Patient Reports With Traumatic or Acute Neck Pain

Screening and Referral Tools (SRTs)
TRAUMATIC and ACUTE NECK PAIN

**Canadian Cervical Spine Rules**

Does the patient have any high risk factors that mandate radiography?
- Age > 65
- Dangerous mechanism
- Paresthesia in extremities

Yes

No

Does the patient have any of the following low risk factors that allow safe assessment of range of motion?
- Simple rear-end MVA
- Assumes sitting position in waiting room
- Ambulatory at any time
- Delayed onset of neck pain
- Absence of mid-line C-spine tenderness

Yes

No

Obtain Radiographs

No Radiographs needed

**Profiles**

Sample severe (A) and moderate (B) neck injury profiles on eProfile.

(A) Severe neck injury examples:
- anything requiring hard collar
- Fracture or instability
- Progressive neuro deficit

(B) Moderate neck injury examples:
- Radiculopathy
- Pain, with decreased c-spine motion or upper body strength

Minimal neck injury example:
- Pain at end range of movement without decreased c-spine motion or upper body strength

*CALL ORTHO, NEUROSURGERY, NEUROLOGY, OR PM&R TO DISCUSS POSITIVE RED FLAG FINDINGS*

HISTORY
- Cancer
- Unexplained weight loss
- Compromised immune system
- Prolonged use of steroids
- Intravenous drug use
- Urinary tract infection (vertebral osteomyelitis)
- Pain increased or unrelieved by rest
- Unexplained fever
- Recent fall or trauma to the head or neck (fall from a height or MVA in a young patient; minor fall or heavy lifting in a potentially osteoporotic patient; recent penetrating injury)
- Osteoporosis
- Bladder or bowel incontinence
- Urinary retention (with overflow incontinence)
- Dysphagia
- Headache and vomiting
- Down Syndrome
- Rheumatoid Arthritis

PHYSICAL EXAM
- Evidence of spinal cord compression (e.g. major weakness in upper extremities; hand atrophy; loss of pain and temperature sensation in upper extremities; gait disturbance; Babinski’s or Hoffman’s sign; saddle anesthesia; loss of anal sphincter tone; etc)
- Fever
- Vertebral tenderness
- Severely limited spinal range of motion
- Neurologic findings persisting beyond one month

**PROFILES**

Sample severe (A) and moderate (B) neck injury profiles on eProfile.

(A) Severe neck injury examples:
- anything requiring hard collar
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- Fever
- Vertebral tenderness
- Severely limited spinal range of motion
- Neurologic findings persisting beyond one month
Patient Reports With Traumatic or Acute Hip Pain

**RED FLAGS**

**Fracture**
- Trauma

**Stress Fracture**
- Pain in hip, groin, thigh, or knee with weight bearing
- Sudden increase in pre-existing pain
- ROM limited or painful, particularly in internal rotation

**Avascular Necrosis (AVN)**
- Trauma
- Corticosteroid use or injections
- Excessive alcohol use

**Infection or Septic Joint**
- Acute pain with fever
- History of recent infection including elsewhere in the body
- Pain with loading or inability to bear weight
- Signs or symptoms of septic arthritis: acute joint swelling, pain, erythema, warmth, joint immobility (see p. 15 for risk factors)

**Vascular Injury**
- Hard/Soft Signs for Vascular Injury (see p.16)

**Screening and Referral Tools (SRTs)**

**TRAUMATIC and ACUTE HIP PAIN**

*Hip Pain References p.17*

**SPECIAL TESTS EXAM**

No

- (+) Special tests (see following page)
- OR
- (+) Antalgic gait

Yes

- Consider imaging per guidelines
- Profile 7-10 days
- Crutches if antalgic gait
- Analgesic Meds PRN (see p.16)
- Re-evaluate in 7-10 days by PCM if symptoms persist
- Further evaluation and/or referral may be warranted

**IMAGING/LAB GUIDELINES**

See following page for Imaging/Lab Guidelines including:
- Suspected hip fracture
- Suspected AVN of the hip
- Suspected stress fracture
- Suspected arthropathy or infectious disease

**PROFILES**

Sample severe (A) and moderate (B) hip injury profiles on eProfile.

(A) Severe hip injury examples:
- Stress fracture/fracture
- Instability

(B) Moderate hip injury examples:
- Motion limited by pain
- Mildly antalgic gait

Minimal hip injury example:
- Pain only at end range of some movements, minimal functional deficit with prolonged or strenuous effort

**Notes:**

- Imaging NOT Ordered
- Imaging ORDERED

- Yes
- No

- Positive findings on imaging or lab
- Discuss with Ortho

- Positive findings on imaging?
- Yes
- No

- + Special tests (see following page)
- OR
- (+) Antalgic gait

- Consider further imaging if clinically indicated (see guide next page)
- Profile appropriately
- Crutches (TTWB/NWB)**

- Profile appropriately
- Crutches if antalgic gait
- Analgesic Meds PRN (see p.16)
- Re-evaluate in 7-10 days by PCM if symptoms persist.
- Further evaluation and/or referral may be warranted

- Hip Minimal profile
- Analgesic meds PRN (see p.16)
- RTD at end of profile

---

**Notes:**

- Crutches (TTWB/NWB)**
- See p.15 for weight bearing descriptions. Refer to PT for crutches and TTTB/WB training. Femoral neck stress fractures on the tension (superior or lateral) side of the femoral neck are at high risk for displacement, even NWB on crutches because of the distraction force from the weight of the leg. **Call ortho immediately to discuss management.**
### Screening and Referral Tools (SRTs)
#### TRAUMATIC and ACUTE HIP PAIN TESTS

<table>
<thead>
<tr>
<th>TEST</th>
<th>PROCEDURE</th>
<th>(+) SIGN</th>
<th>SN/SP</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fracture</strong></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Patellar-Pubic</td>
<td>Helpful to diagnose a fracture of the hip or femur. The patient assumes</td>
<td>Diminished percussion noted on the side of pain.</td>
<td>SN = .89-.96</td>
</tr>
<tr>
<td>Percussion Test</td>
<td>a supine position and the examiner places a stethoscope over the pubic</td>
<td></td>
<td>SP = .82-.9513</td>
</tr>
<tr>
<td></td>
<td>symphysis of the patient. The examiner taps the patella of the patient’s</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>affected side and qualitatively reports the sound. The process is repeated</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>on the opposite side to assess for a difference in auscultation. A tuning</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>fork can be used in place of tapping.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hip Flexion Test</td>
<td>Helps to rule out a pelvic ring fracture. The patient is placed in a</td>
<td>Reproduction of pain during active movement or inability to raise the leg.</td>
<td>SN = .29</td>
</tr>
<tr>
<td></td>
<td>supine position. The examiner instructs the patient to raise his or her</td>
<td></td>
<td>SP = .954</td>
</tr>
<tr>
<td></td>
<td>leg actively (straight leg raise).</td>
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</tr>
<tr>
<td>Thomas Test</td>
<td>Helpful to diagnose a labral tear and demonstrates value as a test for</td>
<td>Reproduction of painful click or concordant groin pain.</td>
<td>SN = .89</td>
</tr>
<tr>
<td></td>
<td>hip flexor / quad tightness. The patient sits at the edge of the plinth.</td>
<td></td>
<td>SP = .975</td>
</tr>
<tr>
<td></td>
<td>The patient is then instructed to lie back, pulling both knees to his or</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>her chest. One knee (the non-tested side) is held to the chest and the</td>
<td></td>
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<tr>
<td></td>
<td>other is passively lowered by the examiner into extension with the knee</td>
<td></td>
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<tr>
<td></td>
<td>also allowed to extend. Tightness findings are as follows: Tight quad:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>knee flexion &lt; 80°. Tight hip flexors: thigh (TFL, sartorius) or lumbar</td>
<td></td>
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</tr>
<tr>
<td></td>
<td>spine (iliopsoas) is elevated off of plinth.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FADDIR Test</td>
<td>Helpful to diagnose labral tear. The patient is supine, and the examiner</td>
<td>Reproduction of deep groin pain, locking, clicking, or catching.</td>
<td>SN = .94-.99</td>
</tr>
<tr>
<td></td>
<td>passively brings the hip into 90° hip and knee flexion. The examiner</td>
<td></td>
<td>SP = .07-.086</td>
</tr>
<tr>
<td></td>
<td>then passively adducts the patient’s hip to end range with overpressure,</td>
<td></td>
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<tr>
<td></td>
<td>then passively internally rotates the patient’s hip with overpressure.</td>
<td></td>
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</tr>
</tbody>
</table>

