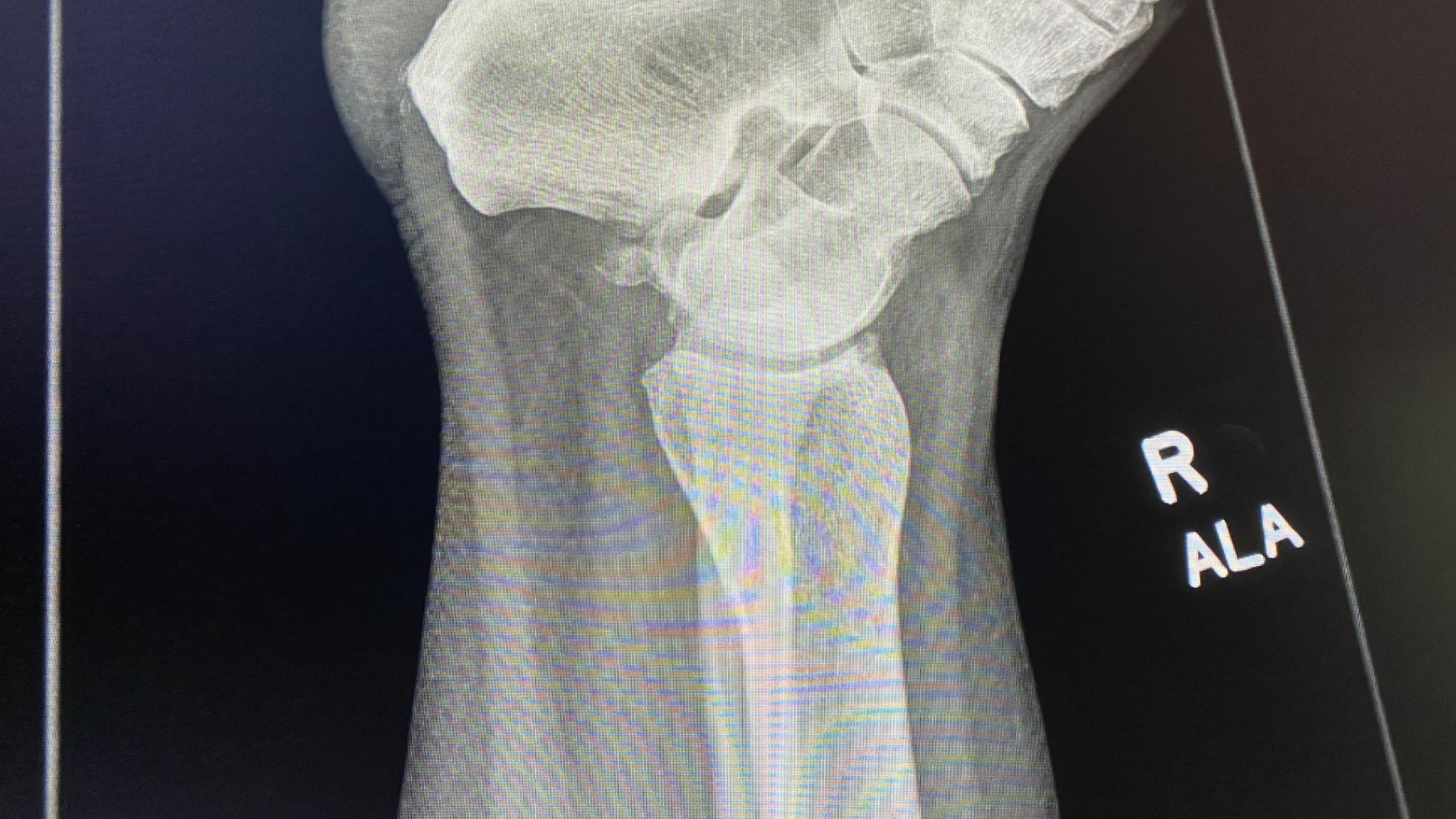
- BP: 167/102 BMI: 35.51
- NVI
- Generalized, moderate, ankle edema
- Somewhat limited ROM both passive and active due to pain
  - Dorsiflexion to neutral, plantar flexion to 30
  - Eversion/Inversion normal with minimal pain

Strength 4/5 with strength testing due to pain.


R
JTM
WB


R
JTM
WB


R
JTM
WB


R
ALA

Plan

Dx: Tibial fracture with potential articular involvement.

