

Upper & Lower Extremity Musculoskeletal Exam Techniques: PBL

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Anthony Beutler, MD, FAAFP

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Dr. Beutler practices family medicine and comprehensive primary care sports medicine for the U.S. Air Force, caring for active-duty service members, retirees, and their families in the Washington, DC, area. He is an award-winning educator and teacher, and he and his team recently developed and implemented a new musculoskeletal curriculum for USU's medical school. The author of numerous articles and a textbook, Dr. Beutler has lectured throughout the world. One of his favorite activities is helping family physicians make their musculoskeletal practices more rewarding and profitable.

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Dr. Leggit earned his medical degree from USU and completed his family medicine residency at DeWitt Army Community Hospital, Fort Belvoir, Virginia. He is a retired Army Colonel with more than 25 years of active service in a variety of capacities, and he earned the Bronze Star Medal in Operation Iraqi Freedom. An active educator, researcher, and clinician, Dr. Leggit is a board-certified family physician with a certificate of added qualifications (CAQ) in sports medicine. In addition, he is a key faculty member for the National Capital Consortium's Military Primary Care Sports Medicine Fellowship and he directs USU's musculoskeletal module.

Learning Objectives

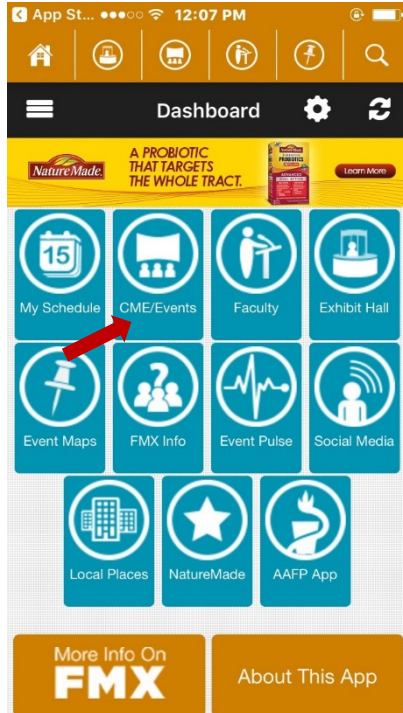
1. Practice applying new knowledge and skills gained from Upper and Lower Extremity Musculoskeletal Exam Techniques sessions, through collaborative learning with peers and expert faculty.
2. Identify strategies that foster optimal management of upper and lower extremity injuries, within the context of professional practice.
3. Formulate an action plan to implement practice changes, aimed at improving patient care.

Associated Sessions

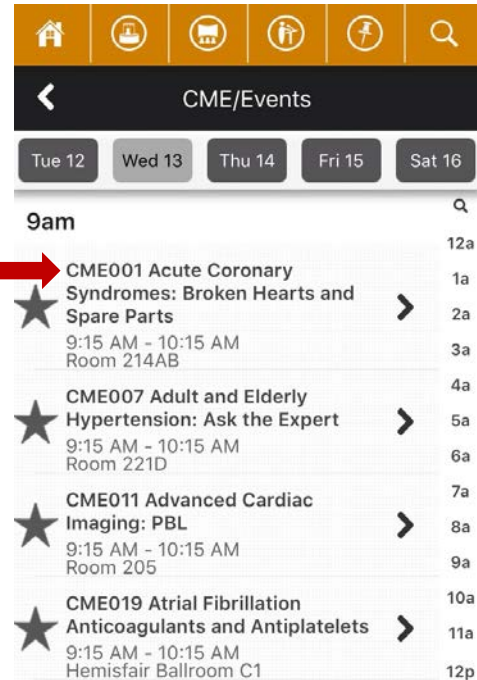
- Upper Extremity Musculoskeletal Exam Techniques: Evidence-Based Treatment of Common Upper-Extremity Injuries
- Lower Extremity Musculoskeletal Exam techniques: Evidence-Based Treatment of Common Lower-Extremity Injuries

Audience Engagement System

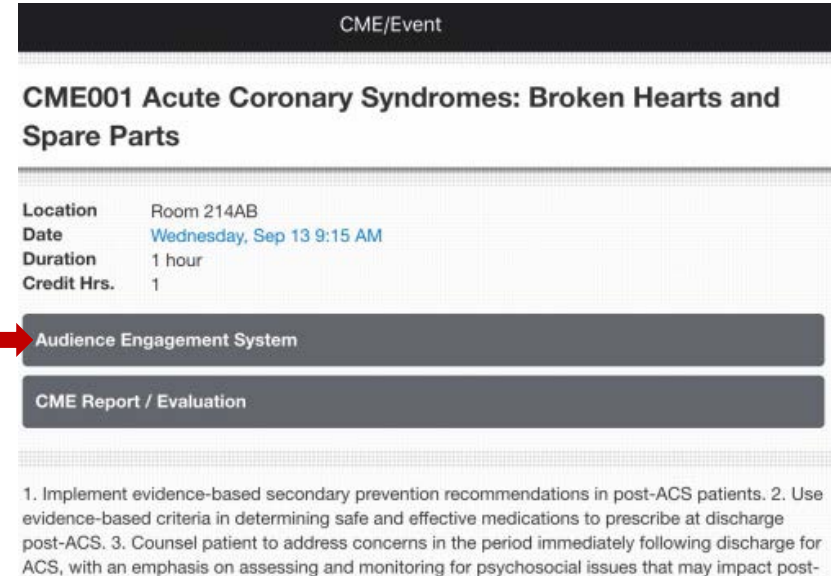
Step 1



Step 2



Step 3



Musculoskeletal Injury PBL

- Case 1
- Case 2
- Questions

Chief Complaint

- “My Shoulder Hurts...”



