Common Musculoskeletal Problems

Jennifer E. Bracey, MD
Assistant Professor of Medicine
Emory University School of Medicine

Objectives
By the end of this lecture, the learner will:
- Be able to develop a framework for using history/physical exam to aid in diagnosis of common orthopedic complaints
- Broaden your differential diagnosis for common musculoskeletal complaints
- Know basic treatment options for common complaints

Why is this important?
- Family and friends are going to ask you about their aches and pains
- Musculoskeletal disorders is one of the most common outpatient complaints seen in the primary care office

Framework
- Go over some common problems
  - Shoulder
  - Elbow
  - Hand
  - Hip
  - Knee
  - Foot
- For each joint
  - Basic anatomy
- For each problem
  - Mechanism
  - Key history
  - Key exam
  - Treatment options

Shoulder Pain
- Rotator Cuff Pathology/Impingement syndrome
- Adhesive capsulitis

Shoulder Pain
Friendly Landmarks:
- Acromion
- AC joint
Rotator Cuff Pathology
- Spectrum of problems
  - Rotator cuff tendonitis
  - Subacromial bursitis
  - Rotator cuff tear
  - Impingement

Rotator Cuff: History
- Repetitive overhead activity
- Night pain
- Weakness, loss of range of motion
- Lateral shoulder pain (deltoid region) exacerbated by overhead activities
- Worse when lying on that side (bursitis)

Physical Exam
Patient’s shoulder is abducted and they are asked to slowly lower arm.
*Positive test if they can’t control movement*

Rotator Cuff Pathology: Mechanism
- Repetitive overhead activity
- Acute injury
- Rotator cuff muscles commonly impinged below the acromion and become painful/inflamed

Rotator Cuff: Exam
- Lateral arm pain
- Pain with active ROM between 60-100 degrees of abduction
- Pain with internal/external rotation
- Common tests to help diagnose impingement/rotator cuff pathology:
  - Drop arm test
  - Hawkins test
  - Empty can sign (supraspinatus)
  - Lift off (subscapularis)

Physical Exam Maneuvers

Hawkins Test
Physical Exam Maneuvers

Lift off test

Rotator Cuff: Treatment

- Bursitis/tendonitis/small rotator cuff tears
  - Activity modification
  - NSAIDs or other analgesic
  - Physical therapy
  - Steroid injection
- Full rotator cuff tear
  (think positive drop arm test!)
  - Refer to orthopedics/imaging

Surgical Referral

- Weakness after an acute injury
- MRI with full thickness rotator cuff tear
- Refractory symptoms after 2-3 months of conservative treatment

Adhesive Capsulitis (Frozen Shoulder)

- Mechanism
  - Capsule thickens, adhesions, less synovial fluid

Adhesive Capsulitis

- History
  - Age > 50
  - Immobility or injury causing decreased ROM
  - Diabetes/thyroid disease.
  - 30% are idiopathic
- Exam
  - Pain
  - Loss of active and passive range of motion
Adhesive Capsulitis: Treatment

- Activity modification/ physical therapy for range of motion exercise.
- Intra-articular steroid injections
- Acetaminophen/NSAIDs
- Surgery referral if no improvement after 6 months

Elbow pain

- Lateral elbow tendinopathy
- Extensors/Tennis
- Medial elbow tendinopathy
- Flexors/Golf

Elbow Tendinopathy (Lateral)

- Mechanism
  - Repetitive elbow activity causing micro tears/apoptosis
  - Tendon is in "watershed zone"- decreased blood supply
- History/Exam
  - Repetitive motion (tennis swing)
  - Tenderness at the lateral epicondyle
  - Pain on resisted wrist extension

Elbow Tendinopathy (Medial)

- Same mechanism
- History/Exam
  - Repetitive motion (golf swing)
  - Tenderness over medial epicondyle
  - Pain with resisted wrist flexion

Elbow Tendinopathy: Treatment

- Initial
  - Rest/Ice/NSAIDs
  - Strengthening exercises
  - Counterforce bracing
  - Almost all improve by 1 year
- Steroid injections
  - Trials small but over last 4-5 years trend towards harm
- Very few people need orthopedic referral

Hand Problems

- Carpal tunnel syndrome
- deQuervain’s tenosynovitis
Carpal Tunnel Syndrome

- **Mechanism**
  - Median nerve entrapment

- **History**
  - Aching pain in wrist with sparing of palm; may radiate to forearm
  - Paresthesias in hand
  - Nighttime pain
  - Repetitive wrist flexion/occupation history
  - If bilateral: Consider pregnancy, diabetes, hypothyroidism

Carpal Tunnel Syndrome Katz Hand Diagram

- **Classic Pattern**
  - Symptoms affect at least 2 of digits 1, 2, or 3. The classic pattern permits symptoms in the fourth and fifth digits, wrist pain and radiation of pain proximal to the wrist, but it does not allow symptoms on the palm or dorsum of the hand.

