

ORTHO REVIEW

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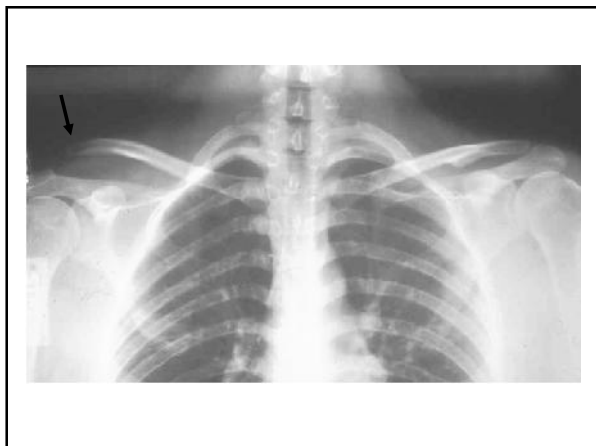
Today's Topics

- ☐ Shoulder
 - Overuse
 - Dislocations
 - Fractures
- ☐ Elbow
 - Dislocation
 - Overuse
- ☐ Wrist/Hand
 - Fractures
 - Overuse
- ☐ Spine
 - Alignment
 - Overuse
- ☐ Hip
 - Fractures
- ☐ Knee
 - Traumatic injury
- ☐ Ankle/Foot
 - Sprain
 - Fracture
- ☐ Infections
 - Osteomyelitis

Acromioclavicular (AC) Joint Separation

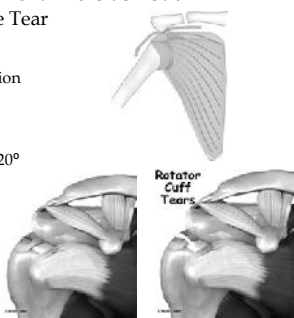
- ☐ Injury to the ligaments that stabilize the acromion, clavicle and coracoid
- ☐ Fall on the point of the shoulder
- ☐ Exam
 - Tender over AC joint
 - Clavicle may be ballotable (Grade II and III)
 - Increased pain with crossover and pulling down arm
- ☐ Treatment
 - Ice and sling
 - PT



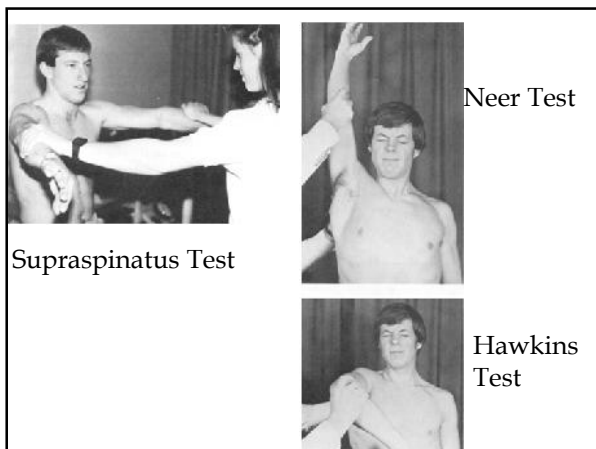


Rotator Cuff Injuries

- ▣ Continuum of Impingement - Bursitis - Strain - Partial Tear - Complete Tear
- ▣ History
 - Repetitive overhead motion
- ▣ Symptoms
 - Diffuse anterior pain
 - Pain worse in arc of 60-120°
- ▣ Exam
 - Impingement tests
- ▣ X-ray
 - Shape of Acromion
- ▣ MRI



The complex block contains three anatomical diagrams. The top diagram shows a lateral view of the shoulder with the rotator cuff muscles (supraspinatus, infraspinatus, teres minor, and subscapularis) highlighted. The middle diagram shows a superior view of the shoulder joint with the rotator cuff muscles and the acromion. The bottom diagram shows a superior view of the shoulder joint with the rotator cuff muscles and the acromion, with the text 'Rotator Cuff Tears' written above it.



The complex block contains three photographs of a man performing physical examination tests. The top-left photo is labeled 'Supraspinatus Test' and shows the man's right arm abducted and rotated. The top-right photo is labeled 'Neer Test' and shows the man's right arm flexed at the elbow and rotated. The bottom photo is labeled 'Hawkins Test' and shows the man's right arm flexed at the elbow and rotated.