History of Present Illness



“Bob”

- 48 yo M c/o R shoulder pain
- Sharp pain with overhead movements; “dull ache” after activity; diffuse lateral deltoid location
- No acute trauma
- Started 4 weeks ago and getting worse
- Doing a lot of home improvement projects recently, but no idea how he injured it

Past Medical History

- PMHx: HTN
- Remote PSx: Appendectomy, no shoulder/neck/ortho surgeries

Social History

- Recently retired military
 - Now working as govt contractor (desk job)
 - But real passion is woodworking/carpentry
- Enjoys sports, plays rec softball, occasional basketball when he gets the chance
- Remote tobacco, quit 15 years ago, 2-3 beers per weekend, No drugs

- What is your differential diagnosis of likely causes for Bob's shoulder pain?

Differential Diagnosis

- Rotator cuff tendinopathy
- Degenerative rotator cuff tear
- Subacromial bursitis

- Biceps tendinopathy
- Degenerative labral tear
- Early adhesive capsulitis

- What physical exam tests will be critical in narrowing or correctly ordering your DDx?

Physical Examination

- WN, WN male, NAD
- Normal inspection, no atrophy/deformity
- Painful arc of motion, but full AROM
- No TTP clavicle or AC joint
- 4/5 full can and external resistance strength
- No Ext or Int Rotation lag

- Do you need to order xrays?
 - Yes or No

- Do you need to order an MRI?
 - Yes or No

- What is Bob's likely diagnosis?
- So what is the "Victim" in this case? What anatomic structure is "being injured/victimized?"

- What is the likely culprit causing Bob's rotator cuff pain?

Assessment

Victim: Rotator Cuff

– That's the easy part

Find the Culprit – Where you Earn the \$\$

- Rotator Cuff

– When victim = culprit, then we have a suicide!

- Discuss the relative importance of each of the following treatment recommendations for Bob:
 - Motrin 800mg PO TID for 28 days
 - Rest, ice, compression, and elevation BID
 - Sling for comfort
 - Subacromial steroid injection
 - Rotator cuff and scapular stabilizer strengthening program
 - Acupuncture
 - Massage therapy

Returning to Differential Diagnosis – What Else Could This Be???

- Rotator cuff tendinopathy – Rot cuff strengthening
- Degenerative rotator cuff tear - ??
- Subacromial bursitis

- Biceps tendinopathy - ??
- Degenerative labral tear - ??
- Early adhesive capsulitis

Plan

- Attack most likely Culprit:
 - Rotator cuff and scapular stabilizer strength
- Rotator cuff strengthening program
 - PT referral or Strength Coach or YouTube
- Consider Injection/Acupuncture/Pain relief
- Do NOT order an MRI
 - unless you are considering surgery

<http://hprc-online.org/physical-fitness/rehab>

an open source rehab program

Rx3
REHAB
REFIT
RETURN TO DUTY

Knee Pain: Phase 1

1 LEG STRENGTH EXERCISES 1-4 | 3 SETS
 1. HEAVY SINGLE-LEG SQUAT WITH BACK SUPPORT
 2. STAIRS AND STEPS
 3. USE STIFF SHOES
 4. HOLD BENCH PRESS

2 CORE EXERCISES 1 & 2 | 3 SETS
 1. PLANK WITH ONE LEG
 2. PLANK, PAVLOV EXERCISE

3 CARDIO 15-20 MINUTES
 Use interval cardio, such as hiking, walking, or swimming.

4 STRETCH EXERCISES 1-6 | 1 SET
 1. HEAVY ANTERIOR TIBIAL
 2. HEAVY QUADR FLEXION (SITTING)
 3. HEAVY QUADR FLEXION (STANDING)
 4. HEAVY QUADR FLEXION (STANDING)
 5. HEAVY QUADR FLEXION (STANDING)
 6. HEAVY QUADR FLEXION (STANDING)

Rx3 is a guide to help service members recover from and prevent common musculoskeletal injuries, ultimately improving service members' overall physical fitness.

