

**Orthopedics Head to Toe:
What the Nurse Practitioner
should know**
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Objectives

- ▶ Explore common musculoskeletal chief complaints
- ▶ Identify common musculoskeletal pathologies encountered in primary care
- ▶ Discuss Assessing, diagnosing and treating common musculoskeletal conditions

Introduction

- ▶ Musculoskeletal disorders are the most debilitating chronic medical conditions
- ▶ Comprise up to 60% of outpatient office visits
- ▶ Studies suggest primary care providers are inadequately prepared to care for musculoskeletal problems

(Benham & Geier, 2014, p. 603)

Musculoskeletal Exam Essentials

- ▶ History
 - Acute
 - Sprain/Strain
 - Fracture
 - Chronic
 - Repetitive motion/Degenerative
 - Inflammatory
 - Greater than 60 minutes morning stiffness
 - Non-inflammatory
 - Less than 30 minutes morning stiffness

Musculoskeletal Exam Essentials

- ▶ Inspection
 - Swelling
 - Warmth
 - Ecchymosis
 - Joint Effusion
 - Side to Side comparison
 - Deformity
 - Alignment
- ▶ Evaluate Gait
 - Antalgic
 - Trendelenburg gait
 - Foot Drop
 - Rhythm
 - Symmetry

Musculoskeletal Exam Essentials

- ▶ Palpation
 - Point of maximal tenderness
 - Ligament
 - Tendon
 - Bursa
 - Crepitance
- ▶ Range of Motion
 - Active
 - Evaluate first
 - Patient initiated
 - Passive
 - Compare to Active
 - Test only joint mobility

Musculoskeletal Exam Essentials

- ▶ Strength Testing
 - Grading 0-5
 - 0- No response
 - 1- Fasciculation, flicker of movement
 - 2- Can initiate movement with gravity removed
 - 3- Reduce strength, resist gravity only
 - 4- Reduced strength, can still move against resistance
 - 5- Normal contraction against resistance

Musculoskeletal Exam Essentials

- ▶ Special Tests
 - Joint/Area specific
 - Illicit pain/expected response
 - Varying Sensitivity and Specificity

Medical Imaging

- ▶ Objective Data
- ▶ Rule in/ Rule out
- ▶ Which tests to order
 - X-rays
 - How many views?
 - MRI
 - CT Scan
 - Bone Scan
 - CT/ MR Arthrogram
 - Ultrasound

Radiology

- ▶ X-rays
 - Be weary of negative x-ray reports
 - Make a habit of reviewing all images with and without findings
 - Must appreciate normal to identify abnormalities
 - Be sure to order appropriate test
 - How many views
 - Make sure point of interest is included in field of view

