

## Musculoskeletal Update 2022



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## Objectives

At the end of this session, the participant will be able to:

- Describe diagnostic strategies for common musculoskeletal disorders
- Describe effective approaches in managing musculoskeletal pain
- Describe recent studies on managing women with osteoporosis

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## Diagnosis

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## Useful signs and symptoms for diagnosing hip osteoarthritis (1)

- Rational Clinical Exam Series
  - Well done systematic review
  - Only included level 1 and 2 studies (n=6; 1110 participants)
  - LR+ (good at ruling in) and LR- good at ruling out) are generally modest at best
  - Limitation – only evaluated individual elements and not combinations
  - Best history elements:
    - Medial thigh pain (LR+ 7.8) and age under 60 (LR- 0.11)
  - Best exam findings
    - Posterior hip pain caused by squatting (LR+ 6.1) normal hip passive adduction or abduction (LR-0.3)

Metcalf, JAMA 2019

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## Clinical tests not very useful for diagnosing infraspinatus tendon tears (2)

- 91 adults undergoing shoulder arthroscopy
  - Single expert examiner
  - Examiner and arthroscopists unaware of each others' assessments
  - 19 full thickness tears, 8 partial tears, 64 intact tendons
- LR+ (good at ruling in) and LR- good at ruling out) were generally not very good (best LR+ was 2.25, best LR- was 0.34) for single maneuvers or combinations

Sgroi, Arthroscopy 2019

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## US is accurate in diagnosing upper extremity fractures in children (3)

- Well done SR
  - 32 studies with 2994 children
  - Various gold standards
  - Mixed quality
- Overall accuracy 98%
  - LR+ 21.1 (95% CI 10.8-41.5)
  - LR- 0.05 (95% CI 0.03-0.07)
- Heterogeneity – slightly less accurate for elbow fractures
  - LR+ 7.3 (95% CI 3.7-14.4)
  - LR- 0.06 (95% CI 0.02-0.16)



Tsou, Am J Emerg Med 2021

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### ACP and AAFP Joint Guideline (4)

- Guided by network meta-analysis
- Strong recommendation
  - Start with topical NSAIDs
- Conditional recommendations
  - Oral NSAIDs as second line
  - Acupuncture and TENS – low quality evidence
  - Avoid opioids – low quality evidence

Qaseem, Ann Int Med 2020

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### Placebo relieves LBP in the short term (5)

- RCT of 127 adults with moderate low back pain (average 5/10)
- Told before enrollment that placebo would be used
- Randomized to usual care or usual care plus placebo (Zeebo twice daily for 21 days)
- Average pain scores decreased more in placebo-treated group (0.6 vs. 0.1) – but this difference is not clinically important
- Would have been nice to report the frequency of those experiencing at least a 15% pain reduction

Kleine-Borgmann, Pain 2019

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### Placebo after spine surgery (6)



- Open-label RCT with 51 adults undergoing spine surgery
- Told before enrollment they would get placebo and evaluating the potential for conditioned responses with placebo
- Randomized to standard post-op oral analgesics with opiates or to placebo plus oral analgesics
  - Placebo taken with each dose of analgesics on first day then scheduled for 3 times daily
  - Oral analgesics administered as needed for each group
- Average 17 days of follow up
  - Average pain scores about the same
  - Placebo-treated patients used 15 daily morphine mg equivalents less

Flowers, Pain 2021

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### Single-dose opiates = non-opiates for pain (7)

- RCT in EDs; 600 adults (mostly Latinx) with sprains, strains or fractures (no back pain); average baseline pain 8/10
- Randomized to 1 of 5 combos:
  - 1000 mg acetaminophen with either 400 mg or 800 mg of ibuprofen
  - 300 mg acetaminophen with 30 mg codeine (e.g., Tylenol #3<sup>®</sup>)
  - 300 mg acetaminophen with 5 mg hydrocodone (e.g., Vicodin<sup>®</sup>)
  - 325 mg acetaminophen with 5 mg oxycodone (e.g., Percocet<sup>®</sup>)
- Average pain scores dropped 3 points in each group after 1 hour and 4.3 to 4.7 points after 2 hours
- About 25% in each group needed rescue analgesia
- Nausea or vomiting higher in the opiate-treated patients (NNTH 20)

Bijur, Ann Emerg Med 2021

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### Injections



Stop injecting crap into joints and tendons

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### Corticosteroid injections provide short-term relief in persons with adhesive capsulitis (8)

- Network MA of 30 RCTs (2132 participants)
  - Participants were 50-65 years of age
  - 6 of the studies were of good quality
  - Authors found evidence of publication bias
- Studies evaluated **many** potential therapies
  - Injected, oral, transdermal
  - Corticosteroids, hyaluronate, platelet rich plasma, NSAIDs, collagenase, adalimumab, saline
- Intra-articular steroid injections provided short-term clinically important improvements in pain