### *IMAGING/LAB GUIDELINES*

**Suspected hip fracture:**
- Plain radiographs will show a suspected fracture in the majority of cases
- If clinical suspicion of occult fracture persists, MRI is the imaging modality of choice
- CT or nuclear medicine bone scan are alternatives to MRI

**Suspected AVN of the hip:**
- Initial imaging with plain films
- If there is ongoing suspicion with normal plain film radiography, MRI is the most accurate imaging modality and contact Orthopedics
- Bone scan is a reasonable alternative to MRI
- Complete MRI for AVN, infection if still symptomatic in 10-14 days and protective WB, earlier if any red flags are present.

**Suspected stress fracture:**
- Plain radiographs are the initial imaging modality of choice, but are limited due to their inability to detect bony changes early in the development of a stress fracture.
- Early radiographs are often normal. Consider repeat plain radiography at 10-14 days.
- MRI is the most sensitive and specific investigation to diagnose a stress fracture when radiographs are normal or equivocal and can best evaluate for other differential diagnoses. Consider using FAST (T2-CORONAL) MRI if clinical suspicion for stress fx.
- Bone scan has high sensitivity for stress fracture but poorer specificity, and is associated with ionizing radiation exposure. It is an alternative when MRI is contraindicated or unavailable.
- CT can be helpful as an alternative to MRI to demonstrate bony changes but is less sensitive.

**Suspected arthropathy or infectious etiology.**
- Order inflammatory indices (CBC, ESR, CRP). If positive contact Orthopaedics.
Patient Reports With Traumatic or Acute Ankle Pain

Screening and Referral Tools (SRTs)

TRAUMATIC and ACUTE ANKLE PAIN

Ankle Pain References p.18

**RED FLAGS**

**Fracture**
- Ottawa Ankle Rules** (Imaging Guidelines)
- Contact ortho/podiatry for all fractures; see Weber classification on p.15 for details

**Achilles Rupture**
- Felt/heard a “pop”
- Palpable defect (posterior leg)
- Positive Thompson Test: Absence of passive plantar flexion upon squeeze of calf muscle with patient prone or kneeling
- Inability to rise up on toes during single leg stance (ensure patient does not substitute by weight bearing through upper extremities)

**Infection, Septic Joint, Crystal Induced Arthropathies**
- Acute pain with fever
- History of recent infection including elsewhere in the body
- Pain with loading or inability to bear weight
- Signs or symptoms of septic or crystal induced arthritis: acute joint swelling, pain, erythema, warmth, joint immobility (see p.15 for details)

**Deformity**

**Fibular Head Tenderness**

**Neurovascular Compromise**

**SYMPTOMS PERSIST?**

**NO**

- Profile (B) x 7-10 days
- Crutches (WBAT)
- Analgesic Meds PRN (see p.16)
- **RICE**
  - Referral: Call PT, Sports Medicine, Podiatry, or Ortho, as indicated, for 24-72 hour consult
  - Close F/U by PCP and referral to PT/Ortho PA

**YES**

- Consider X-Rays AP, Lat, Mortise
- Profile (B) x 1-2 Weeks
- Consider crutches (WBAT) if antalgic gait
- Analgesic meds PRN (see p.16)
- ROM/Stretching
- Referral: 7-10 days to PT, Podiatry, Sports Medicine, or Ortho as indicated

**PROFILES**

Sample severe (A) and moderate (B) ankle injury profiles on eProfile.

(A) Severe ankle injury examples:
- GR II or greater ankle sprain
- Fracture
- Acute Achilles tendonitis/partial or full thickness tear

(B) Moderate ankle injury examples:
- GR I ankle sprain
- Acute on chronic Achilles tendinopathy
- Pain with some loss of motion or strength

Minimal ankle injury example:
- Pain only at end range of some movements, minimal functional deficit with prolonged or strenuous effort

**X-RAY:**

Order A/P, Lateral, and Mortise

**IF FIBULAR HEAD IS TTP:**
Order A/P, Lateral Knee and A/P, Lateral of Tibia / Fibula

Call Ortho TODAY to discuss management

**RICE**

- Relative rest as designated on profile
- Ice compress 2-3 times daily for 20 minutes
- Compression by use of ankle sleeve
- Elevation of affected joint above heart for 10-15 minutes every 2 hours

**GR II or > Sprain**

Check Ottawa Rules
- Antalgic Gait
- Mod Edema
- Limited ROM

**Yes**

- Profile (A) x 7-10 days
- Crutches (WBAT)
- Analgesic Meds PRN (see p.16)
- **RICE**
  - Referral: Call PT, Sports Medicine, Podiatry, or Ortho, as indicated, for 24-72 hour consult
  - Close F/U by PCP and referral to PT/Ortho PA

**No**

**SYMPTOMS RESOLVED?**

**NO**

- Profile (B)
- Analgesic Meds PRN (see p.16)
- RICE
- Encourage ROM
- Re-evaluate in 1 week

**YES**

- Duty Specific Profile PRN
- Analgesic Meds PRN (see p.16)
- RTD end of profile anticipated

**Ottawa Ankle Rules (Imaging Guidelines)**

Pain in Ankle and EITHER:
- Inability to bear weight immediately after injury AND in the Emergency Department (taking 4 steps)
  OR
- Bone tenderness at the posterior edge or tip of either malleolus
  OR
- Bone tenderness at the navicular or proximal base of fifth metatarsal

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**Screening and Referral Tools (SRTs)**

TRAUMATIC and ACUTE ANKLE PAIN

Ankle Pain References p.18
Patient Reports With Traumatic or Acute Leg Pain

Screening and Referral Tools (SRTs)

**TRAUMATIC and ACUTE LEG PAIN**

Leg Pain References p.18

**RED FLAGS**

Compartment Syndrome
- History of:
  - Blunt trauma
  - Crush injury
  - Unaccustomed exercise
  - Symptoms intensified with muscle stretch
  - Pain out of proportion
  - Paresthesias
  - Tightness or fullness
  - Numbness
  - Anticoagulation therapy

Achilles Rupture
- Felt/heard a “pop”
- Palpable defect (posterior leg)
- Positive Thompson test: Absence of passive plantar flexion upon squeeze of calf muscles with patient prone or kneeling
- Inability to rise up on toes during single leg stance (ensure patient does not substitute by weight bearing through upper extremities)

Fracture
- Trauma
- Deformity

Fibular Head Tenderness

Neurovascular Compromise

Deep Vein Thrombosis (Call MED/ER, order Doppler US)
- Pain, swelling, redness/warmth, distended veins in calf
- Recent surgery, long distance travel, malignancy, pregnancy, trauma or leg immobilization

Cellulitis or Other Infections (Call MED/ER or ORTHO)
- Redness (red streak), warmth, swelling, fever

Hard/Soft Signs of Vascular Injury (see p.15 for details)

**Symptoms Persist?**

Yes

Antalgic Gait
Focal tenderness
(+ ) Tuning Fork test
Pain/paresthesia during exercise

- Profile (B) x 2 weeks
- Analgesic Meds PRN (see p.16)
- ★ RICE
- ROM/Stretching
- Re-evaluate in 2 weeks

No

 Mostly Resolved

- Duty-specific profile PRN
- Analgesic meds PRN (see p.16)
- RTD end of profile anticipated

No

Yes

**For a suspected stress fracture:**

- Consider X-Ray (AP & Lateral)
  (typically need 2 weeks symptoms for plain films)
- Consider bone scan
- Profile (A) x 7-10 days
- Crutches (WBAT)
- Analgesic meds PRN (see p.16)
- ★ RICE
- Referral: Call PT, Podiatry, Sports Medicine or Ortho, as indicated, for 24-72 hour consult

**PROFILES**

Sample severe (A) and moderate (B) leg injury profiles on eProfile.

