



**UT Southwestern**  
Medical Center

# Update in Internal Medicine 2022

## Practical Approach to Musculoskeletal Medicine

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# Objectives

- Discuss common musculoskeletal complaints and how to manage them through case-based studies
- Demonstrate simple physical exam maneuvers to help diagnose common musculoskeletal complaints
- Identify indications for imaging
- Review 2019 American College of Rheumatology Guidelines for management of osteoarthritis
- Recap practice changing articles in musculoskeletal medicine

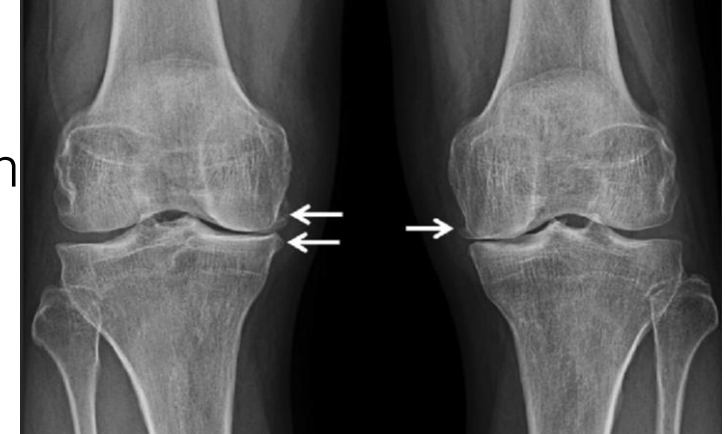
# Case #1



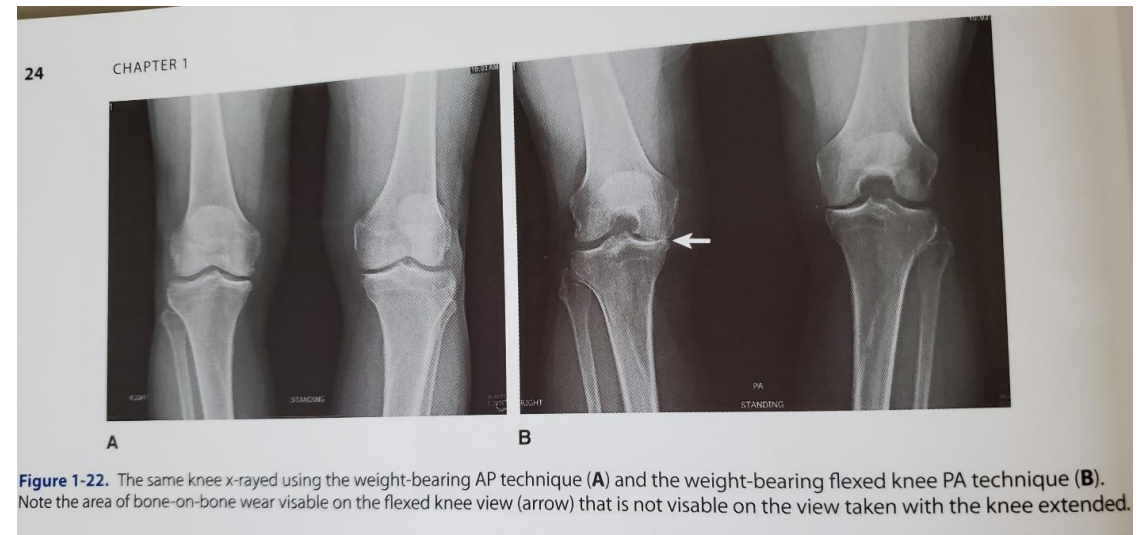
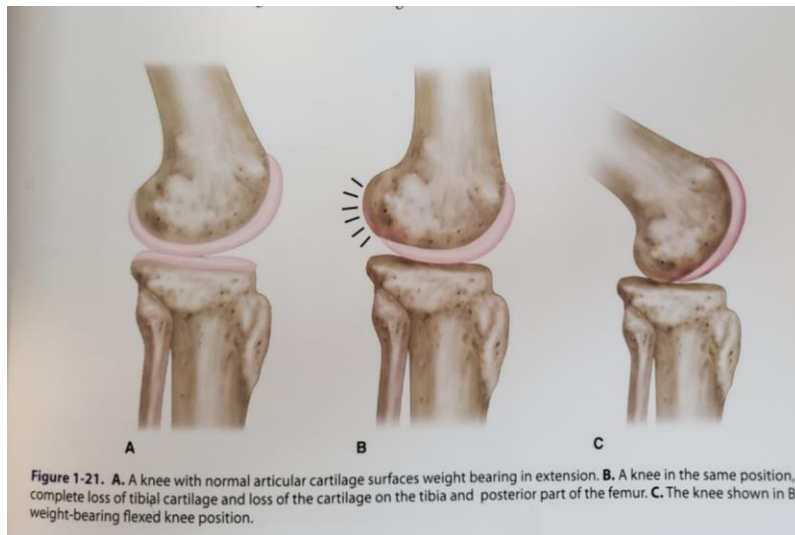
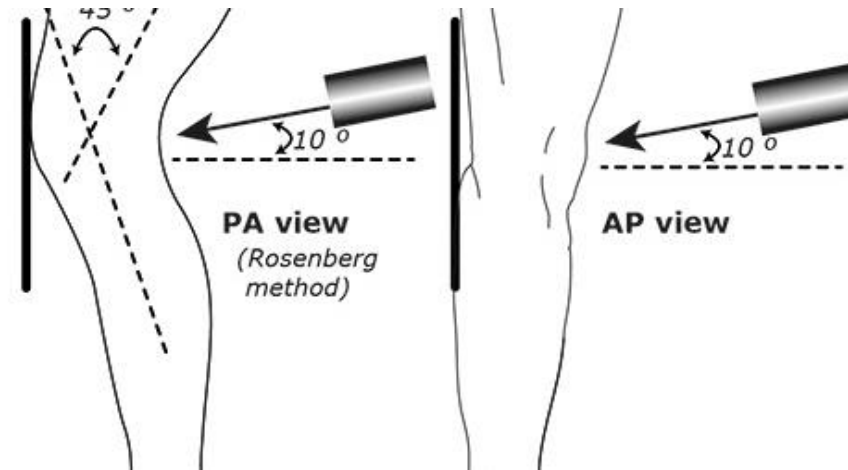
A 70M is evaluated for a 5-year history of L knee stiffness. He reports daily pain and stiffness for 10 min in the morning and when he sits for an extended period. He reports no swelling, knee buckling or locking. On exam, crepitus and medial joint line tenderness to palpation are noted. There is no redness, effusion, or signs of knee instability. Left knee radiograph shows mild medial joint space narrowing.

