Seed
GLOBAL HEALTH

Registrar Education Series

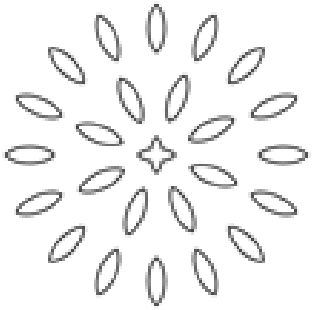
Musculoskeletal

Continuing education for personal growth and quality improvement

DynaMed

How to…

- What is the differential based on the chief complaint?
- What additional information do you want?
- How does the history narrow down the differential?
- What labs/imaging would be most helpful?
- What is the diagnosis?
- What is the assessment?
- What is the treatment/plan?



MUSCULOSKELETAL CASES

challenging the status quo

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Musculoskeletal Case 1

Chief Concern | Histories | PE | Assessment | Plan

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Chief Concern

Lawrence is a 40yoM with no significant PMH who presents for back pain.

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Histories

HPI: Back pain started abruptly at work 2 days ago while he was lifting a bag of cement. Pain is dull and achy located in his lower back on the R side. He denies radiation of the pain. Feels better when he is not moving and when taking a hot shower. Worse with movement and lifting objects. He has not tried anything for the pain. Denies numbness, tingling, weakness, urinary retention, fecal incontinence and saddle anesthesia.

PMH: Depression

PSH: None

FH: None

Social: Originally Lusaka. Lives with his wife and 3 children. Works as a laborer. Enjoys watching football and going to the bar on weekends. Denies heavy alcohol, tobacco and drugs.

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Physical Exam

VITALS: T 37.1, BP 112/64, P 82, R 16

MSK:
INSPECTION: calm sitting in room, no acute distress, not favoring any body part. No asymmetry, edema or erythema of back.
Range of motion: able to touch toes, extend back, perform side bends and lateral rotation although most movements cause pain.
PALPATION: No tenderness along spine, sacrum, or SI joints. R paraspinal tenderness at level of L4-S1.
STRENGTH: Able to stand on toes, walk on heels and perform a squat. Plantar flexion/extension 5/5 b/l. Leg extension 5/5.
SPECIAL TESTING: Seated and supine straight leg raise negative. Patrick's negative.
Sensation intact and equal.
Patellar reflexes 2+ b/l.

Labs

Imaging

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Labs:

*FBC	
WBC	7.5
Hgb	13
Hct	36
Plt	220

*RFTs/LFTs	
Na	138
K	4.6
Bicarb	25
Cl	101
BUN	11
Cr	96
Glucose	5.1
Ca	9.5
T bili	7
AST	35
ALT	32
Alk Phos	125