(A) Severe leg injury examples:
- Suspected stress fracture/fracture
- Acute Achilles tendinitis/partial or full rupture

(B) Moderate leg injury examples:
- Moderate to severe shin splints
- Acute on chronic Achilles tendinopathy

Minimal leg injury example:
- Mild to moderate shin splints
Patient Reports With Traumatic/Acute Knee Pain

**RED FLAGS**

- **Fracture**
  - **Ottawa Knee Rules apply**
  - Deformity
- **ACL Rupture / Int Derangement**
  - Locked knee (ROM < 10-90 degrees)
  - Tense effusion onset < 4 hours
- **Patellar – Quad Tendon Rupture**
  - Inability to perform straight leg raise
  - Infra/suprapatellar pain
  - Palpable defect
  - Inability to maintain full active knee EXT
- **Neurovascular Injury**
  - Knee dislocation (NV injury or fracture)
  - Altered circulation or temperature
  - Altered motor or sensory exam
  - Hard/Soft Signs for Vascular Injury (see p.16)
- **Infection, Septic Joint, or Crystal-Induced Arthropathy**
  - Acute pain with fever
  - History of recent infection anywhere
  - Pain with loading or inability to bear weight
  - Signs or symptoms of septic or crystal-induced arthritis: acute joint swelling, pain, erythema, warmth, joint immobility (see p.15 for details)
  - Exudate with/without constitutional sx
- **Imaging**
  - If you have a high index of suspicion for fracture, order films regardless of Red Flags

**SPECIAL TESTS EXAM**

- **Ligament Instability**
  - (+) Lachmans (ACL)
  - (+) Post Drawer (PCL)
  - (+) Valgus Stress 0/30 (MCL)
  - (+) Varus Stress 0/30 (LCL)
- **Patella Dislocation**
  - (+) Patellar Apprehension
- **Meniscal Tear**
  - (+) Thessaly’s Test
  - (+) Joint Line Tenderness Test
  - (+) McMurray’s Test
  - (+) Apley’s Test

**PROFILES**

Sample severe (A) and moderate (B) knee injury profiles on eProfile.

(A) Severe knee injury examples:
- Fracture
- Ligamentous instability
- Patellar dislocation
- Neurovascular compromise

(B) Moderate knee injury examples:
- Pain throughout the range of motion or pain that limits motion
- Decreased quad/hamstring strength

Minimal knee injury example:
- Pain at end range of motion without decreased knee motion or quad/hamstring strength

**SCREENING AND REFERRAL TOOLS (SRTs)**

**TRAUMATIC and ACUTE KNEE PAIN**

Knee Pain References p.19

- X-Ray – AP & Lateral
- MRI not indicated acutely
- Profile (A) x 7-10 days
- Crutches (WBAT)
- Knee Immobilizer (if leg unstable/ + patellar apprehension, set brace to 0° ROM)
- No propping flexed knee over pillow to rest or sleep
- Analgesic Meds PRN (see p.16)
- **RICE**
- Referral: PT, Sports Medicine or Ortho, as indicated in 72 hours

- Profile (B) x 1-2 weeks
- Crutches PRN (WBAT)
- Analgesic Meds PRN (see p.16)
- **RICE**
- Re-evaluate at end of profile

- Consider X-Rays AP & Lateral
- Profile (B) x 1-2 weeks
- Analgesic Meds PRN (see p.16)
- **RICE**
- Referral: PT, Sports Medicine, or Ortho as indicated in 7 days

- Profile (A) x 7-10 days
- Crutches (WBAT)
- Knee Immobilizer (if leg unstable/ + patellar apprehension, set brace to 0° ROM)
- No propping flexed knee over pillow to rest or sleep
- Analgesic Meds PRN (see p.16)
- **RICE**
- Referral: PT, Sports Medicine or Ortho, as indicated in 7 days

- Profile (B) x 1-2 weeks
- Crutches PRN (WBAT)
- Analgesic Meds PRN (see p.16)
- **RICE**
- Re-evaluate at end of profile

- Progression of RTD Profile PRN
- Analgesic meds PRN (see p.16)
- RTD end of profile anticipated

**RICE**

- Relative rest as designated on profile
- Ice compress 2-3 times daily for 20 minutes
- Compression by use of elastic bandage
- Elevation of affected joint above heart during periods of rest

**Ottawa Knee Rules**

(Guide to X-Rays after trauma in adults)
- Age over 55 years
- Tenderness at head of fibula (if present, order A/P, lateral of tibia / fibula in addition to knee A/P, lateral views)
- Isolated tenderness of patella
- Inability to flex > 90 degrees
- Inability to walk four steps immediately after injury AND in ED

**Perform Ankle – Brachial Index (ABI)**

X-Ray – A/P & Lateral

Call Ortho TODAY: discuss management
## Screening and Referral Tools (SRTs)
### TRAUMATIC and ACUTE KNEE PAIN TESTS

<table>
<thead>
<tr>
<th>TEST</th>
<th>PROCEDURE</th>
<th>(+) SIGN</th>
<th>SN/SP</th>
</tr>
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<tbody>
<tr>
<td><strong>Ligamentous Instability</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Lachman Test</strong></td>
<td>Tests for ACL insufficiency. With the patient supine and the tested knee flexed to 0-30°, the examiner stands on the side of the tested knee and stabilizes the femur with one hand. The examiner applies a quick anterior translation of the tibia on the femur using the free hand. The force should be applied from the posteroiomedical aspect of the proximal tibia.</td>
<td>A soft or &quot;mushy&quot; end feel.</td>
<td>SN = .85</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>SP = .94</td>
</tr>
<tr>
<td><strong>Posterior Drawer Test</strong></td>
<td>Tests for PCL insufficiency. With the patient supine, the tested knee flexed to 90 degrees and the hip flexed to 45 degrees, the examiner stabilizes the tested side with his or her body by sitting on the patient's forefoot. The examiner then uses both hands to grasp the proximal leg, fingers behind the leg and thumbs at the tibial tuberosity. From this position the examiner applies a posterior force to assess translation of the tibia on the femur.</td>
<td>The test is positive if the tibia moves posteriorly excessively (when compared to the other side).</td>
<td>SN = .90</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>SP = .99</td>
</tr>
<tr>
<td><strong>Varus Stress Test at 0° and 30°</strong></td>
<td>Tests for LCL injury. Patient supine. The examiner stabilizes the leg and ankle, holding the patient's leg between the examiner's arm and torso, placing both hands at the knee, fingers on the lateral joint line. The examiner applies a varus force to the knee and appreciates the amount of gapping at the lateral joint line. The test is first performed at 0°, then at 30° knee flexion.</td>
<td>Excessive gapping at the lateral joint line when compared to the other side. (+) at 0° = PCL &amp; LCL involvement (+) at 30° = LCL involvement</td>
<td>Data not available</td>
</tr>
<tr>
<td><strong>Valgus Stress Test at 0° and 30°</strong></td>
<td>Tests for MCL injury. Patient supine. The examiner stabilizes the leg and ankle, holding the patient's leg between the examiner's arm and torso, placing both hands at the knee, fingers on the medial joint line. The examiner applies a valgus force to the knee and appreciates the amount of gapping at the medial joint line. The test is first performed at 0°, then at 30° knee flexion.</td>
<td>Excessive gapping at the medial joint line when compared to the other side. (+) at 0° = PCL and MCL involvement (+) at 30° = MCL involvement</td>
<td>At 0°: SN = .78, SP = .67 At 30°: SN = .91, SP = .49</td>
</tr>
<tr>
<td><strong>Pivot-Shift Test</strong></td>
<td>Defer this test to an orthopedist unless time permits. Tests for ACL insufficiency and anterolateral rotary instability. With the patient supine and both knees extended, the examiner picks up the ankle of the tested knee, applying a force with the ipsilateral / distal hand to internally rotate the tibia and flex the knee while the contralateral / proximal hand applies a valgus force on the lateral side of the proximal tibia.</td>
<td>A sudden reduction of the anteriorly subluxed tibial plateau caused by the IT band as the knee is moved into flexion.</td>
<td>SN = .97-.99, 13</td>
</tr>
<tr>
<td><strong>Dial Test</strong></td>
<td>Defer this test to an orthopedist unless time permits. Tests for PCL insufficiency and posterolateral corner (PLC) injury. With the patient prone, the examiner holds the patient's feet to flex the patient's knees to 30 degrees. The examiner then externally rotates the tibia through the foot on both sides to observe the amount of external rotation. The examiner repeats the process by flexing the patient's knees to 90 degrees, then externally rotating through the feet again.</td>
<td>A side to side difference of more than 10-15° (greater on the affected side): At 30°: Indicates an injury to the PLC At 90°: Indicates an injury to the PCL</td>
<td>Data not available</td>
</tr>
</tbody>
</table>