Rotator Cuff Injuries

Treatment

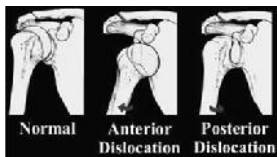
- Rest
- Sub-acromial injection
- Rehab
- Surgical repair



Shoulder Dislocations (Gleno-Humeral injuries)

2 Types

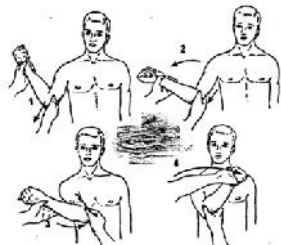
- | | |
|--|---|
| <ul style="list-style-type: none"> ▣ <u>Anterior</u> - most common ▪ ABduction/Ext Rot ▪ 98% of all dislocations ▪ Sulcus sign | <ul style="list-style-type: none"> ▣ <u>Posterior</u> ▪ ADduction/Int Rot ▪ Seizures, electrocutions ▪ Must get a lateral X-ray |
|--|---|



Shoulder Dislocations (Gleno-Humeral injuries)


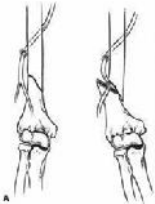
Treatment

- Reduction - modified Kocher method
 - Must do a pre and post-reduction neuro exam
- Surgery



Humerus Fracture

- ▣ Easy to manage because of large ROM of shoulder
- ▣ Hanging traction vs. IM Rod
- ▣ Try to prevent stiffness of the elbow
- ▣ Injury to the radial nerve



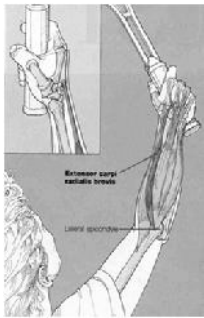
Lateral Epicondylitis (Tennis Elbow)

Anatomy

- Wrist Extensor attachment

Causes

- Repetitive wrist extension
- Repetitive gripping



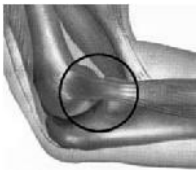
Lateral Epicondylitis (Tennis Elbow)

Signs and Symptoms

- Pain with wrist extension
 - ▣ Shaking hands
 - ▣ Extension of middle finger against resistance
- Tender over lateral epicondyle

Treatment

- Rest
- PT
- Compression wraps



NURSEMAIDS ELBOW Radial Head Subluxation

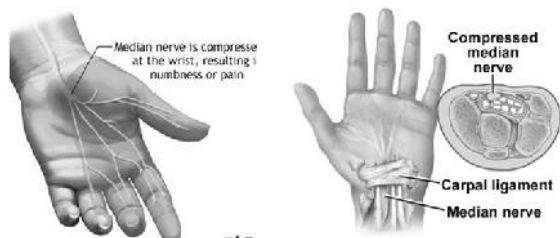


NURSEMAIDS ELBOW Radial Head Subluxation

Treatment

- Reduction by extension, supination, then flexion (can put pressure over radial head to feel for “clunk”)
- Child feels relief almost immediately and starts using the arm
- Educate parents about lifting child from under the arms

Carpal Tunnel Syndrome (CTS)

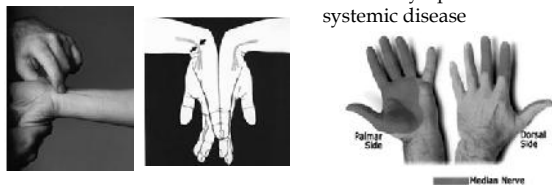


Major Factors Causing CTS

- ☐ Repetitive wrist/finger movement
- ☐ Forceful loading of tendons in carpal tunnel
- ☐ Extreme wrist flexion/extension
- ☐ Vibration
- ☐ Non-occupational factors
 - Diabetes
 - Connective Tissue Dz
 - Pregnancy
 - Mal-union of a wrist fracture
 - Anatomically small carpal tunnel

Carpal Tunnel Syndrome

- ☐ Signs
 - Positive Phalens test (flexion)
 - Positive Tinel's test (tap)
 - Positive compression test
 - >6mm 2-point discrimination
- ☐ Symptoms
 - Numbness (worse in AM)
 - ↓ Grip
 - ↓ Thumb-finger opposition
 - Thenar atrophy
- ☐ Bilateral symptoms think systemic disease




CTS Treatment

- ☐ Conservative Approach
 - Activity Modification
 - NSAIDS
 - Splinting
 - Injection
- ☐ Surgical Decompression
 - Open
 - Endoscopic Technique



