ACOFP 52nd Annual Convention
& Scientific Seminars

Lecture: Practical Approaches to Common Musculoskeletal Conditions in Primary Care

Warren A. Bodine, DO, CAQSM

The Cosmopolitan of Las Vegas
March 12-15, 2015 | Las Vegas, Nevada
39.5 Category 1-A CME credits anticipated • Includes 15 pre-con credits beginning on March 11

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Name of CME Activity: ACOFP 52nd Annual Convention and Scientific Seminars

Dates and Location of CME Activity: March 12-15, 2015, The Cosmopolitan Las Vegas, Nevada
Lecture: Practical Approaches to Common Musculoskeletal Conditions in Primary Care
Saturday, March 14, 2015 9:00-10:00 am

Name of Faculty/Moderator: Warren Bodine, DO, CAQSM

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Signature: Warren Bodine **Date:** 12/23/14

Warren Bodine, DO, CAQSM

Please fax this form to ACOFP at **866-328-1835** or email to joank@acofp.org as soon as possible

Deadline: Monday, January 12, 2015

Practical Approaches to Common Musculoskeletal Conditions in Primary Care

Warren A. Bodine, DO CAQSM

ACOFP's 52nd Annual Convention & Scientific Seminar

Director of Sports Medicine at the Greater Lawrence Family Health Center

Instructor-Harvard Medical School

Assistant Professor-Tufts University School of Medicine

Objectives

- Participants will be able to identify common musculoskeletal conditions seen in primary care
- Participants will differentiate conditions that can be managed in an outpatient setting versus those requiring orthopedic referral
- Participants will organize the physical examination to meet the needs of their patients

Most Commonly Billed Musculoskeletal Conditions

- Cervical Disorder
- Back Pain with radiation
- Pain in Limb
- Osteoarthrosis, unspecified
- Fibromyalgia/myositis
- Rotator Cuff/shoulder syndrome unspecified
- Synovitis/tenosynovitis, unspecified
- Arthropathy, unspecified

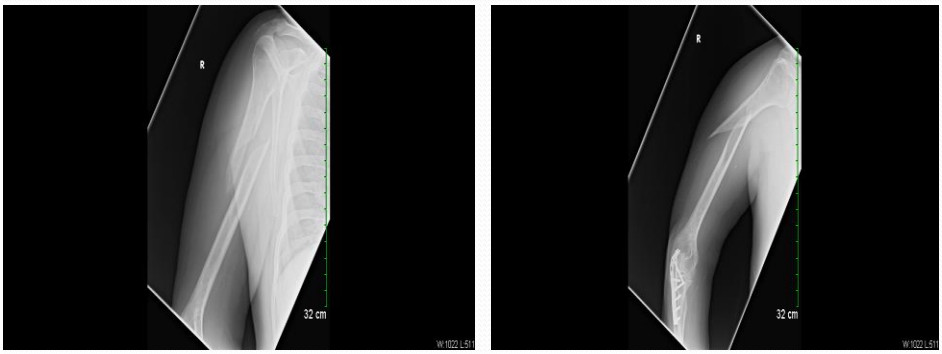
*From: www.aafp.org/fpm/**icd9**/**icd9**-long.xls*

Body Areas We will Cover Today

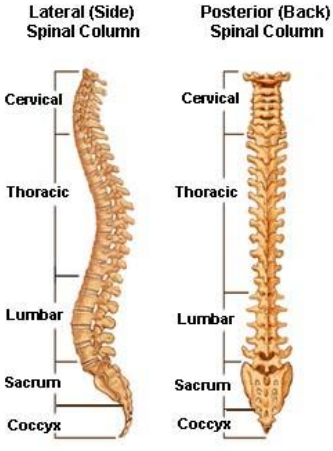
- Cervical Spine
- Lumbar Spine
- Shoulder
- Elbow
- Hand/Wrist
- Knee
- Foot/Ankle

Musculoskeletal Examination Overview

- ***I***nspection
- ***P***alpation
- ***A***ctive Range of Motion
- ***S***trength
- ***S***pecial Testing

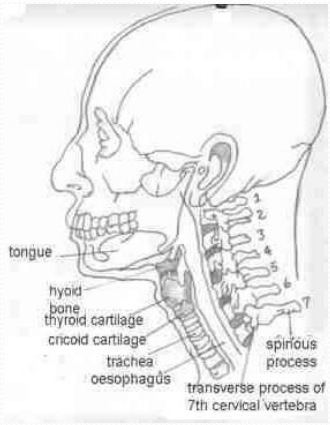


Spine Anatomy



- Cervical – 7 vertebrae
- Thoracic – 12 vertebrae
- Lumbar – 5 vertebrae
- Sacrum – 5 segments
- Coccyx

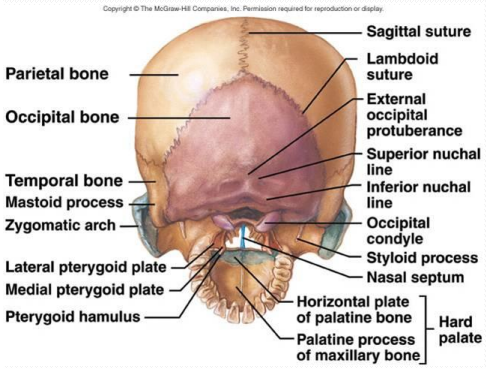
Cervical Spine Bony Examination



Anterior Neck

- Hyoid bone – C3
- Thyroid cartilage – C4-5
- First Cricoid ring – C6

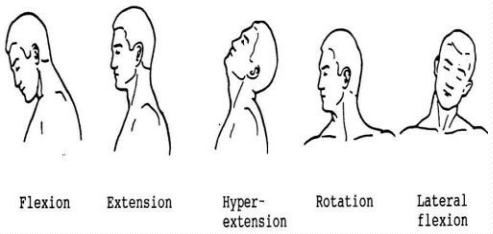
Cervical Spine Bony Examination



Posterior

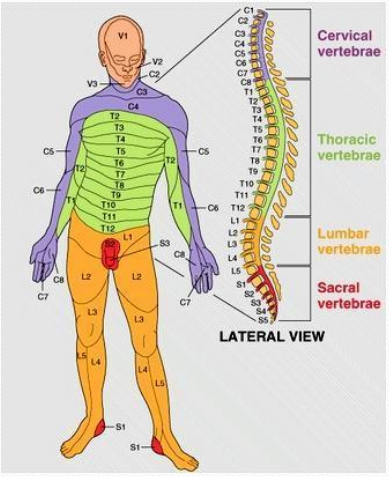
- Occiput
- Inion – (External Occipital Protuberance)
- Superior Nuchal Line (small transverse ridge on both sides of inion)
- Mastoid Processes (lateral to superior nuchal line)
- Spinous Processes

Cervical Spine Range of Motion



- Flexion ROM: chin is within 3-4 cm of chest(**80 degrees)**
- Extension ROM: **70 degrees**
- Rotation ROM: **75 degrees** each direction
- Sidebending ROM: **30-40 degrees**

Cervical Spine Sensory Exam

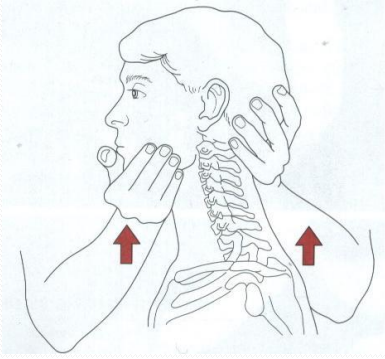


- Sensory Distribution
  - C2-3-anterior neck/clavicle (supraclavicular nerve)
  - C5 – lateral arm (axillary nerve)
  - C6 – lateral forearm, thumb, index, and half of middle finger (sensory branches of the musculocutaneous nerve)
  - C7 – middle finger (median nerve)
  - C8 – ring and little fingers, medial forearms (medial antebrachial-cutaneous nerve from the posterior cord)
  - T1 – medial arm (medial brachia cutaneous nerve from the posterior cord)