- Cast vs. boot
  - Watch for swelling and choose DME accordingly
- Crutches
  - Non weight bearing (NWB) or toe touch weight bearing (TTWB).
- Advanced imaging
  - CT scan to determine conservative vs. surgical treatment
- Work
  - Unlikely to be able to work at her current job
- NSAIDS, Acetaminophen, Tramadol
- 2-week follow up
  - Fracture stability

Case study 4

71-year-old male

- He presents with right knee pain that started over a month ago while he was on vacation. He reports he was very active but was often walking on uneven cobblestone streets and at some point, felt his knee buckle. He was seen by an MD, but no radiographs were obtained. He followed up about 10 days later with an orthopedic provider at the Steadman clinic in Vail, CO where he was diagnosed with patellofemoral joint arthritis and told he could continue with activity as tolerated. He has done several weeks of physician and personally directed home exercises and was improving, however, he rode his bike the last 2 days, and his pain and swelling has returned. At this point the pain and swelling is interfering with his ability to do what he likes. He is wondering if there is anything else that can be done to help determine what is going on and help him devise a treatment plan. He does live in the mountains and skis most of the winter.

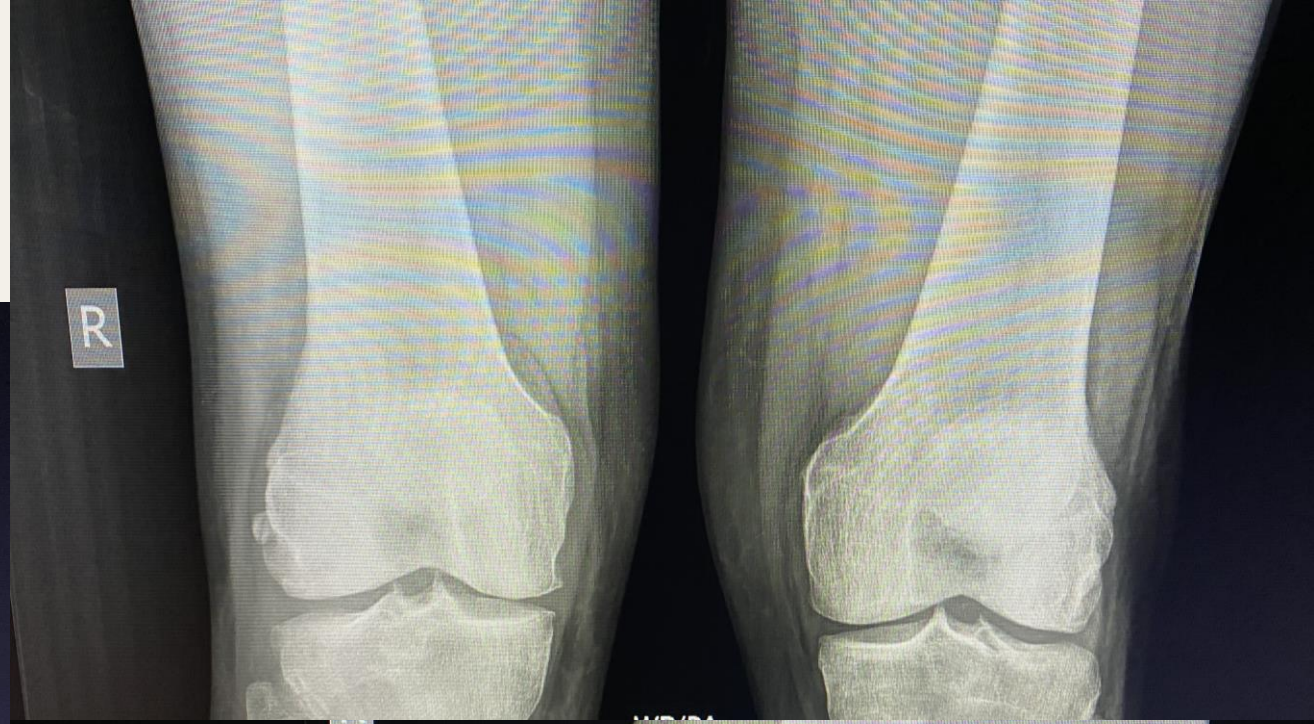
Exam

- Knee ROM:
  - Flexion 130
  - Extension 0
- Special tests
  - Drawer testing: Anterior/Posterior
    - Ligamentous stability (ACL/PCL)
  - Lachman's
    - Ligamentous stability (ACL)
  - Varus/Valgus stress testing
    - MCL/Fibular collateral ligament
  - McMurray test
    - Medial/Lateral menisci
  - Dial test
    - Posterolateral corner
  - Patella grind test
    - Chondromalacia patella and OA Patella