# Tibiofemoral Osteoarthritis

- Degradation and wear of articular cartilage
- Exam: joint swelling, stiffness, tenderness to palpation along joint lines, and even warmth. Specific to OA: presence of severe angular deformities.
- Imaging: Usually not needed, but can be useful in radiographic grading of OA, if patient failed conservative management, or if there are red flags – effusion, trauma
  - Weight-bearing AP view
  - Weight-bearing, flexed knee, posterior anterior view (Rosenberg or weight-bearing notch view)

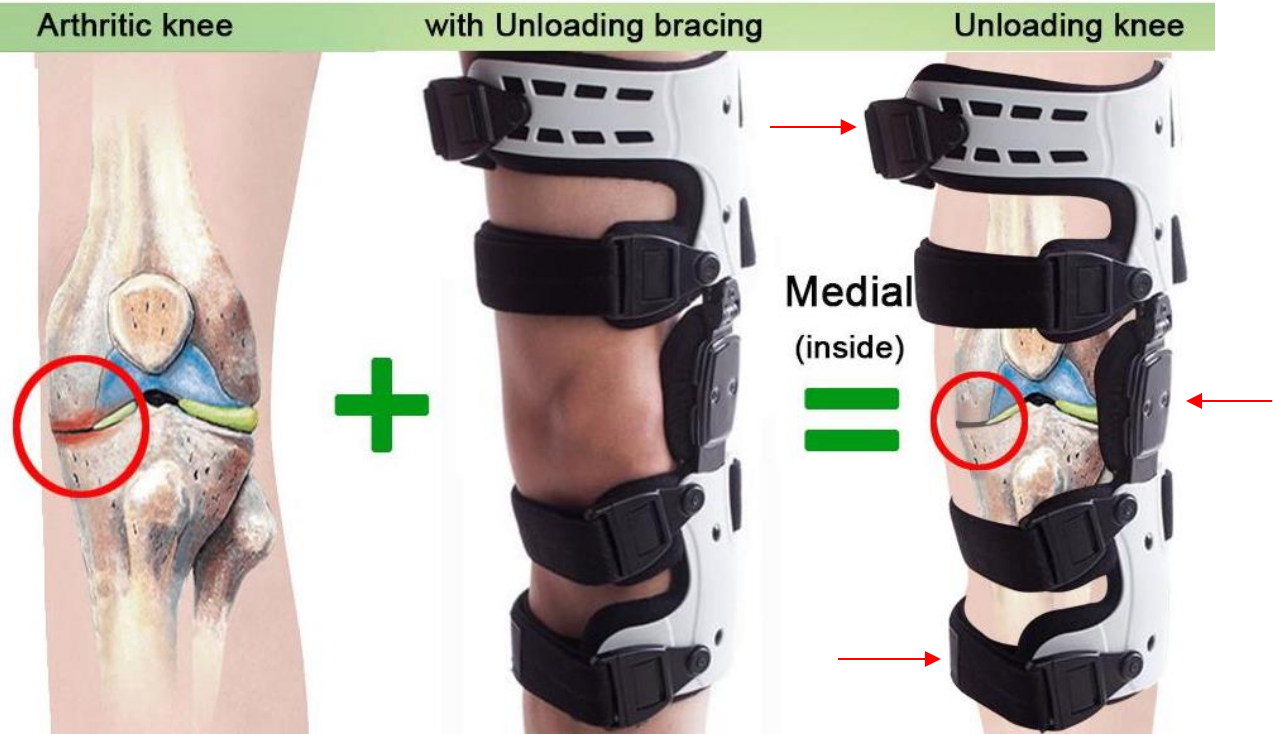


# Advantages of Rosenberg view
















# 2019 American College of Rheumatology/Arthritis Foundation Guideline for the Management of Osteoarthritis of the Hand, Hip, and Knee



