The Elbow

- Central link in the kinetic chain of the UE
- Intersection of 3 bones:
  - Humerus
  - Radius
  - Ulna

Dutton, 2012. pg. 407
The Elbow

- Allows for height and limb adjustments in order for one to position their arm correctly for functional purposes

Magee, 2008. pg. 361
The Elbow

- Compound synovial joint
  - Ulnohumeral (trochlear) joint
  - Radiohumeral joint
  - Superior radioulnar joint

Magee, 2008. pg. 361
Lateral Epicondylitis

- “Tennis Elbow”
  - Repetitive overuse of the wrist extensors that leads to tendonitis of the origin of the extensor carpi radialis brevis tendon

- Common complaints:
  - Pain with palpation of the lateral epicondyle
  - Pain with active or resisted wrist extension
  - Pain with grasping objects with the affected hand

Shankman, 2011. pg. 422
Treatment for Lateral Epicondylitis

- Relative rest
- Pain medicine as prescribed by physician
- NSAIDS
- Protection from unwanted stressors
- Modalities as needed (ice massage, phonophoresis, iontophoresis, ultrasound)
- Bracing may be necessary

Shankman, 2011. pg. 422
Physical Therapy Intervention

- Gentle, static stretching to maintain mobility
- Modalities as indicated
- Strengthening
  - Eccentric loading

Shankman, 2011. pg. 423
Medial Epicondylitis

- “Golfer’s Elbow”
- Occurs less frequently than lateral epicondylitis with a 7:1 ratio
- Overuse condition affecting the pronator teres, flexor carpi radialis, flexor digitorum sublimis and flexor carpi ulnaris
- Pain with resisted wrist flexion and full passive wrist extension as well as palpation

Shankman, 2011. pg. 424
Fractures of the Elbow

- Distal Humeral (Supracondylar) Fractures
- Intercondylar Fractures
- Radial Head Fractures
- Olecranon Fractures
# Supracondylar Fracture

## Type I
- Most common
- Result of a fall on an outstretched arm
- Results in distal humeral fragment being displaced posteriorly

## Type II
- “Flexion injury”
- Occurs after direct trauma to the posterior aspect of the elbow
- Results in the distal humeral fragment being displaced anteriorly
Complications following Supracondylar Fractures

- Mal-union
- Non-union
- Joint contracture
- Vascular compromise
  - Volkmann’s Ischemic contracture – occurs when the fracture particles are displaced causing a hemorrhage beneath the fascia producing an ischemic injury that obstructs both arterial and venous flow
    - Could result in permanent fibrosis, muscle degeneration, and a claw-like hand

Shankman, 2011. pg. 427
Symptoms of Volkmann’s Ischemic Contracture

- Severe pain in the forearm
- Limited/painful finger movement
- Prominent veins of the hand with discoloration (purple)
- Initial paraesthesia followed by loss of sensation
- Loss of radial pulse and eventually loss of capillary return
- Pallor, anesthesia, and paralysis

Shankman, 2011. pg. 427
Intercondylar Fractures

- Result of fall or direct trauma to the elbow
- Extend between the conyles of the humerus and involve the articular surfaces of the elbow joint
  - Type 1: non-displaced fracture between the 2 condyles
  - Type 2: displaced fracture without rotation of fragments
  - Type 3: a displaced fracture with a rotational deformity
  - Type 4: severely comminuted fracture with significant separation of the two condyles

Shankman, 2011. pg. 428
Treatment of Intercondylar Fractures

- Type 1: immobilization x 3 weeks
- Types 2 and 3: Open Reduction Internal Fixation
- Type 4: Open Reduction Internal Fixation vs. “Bag of Bones” technique
- “Bag of Bones” technique: using a collar and cuff sling, the elbow is flexed as far as edema/soft tissue will allow, gravity will assist the freely hanging elbow to obtain as much reduction of the fracture as possible.