Cervical Spine

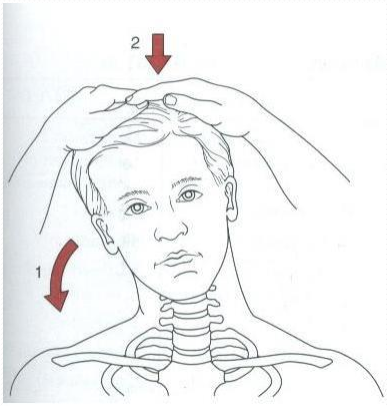
- Motor Levels
  - Shoulder Abduction – C5
  - Wrist Extension – C6
  - Wrist Flexion – C7
  - Finger Extension – C7
  - Finger Flexion – C8
  - Finger Abduction – T1
- Reflexes
  - Biceps – C5
  - Brachioradialis – C6
  - Triceps – C7
  - Reflexes

Cervical Spine Special Tests



- Distraction Test
  - Effect of neck traction
  - Relief of symptoms indicates foraminal compression of nerve root

Cervical Spine Special Test



- Spurlings Maneuver
  - Narrowing neural foramina
  - Pressure on the facet joints
  - Radiating pain to the upper extremities after applying gentle, firm pressure to the head with the head rotated and extended indicates nerve root compression
  - ***Sensitivity 30-50%;Specificty 74-93%***

Cervical Spine Special Tests

- Adson Test
  - Subclavian Artery
  - Feel the radial pulse at the wrist while you abduct, extend, and externally rotate the arm. Have the patient take a deep breath and turn his/her head toward the arm being tested

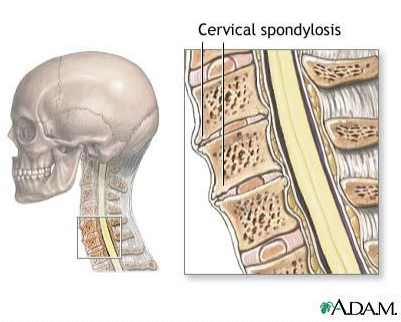
Cervical Spine Special Tests

- Roo's Test
  - Test for thoracic outlet syndrome
  - Patient sits with arms abducted 90 degrees and elbows flexed 90 degrees
  - Patient opens and closes hands for 3 minutes, positive if symptoms develop

Cervical Radiculopathy

- Unilateral, severe neck pain, radiating over posterior shoulder into the arm
- No gold standard for diagnosis of cervical radicular pain or cervical radiculopathy
- Imaging: initial testing with x-ray; magnetic resonance imaging (MRI) to rule out tumor, infection, disc herniation or fracture
- Nonsurgical treatment effective in most patients(immobilization, traction, PT, analgesics, muscle relaxants)
- Consider epidural CS injections but efficacy not established and rare serious complications include spinal cord injury(SORT B)

Cervical Spondylosis

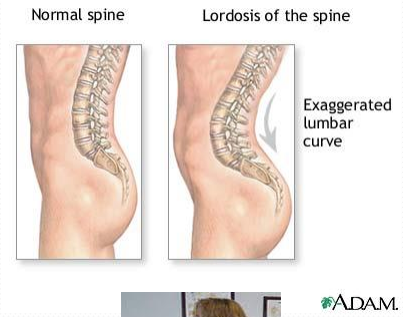


- Degenerative disk disease in the cervical spine
- Decreased ROM, midline neck tenderness, radicular symptoms
- Imaging: initial testing with x-ray(osteophytes, spinal stenosis, facet arthropathy, disc space narrowing)
- Treatment: Supportive, NSAIDS short-term, physical therapy, surgical decompression and fusion

Cervical Strain/Sprain

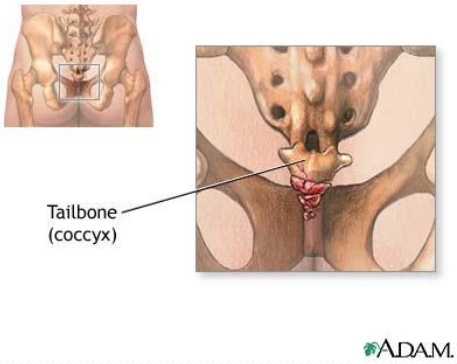
- Muscle injury in the neck, ligamentous stretching-type injury, ligamentous injuries of the facet joints and/or intervertebral disks
- Symptoms – Nonradicular, nonfocal neck pain from the base of the skull to the cervicothoracic junction, pain is worse with movement, paraspinal spasm, occipital headaches
- Imaging: plain films may reveal straightening of lordotic curvature
- Treatment: early mobilization improves pain and hastens return to full function compared to rest and prolonged use of cervical collar. Topical NSAIDs (especially topical ketoprofen) effective in randomized trials for variety of acute soft tissue injuries

Lumbar Spine



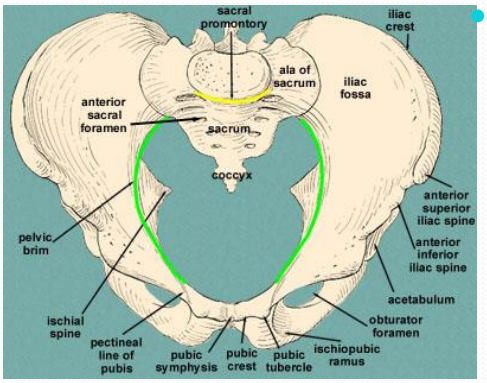
- Inspection
  - Symmetry
  - Lordosis/Kyphosis
  - Pelvic Tilt
  - Posterior and Lateral

Lumbar Spine Bony Exam



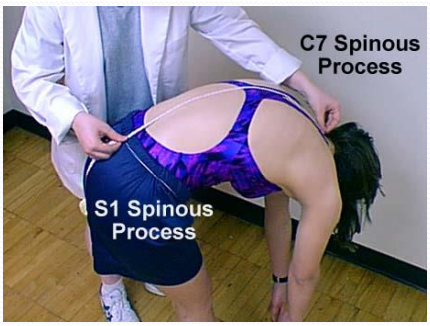
- Posterior Aspect
  - Spinous Processes
  - Posterior Aspect of the Coccyx
  - Posterior Superior Iliac Spines
  - Illiac Crests (L4)
  - Greater Trochanters
  - Ischial Tuberosities

Lumbar Spine Bony Exam



- Anterior Aspect
  - Sacral Promontory – L5-S1 articulation
  - Umbilicus – L3

Lumbar Spine Range of Motion



- Flexion
- Extension
- Lateral Bending
- Rotation

Lumbar Spine Physical Examination

Negative

Positive

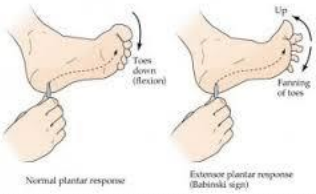
- Gait Analysis
- Heel Walking
- Toe Walking
- Trendelenburg Test
- Standing/Seated Flexion Tests
- Strength of Lower Extremities

Lumbar Spine Physical Examination

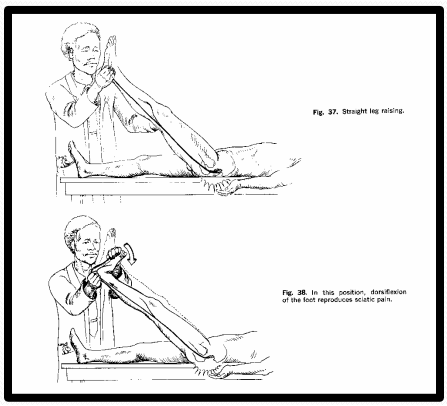
Affected nerve root	*Motor deficit*	*Sensory deficit*	*Reflex*
L3	Hip flexion	Anterior/medial thigh	Patella
L4	Knee extension	Anterior leg/medial foot	Patella
L5	Dorsiflexion\great toe	Lateral leg/dorsal foot	Medial hamstring
S1	Plantar flexion	Posterior leg/lateral foot	Achilles tendon

Lumbar and Sacral Spine Reflexes

- Pathologic Reflexes
  - Babinski Test – sharp instrument in an L-shape from calcaneus to forefoot, positive if big toe extends and the others abduct, significant for UMN lesion
  - Ankle Clonus-an involuntary tendon reflex that causes repeated flexion and extension of the foot. More than four beats of clonus is pathologic.