DeQuervain's Stenosing Tenosynovitis


- Anatomy - First Dorsal Compartment of the Wrist
 - AbPL
 - EPB



- Causes
 - Repetitive gripping or extension of the Thumb

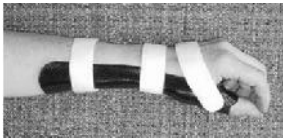
DeQuervain's Stenosing Tenosynovitis

- Signs and Symptoms
 - Tenderness
 - Positive Finkelstein test
 - Must differentiate from Scaphoid (navicular) tenderness and CMC arthritis



DeQuervain's Stenosing Tenosynovitis

- Treatment
 - Splint
 - Ice
 - PT
 - NSAID's
 - Cortisone injection
 - Surgical decompression



Distal Radius Fracture

- ❑ Colles' and Smith's fracture
- ❑ Fall on the outstretched hand
- ❑ Obvious deformity on exam
 - Dinner fork deformity - Colles'
- ❑ Re-establish proper alignment

Humerus
Radius
Ulna
Colles' fracture

Flexion fracture of the radius (Smith's fracture)

Extension fracture of the radius (Colles' fracture)


Colles' Fracture

Distal Radius Fracture Treatment


- ❑ Short arm cast (4-6 weeks) vs. closed reduction vs. External fixator vs. ORIF
- ❑ ROM of fingers and elbow
- ❑ Consider PT/OT

Boxer's Fracture

- ▣ Fracture of the 5th MC neck (not base)
- ▣ Can accept 40° of dorsal angulation
- ▣ Treatment
 - Ulnar Gutter Splint
 - MCP flexed at 60°
 - 4-6 weeks





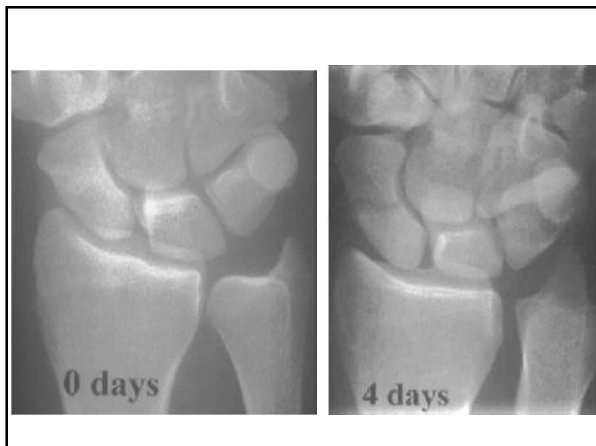
Boxer's Fracture



Scaphoid Fracture

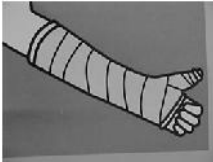
- ▣ History
 - Fall on outstretched hand
- ▣ Exam
 - Snuffbox tenderness
- ▣ X-ray
 - May be negative at first
- ▣ Complications
 - AVN





Scaphoid Fracture

- ☐ Repeat X-ray in 7-10 days
- ☐ May get CT or MRI
- ☐ Treatment
 - Thumb spica cast or splint for 8-10 weeks



Scoliosis

- ☐ $> 10^\circ$ curve as measured by Cobb angle
- ☐ 3-D deformity that includes:
 - Curvature in the coronal plane
 - Kyphosis or lordosis in the sagittal plane
 - Rotation in the axial plane
- ☐ Adolescent Idiopathic Scoliosis (AIS)
 - Most common type
 - 9-10 y/o female
 - Found on school screening
 - Change in appearance
 - Uneven shoulders, hips, skin folds
 - Asymptomatic and painless

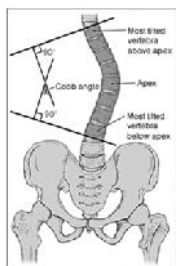
Scoliosis - Physical Exam

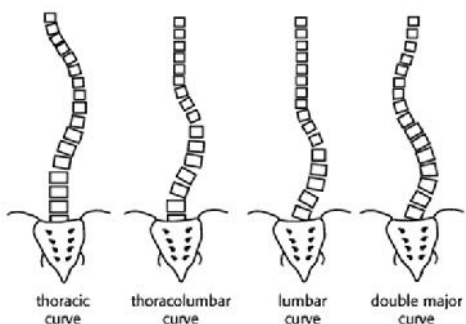
- ☐ Adams forward bend test
 - Look for a rib or muscle prominence
 - Looking at rotation only