*Urine	
LE	Negative
Blood	Negative
Nit	Negative
Bili	Negative

*Other	
A1c	5.1
Chol	4.8
LDL	3.4
HDL	1.1
Trigs	2.1
TSH	3.1
ESR	5
CRP	3

Imaging

*indicates the test was likely not indicated with this clinical presentation

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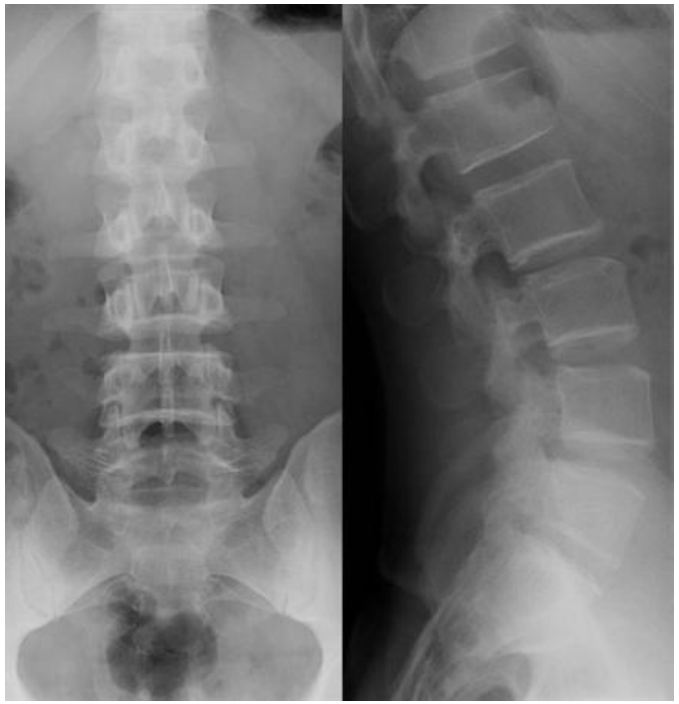
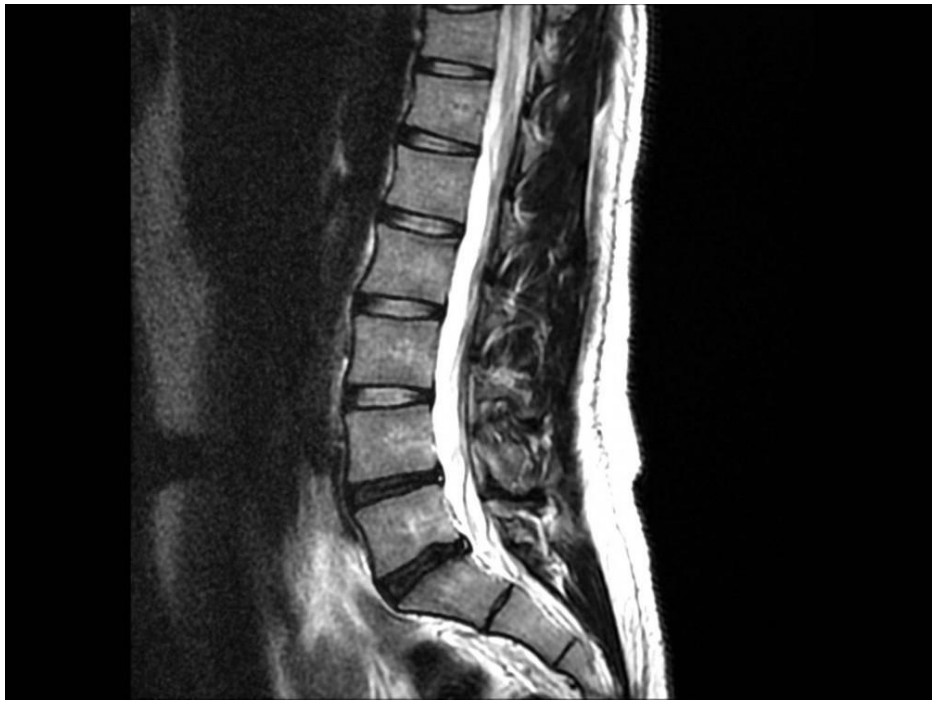
Imaging



*x-ray



*MRI

Labs

*indicates the test was likely not indicated with this clinical presentation

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Assessment

- Lawrence is a 40yoM with what is likely a self-limited injury causing acute lower back pain without any red flags for serious underlying pathology i.e. concern for cancer or fracture, urinary retention, fecal incontinence, saddle anesthesia, severe/progressive neurologic deficits.

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Plan

- No labs or imaging are indicated at this time.
- Educated patient that no matter what conservative therapy he decides on most patients improve with time
- Non-pharmacologic treatments are preferred including heat, massage, acupuncture, or spinal manipulation
- If he wants medication he can take ibuprofen as needed
- Muscle relaxants should not be given in addition to NSAIDs and if used should be reserved for the first week of acute lower back pain
- He should remain active and return to normal full activity as tolerated.
- If this persists for >12 weeks and becomes chronic, non-pharmacologic treatment is still preferred with the addition of exercise/physical therapy
  - NSAIDs, can consider SNRI if NSAIDs are not effective. There is no role for muscle relaxers in chronic back pain
- If symptoms persist despite an adequate trial of conservative therapy can consider imaging with MRI +/- epidural injections to help him tolerate physical therapy.

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Back Pain Summary

80% of adults experience back pain at some point in their life

- Acute: < 4weeks, subacute 4-12 weeks, chronic >12 weeks
- Most are self limited and improve with time regardless of treatment

Labs and *imaging* is not indicated if there are no clinical signs or concerns for a serious underlying pathologic condition (RED FLAGS)

- Cancer, vertebral infection or fracture, neurologic deficits, urinary retention, fecal incontinence, saddle anesthesia

ACUTE *treatment* starts with patient education and expectations, should remain active

- Heat, massage, spinal manipulation, acupuncture
- NSAIDs if medications are used, do not add muscle relaxers to NSAIDs and reserve use of muscle relaxers to the first week. Not an indication for oral steroids.