- **Probable Pattern**
  - Some symptom pattern as classic, except palmar symptoms are allowed unless confined solely to the ulnar aspect. In the posisile pattern, not shown, symptoms involve only 1 of digits 1, 2, or 3.

- **Unlikely Pattern**
  - No symptoms are present in digits 1, 2, or 3.

Carpal Tunnel Syndrome: Exam*

- **Katz hand diagram**
  - Classic/probable (+LR:2.4)
  - Unlikely (-LR:0.2)
  - Hypalgesia (decreased pain in index compared to little finger)
    - +LR:3.1, -LR:0.7
  - Weak thumb abduction
    - +LR:1.8, -LR:0.5
  - Tinel's (tap for tinel's)
    - +LR:1.4, -LR:0.8
  - Phalen's (flex for phalen's)
    - +LR:1.3, -LR:0.7

*From the patient hand carpal tunnel syndrome* JAMA. 2000;283:3110-3117

Carpal Tunnel: Adjunctive Tests

- Diagnosis can typically be made by history/physical alone
- Can order confirmatory tests for those with atypical presentation/intermediate probability
  - Nerve conduction studies (94% specific)
  - EMG (to evaluate primary muscle disorder)
Carpal Tunnel Syndrome: Treatment
- Initial
  - Ergonomics/Rest/NSAIDS
  - Neutral or cock-up wrist splints
  - Carpal tunnel steroid injection
- Later
  - Refer for surgery

deQuervain's Tenosynovitis: Treatment
- Friendly landmark
  - Radial styloid (lateral to radial artery). Anatomic snuffbox
- Mechanism
  - Inflammation of extensor pollicis brevis and abductor pollicis longus tendons
- History
  - Repetitive activity with palm (new parents, cooking, knitting)

Hip Pain
- Osteoarthritis
- Trochanteric bursitis

Hip Landmarks
- Anterior groin pain
  - Hip OA
  - Avascular necrosis
- Lateral hip pain:
  - Trochanteric bursitis
  - IT band
- Posterior/buttock pain:
  - Piriformis syndrome
  - SI joint
  - Lumbar radiculopathy
Hip Osteoarthritis

- **History**
  - Pain in **groin**
  - With walking/weight bearing activity, not at rest (unless advanced)
- **Exam**
  - Pain on internal/external rotation
- **Diag nostic Test**
  - X-ray
- **Treatment**
  - Weight loss/analgesics
  - Hip replacement

Trochanteric Bursitis

- **Mechanism:** gait abnormality
- **History**
  - Lateral hip pain
  - Pain when lying on affected side
- **Exam**
  - Reproducible point tenderness over greater trochanter

Trochanteric Bursitis: Treatment

- **Initial**
  - Heat/passive stretching/NSAIDs
  - Injections for more severe cases/disabling pain
- **Later**
  - TENS/ultrasound
  - VERY FEW need surgery

Specific Tests for Hip Pathology

- **Faber test**
  - Flexion/abduction/external rotation
  - Looking for SI joint pathology
- **Ober’s test**
  - Looking for IT band pathology

Knee Anatomy

Knee Pain

- **Acute Injury**
  - Fracture
  - Anterior cruciate ligament tear
  - Meniscal tear
- **Bursitis**
  - Prepatellar
  - Anserine
- **Patellofemoral syndrome**
Acute Knee Injury

Ottawa Knee Rules

- X-ray if any are present
  - Age > 55
  - Isolated tenderness of patella
  - Tenderness at head of fibula
  - Inability to flex to 90°
  - Inability to bear weight immediately after injury and in clinic/ER

Cruciate Ligament Injury

- ACL more common
- Mechanism/History
  - Twisting/pivoting injury with a pop
  - Acute swelling
  - Gives out
- Exam
  - Lachman test/Anterior drawer sign
  - Urgent Ortho referral
  - Do NOT splint

ACL Exam Techniques

Anterior Drawer  Lachman Test

Meniscus Injury

- Mechanism/History
  - Sudden twisting, cutting, pivoting or decelerating injury
  - Effusion usually develops over 24 hours after injury
  - Clicking, locking, catching
- Exam
  - McMurray test
- Treatment
  - Rest/ice/PT/NSAIDS
  - Routine referral to ortho

Meniscus Injury: Exam

- McMurray Test

Knee Bursitis

- Prepatellar:
  - Mechanism: repetitive kneeling
  - History/Exam: anterior knee pain, swelling
Knee Bursitis

- Pes anserine:
  - Mechanism: Caused by gait abnormality
  - History/Exam: medial pain, worsens with activity and at night.

