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## I. Hand

### Anatomy:

Radial N. (Sensation): Dorsal 2/3 of hand 1-4.5. Pure radial in dorsal web space of thumb and index.

(Motor): Test with wrist extension/finger extension off table.

Median N. (Sensation): Palmar 1-4.5 and dorsal tips of 1-4.5. Pure Median volar tip of 2<sup>nd</sup>.

(Motor): Test with "OK," thumb to pinky and squeeze.

Ulnar N. (Sensation): 4.5-5 dorsal and volar. Pure ulnar on volar tip of 5<sup>th</sup> digit.

(Motor): Intrinsic hand muscles except thenar. Test with finger Abduction.

Intrinsic Muscles: responsible for delicate hand movt's (include Thenar – Median N. and Hypothenar – Ulnar N).

Flexors (9): flexor pollicis longus, FDS(4)-flexion at PIP; FDP(4)-isolated DIP flexion.

Extensors(9): extensor pollicis longus/brevis, Abductor pollicis longus.

Carpal Tunnel: contains 9 flexor tendons and median N.

Snuff Box: The snuffbox is bordered above by the tendon of the extensor pollicis longus and below by the extensor pollicis brevis and the abductor pollicis longus.

### Common Hand Dx's:

1. Finger Dislocations: IP dislocations can be reduced. MP dislocations may be difficult secondary to soft tissue interposed in the joint.

- Tx: reduce and splint +/- referral if complex. Must call for help if cannot reduce or refer urgently.

2. Phalange Fx: immobilize simple fx in splint x 4 wks. Consider referral for all hand injuries.

Consultation if complex fracture that may require surgical repair.

3. Metacarpal Fx:

- **Simple fx** without angulation can get Tx'd with short arm cast or splint.
- **Fx of MC neck (Boxer Fx):** typically fx of 4<sup>th</sup> or 5<sup>th</sup> neck with volar displacement of MC head.
  - Clin: swollen dorsum with bony tenderness of MC.
  - Tx: nondisplaced – gutter splint/cast with outrigger.
  - Displaced/angulated – 2<sup>nd</sup> and 3<sup>rd</sup> finger can have < 15 deg angulation. 4<sup>th</sup> finger can have < 20 degrees angulation, fifth finger < 20-40 degrees angulation. Reduction if needed then immobilization with splint/cast (MCP joint in flexion).
  - Always with ortho/hand follow-up.

4. Bennet's Fx: fracture-dislocation at the carpometacarpal thumb joint.

- Tx: thumb-spica splint/cast and referral for eval and possible surgical repair.

5. Rolando Fx: (Double Bennet) Comminuted intraarticular fx at base of thumb (Y-shaped).

- Tx: thumb-spica splint/cast and refer to ortho/hand for likely ORIF.

6. Carpal Tunnel Syndrome (Median N. compression).

- Clin: usually pain, numbness, tingling along median N. distribution, secondary to repetitive motion (also hypothyroid, RA, gout), bilateral in 50%. *Tinel's sign:* percussing the median nerve reproduces pain and tingling along distribution. *Phalen's sign:* wrist flexion reproduces pain and tingling.
- Tx: eliminate the cause, anti-inflammatory, splinting, injection, PCP referral.

7. Ganglion Cysts: soft tissue lesions, usually originating from a tendon sheath.

- Clin: often on wrist (dorsum > volar).
- Tx: observation, aspiration with pressure dressing, surgical removal (10-15% recurrence).

8. Dupuytren's Contracture: progressive contractures of palmar fascia leading to flexion deformity (idiopathic, DM, alcoholism, liver dz).

- Clin: onset age 40-60; flexed/contracted hand.
- Tx: stretching, surgical.

9. De Quervain's Tenosynovitis: inflammation usually due to overuse (or trauma).

- Clin: pain and tenderness over radial side of wrist (first dorsal compartment - EPB, APL). *Finkelstein's test:* pain reproduced with ulnar deviation while thumb flexed into fist - passive stretching of affected thumb tendons.
- Tx: NSAIDS, immobilization, steroid injection.

10. Extensor Tendon Injury:

- Tx: direct end-to-end repair with nonabsorbable suture; finger splinted in extension and immobilized x 4 wks with ortho follow-up.