2 year Old S/p Fall, Guarding Right Arm

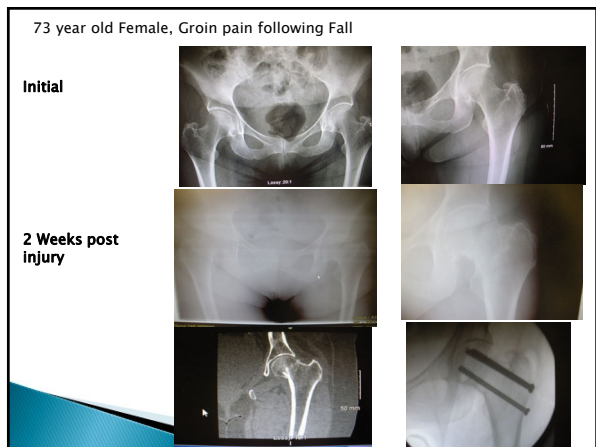
Initial



4 weeks post injury

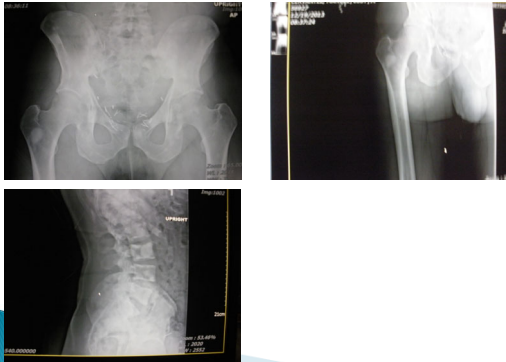








68 year old Male low back pain and right Hip pain



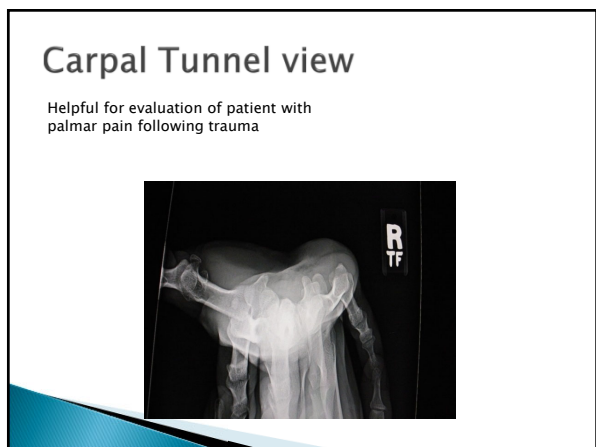
3 views right knee

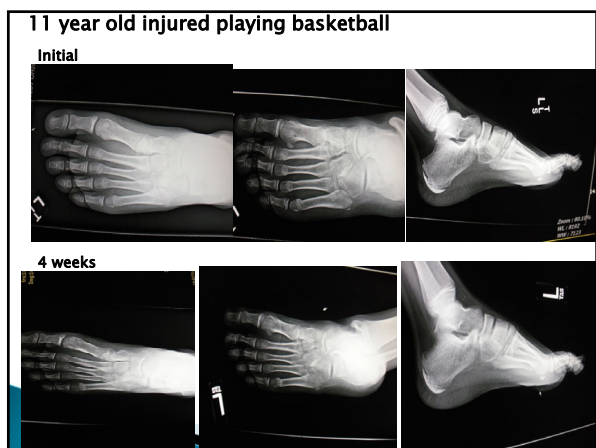


3 views right shoulder

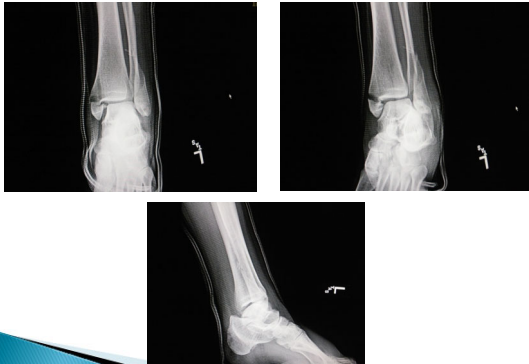






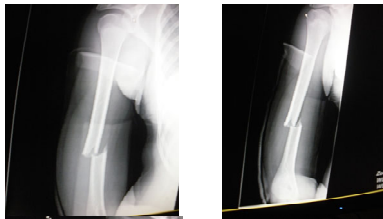


39 year female, tubing injury

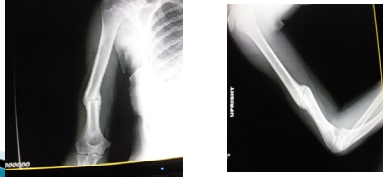


12 year old female, go-cart accident

initial



3 months



MRI

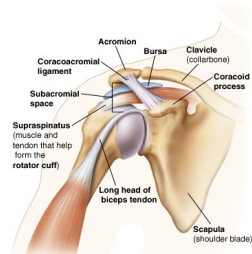
- ▶ **Concern of soft tissue injury**
 - Meniscus
 - Rotator cuff tear
- ▶ **Concern for occult fracture**
- ▶ **With or without contrast**
 - Risk benefits
 - Defer test with contrast to specialty

CT Scan

- ▶ **Evaluate fracture**
 - Evaluate for incongruity of joint for intra-articular fractures
- ▶ May be used in lieu of MRI for patients with contraindications to MRI

Shoulder

- ▶ **Anatomy**
 - **Important Landmarks**
 - Acromioclavicular joint
 - Coracoid
 - Acromion
 - Clavicle



(Shoulder anatomy, n.d.)