CHRONIC: *treatment* starts with patient education and expectations, should include exercise/physical therapy

- Heat, massage, spinal manipulation, acupuncture
- NSAIDS → SNRI
- Do not use muscle relaxers or oral steroids
- MRI is preferred imaging
- Cyclical relationship with depression

Interventions: *epidural injection* may provide short term relief, avoid surgery for non-specific chronic lower back pain if there are no indications for surgical intervention

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Musculoskeletal Case 2

Chief Concern | Histories | PE | Assessment | Plan

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Chief Concern

Frida is a 26yo female with no significant PMH who presents for knee pain.

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Histories

HPI: She has a hard time localizing the pain and says it is all over bilateral knees, right more than left. When asked to point with one finger she draws a circle around her entire anterior knee. It started 3 weeks ago and has been slowly worsening. Describes it as a dull, achy and sometimes sharp pain. Worse when going down stairs, squatting or standing after sitting for long periods of time. Has not tried anything to make it better. Denies radiation of pain, swelling, clicking, locking, trauma or past surgeries on the knee. No skin changes or fevers. No other joint is affected.

PMH: None, not taking any medications

FH: Migraines

Social: Lives with friends. Started a new job as a nanny 5 weeks ago, she has to walk 3 miles twice a day and is constantly squatting to take care of a pair of 1 year old twins. Enjoys going out to eat. Drinks socially, denies smoking and drugs.

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Physical Exam

Vitals: T 37.1, BP 113/72, P 70, R 13

GEN: Female appearing stated age in no acute distress.

R Knee:
INSPECTION: No asymmetry, erythema or edema of knee.
PALPATION: No tenderness over medial joint line, palpation of the patella, patellar and quad tendons, lateral joint line, LCL, MCL, pes, or IT band. No crepitus. Uncomfortable with exam.
ROM: Full flexion and extension with lateral patellar tracking.
STRENGTH: Able to walk without a limp, strength 5/5 on extension and flexion and able to perform a full squat although says it is painful.
SPECIAL TESTS: Lachman's, posterior drawer, Thessaly, Ober's, bounce and collateral ligament testing all negative.


Labs


Imaging

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Labs

*FBC	
WBC	7.5
Hgb	13
Hct	36
Plt	220

*RFTs/LFTs	
Na	138
K	4.6
Bicarb	25
Cl	101
BUN	11
Cr	96
Glucose	5.2
Ca	9.5
T bili	7
AST	35
ALT	32
Alk Phos	125

*Urine	
LE	Negative
Blood	Negative
Nit	Negative
Bili	Negative
UPT	Negative

*Other	
A1c	5.1
Chol	4.8
LDL	3.4
HDL	1.1
Trigs	2.1
TSH	3.1
ESR	5
CRP	3

Imaging

*indicates the test was likely not indicated with this clinical presentation

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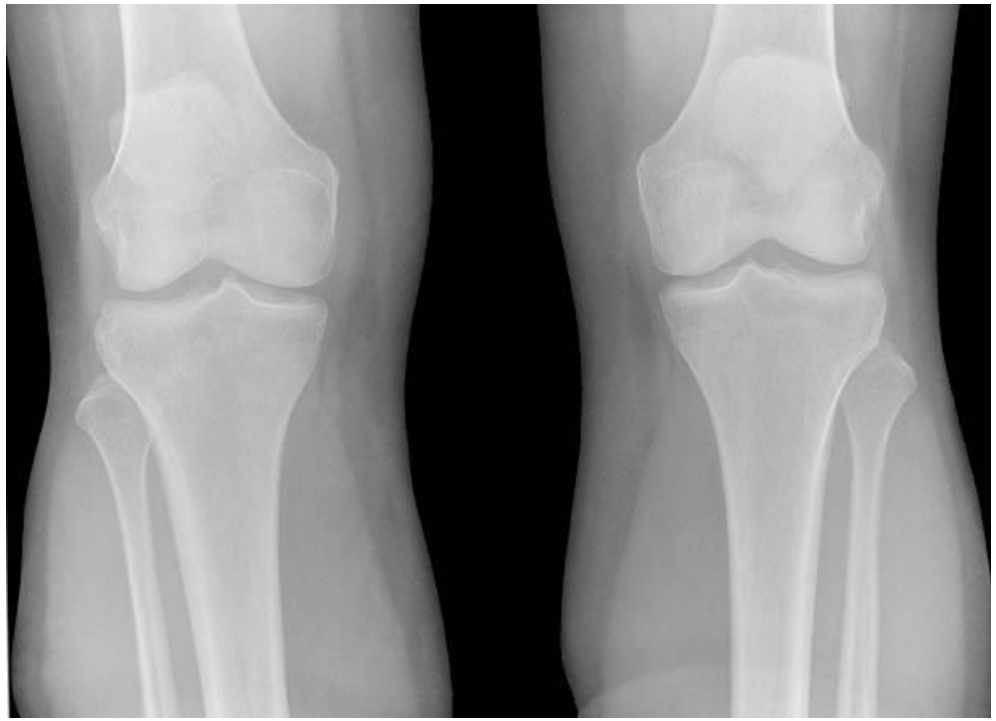
Imaging