- Treatment
  - Rest/ice/NSAIDs
  - Steroid injection
  - Eliminate direct pressure on bursa

Patellofemoral Syndrome “Runner’s Knee”

- Mechanism
  - Patella malalignment/overuse
  - Abnormal force generation and distribution during patella movement
  - Weak quadriceps/hip abductors

- History
  - Anterior knee pain
  - Younger age
  - Worse going down stairs, squatting, prolonged sitting, running
  - Ask about changes to training routine - increased mileage

Patellofemoral Pain

- Exam
  - Lateral patella tracking “J sign”
  - Imbalance between medial/lateral forces

- Treatment
  - Modifying activity!
  - Physical therapy - quad strengthening/hip abductors
  - Little data for knee taping/bracing

Ankle/Foot Pain

- Ankle injury
  - Plantar fasciitis
  - Morton’s neuroma

Ankle Injury

- Mechanism and History
  - Inversion injury most common of sprain
  - Causes varying degrees of ligamentous tear
  - Pain/swelling
  - Inability to bear weight

Ankle Injury: Exam

- Squeeze test: pain in anterior tibiofibular ligament
- Anterior drawer test: excessive anterior displacement of the talus on the tibia
When to X-ray? Ottawa Ankle Rules

<table>
<thead>
<tr>
<th>Lateral view</th>
<th>Medial view</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Fracture edge or diastasis medialis</td>
<td></td>
</tr>
<tr>
<td>B. Fracture edge or diastasis medialis</td>
<td></td>
</tr>
</tbody>
</table>

A foot x-ray series is required only if there is any pain in medialis or any of these findings:
- Bone tenderness at A
- Bone tenderness at B
- Inability to bear weight immediately and in emergency department

Ankle Sprain: Treatment
- Protection + RICE/analgesics
- Use crutches until able to bear weight
- Early rehab
- Return to strenuous physical activity is based on severity (Grade I-III)
- Treatment of grade III controversial (casting)

Plantar Fasciitis
- **Mechanism**
  - Tendinopathy: collagen degeneration at insertion of plantar fascia at the calcaneus
- **History**
  - Severe heel pain with the first few steps on awakening
- **Exam**
  - Point tenderness at insertion

**Plantar Fasciitis Treatment**
- Initial
  - Rest/proper training
  - Calf stretching
  - Proper footwear
  - Orthotics
  - Steroid injections
  - Most improve but can take up to 2 years

Morton’s Neuroma
- **Mechanism**
  - Swelling/scar tissue formation of distal nerves
  - Usually from ill-fitting shoes or abnormal bone structure
- **History**
  - Burning pain in the ball of the foot usually between 3rd and 4th toe
- **Exam**
  - Reproducible by squeezing metatarsals together or applying pressure in the web space

**Morton’s Neuroma Treatment**
- Initial
  - Avoid tight shoes
  - Metatarsal pad/orthotics
- Refer
  - Steroid injection
  - Surgical decompression if conservative measures fail after 9-12 months
Resources

- American Academy of Family Physicians: www.aafp.org
- Annals of Internal Medicine: In the Clinic Series
- JAMA rational clinical exam
- American Academy of Orthopedic Surgeons: www.aaos.org
- Permission received from MMG to use images

Question 1

34 y.o. female without significant PMH presents with R thumb/wrist pain x 1 week. She recently became a new mother. On exam she has a positive Finkelstein’s test. What is the most appropriate initial treatment?

Answers:
- a. Thumb spica splint
- b. Orthopedic referral
- c. Cock-up wrist splint
- d. Physical therapy referral
- e. Opiates for pain control

Question 2

65 y.o. male with PMH systolic heart failure and GERD presents to the office with L hip pain x 1 month. Describes it as lateral hip pain that is worse when he sleeps on that side. Mild relief with acetaminophen. On exam- full ROM hip, negative faber and ober’s test. +TTP over L greater trochanter. What is the proper treatment for this patient?

Answers:
- a. NSAIDs
- b. Steroid injection
- c. TENS
- d. Surgery referral
- e. Ultrasound therapy from physical therapy

Answers

- Question 1: a
- Question 2: b