Scoliosis X-Rays

- ☐ Full column PA and lateral standing films, shoes removed, on single long cassette
- ☐ Determine type of curve
- ☐ Grade severity
 - Cobb angle
- ☐ Evaluate skeletal maturity
 - Risser sign





Scoliosis - Treatment Options

- ☐ Options are observation, bracing and surgery
- ☐ Treatment generally depends on the age of the patient and the severity and risk for progression of the curve
- ☐ The following table serves as a guideline for treatment based on the spinal curvature:

Curve Degree	Treatment Options
<20 degrees	Observation
20-40 degrees	Bracing
>40 degrees	Surgery

Lumbar Spinal Stenosis Syndrome (LSSS)

- ☐ Low back pain when ambulating or extending the lower back (walking downhill)
- ☐ Relieved when lying, sitting or squatting or bending forward
- ☐ Bilateral radicular leg pain
- ☐ Positive "shopping cart" sign
- ☐ Different than vascular claudication pain
 - Symptoms with walking a predictable distance and relieved by stopping and standing

LSSS Treatment

- ☐ NSAIDS, Lumbar corset
- ☐ Physical Therapy- lumbar flexion program
- ☐ Epidural steroid injections (may have up to 3 per year)

Degenerative Disc Disease

- ☐ Low back pain increased with prolonged sitting and activity
- ☐ Pain relieved with extension
- ☐ Radicular leg pain
- ☐ Physical Therapy - lumbar extension program

Herniated Disc (HNP)

- ☐ History of lifting something heavy
- ☐ +/- back pain
- ☐ Unilateral radicular leg pain
- ☐ Numbness/tingling



Herniated Disc (HNP)

- ☐ Treatment
 - ~80% get better on their own
 - Laminotomy/Discectomy



Hip Fractures

- ▣ Presentation
 - Lying on the gurney with a externally rotated and slightly shortened leg
- ▣ Types
 - Subcapital, Femoral Neck, Basilar Neck, Inter-trochanteric, Sub-trochanteric
- ▣ Treatment
 - Pinning vs Hemi-arthroplasty

Hip Fractures



ACL Tear

Mechanisms of Injury

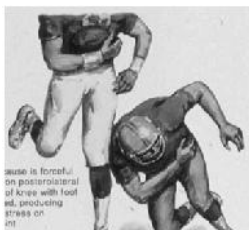
- Valgus Injuries
- Pivoting Injuries

Diagnosis


- Physical Examination
 - Lachman, Anterior Drawer
 - **Acute** (1-2 hours) Bloody Effusion
- MRI

Treatment

- Non-surgical vs. Surgical




Associated with medial meniscal tear and MCL rupture - "Bloody Triad"



Anterior drawer test
With patient's knee bent 90°, knee 90° flexion
The examiner pulls the tibia forward while the patient
is lying on his back with the knee flexed at 90°.
The normal amount of anterior displacement is
less than 10 mm.

Anterior Drawer



Lachman's test
With patient's knee bent 30°-50°, examiner's hands grasp
the tibia and femur and pull them apart.

Lachman's

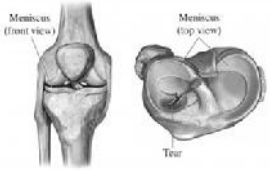
Meniscal Injuries

Diagnosis

- History
 - Twisting injury
 - Effusion over 1-2 days
- Exam
 - Joint line tenderness
 - McMurray's or Apley Grind Test
- MRI

Treatment

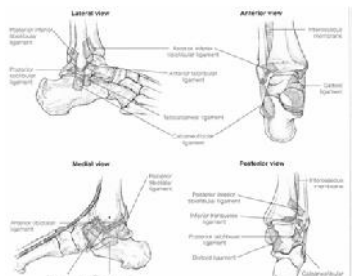
- Arthroscopic repair vs. meniscectomy



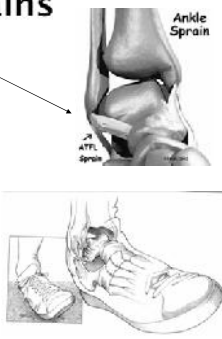
Meniscus (front view) Meniscus (top view)
Tear

Ankle Sprains

Inversion - most common
Eversion



Labels in diagrams: Lateral view, Anterior view, Medial view, Posterior view, Ankle Sprain, ATFL Sprain.