11. Flexor Tendon Injury:

- Tx: orthopedic consultation for operative repair. Can primarily close the skin for referral to orthopedist if delay anticipated.

12. Closed Fist Injury (CFI): mixed flora usually secondary to fist striking tooth.

- Tx: Inspection, cleaning, x-ray, Td, leave wound open, dressing, IV Abx then discharge with PO Abx & close follow-up vs admit for IV Abx (> few hours or already obv. infection).
13. Felon: infection of the closed pulp space in distal phalanx.
- Can progress to osteo, FTS, abscess.
  - Tx: I&D with wick. Abx if associated cellulitis.
14. Paronychia: infection of the distal phalanx along the edge of the nail.
- Tx: drainage; Abx if associated cellulitis.
15. Flexor Tenosynovitis (FTS): a flexor tendon sheath infection.
- Clin: *Kanavel's signs*: swollen finger, held in flexion, pain along flexor sheath, pain with passive extension.
  - Tx: IV Abx and urgent ortho referral/consultation for I&D – often in the OR.
16. Herpetic Whitlow: viral infection of distal finger.
- Clin: one or more painful vesicles on or near finger pad.
  - Tx: self-limiting. DO NOT perform I&D (viral dissemination).
17. High Pressure Injection Wounds: paint gun, oil gun, grease gun.
- Tx: x-ray, Td, IV Abx, & orthopedic consultation for operative debridement.
17. Minor Finger Injuries:
- Nail bed laceration – repair with 6-0 or 7-0 absorbable and replace nail with sutures or place gauze/foil into eponychium for 5-7 days.
  - Subungual hematoma – x-ray to rule-out associated fx. Trephination to relieve hematoma. Some say remove nail if > 50% to assess for nail bed injury (controversial).
  - Mallet finger – laceration of extensor tendon over DIP; tender and cannot extend DIP; Tx with splint of DIP in extension and ortho f/u.
  - Boutonniere deformity – laceration of extensor tendon over PIP; tender over dorsal PIP; cannot extend PIP; Tx with splint in full extension and ortho f/u.
  - Jersey Finger – FDP tendon injury; inability to flex DIP  
Tx: splint and refer to hand for possible surgical repair.
  - Skier's / Gamekeeper's thumb – ulnar collateral ligament injury (forced radial abduction).  
Tx: thumb spica splint and ortho referral for possible surgical repair.

## **II. Forearm / Wrist Injuries:**

1. **Isolated radial/ulnar fractures:** simple, nondisplaced fractures are generally treated with long arm cast.
  - Angulation/displacement may require ORIF.
2. **Distal Radius Fx (Colles):** most common wrist fracture – FOOSH.
  - Clin: dorsal pain and swelling; “dinner fork” deformity.
  - Tx: short arm splint/cast (+/- reduction) and refer to ortho.
  - Always check for median nerve compromise.
3. **Distal Radius Fx (Smith’s):**
  - Clin: Volar deformity (reverse Colles).
  - Tx: short arm splint/cast (+/- reduction) and refer to ortho.
4. **Barton’s Fx:** Oblique, intraarticular, distal radius fracture
  - Tx: often requires ORIF.
5. **Scaphoid Fx:** Usually occurs secondary to FOOSH. Important to catch because the blood supply often runs distal to proximal and nonunion/avascular necrosis can result with poor healing.
  - Four types: tubercle, horizontal oblique, transverse, and vertical oblique.
  - Clin: tenderness and swelling over anatomic snuffbox. X-rays often negative initially.
  - Tx: if fx or suspicious place short arm cast with thumb spica and refer to ortho for repeat x-rays in 10-14 days.
6. **Triquetral Fx:** classic x-ray finding of dorsal bone chip on lateral view.
  - Tx is splint and referral.
7. **Ulnar Styloid Fx:** on lateral x-ray shows characteristic posterior avulsion.
  - Tx is splint and referral.
8. **Scapholunate dissociation:** presents with wrist tenderness over this joint. X-ray shows >3mm space.
  - Tx is early referral for ligamentous repair.
9. **Lunate & Perilunate dislocation:** presents with wrist tenderness over this joint.
  - Tx is referral for closed reduction vs. surgical repair.