	HAND	KNEE	HIP
PHYSICAL, PSYCHOSOCIAL, and MIND-BODY APPROACHES		Exercise*	
		Self-Efficacy and Self-Management Programs	
		Weight loss	
		Tai Chi	
		Cane	
	1 <sup>st</sup> CMC Orthosis	TF Knee Brace**	
		Heat, Therapeutic Cooling	
		Cognitive Behavioral Therapy	
		Acupuncture	
		Kinesiotaping	
PHARMACOLOGIC APPROACHES		Balance Training	
	Other Hand Orthoses***	PF Knee Brace**	
	Paraffin	Yoga	
		RFA	
		Oral NSAIDs	
	Topical NSAIDs	Topical NSAIDs	
	I-A Steroids	I-A Steroids (Imaging-Guidance for Hip)	
		Acetaminophen	
		Tramadol	
		Duloxetine	
	Chondroitin	Topical Capsaicin	

## Cooled Radiofrequency Ablation Compared with a Single Injection of Hyaluronic Acid for Chronic Knee Pain

### A Multicenter, Randomized Clinical Trial Demonstrating Greater Efficacy and Equivalent Safety for Cooled Radiofrequency Ablation

 Chen, Antonia F. MD, MBA<sup>1</sup>;  Khalouf, Fred DO<sup>2</sup>;  Zora, Keith DO<sup>3</sup>;  DePalma, Michael MD<sup>4</sup>;  Kohan, Lynn MD<sup>5</sup>;  Guirguis, Maged MD<sup>6</sup>;  Beall, Douglas MD<sup>7</sup>;  Loudermilk, Eric MD<sup>8</sup>;  Pingree, Matthew MD<sup>9</sup>;  Badiola, Ignacio MD<sup>10</sup>;  Lyman, Jeffrey MD<sup>11,a</sup>

[Author Information](#) 

The Journal of Bone and Joint Surgery: September 2, 2020 - Volume 102 - Issue 17 - p 1501-1510  
doi: 10.2106/JBJS.19.00935

## Efficacy and safety of antidepressants for the treatment of back pain and osteoarthritis: systematic review and meta-analysis

BMJ 2021 ; 372 doi: <https://doi.org/10.1136/bmj.m4825> (Published 20 January 2021)

Cite this as: BMJ 2021;372:m4825

### Linked Editorial

Antidepressants for musculoskeletal pain



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[Responses](#)







[Peer review](#)

Giovanni E Ferreira , doctoral candidate<sup>1,2</sup>, Andrew J McLachlan , professor<sup>3</sup>, Chung-Wei Christine Lin , professor<sup>1,2</sup>, Joshua R Zadro , research fellow<sup>2</sup>, Christina Abdel-Shaheed , research fellow<sup>1,2</sup>, Mary O'Keeffe , research fellow<sup>1,2,4</sup>, Chris G Maher, professor<sup>1,2</sup>

Original Research | April 2021

## The Effect of Flat Flexible Versus Stable Supportive Shoes on Knee Osteoarthritis Symptoms








### A Randomized Trial

Kade L. Paterson, BAppSci(Hons), BPod, PhD , Kim L. Bennell, BAppSci(Physio), PhD,  
Penny K. Campbell, BAppSci(FoodSci&Nutr) , Ben R. Metcalf, BSci(Hons), Tim V. Wrigley, BSci(Hons), MSc ,  
Jessica Kasza, BSci(Hons), PhD , Rana S. Hinman, BPhysio(Hons), PhD  [View fewer authors](#) 

Original Research | 1 December 2020

## Effectiveness of *Curcuma longa* Extract for the Treatment of Symptoms and Effusion-Synovitis of Knee Osteoarthritis

### A Randomized Trial

Zhiqiang Wang, MPharm , Graeme Jones, PhD, Tania Winzenberg, PhD , Guoqi Cai, MmedSci,  
Laura L. Laslett, PhD , Dawn Aitken, PhD , Ingrid Hopper, PhD, Ambrish Singh, MTech , Robert Jones, MD,  
Jurgen Fripp, PhD, Changhai Ding, PhD, Benny Antony, PhD  [View fewer authors](#) 

## Case #2



58M with history of obesity presents with 3-week history of lateral left hip pain that started after an increase in activity. Patient reports he was previously sedentary but has started to walk in order to lose weight. He states that pain is worse at night. Exam is notable for negative windshield wiper test, +tenderness to palpation over left greater trochanter.