*Normal knee x-ray

Labs

*indicates the test was likely not indicated with this clinical presentation

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Assessment

- Frida is a 26yoF with no significant PMH who presents with insidious knee pain after drastically increasing her physical activity. This is an overuse injury most consistent with patellofemoral syndrome.

- Differential includes: patellar tendinopathy, tibial apophysitis, patellar subluxation, pes anserine bursitis, prepatellar bursitis, ITB syndrome, plica syndrome, intra-articular loose body, fad pad impingement syndrome, referred pain from hip

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Plan

- No labs or imaging are indicated at this time.
- Start with relative rest from high impact activities, ice, elevation, compression
- Can take NSAIDs or Tylenol as needed
- Needs to increase strength of quads, IT band, hamstrings and hip flexor
  - Can do 6 weeks of exercise therapy or formal physiotherapy
- No need to tape or use orthoses
- Most cases are self-limited and will improve over time
- If refractory (6-12 months) can consider x-ray, corticosteroid injections, prolotherapy, PRP, surgery

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Knee Pain Summary

Knee pain is a common presenting outpatient condition. Location gives clues to the etiology:

- Anterior: patellofemoral syndrome, IT band, pes anserine
- Medial: osteoarthritis, MCL, meniscal, pes anserine, fat pad
- Lateral: IT band, meniscal, LCL
- Posterior: OA, baker's cyst, meniscus, quads, hamstring

History is key to differentiating knee pain

- Location, onset, duration, and quality of pain; mechanical or systemic symptoms; history of swelling; description of any precipitating trauma; and pertinent previous medical or surgical procedures

Physical exam: Use a systematic approach to every patient regardless of chief complaint

- Inspection, palpation, range of motion, strength, neurovascular assessment, and special tests

Imaging is typically not needed, validated tools can help in deciding when to image

- *Pittsburg knee rules* and *Ottawa knee rule*

Most knee conditions can be *treated* with initial rest, ice, compression and elevation

- NSAIDs can be added for pain relief
- Weight loss can be helpful in many cases of knee pain
- Braces are usually not helpful for common conditions

Exercise or physical therapy is first line treatment for decreasing pain and increasing function

- Usually preferred over surgery or other invasive procedures for most common knee injuries

Knee dislocation and septic joint are emergencies

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Musculoskeletal Case 3

Chief Concern | Histories | PE | Assessment | Plan

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Chief Concern

Eneless is a 44yo female with a PMH of obesity who presents for L foot pain.

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Histories

HPI: She started having the pain on the bottom of her foot about 3 months ago. It has been progressing in pain and frequency. It is worse on the heel and noticed the most when she first wakes up or stands up after watching a movie. It improves throughout the day when she walks on it but returns if she rests and stands again. It is a sharp pain described as a knife going in her heel. Ibuprofen helps short term and she has not tried anything else. When the pain is at its worst it will radiate along her foot towards her big toe. She denies fever, swelling, redness.

PMH: Obesity

PSH: None

FH: No early heart disease or cancers

Social: From Northern Province. Lives her sister and 2 children. Started working as a laborer cleaning the streets of Lusaka 4 months ago. Enjoys cooking and sewing. Denies alcohol smoking and drugs.