### III. Elbow Injuries:

#### Anatomy:

Humorous (*trochlea* – medially and *capitellum*-laterally)

Radius

Ulna (with *olecranon*).

#### Neuro/Vasc:

Ulnar nerve travels behind the medial epicondyle.

#### Common Dx's:

1. Epicondylitis – an overuse syndrome. “tennis elbow” laterally; “golfer’s elbow” medially.
    - Clin: gradual onset, dull ache over affected epicondyle.
    - Tx: Rest, ice, NSAIDS, steroid/Lidocaine injection.
  2. Nursemaid’s Elbow: radial head subluxation beneath the orbicular ligament.
    - Clin: age 1-3 years, arm held at side in slight flexion/pronation.
    - Tx: reduction with supination/flexion with thumb on radial head. Sling can be worn for a few days after reduction if needed.
  3. Olecranon Bursitis: Bursa filled with blood/fluid after an acute trauma, infection, or chronic.
    - Clin: tender, painful, swelling over olecranon.
    - Tx: aspiration of fluid (with culture if suspicious for infxn) with compression dressing and ice. X-rays if trauma to rule-out fracture.
  4. Elbow Dislocation: usually posterior, secondary to FOOSH in extension.
    - Clin: painful, swollen elbow.
    - Tx: reduction with traction-countertraction. Place posterior splint and repeat x-rays when reduced.
  5. Olecranon Fracture:
    - Tx: non-displaced gets posterior splint and referral. Displaced fracture gets urgent ortho referral for likely ORIF.
  6. Supracondylar Fracture: most common elbow fx in kids.
    - Grading: type I: non-displaced fx.  
type II: displaced with intact posterior cortex.  
type III: displaced with no cortical contact.
    - Tx: nondisplaced (minimally displaced) fx gets posterior splint/cast. Displaced fx gets emergent ortho consult for operative repair.
    - Potential complications include Volkman’s ischemic contracture.
  7. Galeazzi Fracture-Dislocation: Distal radius fx with radial-ulnar dislocation.
    - Tx: urgent/emergent ortho referral.
  8. Monteggia’s Fracture-Dislocation: Midshaft ulnar fx with radial head dislocation.
    - Tx: urgent/emergent orthopedic referral.
- “GRUM” Galeazzi (distal radius fx with ulnar dislocation)  
“MURG” Monteggia (ulnar fx with radial dislocation)

## **IV Shoulder Injuries:**

### **Anatomy:**

Bones: Scapula, clavicle, humerus.

Joints: glenohumeral, scapulothoracic, acromioclavicular (AC), sternoclavicular.

Rotator Cuff Muscles (SITS): supraspinatus, infraspinatus, teres minor, subscapularis.

### **Exam:**

Anterior exam with both shoulders exposed, active and passive range of motion and palpation, and crossover for AC examination.

#### **1. Rotator Cuff Tendinitis:**

Clin: shoulder pain, often worse at night, worse with pressure; active palm-down Abduction is painful; passive Abduction is also painful.

Tx: Conservative +/- steroid/lidocaine injection.

#### **2. Rotator Cuff Tear / Rupture:**

Clin: inability (or decr ability) to ABduct or flex the shoulder (most commonly supraspinatus). "Drop-arm" test – passive Abduction to 90 degrees with thumb pointed down, then release.

Tx: partial tears – conservative Tx: with follow-up; Complete tears – ortho referral for possible surgical repair.

#### **3. Rotator Cuff Calcification:**

Clin: pain similar to tendonitis. X-ray will reveal calcification.

Tx: subacromial injection with steroid/lidocaine and conservative Tx.

#### **4. Biceps Tenosynovitis:** inflammation of the tendon and sheath in the bicipital groove.

Clin: pain over the bicipital groove; supination against resistance causes pain.

Tx: Conservative +/- injection.

#### **5. Adhesive Capsulitis (Frozen Shoulder):**

Clin: onset usually gradual (age >50); constant pain and limited shoulder motion (active or passive).

Tx: pain relief and restoration of motion +/- injection.

#### **6. Glenohumeral Dislocation**

Clin: In anterior dislocation (most common), prominent acromion, palpable emptiness below deltoid, limited ROM. Posterior dislocation classically secondary to seizure, electrocution, self-inflicted.