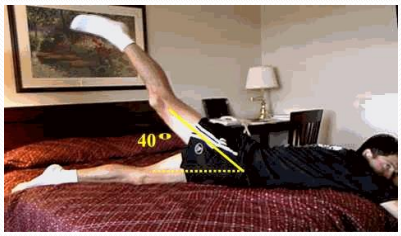
Lumbar Spine Special Tests



- Straight Leg Test
  - Reproduce Pain on affected side
  - Usually between 30-60 degrees
  - With knee extended, raise leg until pain is reproduced
  - Then slowly lower leg until pain is gone
  - Dorsiflex foot
  - **Sensitivity 91%;Specificity 26%**

Lumbar Spine Special Tests

- Reverse Straight Leg Raise
  - Places L1 – L4 nerve roots under tension
  - Can produce anterior thigh pain



- Seated Leg Raise
  - Places stress on the sciatic nerve
  - Patient will lean back if there is sciatic tension

Lumbar Spine Special Tests

- Stork Test
  - Stand on the leg on the same side as the pain and lean backwards
  - Repeat on the unaffected side
  - Evaluates for spondylolysis

Lumbar Spine Special Tests

- Hoover Test
  - For malingering
  - Place your hand under each calcaneus and ask the patient to lift one leg off the table with the knees straight
  - You should feel pressure under the opposite heel, if no pressure is felt or the patient does not lift the affected leg, test is positive

Lumbar Spine Special Tests

- Kernig Test
  - Test for meningeal irritation
  - Flex head to chest and flex hip with leg extended until pain is felt, then flex knee, positive if pain resolves

Lumbar Spine Special Tests

- ASIS Compression Test
  - Palms on ASIS and apply a posteromedial force
  - Compress the Pelvis
  - Positive test is the side that is restricted

Lumbar Spine Special Tests

- Gaenslens's Sign
  - Hip joint is flexed maximally on one side and the opposite hip joint is extended, stressing both sacroiliac joints simultaneously
  - Considered positive if the patient experiences pain while this test is performed

Lumbar Spine Special Tests

- Patrick/FABER Test
  - Hip or Sacroiliac joint; isolates spasm to the iliopsoas muscle
  - Flex, Abduct, and externally rotate the hip, pain while completeing manuever is positive
  - **Sensitivity 77%;Specificity 100%**

Screening For RED Flags

Possible etiology	*History findings*	*Physical examination findings*
Cancer	Strong: Cancer metastatic to bone Intermediate: Unexplained weight loss Weak: Cancer, pain increased or unrelieved by rest	Weak: Vertebral tenderness, limited spine range of motion
Cauda equina syndrome	Strong: Bladder or bowel incontinence, urinary retention, progressive motor or sensory loss	Strong: Major motor weakness or sensory deficit, loss of anal sphincter tone, saddle anesthesia Weak: Limited spine range of motion
Fracture	Strong: Significant trauma related to age* Intermediate: Prolonged use of steroids Weak: Age older than 70 years, history of osteoporosis	Weak: Vertebral tenderness, limited spine range of motion
Infection	Strong: Severe pain and lumbar spine surgery within the past year Intermediate: Intravenous drug use, immunosuppression, severe pain and distant lumbar spine surgery Weak: Pain increased or unrelieved by rest	Strong: Fever, urinary tract infection, wound in spine region Weak: Vertebral tenderness, limited spine range of motion

NOTE: *Presence of one or two weak or intermediate red flags may warrant observation because few patients will be significantly harmed if diagnosis of a serious cause is delayed for four to six weeks. Presence of any strong red flag warrants more urgent workup and probable referral to a spine subspecialist.*

**—Fall from a height or motor vehicle crash in a young patient, minor fall or heavy lifting in a patient with osteoporosis or possible osteoporosis.*

From American Family Physician, 2012;85(4):343-350

Screening for Yellow Flags

Affect

Anxiety; depression; feeling of uselessness; irritability

Behavior

Adverse coping strategies; impaired sleep because of pain; passive attitude about treatment; withdrawal from activities

Beliefs

Thinks "the worst" or that pain is harmful or uncontrollable, or that it needs to be eliminated (before returning to activities or work)

Social

History of sexual abuse, physical abuse, or substance abuse; lack of support; older age; overprotective family

Work

Expectation that pain will increase with work and activity; pending litigation; problems with worker's compensation or claims; poor job satisfaction; unsupportive work environment

From American Family Physician, 2012;85(4):343-350

Compression Fracture

- History of trauma (unless osteoporotic), point tenderness at spine level, pain worsens with flexion, and while pulling up from a supine to sitting position and from a sitting to standing position
- Imaging: standard x-rays considered reference standard for vertebral fractures in patients with suggestive symptoms, magnetic resonance imaging (MRI) findings may differentiate malignant from benign vertebral compression fractures (SORT B)
- Treatment: Back strengthening might delay time to refracture (SORT B), medications which may reduce pain due to osteoporotic spinal fractures include calcitonin and bisphosphnates. Vertebroplasty or kyphoplasty if patient fails conservative measures

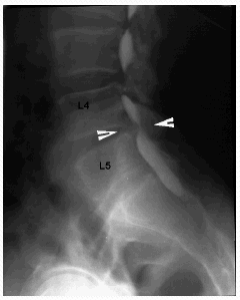
Lumbar Disc Herniation

- Leg pain is greater than back pain and worsens when sitting; L1-L3-→radiates to hip and/or anterior thigh, L4-S1→radiates to below the knee
- Most patients with acute uncomplicated low back pain do not require imaging, blood tests, or other diagnostic tests
- Even with a few weaker red flags,four to six weeks of treatment is appropriate before consideration of imaging studies
- Imaging: Rapid or routine MRI early in the care of patients increases cost, mainly from increased lumbar spine surgeries, without significantly improving pain or long-term function
- Among ***asymptomatic*** adult volunteers, 17% have disk herniation on MRI
- Treatment: in most patients, symptoms of lumbar disk herniation will improve with conservative management alone(PT, oral analgesics, OMT). may be used for short-term pain relief in patients with sciatica and imaging-confirmed neurologic involvement (SORT C)

Lumbar Sprain/Strain

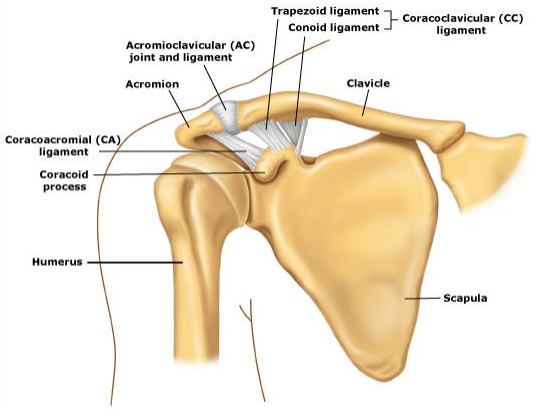
- Diffuse back pain with or without buttock pain, pain worsens with movement and improves with rest
- Rule out pain referred from visceral organs
- Imaging: not indicated in patients with nonspecific low back pain
- Treatment: conservative treatment for 4-6 weeks

Spinal Stenosis



- Leg pain is greater than back pain
- Pain worsens with standing and walking, and improves with rest or when the spine is flexed
- Imaging: MRI is preferred (SORT B)
- Treatment: nonsurgical treatment may be considered for patients with moderate symptoms; epidural steroid injections suggested to provide short-term symptom relief in some patients with lumbar spinal stenosis and neurogenic radiculopathy; decompressive surgery suggested to improve outcomes in patients with moderate-to-severe symptoms of lumbar spinal stenosis

Shoulder Anatomy



Shoulder Inspection

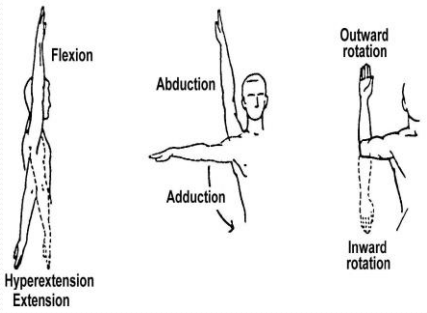
- Swelling or bruising
- Scars
- Deformity at the Acromioclavicular (AC) joint, Clavicle or Glenohumeral(GH) joint
- Asymmetry