| **Meniscal Tear**        |                                                                           |                                                                          |                      |
| **Thessaly's Test**      | Tests for meniscal tear. With the patient standing on the tested leg, the knee flexed to 20°, and holding the examiner's hands for balance, the patient rotates the body and leg medially and laterally. | Patient shows apprehension with lateral glide but not medial glide- either through concern about the patella dislocating or by contracting the quad to stabilize the patella. | SN = 1.00              |
|                          |                                                                           |                                                                          | SP = .88               |
| **Joint Line Tenderness**| Tests for meniscal tear. With the patient's knee flexed to 90°, the examiner palpates the medial and lateral joint lines. |                                                                 |                        |
| **McMurray's Test**      | Tests for a meniscal tear. With the patient supine, the examiner grasps the heel with one hand and places the other hand with the fingers on the joint line. The examiner fully flexes the knee, then internally rotates the tibia while fully extending the knee. Repeat with the tibia externally rotated. | Click or joint line pain. | SN = .55-.71            |
|                          |                                                                           |                                                                          | SP = .71-.77           |
| **Apley's Compression Test** | Tests for a meniscal tear. With the patient prone and the tested knee flexed to 90°, the examiner stabilizes the patient's thigh with his/her knee. The examiner then compresses the joint by applying force through the foot, then rotates the tibia medially and laterally. |                                                                 | SN = .22-.61             |
|                          |                                                                           |                                                                          | SP = .70-.88           |
Patient Reports With Traumatic or Acute Shoulder Pain

**RED FLAGS**

**Fracture/Dislocation or Major Soft Tissue Injury**
- Deformity
- Unwillingness to move due to pain

**Neurovascular Injury**
- Altered circulation or temperature
- Altered motor or sensory exam

**Infection or Septic Joint**
- Acute pain with fever
- History of recent infection including elsewhere in the body
- Signs or symptoms of septic arthritis: acute joint swelling, pain, erythema, warmth, joint immobility (see p.15 for risk factors)
- Exudate with/without constitutional sx

**Uncertain Exam**
- Pain out of proportion to injury/physical exam
- Unable to mechanically reproduce symptoms
- Inconclusive findings
- Symptoms do not follow typical nerve root/superficial nerve/referred pain patterns

**Cervical Spine Pain**
- Work up via neck pain SRT

*Imaging*
- If you have a high index of suspicion for fracture, order films regardless of Red Flags

Yes

X-Ray – A/P, Lateral, Axillary
Call Ortho TODAY to discuss management

**SPECIAL TESTS EXAM**

**Anterior Instability Tests**
- (+) Apprehension Test and
- (+) Relocation Test

**SLAP Tears**
- (+) Passive Distraction Test and
- (+) Active Compression Test

**Rotator Cuff Tests**
- (+) External Rotation Lag Sign
- (+) Belly Press Test
- (+) Lift Off Test
- (+) Drop Sign
- (+) Hawkins
- (+) Neers

**AC Joint Tests**
- (+) Cross Body Adduction and
- (+) AC Resisted Extension and
- (+) Active Compression Tests
- (+) Palpation

**SHOULDER EXAM**

(+ Special Tests (see below)

Yes

- Profile (B) x 1-2 weeks
- Sling PRN
- Analgesic Meds PRN (see p.16)
- ★ RICE
- Re-evaluate at end of profile

No

- Profile (B) x 1-2 weeks
- Sling PRN
- Analgesic Meds PRN (see p.16)
- ★ RICE
- Re-evaluate at end of profile

**Symptoms Persist?**

Yes

- Consider X-Rays AP, Lat, Axillary
- Profile (B) x 2-3 weeks
- Analgesic Meds PRN (see p.16)
- ★ RICE
- Referral: PT, Sports Medicine, or Ortho as indicated, in 72 hours

Mostly Resolved

- Progressive RTD profile PRN
- Analgesic Meds PRN (see p.16)
- RTD end of profile anticipated

**PROFILES**

Sample severe (A) and moderate (B) shoulder injury profiles on eProfile.

(A) Severe shoulder injury examples:
- Dislocation or instability
- Acute labral tear
- Rotator cuff tear
- Acute AC Joint separation or sprain

(B) Moderate shoulder injury examples:
- Pain throughout the range of motion or pain that limits motion
- Decreased shoulder/arm strength

Minimal shoulder injury example:
- Pain at end range of movement without decreased shoulder motion or shoulder/arm strength

* If sling is prescribed, direct patient to remove hourly for gentle motion/no sleeping with sling

**RICE**

Relative rest as designated on profile

Ice compress 2-3 times daily for 20 minutes

Compression by elastic bandage

Elevation of affected joint above heart during periods of rest
### Screening and Referral Tools (SRTs)
#### TRAUMATIC and ACUTE SHOULDER PAIN TESTS