Tx: sedation and reduction – multiple techniques (traction-counter traction, Stimson, etc). Then sling or immobilizer x 1-2 wks.

#### **7. AC Dislocation:**

Grade I: Contusion/sprain; Tx with sling for several days.

Grade II: Incomplete ligament rupture; Tx with sling for several days.

Grade III: Complete AC ligament rupture with associated CC rupture – may need ortho referral.

Grade IV & V: complete rupture with significant displacement – ortho referral.

#### **8. Clavicle Fx**

Clin: tender deformity.

Tx: sling x weeks.

#### **9. Humeral Fx**

Proximal humeral fx:

Tx: if minimally displaced at surgical neck, tx with sling and ortho f/u.

If displaced, may require reduction.

Humeral shaft fx: always evaluate radial N. and splint with sugar tong and close ortho f/u.

## V. Knee Injuries:

### Anatomy:

Bones: medial and lateral femoral condyles, tibial condyles, and patella.

Ligaments: MCL, ACL, LCL, PCL

### Knee exam:

With knee in slight flexion, palpate patella, medial/lateral, popliteal; ROM, wt bear, gait, effusion, drawer signs, laxity, McMurray, Apley,

#### 1. Meniscal Injuries: most common knee injury (medial>lateral)

Clin: a twisting injury while the foot is weight-bearing. Pt may feel “pop” or “tear” then pain +/- locking, with delayed swelling (vs. immediate swelling which implies ligamentous injury with bleeding). On exam, pt will have joint effusion, pain over joint line, limited ROM.

McMurry Test: hip and knee flexed, varus/valgus stress placed reproduces pain on the affected side at meniscus (joint line)

Tx: Conservative (knee immobilizer and crutches as needed) with range of motion in 2-3 days.

Follow-up for re-eval if not improving, first with PMD then ortho as needed.

#### 2. Baker’s (Popliteal) Cyst

Clin: Rupture can cause pain/swelling of popliteal/calf.

Tx: conservative with NSAIDS and follow-up if not improving.

#### 3. Ligamentous Injury

Clin: Inability to bear weight with immediate swelling; Examine collateral ligaments via varus/valgus stress at 30 degrees flexion (relaxes the cruciates to prevent false (-)). Then check

at

0 degrees flexion. Check the drawer signs at 45 degrees flexion and Lachman test with near full extension.

Valgus stress classically MCL injury.

Varus stress classically LCL injury.

Cruciate injuries classically result from a twist.

Tx: Splint, wrap, RICE; early rehab/referral in not improving.

#### 4. Patellar Dislocation

Clin: painful knee cap, generally laterally displaced.

Tx: extend the knee to relax quads, reduce lateral to medial, discharge in knee immobilizer.

#### 5. Osgood Schlatter Disease: a lesion at the attachment of the patellar tendon into the tibial tubercle.

Clin: Adolescents with pain, swelling, tenderness over the tibial tubercle.

Tx: Conservative.

#### 6. Osteochondritis Dissecans: avascular necrosis of subcondral bone with +/- separation.

#### 7. OA / DJD:

Clin: pain with activity, relieved w rest; morning stiffness relieved with mov’t; crepitous at joint.

Tx: x-ray may show joint-space narrowing, osteophyte formation; treatment includes weight loss, rest, NSAIDS, and follow-up for possible surgical replacement.

#### 8. Bursitis: (Anserine, Prepatellar)

Clin: painful, swollen bursa.

Tx: heat, rest, NSAIDS, +/- steroids/lido injection. Send fluid for culture and consider Abx if concerned for infxn.

#### 9. Tibial Plateau Fx:

Undisplaced / impacted – nonweight bearing x 6-8 weeks with ortho f/u.

Displaced – ORIF.

#### 10. Patella Fx:

Nondisplaced (<8mm); Tx with brace, splint for 5-6 wks with ortho f/u.

Displaced: usually needs operative repair; especially if extensor mechanism is disrupted.

## VI. Ankle Injuries:

Bones of the ankle: distal tibia/fibula, talus, calcaneus.

Ligaments of the ankle: **Medially** – the Deltoid ligament group. **Laterally**, the Anterior talofibular ligament (ATF), the calcaneo fibular ligament (CF) and the posterior talofibular ligament (PTF).