Shoulder Palpation

- Begin over the sternoclavicluar joint and proceed laterally along the clavicle to the AC joint
- Scapular spine, superior and inferior angles
- Cervical and thoracic spinous processes
- Subacromial bursa and RC tendons

Shoulder ROM

- Forward flexion: Normal is to **180 degrees**
- Extension**:** Normal is to **40 degrees**.
- Abduction: Normal is to **120 degrees with the palm down, 180 degrees with the palm up**
- Internal rotation: Ask the patient to rotate his arm across his back and walk the fingers as far up the back as possible, recording this by vertebral level. As a guide the **inferior border of the scapula is located at about T7** or **60-90 degrees**
- External rotation: Normal is to **90 degrees**



Shoulder Special Tests

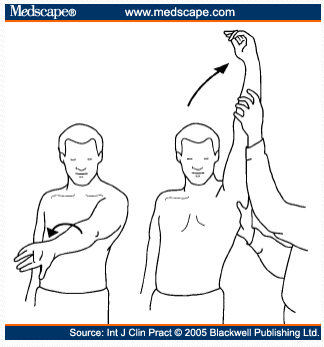
- Impingement Syndrome Tests
- Biceps Tendinopathy Tests
- Rotator Cuff Integrity Tests
- AC Joint Tests
- Glenoid Labrum Tests
- Provocation/relief tests
- Laxity Tests

Impingement Syndrome Tests

- As a general rule, these tests all have decent levels of sensitivity but low specificity because pain can originate from the soft tissue structure being impinged or the ligamentous structure applying the impinging force

Impingement Syndrome Tests

- Neer's: Sensitivity of 75% for bursitis, 88% for RC abnormality; Specificity of 48% and 51%



Impingement Syndrome Tests

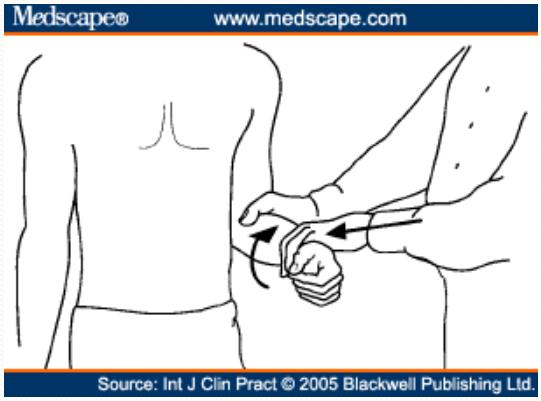
- Hawkin's: Sensitivity of 92% for bursitis, 88% for RC; Specificity of 44% and 43%

Biceps Tendinopathy Tests

- Speed's: Sensitivity of 90%; Specificity of 13.8%

Biceps Tendinopathy Tests

- Yergason's Sign: Sensitivity of 13%; Specificity of 94%

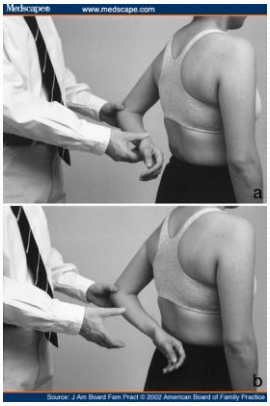


RC Integrity Tests

- Empty Can (Jobe)Test: Sensitivity 77%; Specificity 68%

RC Integrity Tests

- Lift-off Test: Sensitivity 62%; Specificity 100%



RC Integrity Tests

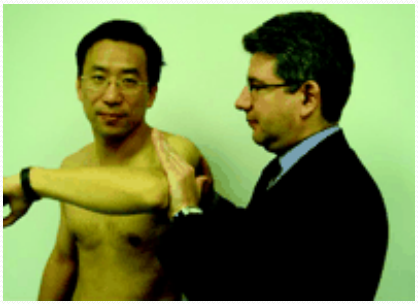
- Drop Arm test: Sensitivity 21%; Specificity 100%

AC Joint Tests

- Active Compression (O'brien's) Test: Sensitivity 100%; Specificity 97%

AC Joint Tests

- AC resisted extension test: Sensitivity 72%; Specificity 85%



Glenoid Labrum Tests

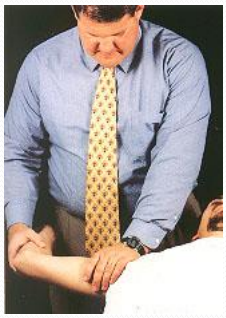
- Crank Test: Sensitivity 90%; Specificity 85%

Provocation/Relief Tests

- Apprehension test: Sensitivity 54-88%; Specificity 44-100%

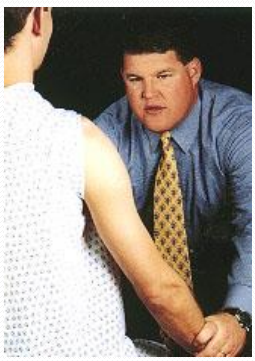
Provocation/Relief Tests

- Relocation test: performed after a positive apprehension test; Sensitivity 30-85%; Specificity 58-100%



Laxity Tests

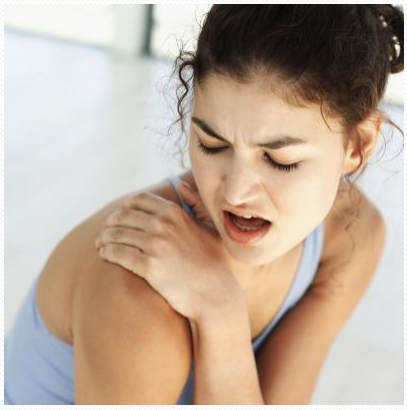
- Sulcus Sign: Sensitivity 28%; Specificity 97%



Shoulder Pathology

- Impingement Syndrome
- Adhesive Capsulitis
- Rotator Cuff Tear
- Acromioclavicular Sprain

Impingement Syndrome



- Pain usually on the anterolateral aspect of the shoulder, catching sensation
- Imaging: ultrasound or magnetic resonance imaging (MRI) not necessary unless pathology suspected; x-ray suggested if suspicion of fracture or dislocation
- Treatment: Conservative with relative rest, analgesics and PT; peritendinous steroid injection may be more effective than placebo injection for up to 12 weeks, but appears no more effective than NSAIDs or physical therapy

Adhesive Capsulitis

- Stage 1: Months 0-3. Pain, achy at rest and sharp at extreme ROM, night pain and progressive loss of internal rotation, forward flexion, abduction and a subtle loss of external rotation and adduction
- Stage 2: Months 3-9. Chronic pain with active and passive ROM; significant limitation of forward flexion, abduction, and internal and external rotation
- Stage 3: Months 9-15. Minimal pain except at the end of ROM, but still with significant limitation in ROM
- Stage 4: Months 15-24. Minimal pain and progressive improvement in ROM

Adhesive Capsulitis

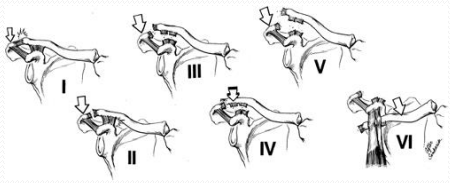
The Three stages of Frozen Shoulder Progression	
Painful Stage	Shoulder pain is the hallmark of this stage. It starts gradually and progressively worsens.
Frozen Stage	Pain may reduce in this stage, although shoulder stiffness and restriction increase. Shoulder range of motion is dramatically reduced.
Thawing Stage	This stage is characterized by spontaneous "thawing." The motion will gradually increase and the shoulder will be more responsive to stretching exercises and treatment.