Landmarks



Shoulder

- ▶ Exam
 - ROM
 - **Forward Flexion:** 0-160°
 - **Abduction:** 0-180°
 - **Internal Rotation:** Mid-thoracic
 - **External Rotation:** 30-60°

Shoulder

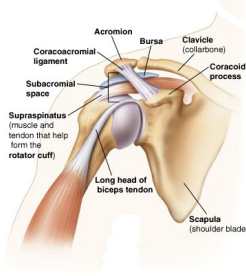
- ▶ Exam
 - **Special Tests**
 - **Supraspinatus Isolation/Jobe's/Empty Can**
 - Supraspinatus
 - Sensitivity 53% Specificity 82%
 - **Speed's Testing**
 - Biceps Tendon
 - Sensitivity 40 % Specificity 75%
 - **Lift off test**
 - Subscapularis
 - Sensitivity 17 % Specificity 92%

Shoulder

- ▶ Exam
 - **Special test**
 - **Cross Body adduction**
 - A.C. Joint
 - **O'Brien's Test**
 - Labral tear
 - Sensitivity 63% Specificity 50%
 - **Neer's**
 - Impingement
 - **Hawkin's**
 - Impingement

Shoulder

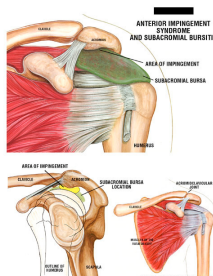
- ▶ **Intrinsic**
 - Shoulder pathology
- ▶ **Extrinsic**
 - Referred pain
 - Cardiac
 - Cervical radiculopathy



(Shoulder anatomy, n.d.)

Shoulder Impingement

- ▶ **Clinical presentation**
 - C/o anterior shoulder pain, pain with overhead activities, may c/o of lateral arm pain
- ▶ **Exam finding**
 - Positive Neers and Hawkins signs
- ▶ **Diagnostics**
 - **X-rays**
 - Acromion morphology
 - Type I,II,III
 - **MRI**
 - **Neer's Test**
 - Diagnostic lidocaine injection
- ▶ **Treatment**
 - Rest
 - Activity modification
 - NSAIDS
 - Therapy
 - Injections
- ▶ **Referral**
 - Failure of conservative treatment



(Subacromial impingement, n.d.)

Proximal Biceps Tendinitis

- ▶ **Clinical presentation**
 - Anterior shoulder pain, radiates over bicep
 - Pain with lifting, pulling and overhead work
- ▶ **Exam finding**
 - Tenderness proximal biceps
 - Positive speeds testing
- ▶ **Diagnostics**
 - X-rays
 - MRI
- ▶ **Treatment**
 - Activity modification
 - NSAID
 - Therapy
 - Injection
- ▶ **Referral**
 - If no improvement with Conservative treatment

Distal Biceps Rupture

- ▶ **Clinical presentation**
 - Acute injury, typically report feeling "pop"
 - Anterior Elbow pain
 - Pain with lifting, pulling and overhead work
- ▶ **Exam finding**
 - Tenderness antecubital fossa
 - Positive Hook test
 - Positive bicep squeeze test
 - Supination with compression bicep
- ▶ **Diagnostics**
 - X-rays
 - MRI
- ▶ **Treatment**
 - Surgical
- ▶ **Referral**
 - Prompt referral