<table>
<thead>
<tr>
<th>TEST</th>
<th>PROCEDURE</th>
<th>(+) SIGN</th>
<th>SN/SP</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Anterior Shoulder Instability</strong></td>
<td><strong>Apprehension Test</strong> The patient flexes elbow to 90° and abducts shoulder to 90°. The examiner holds the patient’s wrist and externally rotates the shoulder. If the Apprehension Test is positive, the examiner should note the degree of external rotation that apprehension occurred and follow-up with a Jobe Relocation Test.</td>
<td>Pain</td>
<td>SN = .40-.50</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>SP = .56-.87^-^1^-^3</td>
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<tr>
<td></td>
<td></td>
<td>Apprehension</td>
<td>SN = .62-.72</td>
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<td>SP = .42-.96^-^1^-^3</td>
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<td></td>
<td><strong>Jobe Relocation Test</strong> The patient flexes elbow to 90° and abducts shoulder to 90°. The examiner then applies posterior pressure over the anterior shoulder. While holding the posteriorly directed pressure, the examiner will repeat the Apprehension Test. If pain and apprehension do not occur at the point of external rotation noted to cause symptoms, it’s a positive test with likely anterior instability. If pain is not relieved with the Jobe Relocation Test, the patient may have subacromial joint impingement.</td>
<td>Reduced pain</td>
<td>SN = .30-.54</td>
</tr>
<tr>
<td></td>
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<td>SP = .44-.90^-^1^-^3^-^5</td>
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<tr>
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<td></td>
<td>Reduced Apprehension</td>
<td>SN = .44-.81</td>
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<td></td>
<td>SP = .54-1.00^-^1^-^3^-^5</td>
</tr>
<tr>
<td><strong>SLAP Tear</strong></td>
<td><strong>Passive Distraction Test</strong> The patient lies supine with the affected extremity abducted to 150° with the elbow extended and forearm supinated. The examiner stabilizes the upper arm to prevent humeral rotation. The examiner then pronates the forearm.</td>
<td>Pain reported deep inside the glenohumeral joint either anterior or posterior</td>
<td>SN = .44-.81</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>SP = .54-1.00^-^1^-^3^-^5</td>
</tr>
<tr>
<td><strong>Active Compression Test</strong> (O’Brien’s)</td>
<td>The patient forward flexes the shoulder to 90° and horizontally adducts the shoulder approximately 10°. With the forearm pronated the patient resists a downward pressure applied by the examiner. The test is repeated with the forearm supinated.</td>
<td>A deep anterior pain with the forearm pronated that is reduced with the forearm supinated</td>
<td>SN = .47-.94</td>
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<td></td>
<td>SP = .11-.55^-^2^-^7^-^10</td>
</tr>
<tr>
<td><strong>Rotator Cuff Tear</strong></td>
<td><strong>External Rotation Lag Sign</strong> Tests for a supraspinatus/infra spinatus tear. The patient is seated with the examiner to the rear. The examiner grasps the patient’s elbow with one hand and wrist with the other. The elbow is flexed to 90° and the shoulder elevated to 20° in the scapular plane. The examiner externally rotates the shoulder to near end range and asks the patient to maintain this position as the wrist is released.</td>
<td>Patient cannot maintain this position (shoulder rotates internally)</td>
<td>SN = .46</td>
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<td></td>
<td>SP = .94^-^1^-^11</td>
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<tr>
<td></td>
<td><strong>Belly Press Test</strong> Tests for a subscapularis tear. The patient sits or stands with the elbow flexed to 90° and internally rotates the shoulder, pressing the palm of the hand into the belly. Examiner places fingers of one hand between palm of patient’s hand and belly. Patient resists examiner’s attempt to pull hand away from belly (test of internal rotation strength).</td>
<td>Substitution for weak internal rotators by 1) flexing wrist or 2) pulling elbow behind body into extension to maintain palm of hand against belly.</td>
<td>SN = .40</td>
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<td>SP = .98^-^12</td>
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<tr>
<td></td>
<td><strong>Lift Off Test</strong> Tests the strength and integrity of the subscapularis. The patient internally rotates the shoulder positioning the back of his hand against the small of his back. The patient attempts to force his hand away from his back against the examiner’s resistance. The Belly Press Test is a good substitute for the Lift Off Test if patient cannot place hand behind back.</td>
<td>Weakness or substitution by extending the elbow or shoulder suggests a subscapularis muscle tear or impingement</td>
<td>SN = .81</td>
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<tr>
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<td>SP = 1.00^-^1^-^12</td>
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<tr>
<td></td>
<td><strong>Drop Sign</strong> Tests for an infraspinatus tear. The patient is seated with the examiner to the rear. The examiner grasps the patient’s elbow with one hand and wrist with the other. The elbow is flexed to 90° and the shoulder elevated to 90° in the scapular plane. The examiner externally rotates the shoulder to near end range and asks the patient to maintain this position as the wrist is released.</td>
<td>Patient cannot maintain this position.</td>
<td>SN = .73</td>
</tr>
<tr>
<td></td>
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<td>SP = .77^-^1^-^11</td>
</tr>
<tr>
<td>TEST</td>
<td>PROCEDURE</td>
<td>(+) SIGN</td>
<td>SN/SP</td>
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<tr>
<td><strong>Hawkins Impingement Test</strong></td>
<td>The patient flexes the shoulder and elbow to 90°. The examiner stabilizes the elbow with one hand and grasps the wrist with the other. The examiner then passively internally rotates the shoulder.</td>
<td>Pain</td>
<td>SN = .55-.80 SP = .38-.43&lt;sup&gt;1,13,14&lt;/sup&gt;</td>
</tr>
<tr>
<td><strong>Neer Impingement Test</strong></td>
<td>The patient starts with the arm at his side. The examiner stabilizes the patient’s shoulder blade /scapula with one hand. With the other hand examiner grasps the patient’s wrist, internally rotates the shoulder, then flexes the shoulder as high as possible.</td>
<td>Pain</td>
<td>SN = .64-.80 SP = .30-.53&lt;sup&gt;1,13-15&lt;/sup&gt;</td>
</tr>
<tr>
<td><strong>Cross Body Adduction Test</strong></td>
<td>With the patient’s shoulder flexed to 90° and elbow extended, the examiner stabilizes the patient’s upper back posteriorly, then passively and fully horizontally adducts the tested shoulder.</td>
<td>Pain indicates a positive test for AC joint or sternoclavicular joint pathology</td>
<td>SN = .77 SP = .79&lt;sup&gt;16&lt;/sup&gt;</td>
</tr>
<tr>
<td><strong>AC Resisted Extension Test</strong></td>
<td>The patient is seated with the shoulder in 90° of flexion and internal rotation and the elbow in 90° of flexion. The examiner is behind the patient and applies resistance as the patient horizontally abducts the arm.</td>
<td>Pain at the AC joint</td>
<td>SN = .72 SP = .85&lt;sup&gt;16&lt;/sup&gt;</td>
</tr>
<tr>
<td><strong>Active Compression Test (O’Brien’s Test)</strong></td>
<td>The patient forward flexes the shoulder to 90° and adducts the shoulder approximately 10°. With the forearm pronated the patient resists a downward pressure applied by the examiner. The test is repeated with the forearm supinated.</td>
<td>Patient will likely report AC joint pain in both test positions (forearm pronated and supinated)</td>
<td>SN = .16 SP = .90&lt;sup&gt;1,17&lt;/sup&gt;</td>
</tr>
<tr>
<td><strong>Palpation</strong></td>
<td>Self explanatory.</td>
<td>Painful palpation</td>
<td>SN = .96 SP = .10&lt;sup&gt;1,17&lt;/sup&gt;</td>
</tr>
<tr>
<td><strong>Biceps Tendon Hook Test</strong></td>
<td>Helps to detect distal biceps tendon rupture. With the patient’s shoulder actively abducted to 90° and the elbow actively flexed to 90°, the patient actively supinates the forearm. The examiner then uses the index finger to “hook” under the distal biceps tendon from the lateral side.</td>
<td>There is no cord-like structure under which the examiner may hook a finger.</td>
<td>SN = 1.00 SP = 1.00&lt;sup&gt;18&lt;/sup&gt;</td>
</tr>
</tbody>
</table>
Screening and Referral Tools (SRTs)

TRAUMATIC and ACUTE ARM/ELBOW PAIN

**ELBOW EXTENSION TEST**
- Seated patient flexes both shoulders 90°
- Patient asked to extend both elbows fully
- If there is a visible difference side to side, order X-rays: A/P, lateral, oblique views of elbow
- If there is no visible difference but symptoms are worse or not improving in 7-10 days, order X-rays: A/P, lateral, oblique views of elbow

**RED FLAGS**
Call Ortho/OT to discuss any positive Red Flag findings:

Fracture/Dislocation or Major Soft Tissue Injury
- Positive Elbow Extension Test**
- History of fall on outstretched hand (FOOSH) with painful elbow
- History of lifting/stretching and feeling a "pop" at biceps insertion
- Deformities of forearm/elbow (possible fx)
- Any acute or traumatic event w/ swelling and limited ROM

Neurovascular Injury
-NV compromise on exam
- Diminished or absent distal pulse

Compartment Syndrome
- Pain out of proportion
- Blunt trauma
- Crush injury/Entrapment
- Unaccustomed exercise
- Symptoms intensified with muscle stretch
- Numbness/ Paresthesias (may be a late sign)
- Tightness or fullness (may be difficult to assess)
- Anticoagulation therapy

Infection / Septic Joint
- Acute pain with fever
- History of recent infection including elsewhere in the body
- Signs or symptoms of septic arthritis: acute joint swelling, pain, erythema, warmth, joint immobility (see p.15 for risk factors)
- Exudate or signs/ symptoms of infection with/ without constitutional symptoms
- Bites – human or animal
- Unwillingness to move due to pain
- Inability to move wrist
- Elbow/forearm edema