- Gradual onset of diffusely painful shoulder, significantly restricted passive AND active motion in all planes
- Avoid prolonged immobilization
- Imaging: not routinely indicated; MRI only recommended in preoperative assessment
- Treatment: treat pain with NSAIDs , progressive range of motion exercises, intra-articular steroid injections may be helpful during painful freezing phase

Rotator Cuff Tear

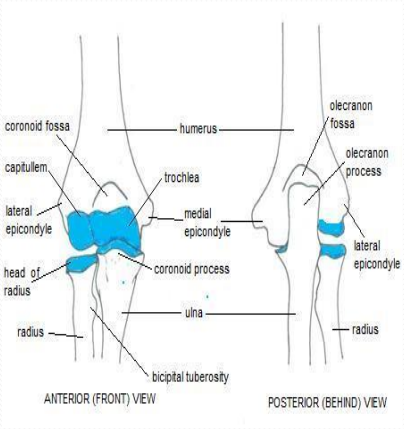
- Weakness, or decreased ability to move joint, for example, difficulty or loss of ability to abduct glenohumeral joint
- Suspect diagnosis in patients > 60 years old, or in younger patients with history of traumatic shoulder injury, who have shoulder pain, limited ROMof shoulder, and positive signs on exam of weakness or pain with external rotation
- Imaging: MRI, ultrasound, and MR arthrography each appears to have high sensitivity and specificity for detecting full-thickness rotator cuff tears in patients with shoulder pain
- Treatment: conservative treatment is an option for small, symptomatic tears, consider surgical repair for patients with chronic, symptomatic full-thickness tears

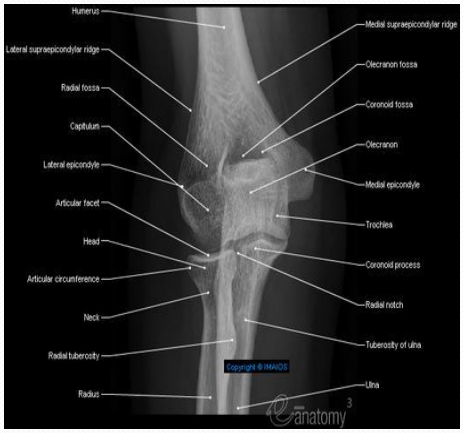
Acromioclavicular Sprain



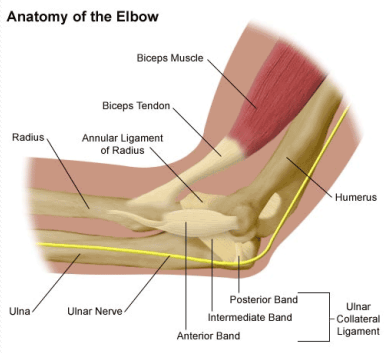
- Pain in the clavicular area after direct trauma
- Imaging: Xrays-normal acromioclavicular distance 1-3 mm, but distance shrinks with age, compare x-ray with uninjured side
- Treatment: type I and II injuries treated nonoperatively, type III injury controversial but trend toward nonoperative management, type IV, V and VI injuries typically treated surgically
- Conservative management includes sling for 1-3 weeks and analgesics

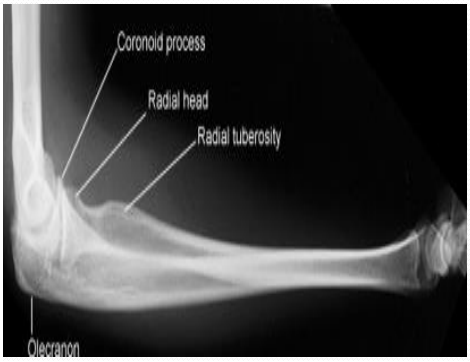
Elbow Anatomy





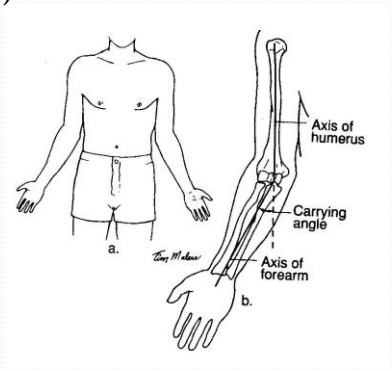
Elbow Anatomy





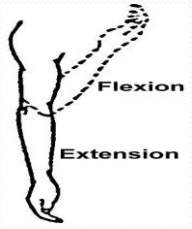
Elbow Inspection

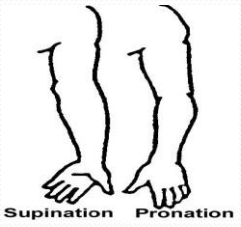
- Erythema/Scars/Swelling/Atrophy
- Alignment (Carrying Angle)



Elbow ROM

- Flexion 140-150 degrees
- Extension 0-5 degrees
- Pronation 90 degrees
- Supination 90 degrees





Elbow Palpation

- Medial/Lateral epicondyle
- Olecranon Process
- Radial head
- Ulnar/radial nerve

Elbow Strength Testing

- Triceps
- Biceps
- Brachioradialis
- Wrist Extension/Flexion

Elbow Special Tests

- Valgus Stress Test
- Varus Stress Test
- Tinel's Sign
- Cozen's

Valgus Stress Test

- Sensitivity 100%; Specificity 75%

Valgus testing

Varus Stress Test

- Sensitivity 97%; Specificity 69%

Tinel's Sign

- Sensitivity 61%; Specificity 43%

Cozen's Test

- Elbow flexed, patient makes a fist and extends wrist while examiner applies resistive force

Elbow Conditions

- Lateral Epicondylitis
- Olecranon Bursitis

Lateral Epicondylitis

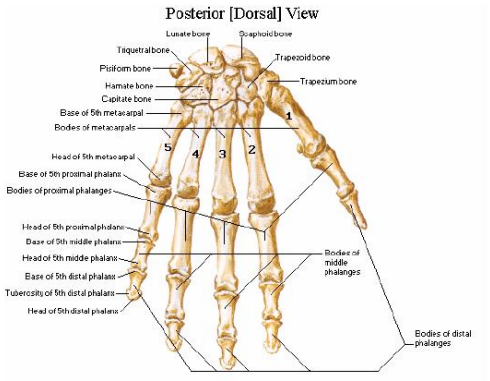
- Pain, often sharp, in the lateral elbow; occurs upon extension of the wrist or supination of the forearm
- Imaging: usually unnecessary, but may be useful if needed to rule out alternative diagnoses
- Treatment: avoid or alter activities responsible for symptoms, PT may speed improvement or recovery, braces may reduce pain and improve function. Topical NSIADs. Steroid injections for lateral epicondylitis may provide short-term pain relief (up to 12 weeks), but result in increased pain and recurrence at 1 year(SORT A)

Olecranon Bursitis

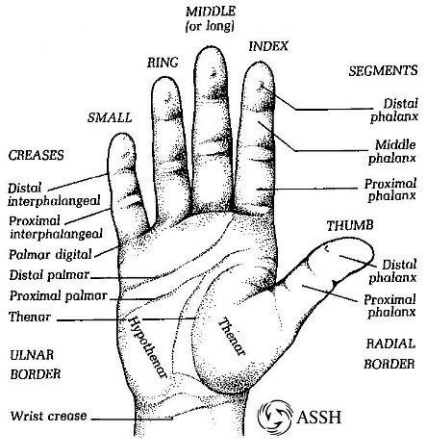
- Swelling over proximal olecranon, tenderness reported in 20%-45% of cases of aseptic bursitis, more likely in septic bursitis
- If septic bursitis suspected, aspiration and analysis of bursal fluid
- Imaging: not typically indicated, ultrasonography of elbow for olecranon bursitis may show bursal wall distension
- Tretatment: *Aseptic*-most can be treated conservatively with padding on elbow and modification of activity to avoid direct pressure steroid injection may be considered if bursitis interferes with movement

  Septic-treat with antibiotics in conjunction with aspiration to drain fluid to dryness

Hand/Wrist Anatomy



Hand/Wrist Anatomy



- Distal Palmar Crease-MCP joints
- Proximal Palmar Crease-middle of metacarpals
- PIP crease-PIP joints
- DIP crease-DIP joints
- Thenar Crease-Thenar eminence

Hand/Wrist Physical Examination

- Observation
- Palpation
- Range of Motion
- Neurovascular
- Provocative Tests/Maneuvers

Hand/Wrist Physical Examination

Observation

- Swelling
- Deformity
- Ecchymosis
- Look at the nails

Hand/Wrist Physical Examination

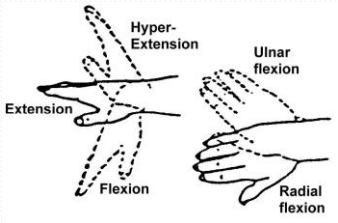
Palpation

- Radial/Ulnar Styloid
- Anatomic Snuffbox
- Proximal Carpal Row
- Distal Carpal Row
- Hook of the Hamate
- Joints of Fingers/Thumb
- Flexor/Extensor Tendons