https://www.youtube.com/watch?v=c3643PM0a2o

Exam

- PMH:
  - Noncontributory
- Medications:
  - Atorvastatin, Metoprolol, NSAIDS
- ROS:
  - Noncontributory
- Physical exam
  - Neurovascular intact, no S&S of infection noted
  - No obvious deformity
  - Mild effusion and prepatellar edema present
  - ROM 0-130 deg
  - Patella grind painful with good mobility
  - Varus and Valgus stress testing negative
  - Drawer testing negative
  - McMurray testing: + medial/ - lateral



Imaging

Differentials

- Knee OA
- Meniscus tear
- Chondromalacia Patella
- Infection

Plan

Dx: OA w/ possible underlying medial meniscus tear

- MRI
- Physical therapy
- NSAIDS for comfort and inflammation
- Injection
  - Cortisone
  - Hyaluronic Acid
  - Platelet Rich Plasma
  - Stem cells
- Specialty follow up

Case study 5

31-year-old female

- She presents with left 4th metatarsal pain. The pain started 30-60 minutes ago when she was running on the treadmill and felt immediate pain. She did not feel any pain leading up to the event and reports she was trying out some new running shoes. She is a highly competitive runner at an international level and wants to make sure she does not have any sort of fracture since she is in the middle of marathon training. She does have a history or stress fractures for which she was treated with a boot for 6 weeks. She reports her vitamin D level is normal.

Exam

Ankle ROM

- Plantar flexion: 30-50
- Dorsiflexion: 20-30
- Supination (inversion): 45-60
- Pronation (eversion): 15-30

Ankle special test

- Squeeze test: fracture or high ankle sprain
- Ankle drawer test: ligamentous instability
- Transverse drawer test: ligamentous instability
- Thompson: Achilles tendon

Foot

- Squeeze
  - Hind, Mid, Forefoot
- Isolated joint testing
  - Immobilize proximal joint
- Palpation of the painful area