Kitridis, Am J Sports Med 2019

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### US-guided steroid injections for frozen shoulder (9)

- RCT at single center with 90 adults with primary frozen shoulder
  - US-guided vs sham US
  - Posterior injection with 40 mg triamcinolone, 4 ml 1% lidocaine, 4 ml saline and 3 ml water soluble contrast dye
- Based on post-injection fluoroscopy, US-guided injections were 100% accurate vs. 71% of controls
- Follow-up at 3, 6 and 12 weeks – each group had clinically important improvements in pain, but the differences were similar as were the measures of mobility and function

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### Multiple steroid injections no better than other injections (10)

- MA of RCTs and observational studies
  - 6 small RCTs for effectiveness-messy reporting
  - 16 RCTs and observational for safety
  - Great variability in condition being treated, the choice of steroids and number of injections
- Authors chose (poor choice) to pool data
- Average pain was better in those receiving multiple injections (0.5 SMD) than in the comparison groups - doubtful clinical importance
- Multiple injections were associated with greater cartilage loss and joint space narrowing and greater risk of joint replacement (these could be an example of confounding by indication)

Ayub, Rheumatology 2021

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### PRP = sham for Achilles' tendinopathy (11)

- Single-blind RCT with 240 adults
  - Platelet rich plasma vs. dry injection
- After 6 months, no difference in
  - Pain
  - Function
  - Activity level
- Adequate power (90%)

Kearney, JAMA 2021

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### PRP=saline for patella tendinopathy (12)

- Single blind RCT with 61 adults
  - US-guided injections of leukocyte-rich platelet-rich plasma, leukocyte-poor platelet-rich plasma or saline
  - 1 week later all began supervised rehab program
- Follow up at 12 weeks was 93% but only 79% after 1 year
- At no point in time was there any difference in the 3 groups on pain, function or patient's global assessment

Scott, Am J Sports Med 2019

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### RESTORE Trial: PRP=placebo for knee DJD (13)

- DB RCT with 288 adults with moderately severe (by Xray) knee DJD
  - 3 weekly PRP or saline injections
- After 12 months
  - Both groups' pain scores improved (borderline clinically important) but the degree of improvement was similar in both groups
  - No difference in cartilage volume (who cares)

Bennell, JAMA 2021

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### Flat flexible shoes vs. stable supportive shoes in knee DJD (14)

- Single-blind RCT with 164 adults with moderate knee DJD
  - Flat flexible shoes (e.g., minimalist shoes like Vivobarefoot or Merrell Bare Access) or stable and supportive shoe (stability walking shoe like Rockport Edge Hill)
  - Participants got to choose the shoe color
- After 6 months of exclusive wear
  - Pain sl better for stable supportive shoe, but not clinically meaningful
  - No report of "responders" vs. non-responders
  - SI more problems identified by flexible shoe wearers

Paterson, Ann Int Med 2021

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### Biomechanical footwear for knee DJD (15)

- Single-blind RCT with 220 adults with knee DJD
  - biomechanical footwear (individually calibrated) or control footwear with same appearance
- After 24 weeks
  - Average pain scores improved in both, slightly greater reduction in the biomechanical footwear group, but net difference was 1.3
  - 50% pain reduction, however, reported by 83% vs 42% of controls
  - NNT=3, 95% CI 1-4
  - No difference in QOL or rescue analgesia use

Reichenbach, JAMA 2020

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### Injuries



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### Below- vs. above-elbow casts in children with forearm fractures (16)

- Unblinded RCT of 66 children with minimally displaced metaphysis fractures of both radius and ulna
  - Randomized to 4 weeks of above or below elbow casts
- After 7.5 years of follow-up (n=51)
  - No difference in function, strength, or appearance

Musters, Acta Orthop 2021

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### Vitamin D supplementation *increases* risk of fall-related fractures in the elderly (17)

- Secondary analysis of data from 2 RCTs
  - 688 community-dwelling elders 70+ years of age, increased fall risk and baseline vitamin D 10-29 ng/mL
  - Randomized to 200 IU/day (control), 1000 IU/day, 2000 IU/day, or 4000 IU/day of vitamin D3
- After 2 years of follow-up
  - More fall-related fractures in higher dose vitamin D than controls (HR 2.66, 95% CI 1.18-6.00)
  - Slightly higher trend (i.e., not statistically significant) to first falls occurring sooner in higher dose group
- Stay tuned

Wanigatunga, JAGS 2021

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### Bottom Lines

- Diagnostic ultrasound is accurate in diagnosing
- Use topical NSAIDs as first line treatment of musculoskeletal pain
- Platelet-rich plasma injections are ineffective.
- Below elbow casts are as effective as above elbow casts in children with uncomplicated fractures of the radius and ulna