Hand/Wrist Physical Examination

Wrist(in degrees)

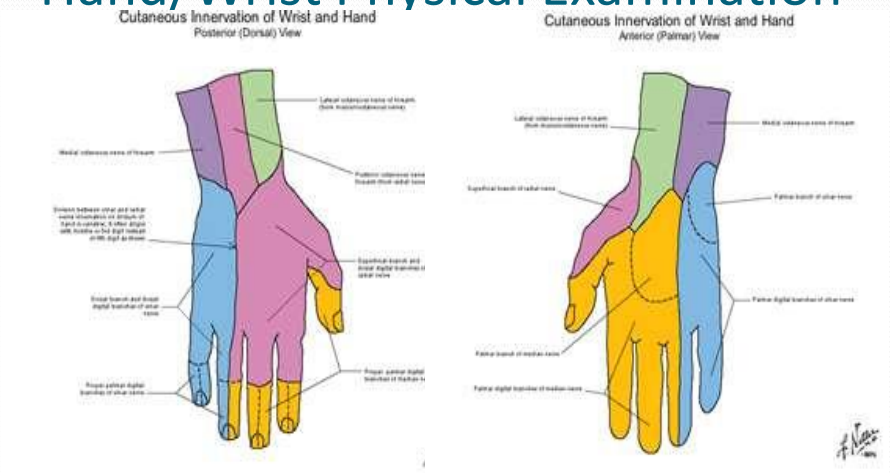
- Flexion-80
- Extension-70
- Ulnar Deviation-30
- Radial Deviation-20
- Supination-90
- Pronation-90



Finger

- MCP Flexion-95
- MCP Extension-30
- PIP Flexion-90
- PIP Extension-0
- DIP Flexion-90
- DIP Extension-0
- Thumb IP Flexion-90
- Thumb IP Extension-20
- Thumb MCP Flexion-50
- Thumb MCP Extension-10

Hand/Wrist Physical Examination



Hand/Wrist Physical Examination

- Gross motor testing accomplished with a simple grip test
- Allen Test-determines vascular patency from radial and ulnar arteries
- Capillary Refill-normal <4 seconds

Hand/Wrist Provocative Tests

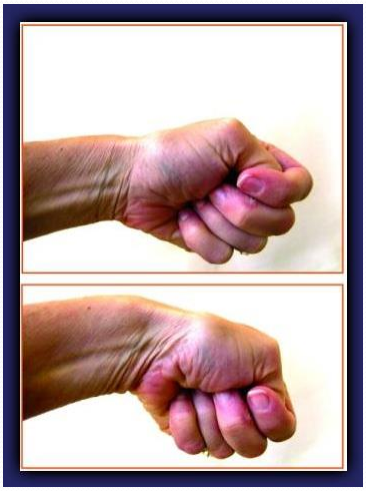
- Finger Flexor Test
- Finklestein's Test
- Tinel's Sign
- Phalen's Test
- Carpal Compression Test
- Watson's Clunk Test
- Shuck Test
- UCL

Finger Flexor Test

- FDS-Stabilize MCP and have patient flex PIP
- FDP-Stabilize PIP and have patient flex DIP

- Positive Test-Loss of flexion at the target joint
- Indicates FDS or FDP damage

Finklestein's Test



- Ask the patient to make a fist encompassing the thumb; examiner then ulnarly deviates the wrist
- Positive Test-Increased pain in the area of the 1st dorsal compartment
- Indicates-DeQuervain's tenosynovitis

Tinel's Sign

- Tap the transverse carpal ligament with the tip of the examiner's finger or reflex hammer with the wrist in extension
- Positive Test-Paresthesias radiating to thumb, index, and middle finger. Possible radiation up the arm
- Indicates CTS
- Sensitivity 23-74%; Specificity 77-100%

Phalen's Test

- Place the dorsal aspects of the hands together and force them into wrist flexion; hold position for 30-60 seconds
- Positive Test-Symptom reproduction in median nerve distribution
- Indicates CTS
- Sensitivity 34-88%
  Specificity 40-100%

Carpal Compression Test

- Examiner places index and middle finger pads over transverse carpal ligament and flex the patient's wrist over the examiner's fingers, position held for 30-60 seconds
- Positive Test- Symptoms in the distribution of the median nerve
- Indicates –CTS
- Sensitivity 28-89%
  Specificity 30-95%

Watson's Clunk Test

- The wrist is placed in ulnar deviation, palm down; the examiner places their thumb over the volar aspect of the scaphoid. While maintaining pressure on the scaphoid, the wrist is passively moved into radial deviation
- Positive Test-Painful click or clunk
- Indicates-Scapholunate Dissociation
- Sensitivity 64-69%
  Specificity 44-66%

Shuck Test

- Patient's wrist supported with 30 degrees of flexion at wrist, patient asked to extend fingers against examiner's resistance
- Positive Test-Pain over lunate
- Indicates-Peri-lunate instability, Kienbock's disease

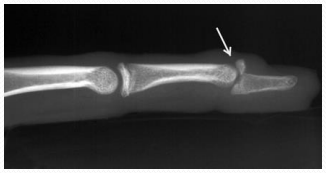
Thumb UCL/Skier's Thumb Test

- MP joint of thumb isolated, examiner then applies a valgus stress
- Positive test-Laxity or pain on ulnar side of MP joint (Normal laxity is up to 15 degrees)
- Indicates-UCL Sprain

Hand/Wrist Injuries

- Mallet Finger
- Metacarpal Fracture
- Distal Radius Fracture
- Carpal Tunnel Syndrome
- DeQuervain's Tenosynovitis
- Trigger Finger
- Gamekeeper/Skier's Thumb
- Ganglion Cyst
- Phalanx Fracture
- Scaphoid Fracture
- Scapho-Lunate Dissociation
- Jersey Finger (Flexor Tendon Disruption)

Mallet Finger



- Jammed Finger
- Disruption of distal extensor tendon
- Xrays-AP/Lateral/Oblique
- Treatment-Continuous DIP splint for 6-8 weeks (SORT A)
- When to refer-orthopedic or hand surgeon if avulsion fracture involving more than 30% of joint or inability to achieve full passive extension

Metacarpal Fracture

- Most common is Boxer's fracture
- Always assess for angulation/digital rotation
- Splinting in 30 degrees of extension for 5-7 days, then short arm cast application for 4-6 weeks
- When to refer-angular/rotational deformity, base of 5th MC, displaced, comminuted

Distal Radius Fracture

- Usually result of FOOSH injury
- AP/Lateral xrays
- Treatment-removable wrist splint for 4-6 weeks preferable in minimally displaced fractures
- When to refer-displaced, open, intra-articular, or involving the epiphyseal plate should be referred

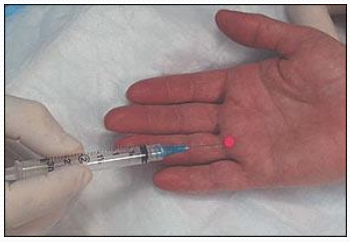
Carpal Tunnel Syndrome

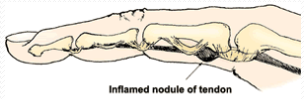
- CTS remains a clinical diagnosis, with EMG as the best confirmatory test
- Effective conservative therapies include nocturnal wrist splints and yoga
- Local CTS steroid injections are more effective than either placebo injections or oral steroids (LOE A)
- Reasonable to offer surgery after failure of conservative therapy for 3 months because delayed surgery appears as effective as immediate surgery with 94% vs. 92% success rates
- NSAIDs, vitamin B6, and diuretics are not effective (LOE B)

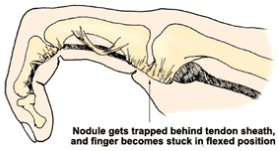
DeQuervain's Tenosynovitis

- Inflammation of the APL and EPB tendons
- Steroid injection might be more effective than splinting + NSAIDs (LOE A)
- Time to recovery in early cases is 6-10 weeks; for chronic cases full recovery may take 3-6 months