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Physical Exam

VITALS: T 37.1, BP 102/64, P 94, R 16

GEN: Obese female in NAD, walking with a limp with her L heel off the ground.

L ANKLE/FOOT:
INSPECTION: No asymmetry, erythema, edema or ecchymosis of ankle or heel.
PALPATION: No tenderness to palpation of the proximal head of the fibula, posterior lateral malleolus, medial malleolus, ATF, CFL, base of 5th metatarsal head or navicular. Pain with deep palpation of medial heel.
RANGE OF MOTION: Full ROM with plantarflexion, inversion and eversion of the ankle. Slightly decreased dorsiflexion that is overcome with manual manipulation.
STRENGTH: 5/5 in dorsiflexion, plantarflexion, inversion and eversion of the ankle. Able to stand on tip toes.
SPECIAL TESTS: Anterior drawer, talar tilt, dorsiflexion-eversion and squeeze test all negative.

Labs Imaging

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Labs

*FBC	
WBC	7.5
Hgb	13
Hct	36
Plt	220

*RFTs/LFTs	
Na	138
K	4.6
Bicarb	25
Cl	101
BUN	35
Cr	80
Glucose	3.7
Ca	9.5
T bili	10
AST	35
ALT	32
Alk Phos	97

*Urine	
LE	Negative
Blood	Negative
Nit	Negative
Bili	Negative

*Other	
A1c	5.4
Chol	4.8
LDL	3.4
HDL	1.1
Trigs	2.1
HIV	negative
TSH	3.1

Imaging

*indicates the test was likely not indicated with this clinical presentation

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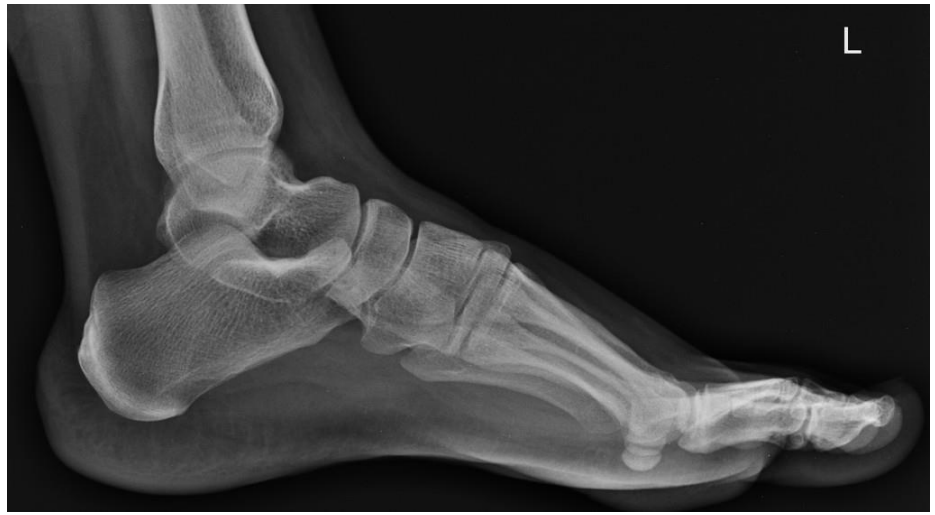
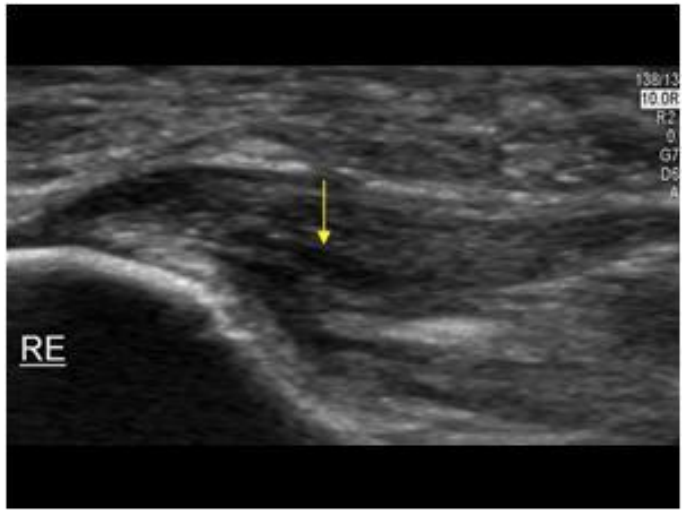
Imaging



*foot x-ray



*heel ultrasound

Labs

*indicates the test was likely not indicated with this clinical presentation

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Assessment

- Eneless is a 44yoF with a history of obesity who has progressive left heel pain that is worse with initial steps after resting that appears to have developed after starting a job with high walking demands on concrete. Based on history alone plantar fasciitis is the most likely diagnosis and exam does not suggest other diagnosis.