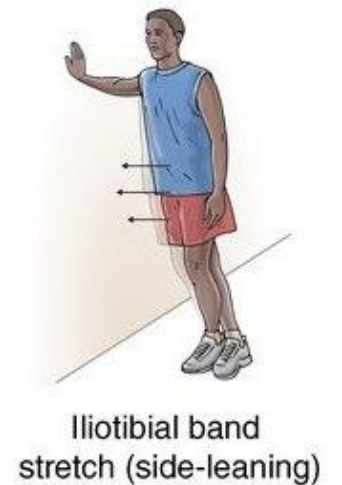
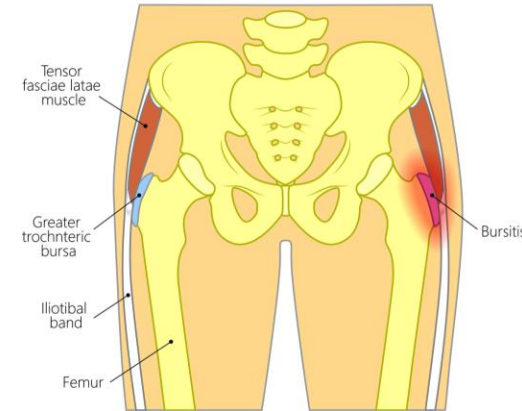


# Windshield wiper test

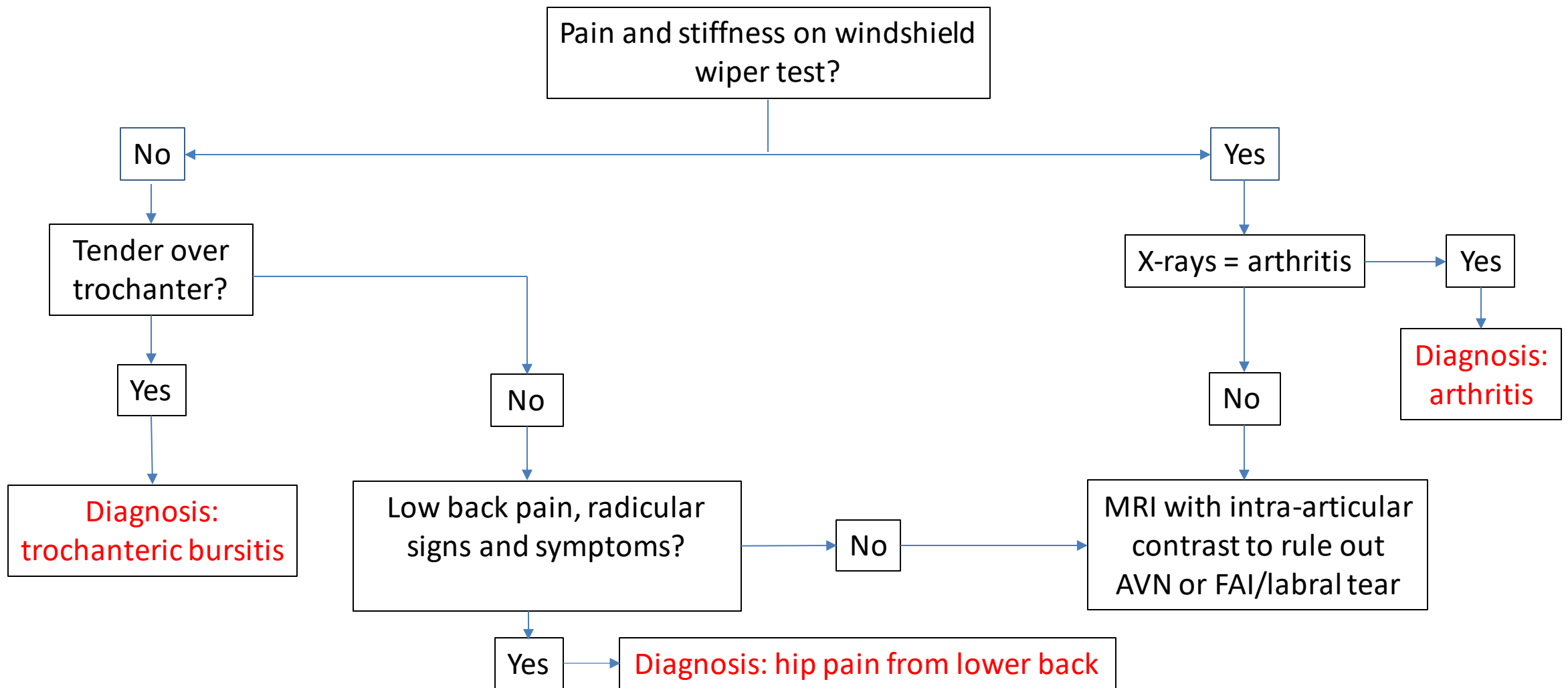


# Greater Trochanteric Pain Syndrome

- IT becomes less elastic and rubs against the greater trochanter with too much friction
- Lateral sided hip pain that is typically worse at night. Rarely, the IT band will catch or snap on the trochanter creating a palpable, or even audible, “clunk,” called **coxa saltans**
- Exam: little to no pain or stiffness on the windshield wiper test, tenderness to palpation over the greater trochanter
- Imaging: Not needed
- Treatment: IT band stretches and NSAIDs, steroid injection