Trigger Finger



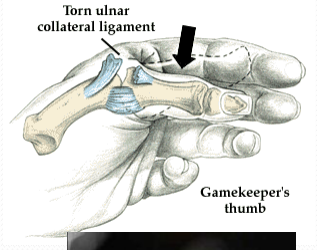




- Digital flexor tendon becomes restricted
- Treat with rest, splinting, NSAIDs, and steroid +Lidocaine injection (LOE C)
- Indications for referral: persistent symptoms despite conservative treatment (up to 3 injections) and diabetes (up to 2 injections)

Gamekeeper's/Skiers Thumb

- Can present with a weak or painful pincer grip
- PA/Lateral/Oblique films should be taken to rule out a Stener lesion
- Treatment involves a thumb spica splint for 6 weeks
- Indications for referral-Stener lesion or failed conservative management



Ganglion Cyst

- Benign tumor mass filled with viscous fluid from the joint capsule or tendon sheath
- Dorsal 60-70%; Volar 20-25%; Flexor tendon sheath 10-15%
- Treatment involves reassurance and trial of aspiration/steroid injection (LOE B)
- Surgical removal for refractory cases

Phalanx Fractures

Proximal/Middle

- PA/Lateral/Oblique xrays
- Nondisplaced, nonangulated shaft fractures managed with buddy taping for 4-6 weeks
- Indications for referral- intraarticular, comminuted, malrotation,oblique, angulated, or spiral fractures

Distal

- PA/Lateral/Oblique xrays
- Treat with U shaped splint for 4 weeks
- Indications for referral- angulated or displaced

Scaphoid Fracture

- FOOSH injury
- AP/lateral/scaphoid xrays; fractures will not show up initially on plain films
- If high index of suspicion, cast for 10-14 days, MRI
- Indications for referral- displacement, angulation, comminution, scapholunate dissociation, long healing time

Scapholunate Dissociation

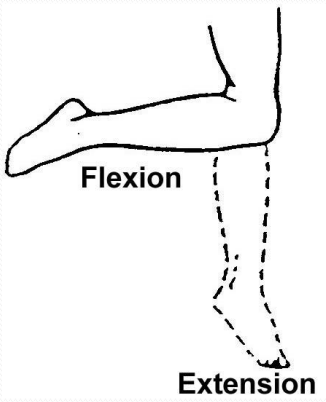
- FOOSH injury causing scapholunate ligament disruption
- AP clenched view/lateral view xrays
- If >3mm space between scaphoid and lunate, then index of suspicion is high

Jersey Finger

- Disruption of FDP tendon near DIP
- AP/Lateral/Oblique xrays
- All require surgical correction

Knee ROM

- Flexion: 130-150 degrees
- Extension: 0 to -10 degrees



Knee Palpation

- Patient in seated position
- Palpate anterior, lateral, medial, and posterior structures

Patellar Assessment

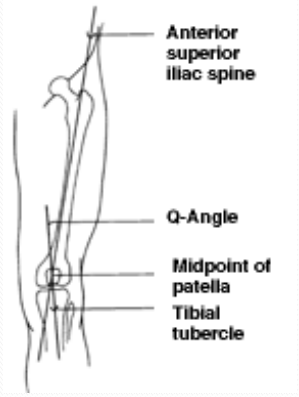
- Patellar Tilt test

Patellar Assessment

- Grind Test

Patellar Assessment

- Q Angle test: normal 14-16 degrees in males; 16-18 in females



Knee Ligament Stability

- Valgus stress test(MCL): performed at 30 and zero degrees, PCL also involved if increased laxity at zero degrees

Knee Ligament Stability

- Varus stress test (LCL): performed at 30 and zero degrees, PCL also involved if increased laxity at zero degrees

Knee Ligament Stability

- Anterior Drawer (ACL): Sensitivity 48%; Specificity 87%

Knee Ligament Stability

- Lachman (ACL): Sensitivity 87%; Specificity 93%

Knee Ligament Stability

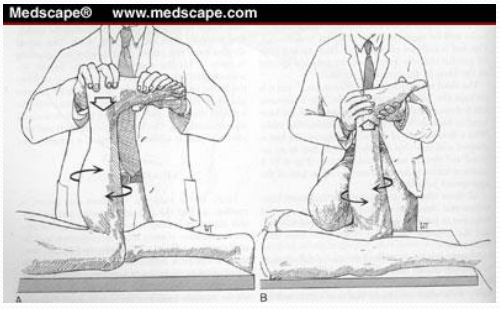
- Posterior Drawer (PCL): Sensitivity 90%; Specificity 99%

Meniscus Testing

- McMurray's test: Sensitivity 52%; Specificity 97%

Meniscus Testing

- Apley Compression: Sensitivity 16-58%; Specificity 82%



Iliotibial Band Testing

- Ober's test

Knee Conditions

- Patellofemoral Syndrome
- Osteoarthritis of the Knee
- Knee Ligament Sprain
- Meniscus Tear

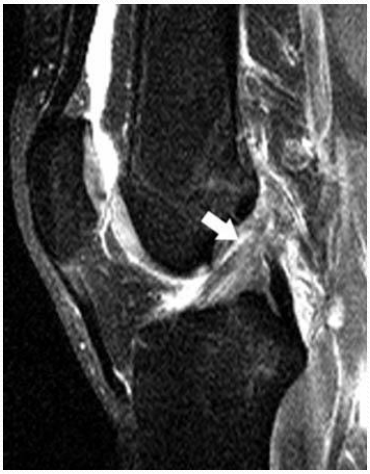
Patellofemoral Syndrome

- Anterior knee pain typically occurs after periods of strenuous activity , relieved with rest
- Reproduce knee pain with squatting for diagnosis and baseline monitoring
- Imaging: -ray may identify osteochondritis dissecans which has similar presentation
- Treatment-activity modification, muscle strengthening (VMO), PT

Osteoarthritis of the Knee

- Recurrent knee pain that worsens with activity, sometimes associated with crepitus and knee instability
- Imaging: plain radiography is considered 'gold standard' for morphological assessment of knee OA
- Treatment: Acetaminophen recommended as first line therapy, cortisone injections with short term benefits, hyalurinoc acids with conflicting evidence; indications for total joint replacement include refractory pain and disability and radiographic evidence of knee OA

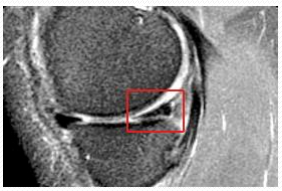
Knee Ligament Sprain/Tear



- Pain and swelling in knee after injury, instability
- Imaging: start with xrays; MRI if high index of suspicion for ligament tear
- Treatment: for partial tears - aspiration of bloody effusion, possible arthroscopy, immobilization, padded splint knee immobilizer and circular cast for 3-4 weeks; then vigorous rehab of quadriceps and hamstrings; for complete tear - surgical repair as soon as possible, best done within 48 hours, possible even 10 days post-injury

Meniscus Tear

- Knee pain, swelling, knee locking, sensation of giving way, painful snapping or clicking sensation
- Imaging: MRI evidence of meniscal tears very common in asymptomatic patients and patients with osteoarthritis
- Treatment: arthroscopic surgery for degenerative meniscal tears does not improve pain more than conservative treatment in patients with mild or no concurrent osteoarthritis (SORT A)



Foot/Ankle Anatomy

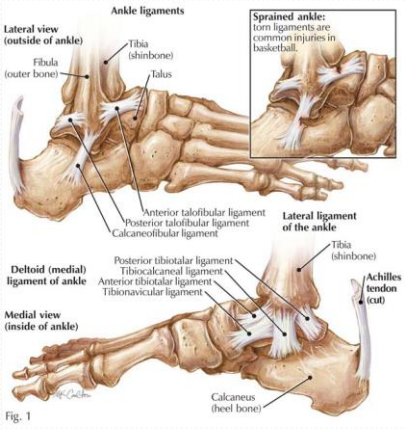
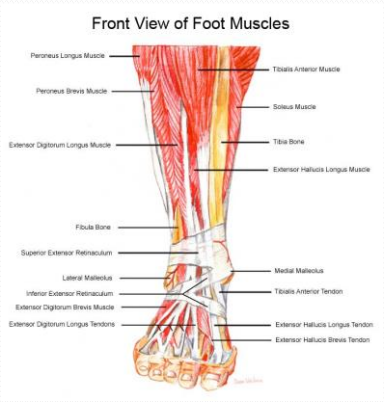