- Differential includes: ankle injury, tarsal tunnel injury, heel spur, stress fracture, calcaneal tendinopathy

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Plan

- Imaging and labs are not indicated for plantar fasciitis unless the diagnosis is in question.
- Educated that symptoms can last a year or longer.
- Taught how to do gastrocnemius/soleus stretching,
- Recommend NSAIDs/Tylenol as needed
- Can roll foot on ice bottle for massage or any hard surface like a baseball
- Counseled on importance of good supportive shoes and addition of over-the-counter rigid orthotics if needed for her flat feet.
- If symptoms persist she can try a night splint for 3 months.
- In the case of refractory pain corticosteroid or botulin toxin injections, iontophoresis, phonophoresis, PRP, extracorporeal shock wave therapy are all options.
- Surgery is rarely needed and only performed when other non-invasive treatments fail.

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Foot & Ankle Summary

The *plantar fascia* helps support the heel, repetitive overload may cause acute/chronic degenerative changes

- Associated with an increase in activity, flat feet, overweight, runners, court sports, deconditioning, poor footwear
- 80% of people will improve within 1 year

Labs and imaging are not necessary when a comprehensive history and physical are performed

Conservative treatment options

- Stretching, massage, NSAIDs/Tylenol, anti-pronation measures, improved footwear

If adequate time with conservative treatment fails, options if needed include injections, iontophoresis, phonophoresis, extracorporeal shock wave therapy

ANKLE INJURIES: usually inversion injuries from twisting or stepping on something

Use a clinical decision tool, i.e. *Ottawa Ankle Rules* to determine need for imaging

There may be a need for non-weight bearing the first few days with rest, ice, elevation, compression, NSAIDs

- If stable fracture or pain from sprain a walking boot can be used until activity is tolerated
- Graduated activity with ROM → balancing → walking → jogging → sport specific movements
- Strengthening exercises (with or without formal physical therapy) are key to preventing recurrent injuries from weakness and laxity

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Musculoskeletal Case 4

Chief Concern | Histories | PE | Assessment | Plan

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Chief Concern

John is a 65yoM with no significant past medical history who presents to the outpatient clinic with right shoulder pain.

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Histories

HPI: He woke up with the pain about a week ago in his right lateral shoulder. It is worse with any overhead activities and when lifting heavy objects. Ibuprofen and rest help. Denies radiation of pain, fevers, redness, deformity, trauma. He is having a hard time with normal everyday things like washing his hair, opening doors, etc.

PMH: None

PSH: None

FH: HTN

Social: Eastern Province. Lives with his wife. Has 4 children and 7 grandchildren. Recently retired and took on a home improvement project painting his entire house inside and outside. Enjoys music. Drinks 2 beers every night. Denies drugs, and tobacco.

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Physical Exam

VITALS: T 36.8, BP 127/84, P 72, R 14

GEN: 65yoM appearing stated age in no acute distress.

MSK: Right shoulder
INSPECTION: No asymmetry or erythema of shoulder.
PALPATION: No tenderness along clavicle, A/C joint, humerus, biceps or spinous process.
RANGE OF MOTION: Full ROM of both shoulders with extension, adduction, internal and external rotation. Decreased flexion and abduction of R shoulder. No scapular dyskinesis.
STRENGTH: Strength 5/5 with internal and external rotation, 4+/5 with flexion.
SPECIAL TESTING: Hawkins and empty can positive on the right. Yergason's, speed's, crossover, Obrien's and apprehension all negative.