Ottawa Ankle Rules: x-rays in patients unable to bear weight at scene/in ER, and in patients with bony tenderness at: medial/lateral malleoli, navicular, base of 5<sup>th</sup>.

### 1. Ankle Sprain

- 85% involve the lateral ligament complex (ATF ligament >> CF ligament).
- Injuries can be graded I-III:
  - Grade I: partial ligament tear with mild tenderness and swelling. No mechanical instability.
  - Grade II: incomplete tear with moderate functional impairment, pain, swelling and some loss of motion and function.
  - Grade III: complete tear and loss of integrity with severe swelling, echymosis, instability.
- Damage to the tibiofibular syndesmosis with associated proximal fibula fx (maisonneuve fx) must always be assessed.
- X-ray of the ankle is generally done to assess ankle bones, mortise, fifth MT base.
- Tx: for low grade sprains: rest, ice compression, elevation with pain meds and crutches if needed for several days (ace wrap or ankle brace).
- Then rehabilitation vs. reevaluation if not improving.

### 2. Ankle Fractures (includes distal tibia, fibula, talus, calcaneous)

- Normally, the dome of the talus sits between the medial and lateral malleoli forming the mortise. The posterior margin of the tibia is referred to as the third or posterior malleolus (ie in a trimalleolar fracture).
- Talar Displacement – will require orthopedic referral for possible surgical repair – an unstable joint.
- Undisplaced malleolar fractures below the joint line – considered stable. Tx with short-leg walking cast/boot with weight-bearing as tolerated.
- Bimalleolar fx - usually treated with long leg cast.
- Isolated lateral malleolus fx with minimal displacement – tx with casting if no medial (deltoid) ligament injury is present.
- Pilon Fx – distal tibia metaphysis Fx and disruption of talar dome.
- Maisonneuve Fx – proximal fibula fx with medial malleolar injury.
- Tillaux Fx – SH III of anterolateral tibial epiphysis.
- Snowboarder Fx – Lateral talar fx.

### 3. Achilles Tendon Rupture – Injury often occurs with jumping or pushing off forefoot.

- Clinically presents with feeling of “pop” at time of injury, pt walks flatfooted – unable to stand on ball of foot. Tender +/- bruising over calf. Decreased ability to plantar flex. *Thompson Test* (squeezed calf causes plantar flexion) may be abnormal.
- Tx: orthopedics consultation. Short-leg cast/splint with foot in “equines” (plantar flexion). Likely surgical repair.

### 4. Other Causes of Calf pain to consider:

- DVT
- Plantaris Tendon Rupture – often presents like an Achilles tendon injury, but without loss of calf strength.
- Partial Gastrocnemius Rupture
- Ruptured Baker Cyst

## VII. Foot Pain:

### Anatomy:

Hindfoot = talus + calcaneous

Midfoot = Navicular (prox/medial), cuboid (lateral), 3 cuneiforms.

Forefoot = metatarsals + phalanges

### Neuro/Vasc:

Dorsum: DP artery / deep peroneal nerve.

Plantar: posterior tibial artery / tibial nerve.

### Can't miss Dx's:

Amputation, compartment syndrome, vascular compromise, deep infection/gangrene, nec fasc, frostbite, burn.