Fig. 1



Foot/Ankle Physical Examination

- Observation
- Palpation
- Range of Motion
- Neurovascular
- Provocative Tests/Maneuvers

Foot/Ankle Physical Examination

Observation

- Gait
- Swelling
- Deformity
- Ecchymosis
- Bony alignment
- Arches
- Look at the nails

Foot/Ankle Physical Examination

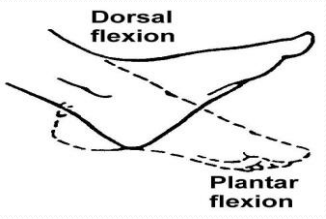
Palpation

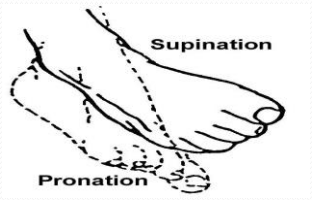
- Proximal Fibula
- Lateral/Medial Malleoli
- ATFL/CFL/PTFL/Deltoid ligament
- Syndesmosis
- Achilles Tendon/Peroneus Longus and Brevis tendons/Posterior Tibialis tendon
- Sinus Tarsi
- Plantar and dorsal surfaces of the hindfoot
- Forefoot

Foot/Ankle Physical Examination

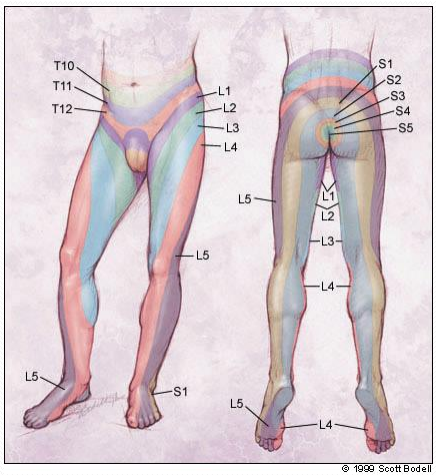
ROM

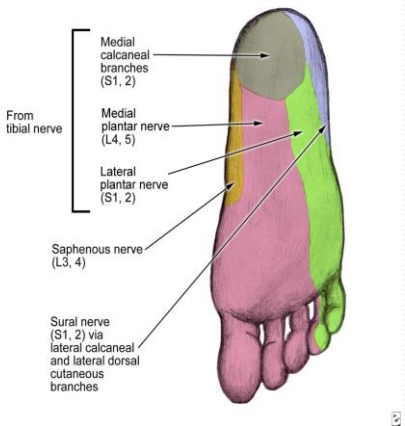
- Dorsiflexion-20
- Plantar Flexion-65
- Pronation-5
- Supination-20
- Subtalar-20





Foot/Ankle Physical Examination





Foot/Ankle Physical Examination

- Reflexes-Achilles Tendon
- Pulses-Dorsalis Pedis and Posterior Tibial

Foot/Ankle Provocative Tests

- Anterior Drawer
- Talar Tilt
- Eversion
- Thompson's
- Syndesmosis Squeeze

Anterior Drawer Test

- Stabilizing hand grasps distal third of tibia and holds in static position
- Examiner makes a "C" with their hand placing 4 fingers around the posterior calcaneus and thumb across anterior talus
- Translational force is applied to distract the calcaneus and talus away from stabilized leg
- Positive Test-Pain or laxity
- Indicates-ATFL sprain
- Sensitivity 71%
  Specificity 33%

Talar Tilt Test

- Same position as Anterior drawer
- Examining hand grasps dorsum of foot or inferior calcaneus and talus is inverted to examine ROM
- Positive Test-Laxity/pain
- Indicates-ATFL and CFL tear

Eversion Test

- Examiner stabilizes lower leg with one hand
- Examining hand grasps the midfoot from the plantar surface and everts the foot
- Positive Test- Laxity/increased ROM
- Indicates-Deltoid ligament sprain

Thompson's Test

- Patient in prone position, distal 1/3 of lower leg hanging off table
- Examiner squeezes gastrocnemius/soleus complex
- Positive test-Absence of plantar flexion of ankle
- Indicates-Achilles Tendon injury
- Sensitivity 96%

Syndesmosis Squeeze Test

- Examiner places thenar eminence of one hand against tibial shaft and other hand against fibular shaft
- Squeeze for 2-3 seconds then brisk release
- Positive Test-Pain at level of syndesmosis
- Indicates-Syndesmosis disruption

Foot/Ankle Injuries

- Ankle Sprain
- Syndesmosis Sprain
- Plantar Fascitis
- Achilles Rupture
- Retrocalcaneal Bursitis
- Bunion
- Morton's Neuroma
- Ankle Fractures
- Metatarsal Fracture
- 5th Metatarsal Fracture
- Toe Fracture

Ankle Sprain

Ottawa Ankle Rules

- Ankle x-rays only required if pain in malleolar zone and any of:

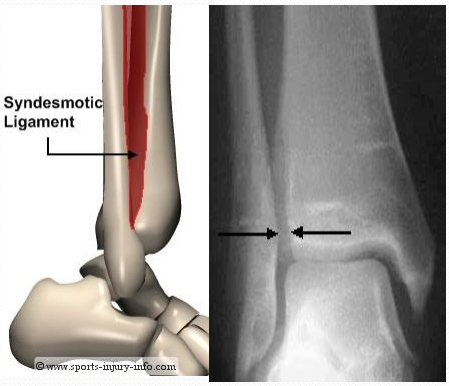
-bone tenderness at posterior edge or tip of lateral malleolus OR

-bone tenderness at posterior edge or tip of medial malleolus OR

-inability to bear weight both immediately and in emergency department

- History and physical exam are key
- Treatment involves PRICES, acetaminophen or nonsteroidal anti-inflammatory drugs (NSAIDs) may reduce pain (LOE B)

Syndesmosis Sprain(High Ankle Sprain)



- Diagnosis based on clinical exam
- Grades 1 and 2 treated non-operatively
- Grade 3 will show syndesmosis widening and are treated surgically

Plantar Fascitis

- Diagnosis is clinical, pain severe with first steps of morning or after prolonged activity
- Treatment includes stretching, shoe inserts, arch supports, night splints, NSAIDs (LOE B)and steroid injection

Achilles Tendon Rupture

- Usually clinical diagnosis, MRI if uncertain
- Immediate surgical consult

Retrocalcaneal Bursitis

- Diagnosis is clinical
- Treatment includes removing offending agent, use of open backed shoe, NSAIDs, ice stretching

Bunion

- Clinical diagnosis
- Treatment includes accommodating shoes, orthoses, Tylenol or surgery (LOE C)

Morton's Neuroma

- Clinical diagnosis
- Treatment involves shoe modification, metatarsal pad, orthotics, and steroid injection (LOE B)

Ankle Fracture

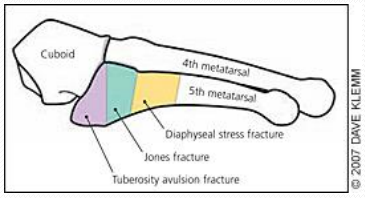
- ***Isolated Malleolar (nondisplaced)***- early mobilization, similar to ankle sprain treatement
- ***Isolated malleolar (minimally displaced)***- immobilization for 4-6 weeks
- ***Bimalleolar/Trimalleolar***- *treated like an unstable fracture, send to surgeon*

Metatarsal Fracture

- Nondisplaced fractures can be treated in SLC for 4 weeks

5th Metatarsal Fracture

- Avulsion fracture-treat conservatively
- Jones Fracture-NWB SLC for 6 weeks or ORIF
- Stress Fractures-elastic wrap, bulky dressing, hard soled shoes, walking casts



Toe Fracture

- Nondisplaced are treated with hard soled shoes and protected weight bearing, buddy taping
- Surgical correction for greater toe or lesser toes with intra-articular involvement

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