# Algorithm for Hip Pain



# Shoulder: Physical Exam

- Key elements of the exam

## ROM

## Inspection/Palpation

+/- Rotator cuff function assessment

+/- Special tests for subacromial impingement

- Remember that the diagnostic accuracy of provocative/special tests is limited

NOTE: In patients with acute shoulder pain, multiple exam maneuvers may yield positive results

# Physical Exam- Range of Motion

- Flexion
- Abduction: 0-30°=Supraspinatus, 30-90°=Deltoid, >90°=Trapezius + Serratus anterior + Scapula
- Adduction
- Internal rotation (IR): Subscapularis
- External rotation (ER): Infraspinatus

\*\*\*Always perform ROM bilaterally

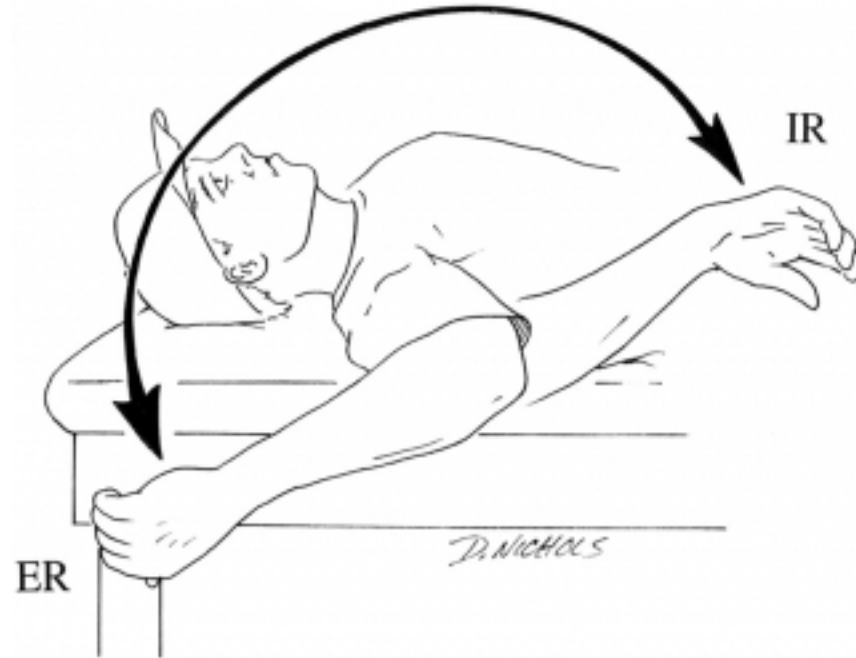
\*\*\*If active ROM is abnormal proceed to passive ROM



# Physical Exam- Range of Motion



External rotation



Internal rotation

Limited passive IR/ER narrows the differential to: Adhesive capsulitis and glenohumeral OA

# Physical Exam- Inspection/Palpation

- Cervical spine, paraspinal muscles
- Scapular spine and adjacent musculature
- Acromioclavicular (AC) joint
- Bicipital groove
- Greater tuberosity of the humerus
  - Insertion site for supraspinatus/infraspinatus



# Case #3

72M presents with 3 weeks of left shoulder pain radiating to mid-upper arm. A few days before pain onset he was taking down Christmas lights. He also reports that the pain wakes him up from sleep