Shankman, 2011. pg. 429
Radial Head Fractures

- Results from a fall on an outstretched arm
- Represents one third of all elbow fractures and 20% of all elbow trauma
- Classified into 4 types:
  - Type 1: a non-displaced fracture
  - Type 2: a marginal fracture with displacement
  - Type 3: a comminuted fracture of the entire radial head
  - Type 4: any radial head fracture with elbow dislocation

Shankman, 2011. pg. 430
Olecranon Fractures

- Commonly result after a fall directly onto the olecranon process
- Can occur indirectly from a forceful contraction of the triceps
- Categorized as displaced vs. non-displaced

Shankman, 2011. pg. 430
Elbow Dislocations

- The elbow is the second most frequently dislocated joint in the body
- Occurs most often in men with 60% of dislocations being the non-dominant arm
- Posterior dislocations are the most common with anterior dislocations making up 1-2% of injuries
- 10% of all dislocations will occur with radial head fractures

Shankman, 2011. pg. 431
Myositis Ossificans

- **Traumatic**: calcifications that develop within the site of an injured muscle following trauma
- **Progressive**: inherited condition where the ossification occurs without injury that typically follows a specific pattern
  - Typically starts at the neck and back and progresses into the trunk and extremities
Medial Valgus Stress Overload

- Occurs at the capsulo-ligamentous structures as a result of repetitive valgus stress to the elbow
- Patient will complain of pain of the medial aspect of the elbow and the posterior aspect of the olecranon
- On assessment, the patient will demonstrate ulnar collateral ligament laxity

Shankman, 2011. pg. 425
Special Tests for the Elbow
Cozen’s Test

- Resistive Tennis Elbow Test: The patient sits with the examiner stabilizing the involved elbow while palpating the lateral epicondyle.
- With a closed fist, the patient pronates and radially deviates the forearm and extends the wrist against the examiner’s resistance.

Cook, 2013. pg. 233
Cozen’s Test

- Pain along the lateral epicondyle or objective muscle weakness as a result of pain would be a positive result indicative of lateral epicondylitis.
Golfer’s Elbow Test

- The patient sits and makes a fist on the involved side while the tester faces the subject and palpates along the medial epicondyle while grasping the patient’s wrist.
- The tester then passively supinates the forearm and extends the elbow and wrist.
- Considered positive for possible medial epicondylitis if the patient reports pain along the medial epicondyle.

Konin, 2006. pg. 84
Varus Stress Test

- The patient sits with the test elbow flexed to 20-30 degrees and the tester stands with their distal hand around the subject’s lateral wrist and the proximal hand over the subject’s medial elbow.
- With the wrist stabilized, the tester applies a varus stress to the elbow with the proximal hand.

Konin, 2006. pg. 99
Varus Stress Test

- When compared to the uninvolved elbow, lateral elbow pain and/or increased varus movement with a diminished or absent end point is indicative of damage to the radial collateral ligament.
Valgus Stress Test

- The patient sits with the test elbow flexed to 20-30 degrees while the tester stands with the distal hand around the subject’s medial wrist and the proximal hand around the subject’s lateral elbow.
- With the wrist stabilized, the tester applies a valgus stress to the elbow with the proximal hand.
Valgus Stress Test

- When compared to the uninvolved elbow, pain in the medial aspect of the elbow and/or increased valgus movement with a diminished or absent endpoint may be indicative of damage to the medial collateral ligament.
Tinel’s Sign

- The patient is seated with the elbow in slight flexion and the examiner stands with the distal hand grasping the patient’s lateral wrist.
- With the wrist stabilized, tap the ulnar nerve in the ulnar notch between the olecranon process and medial epicondyle with the index finger (proximal to the cubital tunnel).

Cook, 2013. pg. 225
Tinel’s Sign

- Tingling along the ulnar nerve distribution of the forearm, hand, and fingers is indicative of ulnar nerve compromise (cubital tunnel syndrome).
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