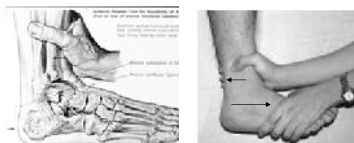


Ankle Sprain
ATFL Sprain

Ankle Sprains

PE Findings

- Drawer test



- Talar tilt test



Ankle Sprains

Diagnosis

- Grades I-III based on severity

Grade	Ligament Injury	Symptoms	Sign
I	Stretch	Pain Swelling	Able to walk Unable to run
II	Partial Tear	Pain Swelling Bruising	Pain with walking
III	Tear	Pain Swelling Bruising	Unable to walk

Ankle Sprains

Treatment

- ▣ - Early Mobilization
- - Use RICE treatment acutely
- - Ankle Rehab
 - Flexibility
 - Strength
 - Proprioception



Ankle Xrays

- AP, Lateral, Mortise view
- Follow Ottawa Ankle Rules (OAR)
- ▣ Get an X-ray for:
 - Malleolar pain and tenderness
 - Inability to bear weight for 4 steps
- Swelling is NOT a reliable guide to the presence of a fracture

Ankle X-Ray



Jones Fracture

- ▣ Stress fracture
- ▣ Transverse fracture through the base of the 5th MT
- ▣ 1-2 cm from the proximal tip
- ▣ Short-leg cast vs. ORIF
- ▣ High incidence of nonunion

Jones Fracture



Osteomyelitis

- ▣ *Bacterial infection of the bone*
- ▣ Pathogens
 - Staph aureus - MOST COMMON
 - Salmonella in children with sickle cell disease
 - Pseudomonas after puncture wounds (animal bites)

Osteomyelitis

- Symptoms - Vary by age
- Localized bone pain
 - Fussiness and fever
 - Swelling, warmth and erythema of the overlying tissue
 - Decreased movement of the affected extremity (pseudo paralysis in infants, refusal to walk or limp in older children)

Osteomyelitis

Radiographic findings:

- Remember:
 - Radiographic findings lag behind infection by 1-2 weeks
 - Bone scan is most sensitive for detecting early osteomyelitis
- Plain film findings:
 - Blurring or obliteration of soft tissue fat planes (the earliest sign)
 - Elevation of the periosteum (pus) with periosteal reaction
 - Cortical destruction and endosteum scalloping
 - Eventually a sequestrum and involucrum may develop

Summary

<ul style="list-style-type: none"> ▫ AC joint dislocation <ul style="list-style-type: none"> ▪ Fall on point of shoulder ▫ Rotator Cuff <ul style="list-style-type: none"> ▪ Pain with overhead activity ▫ Humerus Fx <ul style="list-style-type: none"> ▪ Radial N. injury ▫ Tennis Elbow <ul style="list-style-type: none"> ▪ Pain with wrist extension ▫ Nursemaids <ul style="list-style-type: none"> ▪ Picture 	<ul style="list-style-type: none"> ▫ CTS <ul style="list-style-type: none"> ▪ Phalens, Tinels, thenar atrophy ▫ DeQuervain's <ul style="list-style-type: none"> ▪ + Finkelsteins ▫ Colles' Fx <ul style="list-style-type: none"> ▪ FOOSH, dinner fork ▫ Boxers Fx <ul style="list-style-type: none"> ▪ Ulnar gutter splint ▫ Scaphoid Fx <ul style="list-style-type: none"> ▪ Snuff box tenderness
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Summary

<ul style="list-style-type: none"> ▫ Scoliosis <ul style="list-style-type: none"> ▪ Cobb angle ▫ LSSS <ul style="list-style-type: none"> ▪ + shopping cart sign ▫ HNP <ul style="list-style-type: none"> ▪ Unilateral leg pain ▫ Hip Fx <ul style="list-style-type: none"> ▪ Shortened externally rotated leg ▫ ACL <ul style="list-style-type: none"> ▪ Acute bloody effusion 	<ul style="list-style-type: none"> ▫ Meniscus <ul style="list-style-type: none"> ▪ Non-bloody effusion over 1-2 days ▫ Ankle Sprain <ul style="list-style-type: none"> ▪ Inversion, ATFL ▫ Ankle Fx <ul style="list-style-type: none"> ▪ Mortise widening ▫ Jones Fx <ul style="list-style-type: none"> ▪ Non-union ▫ Osteomyelitis <ul style="list-style-type: none"> ▪ Staph A.
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