History of chronic left shoulder pain exacerbated by overhead activities

ROM intact, pain with active abduction

TTP over greater tuberosity of the proximal humerus

Empty can is positive for pain, no weakness

# Physical Exam- Rotator Cuff Function

External rotation test



Weakness suggests infraspinatus tendon tear

Strength testing  
should be performed  
with the arms low



Supraspinatus (Empty Can) Test

Weakness suggests supraspinatus tendon tear

Push off or Gerber's test



Weakness suggests subscapularis tendon tear

Remember that pain can  
affect exam yield

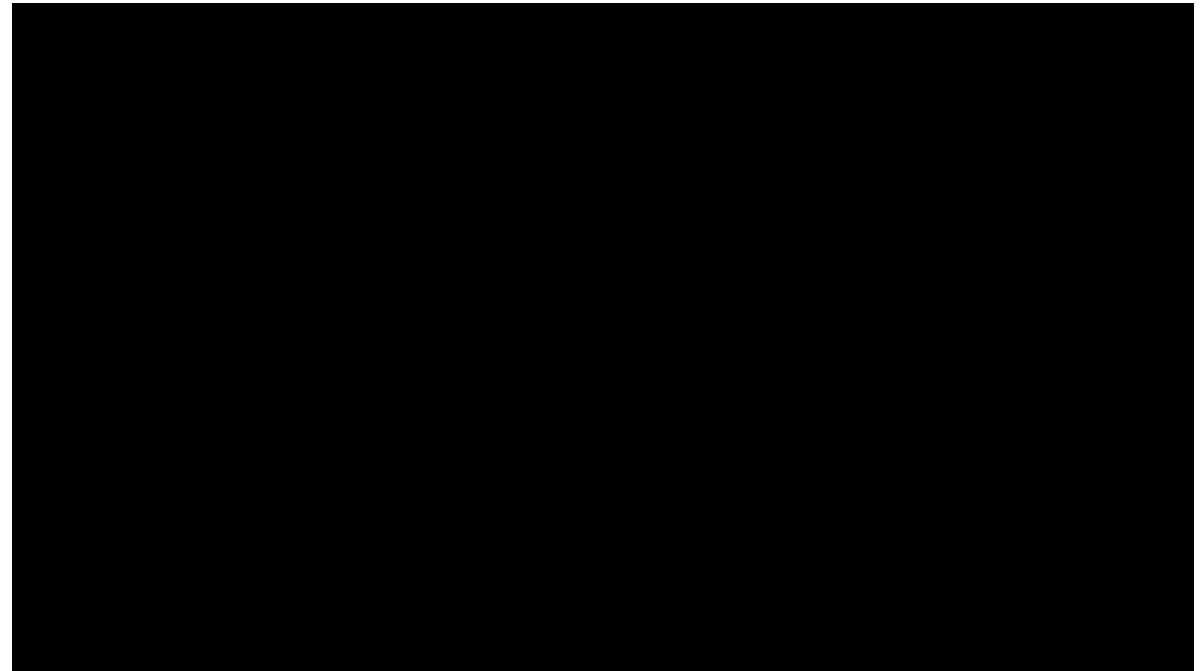
# Physical Exam- Shoulder Impingement

Hawkins Kennedy test for shoulder impingement



Positive if pain is elicited  
Sensitivity for impingement 70-90%

Passive painful arc (Neer) test

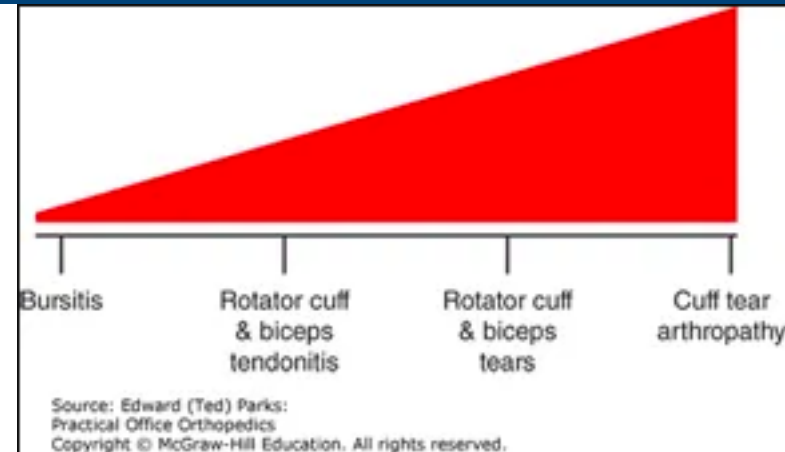


Pain is a sign of subacromial impingement  
Sensitivity for impingement 70-80%



# Shoulder Pathology: Subacromial Impingement

- Continuum of conditions ranging from bursitis to cuff tear arthropathy.
- Chronic impingement of the rotator cuff against the acromion causes the rotator cuff to fray and eventually tear
- Patients typically present with overhead pain that radiates to mid-humerus



# Subacromial impingement- GRASP Trial

RCT assessing the effects of exercise interventions, with or without subacromial corticosteroid injection in patients with shoulder pain attributable to a rotator cuff disorder.