Rotator Cuff Injuries

- ▶ **Clinical presentation**
 - Insidious onset
 - May have acute injury
- ▶ **Exam finding**
 - Painful motion
 - Positive Empty can, pain and weakness with RTC testing
- ▶ **Diagnostics**
 - X-rays
 - MRI
 - Neers Test
- ▶ **Treatment**
 - Activity modification
 - NSAIDS, Acetaminophen
 - Therapy
 - Injection
 - Surgery

Rotator Cuff injury

- ▶ **Referral**
 - No improvement with conservative treatment
 - Full thickness tears
 - Partial tears with nighttime symptoms.
 - Night awakening poor prognostic indicator of successful conservative treatment

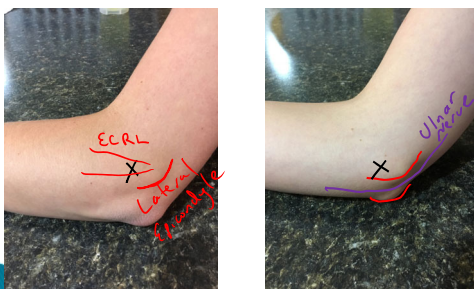
Adhesive Capsulitis

- ▶ **Clinical presentation**
 - C/o Painful shoulder with progressive limitation of motion
- ▶ **Exam finding**
 - Limited active and passive rom
 - External rotation
 - Hallmark
- ▶ **Diagnostics**
 - X-rays
 - TSH
 - A1c
- ▶ **Treatment**
 - Therapy
 - Injections
 - Subacromial
 - Glenohumeral
 - Manipulation under anesthesia
 - Arthroscopic lysis of adhesions
- ▶ **Referral**
 - If no improvement with conservative treatment

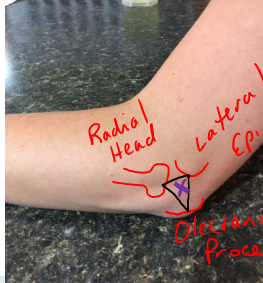
Elbow

- ▶ **Exam**
 - ROM
 - **Extension** - 0°
 - **Flexion** - 150°
 - **Supination** - 90°
 - **Pronation** - 90°
 - Point tenderness
 - Varus and Valgus stress testing
 - Tinels over Cubital tunnel
 - Resisted extension/flexion at Wrist

Landmarks

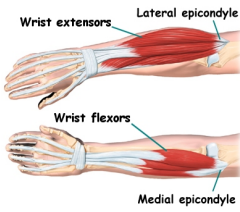


Landmarks



Lateral epicondylitis

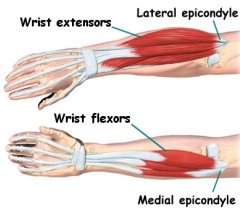
- ▶ **Clinical presentation**
 - Lateral elbow pain
 - Repetitive motion
 - Complain of loss of grip strength
- ▶ **Exam finding**
 - Point tender lateral epicondyle
 - Pain with resisted extension at the wrist
 - Elbow ROM and strength usually unaffected
- ▶ **Diagnostics**
 - X-rays
 - MRI
- ▶ **Treatment**
 - Activity modification
 - NSAIDS
 - Cho pat strap
 - Injection
 - Surgery
- ▶ **Referral**
 - Failed conservative treatment



(Medial and lateral epicondylitis, 2008)

Medial Epicondylitis

- ▶ **Clinical presentation**
 - Medial elbow pain
 - Repetitive motion
 - Complaints of loss of grip strength
 - Most commonly affects dominant extremity
- ▶ **Exam finding**
 - Point tender medial epicondyle
 - Elbow ROM and strength usually unaffected
- ▶ **Diagnostics**
 - X-rays
 - MRI
- ▶ **Treatment**
 - Activity modification
 - NSAIDS
 - Cho pat strap
 - Injection
 - Surgery
- ▶ **Referral**
 - Failed conservative treatment