Labs


Imaging

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Labs

*FBC	
WBC	7
Hgb	14
Hct	43
Plt	195

*RFTs/LFTs	
Na	138
K	4.6
Bicarb	25
Cl	110
BUN	13
Cr	110
Glucose	5.1
Ca	9.5
T bili	10
AST	35
ALT	32
Alk Phos	97

*Urine	
LE	Negative
Blood	Negative
Nit	Negative

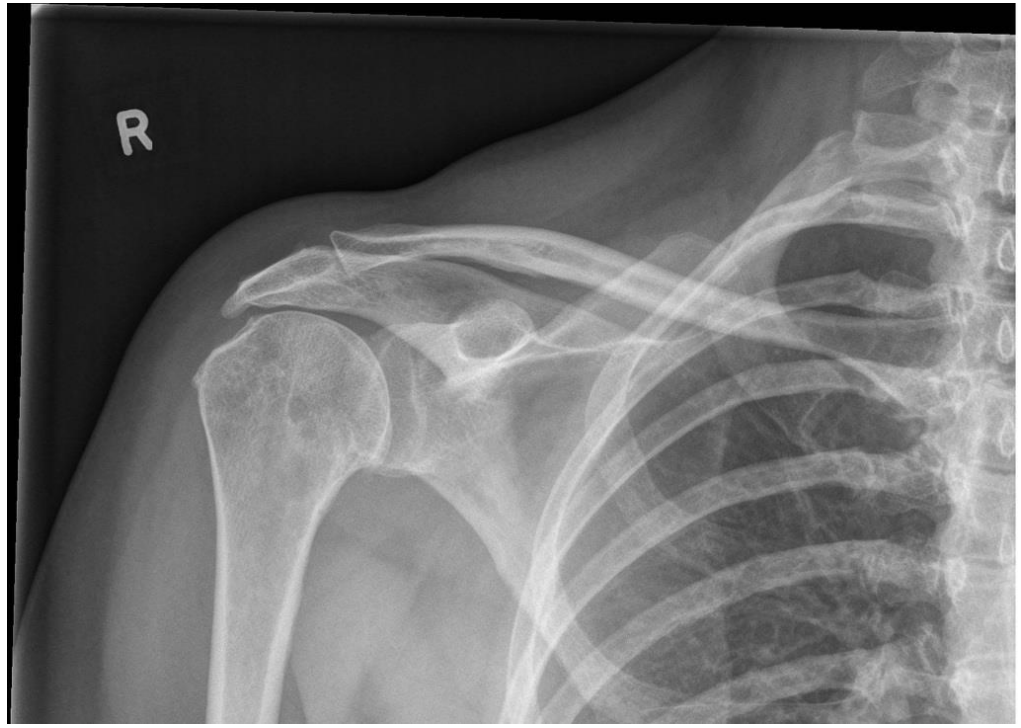
*Other	
A1c	5.4
Chol	4.8
LDL	3.4
HDL	1.1
Trigs	2.1
TSH	3.1

Imaging

*indicates the test was likely not indicated with this clinical presentation

Seed Global Health

Imaging



*shoulder x-ray

Labs

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Assessment

- John is a 65yoM with no significant PMH who presents for R shoulder pain which started after painting his house. This is likely an overuse injury related to the rotator cuff, specifically subacromial impingement syndrome.

- Differential would include: other rotator cuff pathology, AC joint, biceps tendinopathy, labrum SLAP tear

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Plan

- Labs and imaging are not needed or indicated at the initial visit
- Should limit activity that exacerbates the pain
- Can try ice and/or heat
- NSAIDs/Tylenol as needed
- Should do strengthening exercises/physical therapy unless the AC joint is the issue
- If he fails more conservative treatment a corticosteroid injection can be considered
- Surgery should be reserved for stage 3 tears or stage 2 that have failed conservative therapy

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Shoulder Pain Summary

Shoulder pain is commonly from overuse injuries

- Sports or occupation related

Typical shoulder pain arises from the rotator cuff, biceps, AC joint and labrum

Imaging is usually not indicated at the initial visit

- If needed ultrasound, x-ray or MRI may be used depending on the suspected pathology

Treatment

- Avoid activities that exacerbate the pain
- Ice/heat, NSAIDs/Tylenol

Physical therapy is key to treatment and prevention of most causes of shoulder pain

- AC joint pain needs lifestyle modification and not exercise therapy

A corticosteroid injection can be considered if conservative management fails

Surgery may be indicated for specific injuries although most people will improve without needing surgical intervention