Infection / Septic Joint
- History of recent infection including elsewhere in the body
- Signs or symptoms of septic arthritis: acute joint swelling, pain, erythema, warmth, joint immobility (see p.15 for risk factors)
- Exudate or signs/ symptoms of infection with/ without constitutional symptoms
- Bites – human or animal
- Unwillingness to move due to pain
- Inability to move wrist
- Elbow/forearm edema

**SPECIAL TESTS EXAM**
Ligamentous Instability
(+ ) Pain/instability w/ Moving Valgus Stress
(+ ) Posterolateral Rotary Instability Test

Epicondylalgia
(+ ) Medial epicondyle tenderness to palpation (TTP) w/ wrist ext + supination
(+ ) Lateral epicondyle pain w/ Cozen’s Test or w/ Tennis Elbow Test

Ulnar Nerve Injury
(+ ) Tinel’s at ulnar groove
(+ ) Combined pressure and Flexion Provocative Test

Radial Head Injury
(+ ) TTP over radial head/neck

**RICE**
- Relative rest as designated on profile
- Ice compress 2-3 times daily for 20 minutes
- Compression by elastic bandage
- Elevation of affected joint above heart during periods of rest

**PROFILE**
Sample severe (A) and moderate (B) arm/elbow injury profiles on eProfile.

(A) Severe arm/elbow injury examples:
- Fracture
- Biceps rupture
- Neurovascular compromise

(B) Moderate arm/elbow injury examples:
- Pain at end range of movement without decreased elbow motion or arm/forearm strength
- Decreased arm/forearm strength

Minimal arm/elbow injury example:
- Pain at end range of movement without decreased elbow motion or arm/forearm strength

* If sling is prescribed, direct patient to remove hourly for stretching into extension and no sleeping in sling
# Screening and Referral Tools (SRTs)

## TRAUMATIC and ACUTE ARM AND ELBOW PAIN TESTS

<table>
<thead>
<tr>
<th>TEST</th>
<th>PROCEDURE</th>
<th>(+) SIGN</th>
<th>SN/SP</th>
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</thead>
<tbody>
<tr>
<td><strong>X-Rays</strong></td>
<td></td>
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</tr>
<tr>
<td>Elbow Extension Test</td>
<td>Helpful to heighten the examiner’s suspicion of fracture. With the patient seated and shoulders flexed to 90°, the examiner asks the patient to extend both elbows fully.</td>
<td>Visible difference in extension side to side.*</td>
<td>SN = .88-.97, SP = .48-.70&lt;sup&gt;1-5&lt;/sup&gt;</td>
</tr>
<tr>
<td><strong>Ligamentous Instability</strong></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Moving Valgus Stress Test</td>
<td>A test for ulnar collateral ligament instability. Patient may sit or stand for this test. Examiner grasps patient’s forearm with one hand and stabilizes the elbow with the other hand. With the patient’s shoulder abducted to 90° and the arm placed in full external rotation, the examiner fully flexes the elbow, applies a valgus force, and quickly extends the elbow to 30°.</td>
<td>Pain at the medial elbow between 120 and 70° of flexion.</td>
<td>SN = 1.00, SP = .75&lt;sup&gt;5,6&lt;/sup&gt;</td>
</tr>
<tr>
<td>Posterolateral Rotary Instability Test</td>
<td>Defer to an orthopedist unless time permits this test. Test for posterolateral instability. The test is performed with the patient supine and the tested arm overhead with the elbow extended. The examiner supinates the patient’s forearm, applies valgus and axial compression forces to the elbow, and flexes the elbow.</td>
<td>Apprehension occurs at 20-30° followed by a reduction in apprehension at 40-70°.</td>
<td>Data not available</td>
</tr>
<tr>
<td><strong>Ligamentous Instability</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medial Epicondyle TTP With Passive Wrist Extension &amp; Supination (Golfer’s Elbow Test)</td>
<td>Test for medial epicondylalgia / epicondylitis, also known as Golfer’s Elbow. Patient may sit or stand for this test. Patient should flex fingers to make a fist. With the patient’s elbow flexed, the examiner palpates the patient’s medial epicondyle while simultaneously passively supinating the forearm, extending the patient’s elbow and wrist fully, and applying radial deviation at the wrist.</td>
<td>Pain at the medial epicondyle.</td>
<td>Data not available</td>
</tr>
<tr>
<td>Cozen’s or Resisted Wrist Extension Test</td>
<td>Tests for lateral epicondylalgia/epicondylitis. Patient sits or stands with the forearm pronated (knuckles facing up). The examiner stabilizes the patient’s elbow in 90° flexion, placing the his/her thumb on the patient’s lateral epicondyle. The patient actively makes a fist and actively pronates the forearm. Against resistance from the examiner, the patient radially deviates and extends the wrist.</td>
<td>Pain at the lateral epicondyle.</td>
<td>Data not available</td>
</tr>
<tr>
<td>Tennis Elbow Test</td>
<td>The patient actively extends the middle digit against resistance from the examiner while the examiner stabilizes the wrist/hand proximally.</td>
<td>Pain at the lateral epicondyle.</td>
<td>Data not available</td>
</tr>
<tr>
<td><strong>Ulnar N. Injury</strong></td>
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<tr>
<td>Tinel’s at the Ulnar Groove or Cubital Tunnel</td>
<td>Tests for ulnar nerve injury. The examiner taps the nerve in the groove. NOTE: This test may also elicit pain, tingling, or a shock sensation in asymptomatic individuals. Examiner can also perform Tinel’s testing over the carpal tunnel at the palmar wrist to assess for median nerve symptoms.</td>
<td>Symptoms in the distribution of the ulnar nerve.</td>
<td>SN = .70, SP = .98&lt;sup&gt;5,7,9,11&lt;/sup&gt;</td>
</tr>
<tr>
<td>Combined Pressure and Flexion Provocation Test</td>
<td>Tests for ulnar nerve injury. With the patient’s forearm fully supinated and the elbow fully flexed, the examiner applies pressure to the ulnar nerve just proximal to the cubital tunnel for 60 seconds.</td>
<td>Symptoms in the distribution of the ulnar nerve.</td>
<td>SN = .98, SP = .95&lt;sup&gt;5,11&lt;/sup&gt;</td>
</tr>
<tr>
<td><strong>Other</strong></td>
<td></td>
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<tr>
<td>Tenderness to Palpation Over the Radial Head or Neck</td>
<td>TTP over the radial head or neck can indicate a variety of injuries including synovitis, osteoarthritis, ligamentous injury, or fracture.</td>
<td>TTP over the radial head or neck.</td>
<td>Data not available</td>
</tr>
</tbody>
</table>
Patient Reports With Traumatic or Acute Wrist/Hand Pain

RED FLAGS
Call Ortho/OT to discuss any positive Red Flag findings:
General
- Unwillingness to move due to pain
- Wrist/hand edema
- Unable to actively flex/ext an individual digit
- Hand/wrist trauma + swelling/limited ROM
Fracture/Dislocation or Major Soft Tissue Injury
- History of fall on outstretched hand (FOOSH) with pain, TTP at anatomical snuffbox, or signs of dislocation
- Deformities of wrist/hand
Neurovascular Injury
- NV compromise on exam
Infection or Septic Joint
Hold all antimicrobial therapy until discussion with ortho
- Kanavel signs present (see p.14)
- Acute pain with fever
- Hx of recent infection anywhere
- Signs or symptoms of septic arthritis: acute joint swelling, pain, erythema, warmth, joint immobility (see p.15)
- Exudate or signs/symptoms of infection with/without constitutional symptoms
- Bites – human or animal
- Puncture wound to hand

Hand/Wrist Exam
(+ ) Special Tests (see below)

Yes

No

No

Hand/Wrist Exam
1) Observe:
- Symmetry and resting position
- Edema*
- Location of soft tissue injury
- Color/skin texture abnormalities may suggest nerve injury
- Vascular status – assess capillary refill, check radial and ulnar pulses
2) Sensory assessment
3) Motor and tendon screening:
- Able to individually raise each finger and flex/ext each finger joint – remember to block digit joints for individual finger function
4) Bones and Joint Assessment

YES

Profile (A) x 14-21 days
- Splint as needed acutely, then send to ortho or OT for formal splinting (examples: mallet finger, de Quervain’s, trigger finger)
- Analgesic Meds PRN (see p.16)
- RICE
- Referral: OT or Ortho, as indicated, within 72 hours

NO

Profile (B) x 2-3 weeks
- Analgesic Meds PRN (see p.16)
- RICE
- Referral: OT or Ortho, as indicated, within 72 hours

Symptoms Persist?