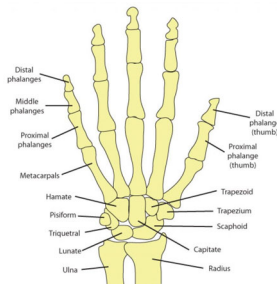
(Medial and lateral epicondylitis, 2008)

Wrist/Hand

- ▶ **Anatomy**
- ▶ **Exam**
 - **Wrist ROM**
 - **Extension** 70 °
 - **Flexion** 90 °
 - Finkelstein's Test
 - Grind Test
 - Tinel's
 - Phalan's Sign

Hand

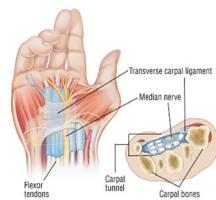
- ▶ **Exam**
 - **Hand ROM**
 - **MCP** 0-90°
 - **IP** 0-100°
 - **DIP** 0-80°



(Hand anatomy, 2016)

Carpal Tunnel Syndrome

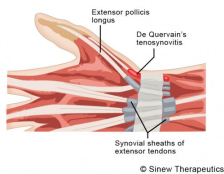
- ▶ **Clinical presentation**
 - C/o of Numbness and tingling with activities and night time
 - "Wake and shake syndrome"
- ▶ **Exam finding**
 - Positive Tinel's and Phalanx signs
 - +/- thenar atrophy
- ▶ **Diagnostics**
 - Wrist x-rays with Carpal tunnel views
 - EMG/NCS
 - TSH
- ▶ **Treatment**
 - **Mild/CTS of pregnancy**
 - Therapy
 - Activity modification
 - Injections
 - Night splinting
 - **Moderate/Severe**
 - Surgery
- ▶ **Referral**
 - Failure of conservative treatment
 - Moderate/Severe finding on EMG/NCS



Carpal Tunnel, 2014)

De Quervains Tenosynovitis

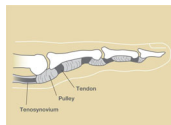
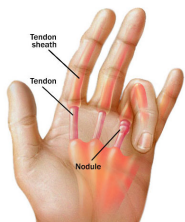
- ▶ **Clinical presentation**
 - Radial sided wrist pain
- ▶ **Exam finding**
 - Positive finklestein's test
 - Marked tenderness radial styloid
 - May have swelling along 1st dorsal compartment
- ▶ **Diagnostics**
 - X-rays
 - MRI
- ▶ **Treatment**
 - Activity modification
 - NSAID
 - Thumb spica brace
 - Injection
 - Surgery
- ▶ **Referral**
 - Failure of conservative treatment



(Dequervains tenosynovitis, n.d.)

Trigger Finger

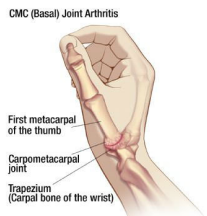
- ▶ **Clinical presentation**
 - C/o pain and locking finger
- ▶ **Exam finding**
 - Tenderness A1 pulley
 - Active triggering
- ▶ **Diagnostics**
 - Exam
- ▶ **Treatment**
 - Night Splinting
 - Injections
 - Poor prognostic indicators
 - Male
 - DM
 - Young age at presentation
 - Therapy
- ▶ **Referral**
 - Failure of conservative treatment



(Trigger finger, n.d.)

1st Carpometacarpal Arthritis

- ▶ **Clinical presentation**
 - c/o radial sided wrist and hand pain
 - Decreased grip strength
- ▶ **Exam finding**
 - Decrease grip
 - Decreased thumb motion
 - Positive Grind test
- ▶ **Diagnostics**
 - X-rays
- ▶ **Treatment**
 - Therapy
 - Activity modification
 - NSAIDS
 - Bracing
 - Injection
 - Surgery
 - Interpositional arthroplasty
- ▶ **Referral**
 - Failure of Conservative treatment

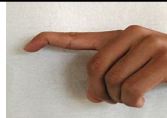


(CMC (BASAL joint) arthritis, 2014)