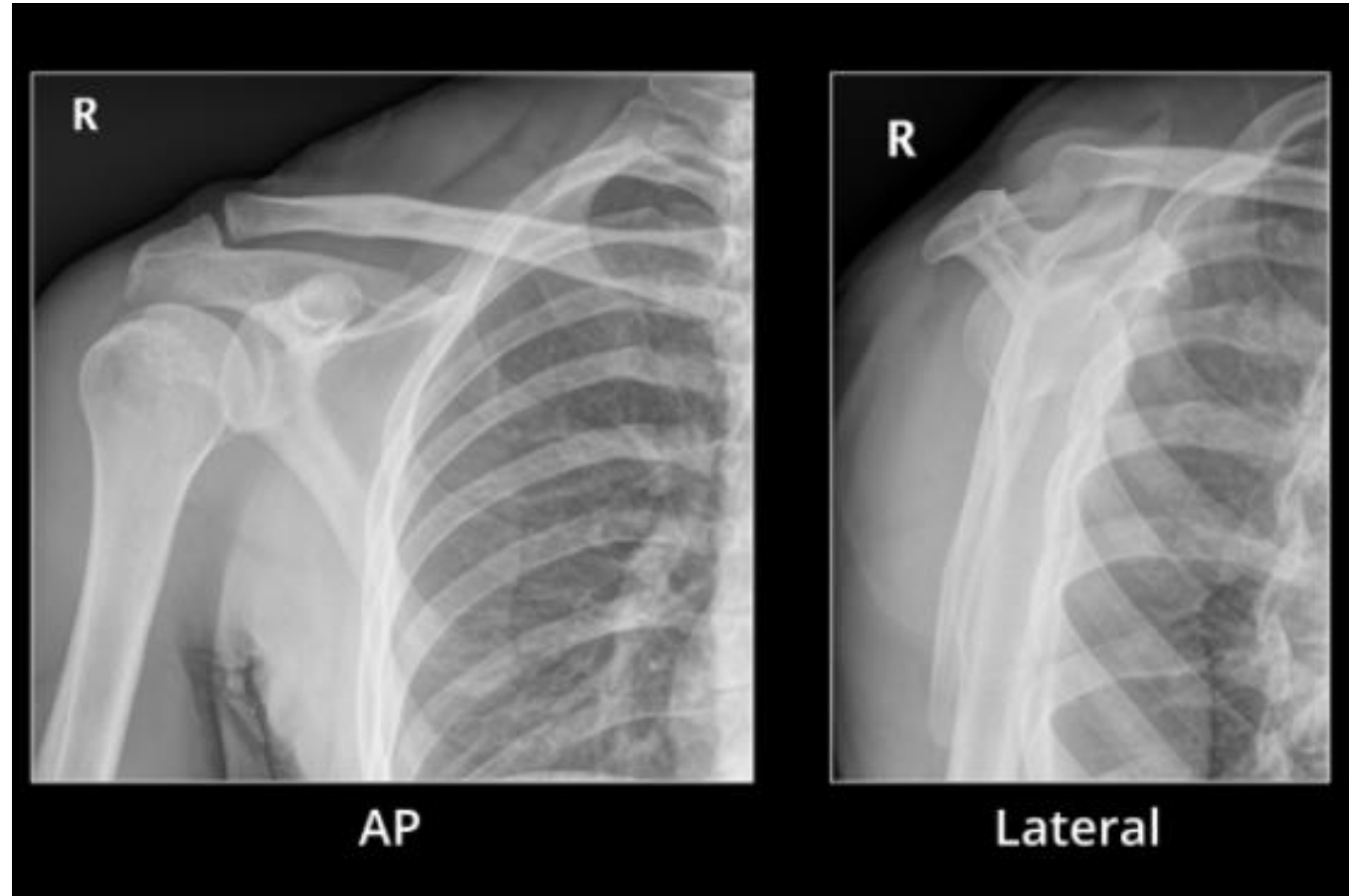
## Takeawa

- ❖ Subacromial corticosteroid injection provides modest short-term but no long-term benefit.
- ❖ Single face-to-face session with a physiotherapist is not significantly different in terms of clinical outcomes when compared with a comprehensive physiotherapy intervention of up to six face-to-face sessions.

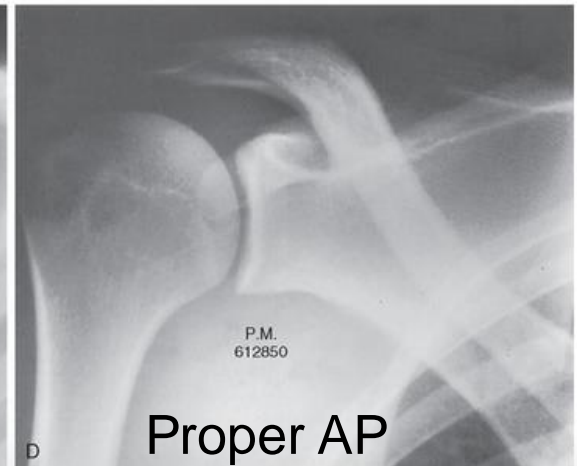
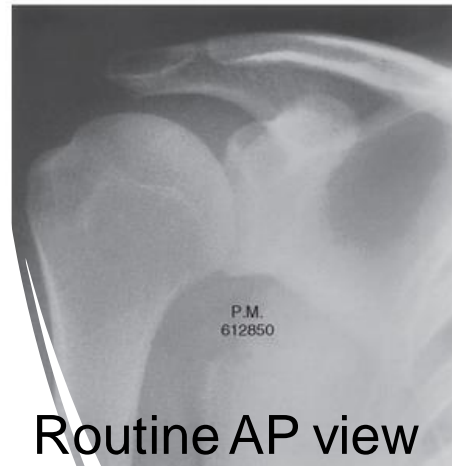
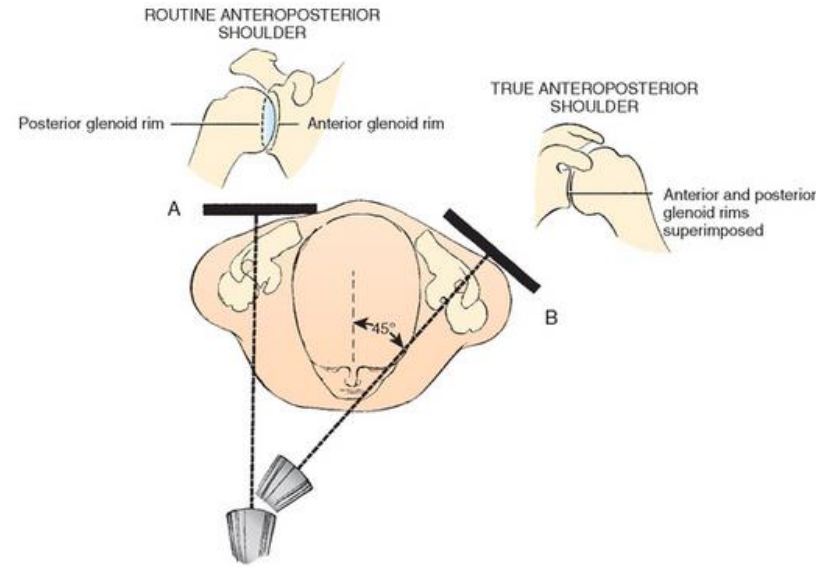
# Shoulder Imaging: Indications