Exam

PMH

- Hypothyroidism
- Hx of stress fracture

Medications/Allergies

- Levothyroxine/NKDA

ROS

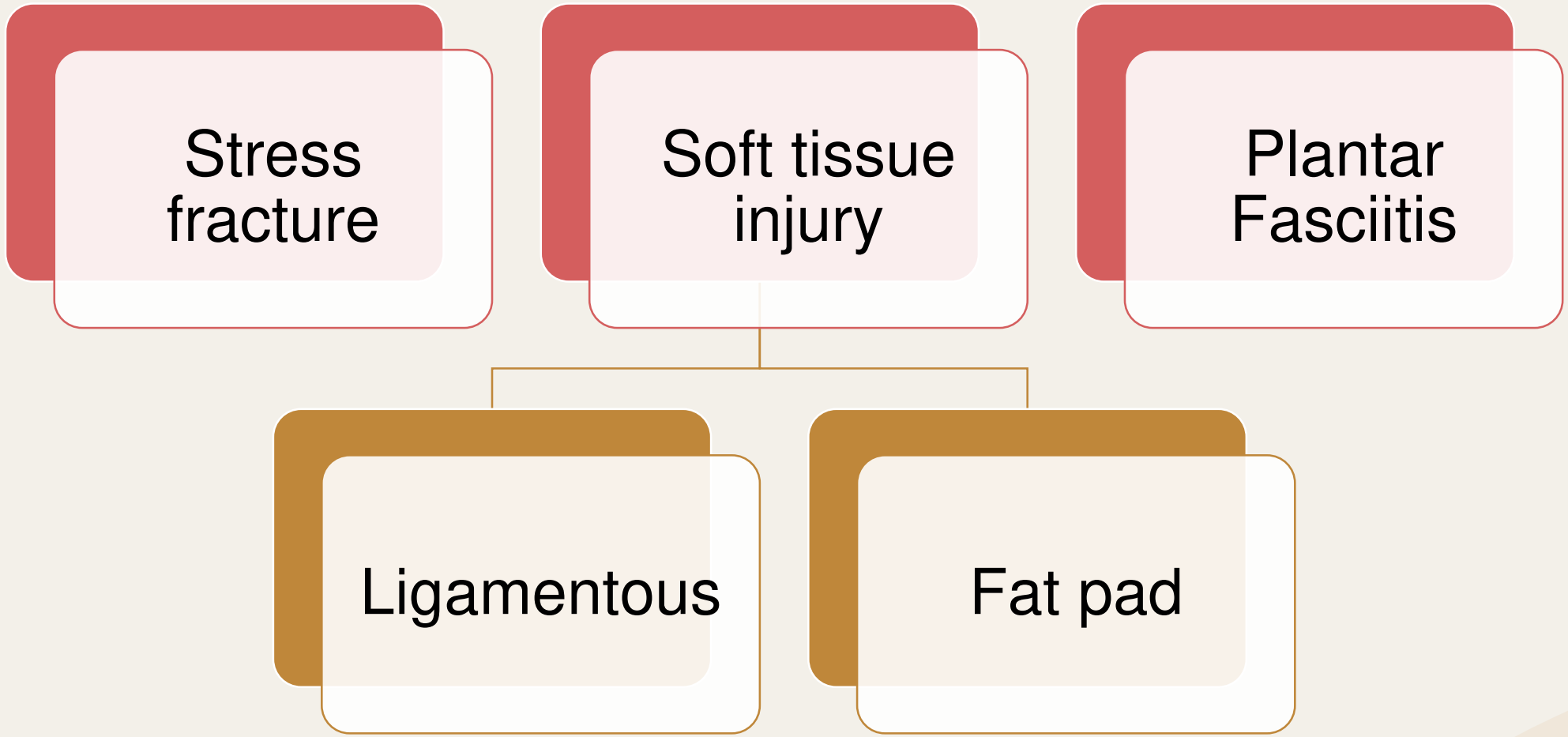
- Non-contributory/WNL

Physical exam

- No S&S of infection NVI
- No obvious deformity
- No obvious edema, erythema, or ecchymosis
- Pain with palpation of the distal fourth metatarsal
- Normal ROM of the foot and ankle
- 5/5 strength with strength testing of the foot and ankle.

Imaging

Differentials



Plan

Dx. 4th metatarsal stress fracture (until proven otherwise)

- Rest for 1 week
- If pain returns after 1 week boot 4-6 weeks with activity
- ROM exercises
- NSAIDS as needed
- F/U with foot specialist
  - Female athlete triad
    - Weight loss or eating disorder
    - Cessation of period
    - Low bone density

Case study 6

79-year-old male

- He presents with a 5-week-history of right shoulder pain. The pain started when he bent down to pick up a turkey before Thanksgiving and felt immediate pain when pulled on it and tried to pick it up. The pain is much better since that time and at times it does not bother him at all, however, depending on his activity the pain can become debilitating. This morning he tried to pick up a gallon of milk from the fridge and dropped it on the floor. He reports his wife told him he needed to get seen and to stop putting it off. He has been using aleve BID but is also on Rivaroxaban for A-fib.

Exam

Shoulder ROM:

- Flexion 180
- Abduction 180
- External/Internal rotation 90
- Extension 45

Exam

PMH:

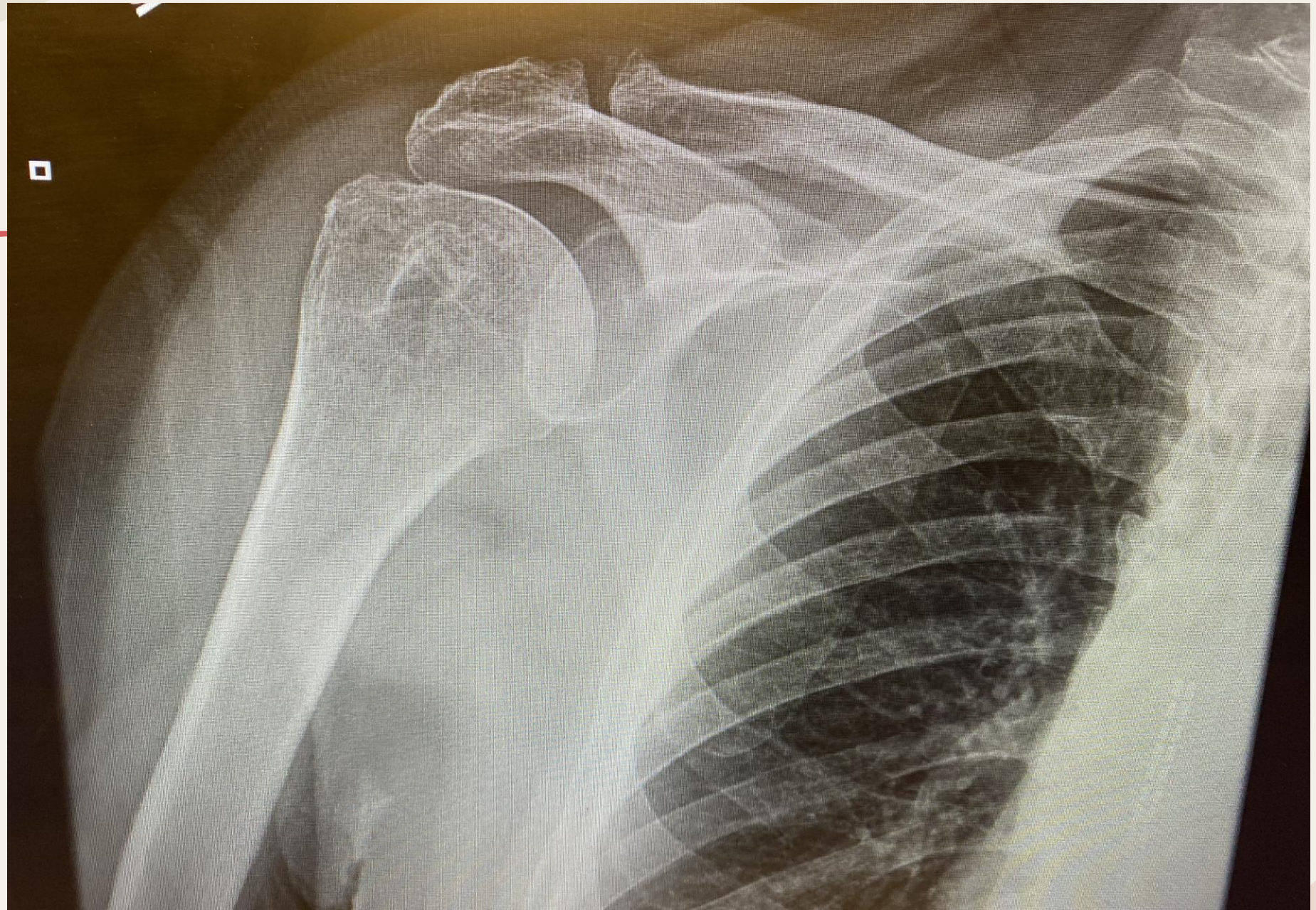
- A-fib, BPH, Chronic low back pain with SCS