No

Yes

Profile (A) x 10-14 days
- Analgesic Meds PRN (see p.16)
- RICE
- Re-evaluate at end of profile

Profile (B) x 3 weeks
- Analgesic Meds PRN (see p.16)
- RICE
- Referral: OT or Ortho, as indicated, within 72 hours

Profile (A) x 14 days
- Splint as needed acutely, then send to ortho or OT for formal splinting (examples: mallet finger, de Quervain’s, trigger finger)
- Analgesic Meds PRN (see p.16)
- RICE
- Re-evaluate at end of profile

Profile (B) x 2-3 weeks
- Analgesic Meds PRN (see p.16)
- RICE
- Referral: OT or Ortho, as indicated, within 72 hours

Profile (A) x 21 days
- Splint as needed acutely, then send to ortho or OT for formal splinting (examples: mallet finger, de Quervain’s, trigger finger)
- Analgesic Meds PRN (see p.16)
- RICE
- Referral: OT or Ortho, as indicated, within 72 hours

Profile (B) x 3 weeks
- Analgesic Meds PRN (see p.16)
- RICE
- Referral: OT or Ortho, as indicated, within 72 hours

A/P and Lateral of wrist/hand
Call Ortho/OT to discuss management

SPECIAL TESTS EXAM
Tenosynovitis
(+) Finkelstein’s
Artery Occlusion
(+) Allen’s test
Nerve Compression/Neuropathy
(+) Tinel’s at wrist
(+) Phalen’s
Other
(+) Mallet finger/ganglion/trigger finger
(+) Bone tenderness

Hand/Wrist Pain References p.22

RICE
Relative rest as designated on profile
Ice compress 2-3 times daily for 20 minutes
Compression by elastic bandage
Elevation of affected joint above heart during periods of rest

PROFILES
Sample severe (A) and moderate (B) hand/wrist injury profiles on eProfile.

(A) Severe hand/wrist injury examples:
- Fracture
- Ligamentous instability/ tendon rupture
- Neurovascular compromise

(B) Moderate hand/wrist injury examples:
- Pain throughout the range of motion or pain that limits motion
- Decreased hand/grip strength

Minimal hand/wrist injury example:
- Pain at end range of movement without decreased hand/wrist motion or strength
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<tr>
<td>Infectious Tenosynovitis</td>
<td>Kanavel’s Signs</td>
<td>Signs of flexor tendon sheath inflammation/ infection</td>
<td>Any of the signs listed at left.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1. Uniform, symmetrical swelling of digit or tendon</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. At rest, digit is held in partial flexion</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. Tenderness along the flexor tendon sheath</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>4. Pain when passively extending the affected finger</td>
<td></td>
</tr>
<tr>
<td>Tenosynovitis</td>
<td>Finkelstein’s Tests</td>
<td>Tests for de Quervain’s tenosynovitis, or stenosing tenosynovitis of the abductor pollicis longus (APL) and the extensor pollicis brevis (EPB) tendons in the first extensor tunnel. The patient makes a fist with the thumb held beneath the clenched fingers. The examiner ulnarly deviates the patient’s wrist.</td>
<td>Pain at the APL and EPB tendons that reproduces the patient’s symptoms.¹ ²</td>
</tr>
<tr>
<td>Arterial Occlusion</td>
<td>Allen’s test</td>
<td>Tests for occlusion of the ulnar or radial artery. The patient clenches and unclenches the hand several times, then squeezes tightly into a fist. The examiner holds one thumb on the radial artery just proximal to the wrist, and one thumb on the ulnar artery just proximal to the wrist. While maintaining pressure on both arteries, the examiner instructs patient to relax the fist, then checks whether the palm and fingers have blanched (turned pale or white). Palm and fingers should blanch when examiner places sufficient pressure on both arteries. After ensuring sufficient pressure on both arteries, examiner directs patient to relax the fist. Examiner then releases pressure over one artery and checks for color change in the palm and fingers. The test is repeated from the beginning for the other artery.</td>
<td>Hand does not flush red within 5 seconds.</td>
</tr>
<tr>
<td>Neuropathy</td>
<td>Tinel’s test for the median nerve at the wrist</td>
<td>Tests for carpal tunnel syndrome. The examiner taps the median nerve/carpal tunnel at the palmar wrist with his/her fingers or reflex hammer while assessing for symptoms. The examiner taps the median nerve at the wrist in an attempt to elicit symptoms either Tingling in the distribution of the median nerve.</td>
<td>Tingling in the distribution of the median nerve.</td>
</tr>
<tr>
<td>Phalen’s test</td>
<td>Tests for carpal tunnel syndrome. Patient places flexed elbows on table, then places dorsum of hands together as hands fall into maximal wrist flexion. Patient holds this position for at least 60 seconds.</td>
<td>Symptoms in the distribution of the median nerve.</td>
<td>Symptoms in the distribution of the median nerve.</td>
</tr>
<tr>
<td>Other</td>
<td>Observational findings can heighten the examiner’s suspicion of conditions such as mallet finger (inability to extend the distal interphalangeal joint –DIP- or tip of finger because the extensor tendon has ruptured or the distal insertion of the extensor digitorum has torn away from the distal phalanx with possible bony avulsion), ganglion cyst (may occur in multiple locations, but commonly recognized as a firm cystic, pea-sized nodule on the dorsal or volar wrist), and trigger finger (flexor tendon nodule “catches” in the tendon’s sheath or pulley during finger flexion or extension).</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Septic Arthritis / Crystal Induced Arthropathies

<table>
<thead>
<tr>
<th>Locations most commonly affected</th>
<th>Septic Arthritis(^1,2)</th>
<th>Crystal-Induced Arthropathies(^3,4) e.g. Gout / Pseudogout</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knee</td>
<td>1(^{st}) MTP</td>
<td>Elbow</td>
</tr>
<tr>
<td>Hip</td>
<td>Ankle</td>
<td>Shoulders</td>
</tr>
<tr>
<td>Shoulder</td>
<td>Heel</td>
<td>Hips</td>
</tr>
<tr>
<td>Ankle</td>
<td>Knee</td>
<td>Bursae</td>
</tr>
<tr>
<td>Elbow</td>
<td>Wrist</td>
<td></td>
</tr>
<tr>
<td>Wrist</td>
<td>Fingers</td>
<td></td>
</tr>
</tbody>
</table>

### Presentation

- Acute joint swelling
- Pain
- Erythema
- Warmth
- Joint immobility
- Joint inflammation due to underlying bacterial or fungal infection
- Fever

### Risk factors

<table>
<thead>
<tr>
<th>Risk factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contiguous spread</td>
</tr>
<tr>
<td>Direct inoculation</td>
</tr>
<tr>
<td>Hematogenous spread</td>
</tr>
<tr>
<td>Other</td>
</tr>
</tbody>
</table>

#### Contiguous spread
- Skin infection
- Cutaneous ulcers
- Open wound
- Bacterial infection elsewhere in the body

#### Direct inoculation
- Previous intraarticular injection
- Prosthetic joint
- Recent joint injury or surgery

#### Hematogenous spread
- Diabetes mellitus
- HIV infection
- Other chronic illness/disease (i.e. rheumatoid arthritis, sickle cell disease)

#### Other
- Immune suppression medications

### Demographics

- Male gender
- Postmenopausal women
- Age > 65

### Dietary factors

- Alcohol consumption
- Higher meat/seafood intake
- Higher intake of sugar sweetened soft drinks
- Higher intake of foods high in fructose

### Medications that increase risk

- Thiazide
- Loop diuretics

### Weber Classification\(^5\) For Ankle Fractures

Refer all patients with known or suspected ankle fractures to ortho or podiatry.