### Common Dx's:

1. Plantar fasciitis: results from constant/repetitive strain on plantar fascia/ligaments. Pain is generally unilateral and worse after rest. Pain is reproducible with palpation of medial tubercle of calcaneus. Tx is arch support, rest, NSAIDS.
2. Morton's neuroma: presents as pain/paresthesia between MT heads. Especially prevalent with high heels. R/O fx with x-ray. Tx conservatively as above.
3. Diabetic neuropathy: often in glove-stocking distribution. Presents with pain followed by sensory loss. Tx with referral and Gabapentin (?)
4. Gout: accumulation of uric acid crystals. Usually monoarthropathy, develops over hours. Presents as painful, swollen, red toe. Fluid can have wbc's, but no bacteria. Serum uric acid often elevated. Tx with NSAIDS (Indomethacin 25-50 q8 hrs).
5. Puncture wounds/FB: clean, examine, x-ray/ultrasound, and extract FB if possible. Do not close punctures. Give Td. Abx if dirty/contaminated/cellulitic. Consider Pseudomonas if shoe involved.
6. Ingrown toenails: enough said. Repeat PGY2 year 1060 if questions.
7. Stress Fractures: occur from excessive/repetitive trauma. Pain worse with weight-bearing, relieved with rest. Tx with rest, hard-soled shoe x weeks.
8. MT Fx: simple (non-articular) Fx can treated with soft compression dressing and crutches. Displaced fx's may need reduction with orthopedics (closed or open).
9. Phalanx Fx: buddy-taped and hard sole shoe.
10. 5<sup>th</sup> MT (Jones) Fx: a fx through the shaft (15 mm from proximal base): urgent orthopedic follow-up with cast vs. surgery. Potential for delayed union/nonunion due to poor circulation.
11. 5<sup>th</sup> MT (Dancer) Fx: a fx of the tuberosity: Tx with hard-sole shoe.
12. Talus Fx: usually presents with significant pain and swelling. X-ray may or may not demonstrate Fx; may require CT/MRI. Splint and refer.
13. Calcaneus Fx: usually result from fall onto heel (always examine the knees, hips, and spine!).
  - x-ray with standard and Harris (axial) view. Boehler's angle < 20 degrees is suspicious.
  - Splint and refer – often needs CT.
14. Lisfranc Fx/Dislocation: a disruption at the base of the 2<sup>nd</sup> MT and attachment to medial cuneiform. Tx is hard splint, non-weight bearing, and urgent ortho referral for cast vs. surgical repair.

## **VIII. Low Back Pain:**

**History:** prst of pain, age, hx trauma, hx infections/hiv, hx ca, hx incontinence

- **Red Flags:** Wt loss (CA), Incontinence (cauda equina), Prostate, Fever (epidural abscess), IVDA, Steroid use, night pain worse.
- **Buttock Pain D/Dx:** Sciatica, Claudication, Deep abscess, Hernia, Radiculopathy

**Physical Exam:** inspection/palpation of back, range of motion, cva's, LE neuro exam

1. **Standing position** – kyphosis/lordosis, iliac crests, spine and SI joints. Have pt flex forward and observe. Observe gait pattern; ability to walk on heels (L5 root) and balls of feet (S1 root).
2. **Sitting position:** complete neuro exam of LE's (reflexes, motor strength, sensation). Peripheral pulses.
3. **Supine position:** hip placed through full range of motion, straight leg raise test.
4. **Rectal exam:** important if any concern for nerve compromise.

**X-rays:** who needs them? (AP, Lateral, Oblique)

- Any reds flags, trauma, osteoporosis, age <20 or >50, planned ortho f/u.

**Labs:** ESR, Ca, ALP, HLA-B27 (if suspicious for CA, infection, ankylosing spondylitis).

### **Common Diagnoses:**

1. **Lumbar Disk Syndrome:** majority occur at L4, L5 usually after age 30.
  - L4 root: pain posterolateral thigh, patella, anteromedial leg; weakened quads/knee jerk.
  - L5 root: pain posterolateral thigh; weak great toe extension/dorsiflex/heel-walking.
  - S1 root: pain posterolateral thigh; weakened calf/plantar flex/great-toe walking.
  - Tx: conservative – rest, NSAIDS, heat, then gradual activity.
2. **Acute Lumbar Strain:** usually associated with physical activity, often with history of previous similar exacerbations. Don't ignore red flags. Tx with acute pain control in ER, reassess, and usually discharge with pain control and conservative tx recs.
3. **Spondylolisthesis:** a disorder where one vertebrae slips on another.
  - Tx is generally conservative.
4. **Discitis:** an infectious or inflammatory disease of unknown etiology.
  - Clin: low back pain, usually in a child, with tenderness to palp, often low grade fever, +/- elevated ESR.
  - Tx: Abx, rest.
5. **Seronegative Spondyloarthropathies**
  - **Ankylosing Spondylitis:** morning stiffness and progressive loss of spinal movement; men>women; sacroiliitis; age 15-30 years. anterior uveitis in 25%. "Bamboo spine."
  - **Reiter's Syndrome:** uveitis, urethritis, SI arthritis.
6. **Multiple Myeloma:** neoplastic proliferation of plasma cells of bone marrow.
  - Clin: weakness, anorexia, weight loss, bone pain (spine); X-rays show "punched-out" lesions in spine, skull, ribs, pelvis. Labs show Bence-Jones proteins in urine (+/- anemia and ESR elevation).
  - Tx: oncologist consultation.

