Objectives:

- Recognize common upper extremity sports injuries
- Discuss prevention strategies
Background

• Increase in youth sport participation
  – 2 million high school injuries annually

• Risk factors for injury
  – Intrinsic
  – Extrinsic

Shoulder: Acute Injuries
Clavicle Fracture

• Mechanism of injury
  – Fall on point of shoulder
  – Fall on outstretched hand
  – Direct force

• Presentation
  – Severe pain
  – Guarding
  – Difficulty carrying affected arm

Evaluation
  – Deformity
  – Neurovascular examination
  – Imaging?
• Management
  – Sling
  – Sleep
  – Pain medication
  – Rehabilitation
    • Range of motion
    • ADLs

[Image courtesy of HubPages]

• Orthopedic surgery referral
  – Significantly angulated fracture
    • Severe tenting of skin
    • Neurovascular compromise
    • Persistent pain
    • Failure to form callus
    • Fracture location

[Image courtesy of FRPMED]
Acromioclavicular (AC) Sprain

• Mechanism of Injury
  – Blow to top of shoulder
  – Fall on lateral or posterior shoulder

• Presentation
  – Pain on top of shoulder

Picture courtesy of Axon Physio & Acupuncture

• Evaluation
  – Swelling
  – Tenderness
  – Step-off
  – Range of motion
  – Scarf test
  – Imaging
  – Rockwood classification

Picture courtesy of Osce Skills
Rockwood Classification

<table>
<thead>
<tr>
<th>Degree</th>
<th>Description</th>
<th>Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st</td>
<td>Extension of the acromioclavicular ligaments</td>
<td>Orthopedic treatment</td>
</tr>
<tr>
<td>2nd</td>
<td>Break of the acromioclavicular ligaments</td>
<td>Orthopedic treatment</td>
</tr>
<tr>
<td>3rd</td>
<td>Break of the acromioclavicular and coracoclavicular ligaments</td>
<td>Orthopedic treatment</td>
</tr>
<tr>
<td>4th</td>
<td>Break of the acromioclavicular and coracoclavicular ligaments Acromioclavicular joint separations with posterior movement of the clavicle</td>
<td>Surgery treatment</td>
</tr>
<tr>
<td>5th</td>
<td>Break of the acromioclavicular and coracoclavicular ligaments Acromioclavicular joint dislocations</td>
<td>Surgery treatment</td>
</tr>
<tr>
<td>6th</td>
<td>Break of the acromioclavicular ligaments Subcoracoid type</td>
<td>Surgery treatment</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table courtesy of Journal of Medicine and Life

• Management
  – Sling
    • Grade I: 2-3 days
    • Grade II: 1-2 weeks
  – Ice
  – Rehabilitation exercises
    • Range of motion
    • Strengthening

Picture courtesy of Dr. David Geier and Sports Medicine Simplified
• Orthopedic surgery referral
  – Grade III or higher injury

Glenohumeral Dislocation

• Mechanism of Injury
  – Shoulder abducted and forcefully externally rotated and extended
  – Fall on outstretched arm
  – Blow to posterior shoulder

• Presentation
  – Severe discomfort
  – Generalized weakness
• Evaluation
  – Gross deformity
  – Crepitus?
  – Neurologic evaluation
    • Axillary nerve
  – Imaging

• Management
  – Shoulder reduction
    • Hippocratic method
      [Link](https://www.youtube.com/watch?v=cvCHi7pzNSs)
    • Sitting method
    • Prone method
  – Imaging
  – Sling
  – Rehabilitation
• Orthopedic surgery referral
  – Fracture of clavicle or humerus
  – Bankart lesion
  – Persistent pain

Brachial Plexus Injury
(“Burner” or “Stinger”)

• Mechanism of Injury
  – Traction most common
  – Compression

• Presentation
  – Immediate burning pain down arm
    • Dysesthesia
    • Numbness
    • Weakness