Scaphoid Fracture

- ▶ **Clinical presentation**
 - FOOSH
- ▶ **Exam finding**
 - Tenderness anatomic snuffbox
 - ASSESS ELBOW, Scaphoid fractures are associated with radial head fractures
- ▶ **Diagnostics**
 - X-rays
- ▶ **Treatment**
 - Thumb spica
 - Proximal pole fractures
 - Slow to heal
 - Risk for Avascular necrosis

Mallet Finger



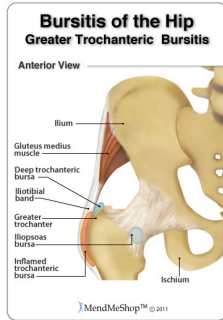
- ▶ **Clinical presentation**
 - Typically acute injury with fixed deformity
- ▶ **Exam findings**
 - Swelling, extension lag distal interphalangeal joint
- ▶ **Diagnostics**
 - X-rays
 - Differentiate Tendinous Mallet versus Bony Mallet
- ▶ **Treatment**
 - Bony Mallet
 - Referral
 - Tendinous Mallet
 - Extension Splinting x 6 weeks, then nightly x 6 weeks

Hip

- ▶ **Exam**
 - Point of maximal tenderness
 - **ROM**
 - **Flexion** -120°
 - **Extension** -<20°
 - **Abduction** - 45°
 - **Adduction** -30°
 - **Internal** -40°
 - **External rotation** -45°

Greater Trochanteric Bursitis

- ▶ **Clinical presentation**
 - C/o lateral hip pain
 - May complain of snapping
 - Cannot lay on affected side
 - Pain may radiate laterally to knee
- ▶ **Exam finding**
 - Point Tenderness Greater trochanter
 - Positive Trendelenburg Sign
 - Trendelenburg gait
- ▶ **Diagnostics**
 - X-rays
 - MRI
- ▶ **Treatment**
 - Therapy
 - Activity modification
 - NSAIDS
 - Orthotics
 - Sleep with pillow between knees
 - Injection
- ▶ **Referral**
 - Failure of conservative treatment



(Greater trochanteric bursitis, 2011)

Hip Arthritis

- ▶ **Clinical presentation**
 - Complain of groin pain and decreased motion
- ▶ **Exam finding**
 - Positive C-sign
 - Decreased motion
 - Especially internal rotation
 - Groin pain with internal rotation
- ▶ **Diagnostics**
 - X-rays
 - MRI
 - Rule out femoral neck stress fracture
- ▶ **Treatment**
 - Therapy
 - Activity modification
 - NSAIDS
 - Weight loss
 - Injection
 - Studies show IM injection as effective as Intraarticular injection for symptomatic hip arthritis
 - Surgery
- ▶ **Referral**
 - Failure of conservative treatment

Avascular Necrosis

- ▶ **Clinical presentation**
 - Acute/insidious onset of hip pain
 - Groin pain
- ▶ **Exam finding**
 - Same as Hip OA
- ▶ **Diagnostics**
 - X-rays
 - MRI
 - Hypercoagulable workup
 - Hematology referral
- ▶ **Treatment**
 - Core decompression
- ▶ **Referral**
 - Prompt referral to orthopedist

Pediatric Hip

Condition	Epidemiology	Symptoms	Diagnostics	Treatment
Legg-calves-perthes	3-12 years old Peak: 5-7 years old Rare in blacks Males	Painless limp Groin pain	X-rays	Referral Protected weight bearing
Slipped Capital femoral epiphysis	Early adolescence Girls: 12 Boys: 13.5 Obese teenagers	Dull aching pain groin thigh or knee	X-rays	Prompt Referral, NWB, Surgery
Septic Arthritis	Any age, peak 0-6 years old	Febrile ill appearing, hip pain	CBC with Diff Sed Rate CRP Aspiration w U/S	Prompt referral, Surgery, Antibiotics
Transient synovitis	3-8 years old	Fall/Winter	Rule out infection	Resolve with conservative care.