Plain radiographs indicated when:

- History of trauma/injury
- ROM is limited
- Pain limiting exam yield



# Shoulder Imaging: Views



# Case #4

36 year-old right-handed Male with history notable for UC presenting with right elbow pain for at least 4 weeks

Works in water utilities  
"Use hands a lot for work"

Exam notable for TTP over lateral epicondyle, especially with resisted wrist extension



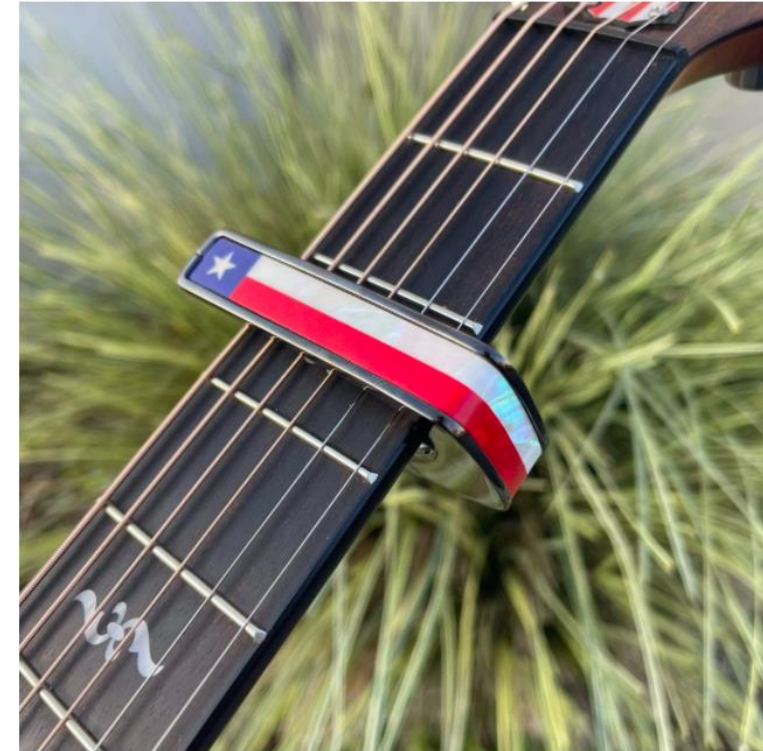
# Lateral/Medial epicondylitis

- Association with workplace ergonomics or overuse
- Tasks that require prolonged wrist extension=Lateral epicondylitis
- Tasks that require prolonged wrist flexion=Medial epicondylitis
- PEX:
  - TTP over affected epicondyle
  - Pain with resisted wrist motion
  - Elbow/wrist/fingers should be straight in full extension



# Lateral/Medial epicondylitis: Treatment

- Stretching (to restore tendon flexibility)
- NSAIDs
- Counterforce brace
  - Per 2020 systematic review and meta-analysis of RCTs counterforce bracing may have better effects on pain in younger people (<45 years old) over the short term (<6 weeks)
  - “Tennis elbow” strap will work for both conditions
- Corticosteroid injection—**Proceed with caution**



# What if your patient can't go to physical therapy?



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## Knee Conditioning Program STRETCHING EXERCISES

### 1. Heel Cord Stretch

#### Repetitions

2 sets of 4

#### Days per week

6 to 7

**Main muscles worked:** Gastrocnemius-soleus complex  
You should feel this stretch in your calf and into your heel

**Equipment needed:** None

#### Step-by-step directions

- Stand facing a wall with your unaffected leg forward with a slight bend at the knee. Your affected leg is straight and behind you, with the heel flat and the toes pointed in slightly.
- Keep both heels flat on the floor and press your hips forward toward the wall.
- Hold this stretch for 30 seconds and then relax for 30 seconds. Repeat.

**Tip** Do not arch your back.