### **Misc:**

- Benign mechanical pain is usually worse with activity and relieved by rest; malignancy is often constant/worse at night with rest.
- Ankylosing spondylitis usually worst in morning and improves with activity.
- Always consider AAA and document abdominal exam.
- Multiple Myeloma: anemia, back pain, osteoporosis, age > 50, increased ESR.
- Cancer Mets: consider in breast CA in female > 50, back pain, hypercalcemia; Prostate CA in men > 50 with similar presentation.

### **D/Dx:**

1. **Musc-Skeletal:** disc herniation, tumor, osteomyelitis/epidural abscess, ankylosing spondylitis/spinal stenosis, Fx,  
Sciatica (radiculopathy), Muscular strain, Mets (PB KTL) Prostate, Breast, Kidney, Thyroid, Lung/Lymphoma)
2. **Neuro:** Cauda Equina Syndrome: (bowel/bladder incont., sacral anesth., paralysis, numbness)
3. **ID:** Osteo, Epidural abscess: (F/C, wt loss, pain, hx IVDU/TB/HIV/instrumentation in back)
4. (**L3-L4 lesion:** decr. nee extension strength, decr. knee reflex / **L5 lesion:** decr. extension big toe, decr sensation 1<sup>st</sup> web space / **S1 lesion:** decr. plantar flexion, decr. ankle jerk), straight leg raise, rectal exam (extreme pain, bowl incont, abnorm neuro finding, pt's with risk factors), assess ambulation, pulsatile abdominal mass in older pts.
4. **Renal:** pyelo or stones; fever, flank pain, UTI Sx)

5. *GYN*: ruptured ectopic, ovarian torsion, mass
6. *GI/GU*: pancreatitis, cholecystitis, gastric ulcer, nephrolithiasis, UTI
7. Vasc: AAA (elderly, HTN, marfans, ehlers danlos)

## IX. Arthritides

### Joint Swelling

- 1. Monoarthritis:** trauma (hemarthrosis), infection (septic: gonococcus, Staph, gram (-)'s), Crystals, osteoarthritis, lyme dz, avascular necrosis, tumor.
- 2. Oligoarthritis (2-3):** lyme dz, reiter's, ankylosing spondylitis, gonococcal, rheumatic fever.
- 3. Polyarthritis (>3):** rheumatoid arthritis, SLE, viral, osteoarthritis.

### Synovial Fluid Analysis (Generalizations)

	<b>Normal</b>	<b>Noninflammatory</b>	<b>Inflammatory</b>	<b>Septic</b>
WBC	<200	<2000	<50,000	5000-50,000
PMN(%)	<25%	<25%	>75%	>75%
Crystals	None	None	Maybe	None
Glucose	95-100%	95-100%	80-100%	<50%
Culture	Neg	Neg	Neg	Positive > 50%
Disease	Normal	OA, Trauma, RF	Gout, Pseudogout, RA, Lyme, SLE	Septic Arthritis

## X. Miscellaneous

### **Extremity exam:**

1. Skin – describe (include lesions, wounds, erythema, etc).
2. Soft tissue – apparent infection / bleeding.
3. Bones – tenderness to palpation (TTP), deformities.
4. Joints – range of motion, TTP, (un)stable.
5. Neuro – sensory / motor in all relevant distributions.
6. Compartments – soft, firm, hard.
7. Vascular – pulses / cap refill.

### **Fracture description:**

1. Name/location of bone (ex. distal radius).
2. Open vs. closed fracture.
3. Type of fracture: transverse/oblique/comminuted/avulsed/greenstick.
4. Angulated? Displaced? Intraarticular?
5. Salter Harris classification if epiphyseal plate involved.