Knee

- ▶ **Exam**
 - **Point of maximum tenderness**
 - Joint line
 - Bone
 - Bursa
 - **ROM**
 - Flexion- 130°
 - Extension- Neutral to 2-3° hyperextension
 - **McMurray's**
 - Meniscus
 - **Lachman's**
 - ACL
 - **Varus/Valgus Stress testing**
 - Test in extension and 30° flexion
 - Medial/lateral collateral ligament
 - **Anterior/Posterior Drawer**
 - ACL PCL

Knee sprain

- ▶ **Clinical presentation**
 - Acute knee injury
- ▶ **Exam finding**
 - Varus/Valgus Stress testing
 - Pain? Gapping?
 - Sprain grading
 - Anterior or Posterior Drawer
- ▶ **Diagnostics**
 - X-rays
 - MRI
- ▶ **Treatment**
 - **Isolated LCL, MCL, PCL**
 - Conservative treatment
 - **ACL sprains**
 - **Grade I**
 - Therapy, bracing
 - **Grade II**
 - Therapy, bracing, possible repair
 - **Grade III**
 - ACL Reconstruction
- ▶ **Referral**
 - ACL Tears
 - Internal Derangement
 - Grade III sprains

Meniscal tears

- ▶ **Clinical presentation**
 - Acute
 - Twisting injury
 - Chronic
 - Insidious onset
- ▶ **Exam finding**
 - Positive McMurrays
 - Positive Squat test
- ▶ **Diagnostics**
 - X-rays
 - Weight bearing films
 - Grading of arthritis
 - MRI
- ▶ **Treatment**
 - Acute
 - Surgery
 - Chronic
 - Conservative Treatment for most unless mechanical symptoms
- ▶ **Referral**
 - MRI with Meniscal tear

Knee Osteoarthritis

- ▶ **Clinical presentation**
 - Gradual onset knee pain
 - Worse with periods of rest, improved with activities
- ▶ **Exam finding**
 - Joint line tenderness
 - Effusion
 - Varus/Valgus alignment
- ▶ **Diagnostics**
 - Weight bearing x-rays
- ▶ **Treatment**
 - Activity modifications
 - Bracing
 - Weight loss
 - NSAIDS/Tylenol/topical NSAIDS
 - Injections
 - Corticosteroids
 - Viscosupplements
 - Platelet rich plasma
 - Surgery
- ▶ **Referral**
 - Failure of Conservative treatment

Patellar tendinitis

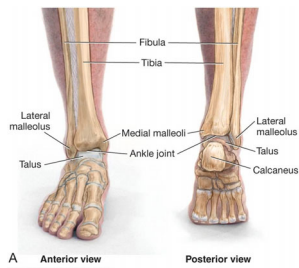
- ▶ **Clinical presentation**
 - Anterior knee pain
- ▶ **Exam finding**
 - Tenderness patellar tendon
- ▶ **Diagnostics**
 - X-rays
 - MRI
- ▶ **Treatment**
 - Rest
 - Therapy
 - Activity modification
 - NSAIDS
 - Cho-pat strap
- ▶ **Referral**
 - Failure of conservative treatment

Osgood Schlatters

- ▶ **Clinical presentation**
 - Anterior knee pain
 - Lump proximal tibia
- ▶ **Exam finding**
 - Prominent tibial tubercle
 - Tenderness
- ▶ **Diagnostics**
 - X-rays
- ▶ **Treatment**
 - Activity modification
 - NSAIDS
 - Ice after activity
 - Cho-pat strap
- ▶ **Referral**
 - Failure of conservative treatment

Ankle

▶ **Anatomy**



(Ankle, 2014)

Ankle

▶ **Exam**

- **Anterior Drawer**
 - Ankle sprain
- **Squeeze Test**
 - Positive test suggest syndesmotic injury
- **Thompsons Test**
 - Positive Test suggest Achilles tendon rupture