Picture courtesy of The Radiology Assistant

Picture courtesy of AAFP
• Evaluation
  – Rule out C-spine injury
  – Neurological exam
  – Imaging
    • Plain films
    • MRI
  – Consider nerve conduction study

• Management
  – Rest
  – Observation
  – NO physical therapy

Picture courtesy of Happy News
Shoulder: Overuse Injuries

Recurrent Subluxation or Dislocation

• Mechanism of Injury
  – Position of abduction and external rotation

• Presentation
  – Describe shoulder “popping” or “popping out”
• Evaluation
  – Atrophy of deltot and trapezius
  – Weak rotator cuff
  – Load and shift test: https://www.youtube.com/watch?v=0edignSiNGs
  – Apprehension test: https://www.youtube.com/watch?v=IfPLBFgYbCg
  – Radiographs

• Management
  – Rotator cuff strengthening
  – Physical therapy
  – Remove offending agents
  – Shoulder brace

• Orthopedic surgery referral
  – Operative stabilization as treatment option
Impingement Syndrome

- Mechanism of Injury
  - Supraspinatus tendon pinched between humeral head and acromion with abduction

- Presentation
  - Pain
  - Similar to rotator cuff tendonitis

- Evaluation
  - Demonstrate multidirectional instability
    - Load and shift test
    - Impingement tests
      - Kennedy-Hawkins
      - Neer impingement test
  - MRI?
• Management
  – Similar to rotator cuff tendinitis
  – Relative rest
  – Pain medication
  – Strengthening

Physiolysis of the proximal humerus
(Little League Shoulder)

• Mechanism of Injury
  – Repetitive throwing

• Presentation
  – Pain worsening with throwing
  – Insidious onset
• Evaluation
  – Tender to deep palpation proximal upper arm
  – Slightly decreased ROM
  – Mild weakness
  – Radiographs

Picture courtesy of OrthoInfo

• Management
  – Conservative
  – Throwing cessation
  – Radiographs
  – Rotator cuff strengthening
Elbow: Acute Injuries

Elbow Fracture

- Presentation
  - Diffuse swelling
  - Limited range of motion

- Evaluation
  - Diffuse swelling
  - Limited range of motion
  - Imaging

Picture courtesy of Medscape
• Management
  – Splint
  – Sling

• Orthopedic surgery referral
  – Neurovascular compromise
  – Significant deformity
  – Supracondylar fracture

Elbow Dislocation

• Mechanism of Injury
  – Fall on outstretched hand

• Presentation
  – Pain
  – Gross deformity
• Evaluation
  – Neurologic exam
  – Vascular exam
  – Sensory exam
    • Ulnar nerve most commonly affected

• Management
  – Reduction
    • May worsen injury
    • Parvin technique
  – Repeat exam
    • Median nerve injury
  – Imaging
  – Splint and Sling
  – Hospitalization

Picture courtesy of Emergency Medicine News
Elbow: Overuse Injuries

Medial Epicondylitis
(Little League Elbow)

• Mechanism of Injury
  – Throwing with valgus stress on elbow

• Presentation
  – Insidious onset
  – Medial elbow pain

Picture courtesy of BaseballChiro.com
• Evaluation
  – Mild soft tissue swelling
  – Tender to palpation
  – Normal range of motion
  – Valgus stress testing
  – Tinel test
  – Imaging

Picture courtesy of HandLab

• Management
  – REST
  – Ice
  – Education
    • Pitch counts
Wrist Injuries

Carpal Bone Fractures

• Mechanism of Injury
  – Fall on outstretched hand

• Presentation
  – Swelling
  – Tender to palpation
    • Scaphoid: anatomic snuffbox

Picture courtesy of AAFP
• Evaluation
  – Swelling and tenderness
  – Imaging

• Management
  – Thumb spica cast

Prevention

• Modify risk factors
  – Intrinsic
    • Strengthening to correct deficiencies
    • Optimize mechanics
  – Extrinsic
    • Activity modification

• Education
In Summary

• Most upper extremity injuries are due to overuse

• Rest and activity modification are crucial for recovery

• Education is critical to help prevent injury