### **Common fractures**

- |  |                                   |
|--|-----------------------------------|
| 1. Anterior shoulder dislocation ----- | Axillary Nerve (deltoid numbness) |
| 2. Humeral fracture                    | Radial Nerve (wrist drop)         |
| 3. Medial epicondyle fracture -----    | Median Nerve                      |
| 4. Fibula fracture                     | Peroneal Nerve (foot drop)        |
| 5. Tibia fracture -----                | Compartment syndrome              |
| 6. Supracondylar fracture (displaced)  | Volkman's contracture             |
| 7. SH III – V -----                    | Growth disturbance                |

### **Potential complications:**

### **Common fractures that do not usually require casting:**

- |                                       |                             |
|---------------------------------------|-----------------------------|
| 1. Non-displaced radial head fx ----- | sling                       |
| 2. Non-displaced olecranon fx         | sling                       |
| 3. Non-displaced patella fx -----     | knee immobilizer            |
| 4. Fibula shaft fx                    | crutches                    |
| 5. Base 5 <sup>th</sup> MT -----      | hard-sole shoe              |
| 6. Toe phalynx                        | buddy tape / hard-sole shoe |

## Wound Care - draft

### 1. Irrigation

- 60 ml of NS per 1 cm of wound length.

### 2. Abx

- Skin flora: keflex / Diclox (Clinda if allergic). Consult current recs for MRSA.
- Bites: Amoxicillin-clavulanate (Augmentin).
- Oral: Penicillin.
- Freshwater/puncture through shoes: FQ (Pseudomonas coverage).
- Generalizations:
  - o Prophylax for bites on extremities (augmentin), intraoral wounds (pen or clinda), open fractures and exposed joints/tendons (ancef + gent).

### 3. Td

- Always update pm.

### 4. Sutures

- Monofilament absorbable (Monocryl) for deep closure.
- Rapid absorbing (Vicryl) for subcutaneous / superficial closure.
- Nylon for skin closure.
- 6-0 nylon: face / cosmetically important areas.
- 5-0 nylon: hand / finger.
- 4-0 nylon: trunk / extremities.
- 3-0 nylon: scalp / sole / high tension.
- Generalizations:
  - o Remove facial sutures 3-5 days, non-facial 7-10 days, and joints/high tension areas 10-14 days.

### 6. Delayed Closure

- Contaminated wounds or presentation > 12 hrs; may leave open for 3-5 days and reassess for closure at that time.

7. Eyebrows: - never shave.

8. Scalp: - never shave. Close with staples or large nylon suture (leave long tails for recovery and removal).

9. Eyelids: close uncomplicated with 6-0 nylon.

- Refer to optho for: involvement of inner lid, lid margins, lacrimal duct, associated ptosis, and tarsal plate involvement.

10. Lips: often a multi-layer closure.

- Align vermilion border with 6-0 nylon. Repair orbicularis orbis with 4-0 absorbable. Repair vermilion-mucous membrane with 5-0 absorbable.

11. Ears: Repair cartilage then skin with 6-0 nylon.

### 12. Tendon Injuries

- Extensor tendons can be primarily repaired with figure-of-eight nylon.
- Flexor tendons - irrigate and close skin for specialist repair (up to 7 days).

### 13. Puncture Wounds

- Low pressure irrigation, Td pm, Abx if immunocompr (DM, PVD).
- FQ for pseudomonas coverage if shoes involved.
- 14. High Pressure Injection (oil. paint): following x-rays, begin IV antibiotics and refer to hand specialist / ortho immediately.

### 15. Clenched Fist Injury (Fight Bite)

- Leave the wound open after irrigation, check x-rays and tendons, abx (augmentin), sterile dressing, and re-evaluate in 24-48 hours.
- Obvious infection requires IV abx and consultation.

### 16. Dog/ Cat Bites

- In general, hands and feet are left open (or closed loosely if large defect).
- All puncture wounds are given prophylactic Abx (Augmentin or Clinda + Cipro).

Infections at 24hrs suggests possible Pasturella (Pcn, Cipro, Bactrim).

17. Typical Exam/Procedure Note:

Following local anesthesia, the wound was copiously irrigated with normal saline under pressure and the (hand, foot, etc) was placed through a full range of motion and explored under a bloodless field. No foreign bodies were seen and all tendons were ranged showing no deficits. A repair was made using (describe type and # of sutures) with no complications. The patient was given precautions regarding potential infection and the possibility of retained FB, not detected at this time. Follow-up was arranged as noted in the discharge summary. The need for Td and Abx were discussed and documented below

