**EVALUATION OF THE SHOULDER/ELBOW IN THE EMERGENCY DEPARTMENT SUMMARY HANDOUT**

**Anatomy**

* Bones: clavicle, scapula/acromion, humerus, ulna, radius
* Ligaments: AC, annular ligament of radius
* Cartilage: glenoid/labrum
* Tendons: rotator cuff, biceps, triceps, extensor and flexor tendons of forearm
* Nerves: axillary, musculocutaneous, median, radial, ulnar
* Arteries: axillary, brachial, radial, ulnar

**Radiographs**

* AP, Y-view, and axillary x-rays are standard for shoulder.
* AP and lateral x-rays are standard for elbow. Note anterior humeral and radiocapitellar lines.

**Physical exam**

* Inspection
* Palpation
* Range of motion
* Strength
* Neurovascular exam
* Special tests

[Link to ACEP Sports Medicine Section physical exam demonstration videos](https://www.acep.org/how-we-serve/sections/sports-medicine/musculoskeletal-exam-series/)

**Pathological conditions**

* Sternoclavicular Sprain
  + Pain/swelling at the SC joint
  + Treatment is conservative
* Anterior Sternoclavicular dislocation
  + Medial clavicle is palpable and prominent (cosmetic deformity)
  + Treatment is conservative
* Posterior Sternoclavicular dislocation
  + Medial clavicle is less visible and sunken
  + May be life-threatening with impingement of mediastinal contents (CT-angiogram chest)
  + Requires ortho consult in the ED
* Clavicle Fractures
  + Ortho consult in the ED for open fracture, neurovascular injury, or skin tenting
  + Prox 1/3: Treatment is conservative
  + Mid 1/3: may require OR fixation with risk factors for nonunion
  + Distal 1/3: types IIa & IIb require OR fixation
* Scapula Fractures
  + Usually 2/2 high impact trauma. Assess for other injuries.
  + OR fixation for significant/displaced articular fractures of the glenoid, acromial fractures associated with a rotator cuff tear, some coracoid fractures
* AC Joint Injuries
  + Ortho consult in the ED for open fracture, neurovascular injury, or skin tenting
  + Type I & II: Treatment is conservative
  + Type III & IV: trial of conservative treatment 🡪 OR fixation
  + Type V & VI: OR fixation
* Anterior Glenohumeral Dislocation
  + Most common type; at risk with arm abduction, extension, and external rotation
  + XR and ortho referral if first occurrence
  + Associated with rotator cuff tears, Hill-Sachs deformity, and Bankart lesion
* Posterior Glenohumeral Dislocation
  + At risk with internal rotation and adduction, and associated with seizures
  + Y-view and Axillary XR help with diagnosis 🡪 lightbulb sign and trough line sign
* Inferior Glenohumeral Dislocation
  + At risk with hyperabduction
  + Patient presents with arm fully abducted and hand on/behind their head
* Subacromial Impingement Syndrome
  + Progressive disease over 3 stages, due to repetitive overhead use of the arm
  + Positive Neer and Hawkins tests
  + Treatment is conservative
* Rotator Cuff Tears
  + Acute vs. Chronic (more common)
  + Partial (more common) vs. Full thickness
  + Treatment is conservative unless fail conservative treatment, full thickness, or NV injury
* Calcific Tendinitis
  + Pre-calcific 🡪 Calcific 🡪 Resorptive (most painful) 🡪 Post-calcific
  + Treatment is conservative +/- US-guided needle lavage
  + Shoulder dysfunction for several months
* Adhesive Capsulitis or Frozen Shoulder Syndrome
  + 4 stages of progressive pain and limited ROM
  + Treatment is conservative without immobilization; PT is crucial
  + If symptoms persist >6 months 🡪 closed manipulation under general anesthesia
* Osteoarthritis
  + Gradual and progressive pain, worse with activity, better with rest
  + Treatment is conservative
* Thoracic Outlet Syndrome
  + Arterial vs. Venous vs. Nervous compression proximal to shoulder
  + Elevated arm stress test and Adson’s test
  + Treatment is conservative
* Proximal Humerus Fractures
  + Neer classification: Treatment is conservative for 1-part fragment
  + Ortho consult in ED for 2-part, 3-part, and 4-part fragments
* Humeral Shaft Fractures
  + Transverse, oblique, and spiral fractures
  + Angulation >20º, shortening >3cm, or NV injury 🡪 ortho consult in the ED
* Disorders of Biceps Tendon
  + Tendinitis, Subluxation, Partial or Complete Rupture