Ankle sprain

- ▶ **Clinical presentation**
 - Acute onset pain with injury +/- feeling pop
 - Type of injury
 - Inversion
 - Eversion
- ▶ **Exam finding**
 - Swelling/pain/ecchymosis
 - Point Tenderness
 - Ligamentous
 - Boney Tenderness
 - Fracture until proven otherwise

Ankle sprain

- ▶ **Diagnostics**
 - X-rays
 - Ottawa Ankle Rules
 - Highly sensitive, variable specificity
 - Ankle: Pain malleolar zone, + bone tenderness, inability to bear weight
 - Foot: Pain navicular or midfoot zone, bone tenderness, inability to bear weight
 - MRI
 - R/o occult fracture, evaluate osteochondral injury, evaluate syndesmotic injury
- ▶ **Treatment**
 - Nonweight bearing
 - CAMBOOT
 - Air cast
 - RICE
 - Therapy
 - Bracing
- ▶ **Referral**
 - Fracture
 - Failure to respond to conservative treatment
 - Syndesmotic injury

Medial Tibial Stress Syndrome

- ▶ **Clinical presentation**
 - C/o of pain shin with running activities
 - Pain at the beginning of activity that improves with activity
- ▶ **Exam finding**
 - Tender middle to distal 1/3 anterior tibia
- ▶ **Diagnostics**
 - X-rays
 - Dreaded Black line
- ▶ **Treatment**
 - Rest
 - Therapy
 - NEW SHOES
 - Alternate surfaces
- ▶ **Referral**
 - Failure to respond to conservative treatment
 - Stress fracture
 - Concern for exertional compartment syndrome

Achilles tendinitis

- ▶ **Clinical presentation**
 - C/o of heel pain in the morning and with activity
- ▶ **Exam finding**
 - Negative Thompsons test
 - Tight Gastrocs
 - +/- Haglund Deformity
- ▶ **Diagnostics**
 - X-rays
 - MRI
 - Recalcitrant cases
- ▶ **Treatment**
 - Rest
 - Ice
 - NSAIDS
 - Therapy
 - Heel lift
 - Night splinting
- ▶ **Referral**
 - Failure of Conservative treatment
 - Concern for Achilles tendon tear

Calf Strain

- ▶ **Clinical presentation**
 - Pain calf
 - Identifiable injury
 - +/- Pop
- ▶ **Exam finding**
 - Tender medial/lateral gastroc
 - Tender Soleus
 - Negative Thompson sign
- ▶ **Diagnostics**
 - X-rays
 - Venous Duplex scan
 - If DVT is suspected
 - MRI
 - Rule out Achilles tendon rupture
- ▶ **Treatment**
 - Protected weight bearing
 - Heel lift
- ▶ **Referral**
 - Failed Conservative treatment
 - Tendon Ruptures

Foot


- ▶ **Anatomy**
 - ROM
 - First MTP
 - Extension 70
 - Flexion 45
 - Subtalar joint
 - Inversion- 40
 - Eversion- 20
 - Lesser toes
 - MTP
 - Flexion- 40
 - Extension- 40

Foot

- ▶ Exam
 - Arch
 - Pes Planus
 - Flat foot
 - Pes Cavus
 - High arch
 - Wounds
 - Pulses
 - Nails
 - Sensation

Plantar Fasciitis

- ▶ **Clinical presentation**
 - Plantar heel pain worse in the morning
- ▶ **Exam finding**
 - Tender plantar heel over medial calcaneal process
 - Tender plantar fascia
 - Pes planus
 - Tight gastrocs
- ▶ **Diagnostics**
 - X-rays
 - MRI
- ▶ **Treatment**
 - Rest
 - Ice
 - Therapy
 - Heel cups/orthotics
 - Night splints
 - Injection
- ▶ **Referral**
 - Failure of conservative treatment



(Plantar fasciitis, 2011)

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