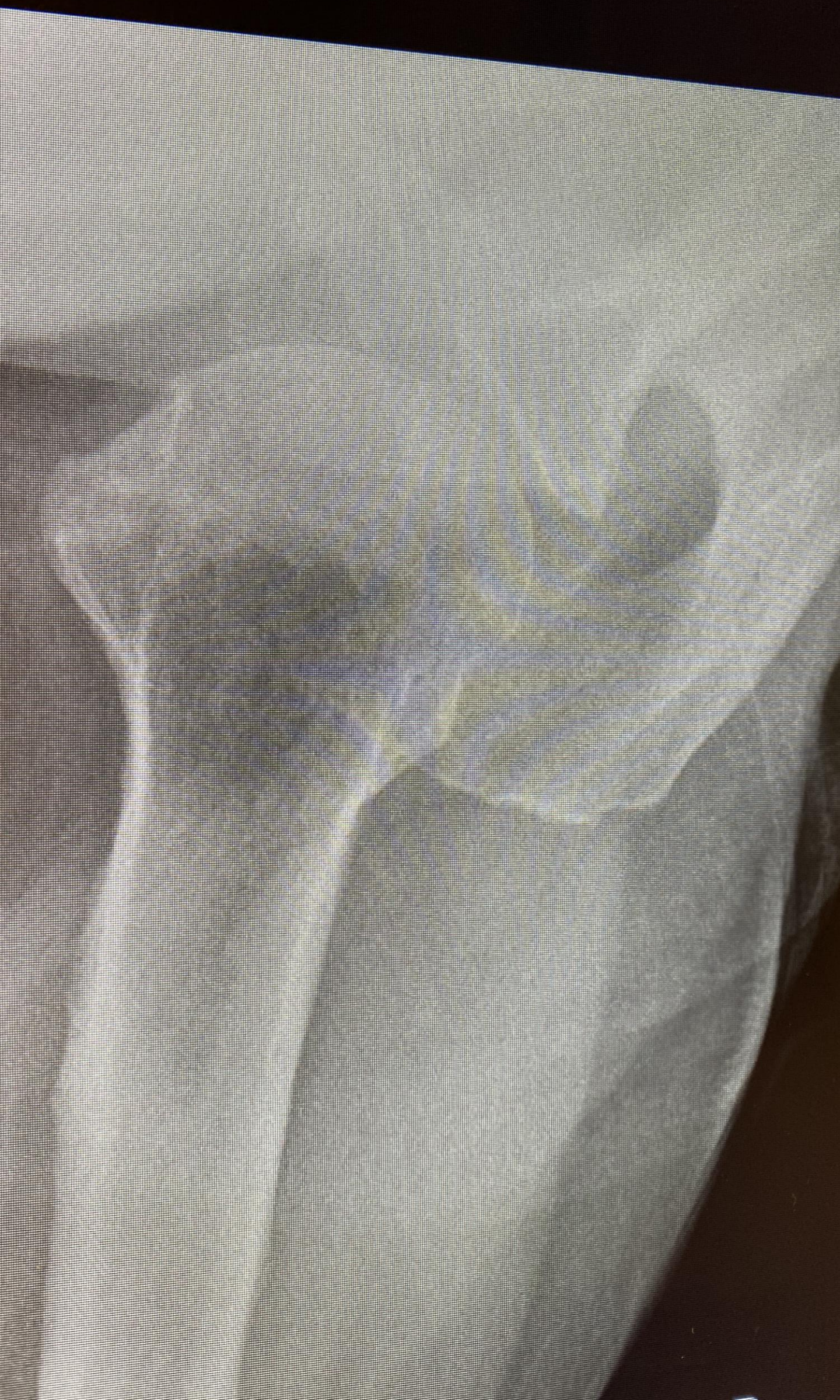
Medications

- Amlodipine
- Finasteride
- Hydrocodone
- Lisinopril
- Methylprednisolone
- Naproxen
- Rivaroxaban
- Tramadol

Physical exam

- No S&S of infection, NVI
- No obvious deformity
- No edema, erythema or ecchymosis
- Minimal pain around the shoulder
- Full ROM of the shoulder with ROM testing
- Strength 5/5 with strength testing
- Painful empty can, Hawkins, and Speeds.





Differentials

Glenohumeral joint OA

Rotator Cuff tendonitis

Rotator cuff tear

Labral tear

Plan

Dx: Right rotator cuff strain with underlying GH joint OA

- Formal physical therapy
  - ART, Dry needling, strengthening and stabilization
- Subacromial bursa injection with cortisone if no improvement
- 6-8 week follow up with a shoulder specialist

- What if:
  - Positive empty can
  - Significantly reduced active ROM with full passive ROM
  - Strength 2-4/5 with external rotation

- MRI to r/o full RTC tear likely leading to surgery

Case study 7

40-year-old male

- Left distal calf pain that started this morning. The pain occurred about an hour into playing basketball while he was running on the basketball court with nobody around him. He felt a pop accompanied by instant pain and disability. He is very active and plays basketball regularly. He came to the clinic immediately after his injury for further evaluation of his Achilles tendon.

Exam

PMH:

- Non-contributory

Medications/Allergies

- None/NKDA

Physical Exam

- No S&S of infection, NVI
- Edema in the posterior ankle
- No obvious skeletal deformity though there seems to be some Achilles retraction
- Reduced active ROM/Normal passive ROM
- Positive Thompson's (Pt on stomach, knee bent to 90deg, squeeze the calf)
- Negative drawer testing
- Radiographs not usually necessary
  - Can r/o avulsion fractures

Plan

Dx: probable Achilles tendon rupture

- Tall walking boot
- STAT follow up with surgeon (in this case lower extremity specialty)
- Advanced imaging?
- MRI ankle w/o contrast

References

1. Ichesco, I., Leschied, J., Freed, G. (2020). How to diagnose shoulder injuries in young athletes. *Contemporary PEDS Journal.* 37(4). Retrieved from https://www.contemporarypediatrics.com/view/how-diagnose-shoulder-injuries-young-athletes.
2. Ebraheim, N. (2016). Tests for examination of the knee—everything you need to know. Retrieved from https://www.youtube.com/watch?v=c3643PM0a2o