<table>
<thead>
<tr>
<th>Weber Classification</th>
<th>Basic Info</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Lateral malleolar fracture below the syndesmosis/joint line (syndesmosis intact). May be accompanied by medial malleolar fracture.</td>
</tr>
<tr>
<td>B</td>
<td>Fracture at the level of the syndesmosis/joint line. Unstable fracture if distal fibular/lateral malleolar fracture accompanied by medial malleolar fracture or deltoid ligament rupture.</td>
</tr>
<tr>
<td>C</td>
<td>Fracture above the syndesmosis/joint line (syndesmosis generally ruptured). Includes Maisonneuve fracture.</td>
</tr>
</tbody>
</table>

### Weight Bearing Status With Crutches\(^6,\ast\)**

<table>
<thead>
<tr>
<th>Weight Bearing Status</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>NWB (=) Non Weight Bearing</td>
<td>0% Weight bearing. Foot and toes do not touch the ground – gait with crutches is swing-through. NWB may result in hip flexor muscles being consistently active.</td>
</tr>
<tr>
<td>TTWB (=) Toe Touch Weight Bearing Also known as TDWB or touch down weight bearing</td>
<td>Patient may rest foot on the floor but puts no weight through affected extremity (touches down only for balance assistance). TTWB may result in hip flexor muscles being consistently active. Some referring physicians may consider up to 20% body weight TTWB (see note below).</td>
</tr>
<tr>
<td>PWB (=) Partial Weight Bearing</td>
<td>Patient puts a percentage of his/her body weight through foot of affected extremity, i.e. 50% PWB. PWB is usually considered 20-50%, though interpretations vary widely (see note below).</td>
</tr>
<tr>
<td>WBAT (=) Weight Bearing As Tolerated</td>
<td>Weight bearing is limited by the patient’s tolerance. WBAT is usually considered 50-100% weight bearing.</td>
</tr>
<tr>
<td>FWB (=) Full Weight Bearing</td>
<td>Patient bears 100% (full) weight through affected extremity. Use of crutches is for balance, fatigue, etc.</td>
</tr>
</tbody>
</table>

\(*\)Categorizes fractures per location of the distal fibular fracture in relation to the syndesmosis/ankle joint line

\(**\)Note: Determine in advance which weight bearing percentages (or absolute pounds) the referring physician associates with each weight bearing status.
### Diagnosis and Treatment of Nail Injuries

<table>
<thead>
<tr>
<th>Condition</th>
<th>Presentation</th>
<th>Diagnosis</th>
<th>Treatment</th>
</tr>
</thead>
</table>
| **Subungual hematoma**  
*Sometimes called runner's toe, skier's toe or tennis toe* | • Painful, throbbing fingertip or toe (especially longest toe); vascular nail bed bleedin can increase pressure beneath nail  
• History of crush injury  
• Blunt or sharp trauma  
• For toes:  
  o Toe repetitively contacting the shoe/boot toebox during prolonged run/march  
  o Repetitive stop & go activity | • Discolored nail  
• Radiographs (AP, lateral, oblique) to rule out associated fractures | If relatively painless, treatment can consist of RICE and tincture of time. Nailbed will gradually grow out (generally across six to nine months) and be completely replaced by new nailbed  
Refer to ortho/podiatry for:  
• Subungual decompression through two to three small holes in nail created with cautery unit or heated paper clip  
• Large subungual hematomas (involving ≥ 50 percent of the nail) may require nail removal and nail bed suturing  
• Splint the fingertip until tenderness subsides |

<table>
<thead>
<tr>
<th>Condition</th>
<th>Presentation</th>
<th>Diagnosis</th>
<th>Treatment</th>
</tr>
</thead>
</table>
| **Nail bed laceration** | • Painful fingertip or soft tissue below a toenail with active bleeding | • Grossly deformed nail with visible nail fracture and nail bed laceration  
• History of a high-force crush or pinch injury or high-speed laceration (i.e., machine press or rotary saw)  
• Nail bed lacerations may be associated with large subungual hematomas (involving ≥ 50 percent of the nail)  
• Radiographs (AP, lateral, oblique or dorsal-planter and oblique views of toes) to rule out associated fractures | Refer to ortho/podiatry for:  
• Nail plate removal with blunt dissection  
• Primary suturing of the nail bed with 6-0 or 7-0 absorbable suture  
• Maintain the space of the nail fold to allow for a new nail plate by placing the original nail or petroleum gauze over the nail bed and into the nail fold for two to three weeks.  
• Refer nail bed lacerations involving distal tip amputation.  
• Patient may also require tetanus shot. |

### Vascular Injury

<table>
<thead>
<tr>
<th>Hard Signs*</th>
<th>Soft Signs</th>
</tr>
</thead>
</table>
| • External or pulsatile bleeding  
• Rapidly expanding hematoma  
• Any of the classical signs of arterial occlusion  
  o Pulselessness  
  o Pallor  
  o Paresthesias  
  o Pain  
  o Paralysis  
• A palpable thrill/audible bruit | • A history of arterial bleeding at the scene or in transit  
• Proximity of a penetrating wound or blunt injury to an artery  
• A small nonpulsatile hematoma over an artery  
• A neurologic deficit originating in a nerve adjacent to a named artery  
• Peripheral nerve deficit  
• Arterial bleed or hemorrhaging at the scene or in transit  
• Reduced but palpable pulse  
• Injury near a major artery |

*Vascular injury with hard signs requires immediate operative care.

### Analgesic Medication

- Tylenol/NSAIDs
- Short-term Tramadol, Norco, or Percocet
- Muscle relaxants, Valium
## References

### Neck


### Hip


**American College of Radiology (ACR) Appropriateness Criteria**
- Stress fracture, Including Sacrum, Excluding Other Vertebrae (2011)
- Avascular Necrosis of the Hip (2005)
- Acute Hip Pain – Suspected Fracture (2013)

**Diagnostic Imaging Pathways from the Government of Western Australia’s Department of Health**
- Suspected Stress Fracture (2013)
- Suspected AVN of the Hip (2013)
- Suspected Hip Fracture (2013)

### Hip Special Tests References

References

Ankle

American College of Radiology: ACR Appropriateness Criteria® Clinical Condition: Acute Trauma to the Ankle. 2013

Leg

Tovey C, Wyatt S. Diagnosis, investigation, and management of deep vein thrombosis. BMJ. 2003; 326: 1180-1184
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### Knee


American College of Radiology: ACR Appropriateness Criteria® Clinical Condition: Acute Trauma to the Knee. 2011

American College of Radiology: ACR Appropriateness Criteria® Clinical Condition: Acute Trauma to the Ankle. 2013


New Zealand Guideline Group. The diagnosis and management of soft tissue knee injuries: internal derangements. May 2005


### Knee Special Tests References

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Shoulder


Fongemie AE, Buss DD, Rolnick SJ. Management of shoulder impingement syndrome and rotator cuff tears. 1998: 54(4);


Hegedus, EJ. (2012). Which physical examination tests provide clinicians with the most value when examining the shoulder? Update of a systematic review with meta-analysis of individual tests. British Journal of Sports Medicine, 46, 964-978.


Shoulder Special Tests References


References

## Arm / Elbow


### Arm / Elbow Special Tests References


References

Hand / Wrist


Magee DJ. Orthopedic Physical Assessment. 2014.


Hand / Wrist Special Tests References


SRT Additional Information References