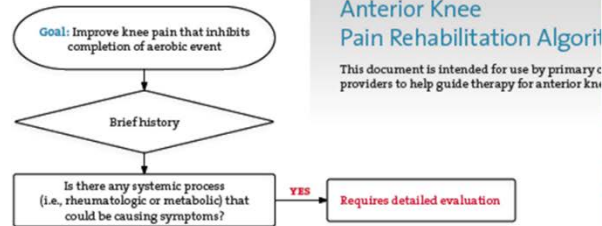
FOR THE SERVICE MEMBER

FOR THE PROVIDER

FREQUENTLY ASKED QUESTIONS



FOR THE PROVIDER: REHABILITATION PROGRAM



Directions for Special Tests

Patellar Glide Test
 With the knee extended and relaxed, move patella medially and laterally. Normal is 1-2 quadrants.

Thessaly Test
 With the patient standing on one leg with knee bent 20 degrees, instruct patient to twist his/her hips/trunk back/forth three times to rotate the femur on the tibia. This will use body weight and rotation to grind the menisci. Patient is allowed to steady him/herself. Pain at the medial or lateral joint line is considered a positive Thessaly test. Pain under

Musculoskeletal Injury PBL

- Case 1
- Case 2
- Questions

Case #2 - Chief Complaint

- “My knees hurt when I run...”



History of Present Illness

“Laura”

- 28 yo F c/o B knee pain during/after runs
- Pain is sharp when running and a “dull ache” after activity
- No trauma
- Has a 60 min drive to work and increased pain while driving and feels like she needs to straighten her knee out
- Hurst going up and down stairs

Past Medical History

- No significant PMHx
- G1P1
 - First baby via C-section 1 year ago
- No medications

Social History

- Paralegal
 - works 30 hours/week now after baby
- Started running regularly 6 weeks ago to get in shape and loose weight
- Never tobacco, 1-2 glasses wine/wk, No drugs (to include OTCs)

Review of Systems

- No swelling, locking of knees
- No other joint complaints
- No unusual fatigue
- No nausea, vomiting, night pain

- She gained 42 lbs with pregnancy and has lost 22 lbs since delivery

What is your differential diagnosis for
Laura's knee pain?

Differential Diagnosis

- Patellofemoral pain syndrome/Anterior knee pain
- Patellar tendonitis/tendinopathy
- Pes anserine bursitis
- Iliotibial band syndrome
- Chondral Injury → Osteoarthritis
- Inflammatory Arthropathies

- What physical exam findings and tests will aid in narrowing your DDx and creating a treatment plan?

Physical Examination

- BMI 29
- Valgus (Knock kneed) Lower Extremity alignment
- B knees no effusion, erythema, no gross atrophy
- No joint line TTP
- + retropatellar TTP
- + increased pain with patellar shrug/Clarke's
- No ligamentous laxity/instability to include patella
- Negative McMurray but some pain under kneecap with Thessaly

- Do you need to order x-rays?
 - Yes or No
- If you said yes, which x-rays and what are you looking for?
- Do you need to order an MRI?

- What is Laura's likely diagnosis?
- So what is the "Victim" in this case? What anatomic structure is "being injured/victimized?"

Assessment

Victim: Patellofemoral Pain Syndrome (PFPS)

– What is PFPS?

PFPS is defined as anterior knee pain in the absence of any other pathologic condition

- What are the three major categories of biomechanical culprits that usually cause patellofemoral pain?

Assessment

Victim: Patellofemoral Pain Syndrome

- That's the easy part

Find the Culprit – Where you Earn the \$\$

- Assess 3 major biomechanical culprits:
 - Muscular weakness
 - Muscular tightness
 - Skeletal malalignment

- Discuss the relative importance of each of the following treatment recommendations for Laura:
 - Rest, ice, compression, and elevation BID
 - Motrin 800mg PO TID for 28 days
 - Knee brace/taping
 - Stop running and switch to elliptical trainer
 - Get new running shoes
 - Hamstring, quadriceps and calf stretching
 - Quadriceps and Core strengthening program

Plan

- Attack most likely Culprit:
 - Muscular strength
- Quadriceps strengthening program
 - Bike or elliptical (forward & backward)
- Core strengthening program
 - PT referral or Yoga, Pilates, Strength Coach etc
- Load Management

<http://hprc-online.org/physical-fitness/rehab>

an open source rehab program

Rx3
REHAB
REFIT
RETURN TO DUTY

Knee Pain: Phase 1

1 LEG STRENGTH EXERCISES 1-4 | 3 SETS

2 CORE EXERCISES 1 & 2 | 3 SETS

3 CARDIO 15-20 MINUTES
Low-impact cardio, such as hiking, walking, or swimming.

4 STRETCH EXERCISES 1-6 | 1 SET

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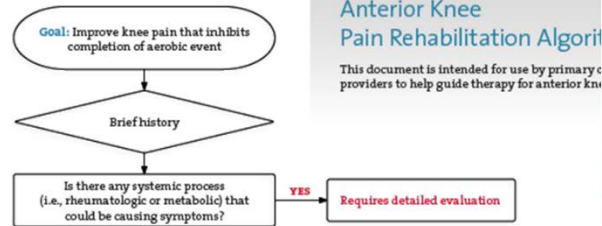
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Practice Recommendations

- Strengthening of the core & kinetic chain is key for rehab/prevention of overuse injury
- Most patients with overuse injury need good rehabilitation program, not surgery

Questions