  + Speed’s test, uppercut test, active compression test, and US helpful for diagnosis
  + Treatment is conservative
* Biceps Tendon Rupture
  + Proximal (Popeye sign) vs. Distal (Reverse Popeye sign)
  + Biceps squeeze test, hook test, and XR to rule out avulsion fractures of shoulder/elbow
  + Treatment is conservative if patient is older, less active, injury is at nondominant arm, patient can tolerate not having full arm function
* Triceps Tendon Rupture
  + Modified Thompson test and XR to rule out avulsion fractures of elbow
  + Treatment is conservative if patient is older, less active, injury is at nondominant arm, patient can tolerate not having full arm function
* Lateral Epicondylitis or Tennis Elbow
  + Tenderness over the lateral epicondyle
  + Pain with resisted wrist extension, digit extension, and forearm supination
  + Treatment is conservative
* Medial Epicondylitis or Golfer’s Elbow
  + Tenderness over the medial epicondyle
  + Pain with resisted wrist flexion and forearm pronation
  + Treatment is conservative; Ulnar neuropathy requires ortho referral
* Olecranon Bursitis or Student’s Elbow
  + Swelling and pain over olecranon, full passive ROM, decreased active ROM
  + Aspiration to rule out infection and microcrystalline disorder
  + Treatment is conservative
* Elbow Dislocation
  + Assess the brachial a., ulnar n., and median n.
  + Terrible triad (elbow dislocation, radial head fx, coronoid fx), irreducible, neurovascular compromise, instability, fractures, open dislocations 🡪 ortho consult in ED
* Radial Head Subluxation or Nursemaid’s Elbow
  + Child 1-4 years old with Hx of being pulled up by wrist
  + Closed reduction by hyperpronation method vs. supination/flexion method
* Radial Head Dislocation
  + Infants or children unwilling to use that arm- often delayed presentation/diagnosis
  + Look for radiocapitellar line on XR; look for ulna fracture to r/o Monteggia’s F-D
  + Closed reduction with distal axial tension with pressure on radial head
* Supracondylar Fractures
  + Extension-type vs. Flexion-type
  + More common in children than adults
  + Look for sail sign in radiographically-occult fractures
  + Displaced fractures must be reduced and require urgent ortho consult
  + Neurovascular compromise, open fracture, or irreducible fracture 🡪 ortho consult in ED
  + High incidence of anterior interosseous n. injury (test with “OK” sign)
* Epicondyle Fractures
  + Medial more common than lateral
  + Little League Elbow is an atraumatic medial epicondyle avulsion fracture from throwing activity
  + High-energy injuries, open fractures, unstable joints, significant fragment displacement, intraarticular fragment, or ulnar neuropathy 🡪 ortho consult in ED
* Condyle Fractures
  + Lateral more common than medial
  + Displaced fx or neurovascular compromise 🡪 ortho consult in ED
* Trochlea and Capitellum Fractures
  + Often associated with other injuries
  + Treatment is conservative
  + Complications: limited ROM, elbow joint instability, AVN, nonunion, and arthritis
* Coronoid Fractures
  + Often associated with posterior elbow dislocation
  + Treatment is conservative
  + Displaced fx or joint instability require urgent ortho consult
* Olecranon Fractures
  + Often associated with other injuries
  + Stable, nondisplaced fractures with intact extensor function can be treated conservatively. All other olecranon fractures require surgical repair.
* Radial Head Fractures
  + Most common fracture of the elbow amongst adults
  + Often associated with other injuries, including Essex-Lopresti fracture
  + Look for sail sign in radiographically-occult fractures
  + Treatment is conservative
* Ulna Fractures
  + Nightstick fracture: fx from raising forearm in defense of a strike
  + Treatment is conservative
  + >50% displacement, >10% angulation, involve the prox 1/3 of ulna 🡪 ortho referral
  + Monteggia’s Fracture-Dislocation: fx of prox 1/3 of ulna with radial head dislocation
* Radius Fractures
  + Classified as Proximal 2/3 radial fracture (less common) vs. Distal 1/3 radial fracture
  + Displaced fx 🡪 ortho consult in ED
  + Galeazzi’s Fracture-Dislocation: distal 1/3 fx + dislocation of distal radioulnar joint