Advanced Imaging Checklist: Upper Extremity April 13, 2010

I. Wrist/Hand

Note: Plain radiographs of the wrist are recommended as the best initial study following wrist trauma or as the initial study for chronic wrist pain. (ACR-Acute Hand and wrist, chronic wrist pain). MRI is indicated for the following:

- Carpal Tunnel Syndrome (CTS): no indication for routine use of MRI.
- Note: Clinical history and electrodiagnostic studies are considered the gold standard for the diagnosis of CTS.
- See Work-related CTS Diagnosis and Treatment Guideline: http://www.lni.wa.gov/ClaimsIns/Files/OMD/CTSGuidelineFINAL.pdf

☐ Severe acute wrist trauma with normal radiographs, but fracture or ligament/cartilage tear suspected (*MRI with or without contrast)* [1]

- Note: Suspected fracture, e.g., evaluation of scaphoid fracture when degree of displacement is not well characterized or age of fracture is not known.
- CT is indicated in general for occult fracture when plain radiographs are normal; may be useful for surgical planning for complex, intra-articular fractures of the first metacarpal base.
- For suspected distal radioulnar joint subluxation, CT is indicated in addition to radiographs of the affected side (ACR Acute HAND and Wrist Trauma).
- For suspected hook of hamate fracture following initial normal or equivocal radiographs, CT is recommended (ACR ACR Acute Hand and Wrist Trauma).
- Suspected ligament/cartilage tear, e.g., triangular cartilage ligament tears, particularly when done in association with an arthrogram.
- Note: Where Kienbock's disease (avascular necrosis) is present on radiographs or not present and suspected, CT only needed to assess degree of collapse and associated fracture[1,3, 4].

☐ Suspected soft tissue mass (*MRI without contrast*) [1]
☐ Suspected soft tissue mass, if routine (non-contrast) MRI does not answer question (*MRI with contrast*)

Note: Ultrasound of the wrist "is often helpful in evaluating wrist masses as the very common fluid filled ganglion may be easily distinguished from a solid mass." (ACR Chronic wrist pain)

II. Elbow

Note: X-ray is recommended for the initial evaluation for chronic elbow pain. MRI is rarely indicated as a preferred diagnostic modality for any elbow condition except the following (*MRI without contrast unless otherwise specified)*:

☐ Severe acute elbow trauma with normal radiographs, but fracture or ligament tear suspected. MR arthrogram OR MRI without contrast). *Ultrasound is next appropriate alternative if neither is available.
☐ Suspected biceps tendon rupture.
☐ Suspected mass (*MRI with or without contrast*). *Ultrasound is appropriate alternative if MRI is not available.
☐ Suspected avascular necrosis.
☐ Suspect intra-articular loose bodies, heterotopic calcifications, or suspected cartilaginous defects; radiographs nondiagnostic (MRI without contrast OR MR arthrography depending on availability).

III. Shoulder

Acute/traumatic shoulder pain

☐ Acute pain following shoulder trauma not responsive to conservative measures for 4 weeks.
☐ Clinical signs and symptoms suspicious for rotator cuff tear/impingement, age ≥ 35 years.
☐ Suspected instability/labral tear, age < 35 years.
  ☐ Recurrent dislocation
  ☐ Suspected intra-articular loose bodies
  ☐ Suspected avascular necrosis

- Note: Shoulder symptoms and physical assessment indicating the need for MRI after 4 weeks of treatment should include at least two of the following[5]:
  - Anterior or posterior shoulder instability
  - External rotation pain or weakness
  - Impingement signs
  - Loss of abduction
  - Persistent pain with activity
- MR or MR arthrogram may be performed for either of the first 2 criteria

Subacute/chronic shoulder pain

☐ Subacute shoulder pain and suspect instability/labral tear (MR arthrography is recommended, MRI with high resolution is next alternative).
☐ Surgical planning and no MRI within 6 months.
☐ Previous surgery and substantial increase in objective signs of impingement or instability/labral tear.
☐ Evaluate abnormality, 'red flags'
  ☐ Palpable mass
  ☐ Suspect fracture
  ☐ Suspect infection
  ☐ Imaging abnormality on radiograph
  ☐ Suspect neoplasm
  ☐ Hemarthrosis

References

- ACR Guideline(s) American College of Radiology (2005). ACR appropriateness criteria: chronic wrist pain. Available at: http://www.guideline.gov/summary/summary.aspx?ss=15&doc_id=8287&nbr=004619&string=triangular+AND+fibrocartilage

- Washington State Department of Labor and Industries' Work-Related Carpal Tunnel Syndrome Diagnosis and Treatment Guideline. Available at: http://www.lni.wa.gov/ClaimsIns/Files/OMD/CTSGuidelineFINAL.pdf

- HealthLink Clinical UM Guideline: CT/MRI Shoulder, Elbow, Wrist, Hand.
- Available at: http://www.healthlink.com/provider/medpolicy/policies/guidelines/RAD/CT_MRI_shoulder.html

- Bussieres AE, Peterson C, Taylor JAM. Diagnostic imaging guideline for musculoskeletal complaints in adults—an evidence-based approach—part 2: upper extremity disorders. J Manipulative Physiol Ther 2008; 31: 2-32.

- ACR Guideline(s) American College of Radiology (2008). ACR appropriateness criteria: chronic elbow pain. Available at: http://www.guideline.gov/summary/summary.aspx?doc_id=13663&nbr=006997&string=elbow+AND+MRI+AND+ACR

- ACR Guideline(s) American College of Radiology (2005) ACR appropriateness criteria: shoulder trauma. Available at: http://www.guideline.gov/summary/summary.aspx?doc_id=8300&nbr=004632&string=shoulder+AND+MRI+AND+ACR

- New Zealand Guidelines Group (NZGG). The diagnosis and management of soft tissue shoulder injuries and related disorders. Available at: http://www.guideline.gov/summary/summary.aspx?doc_id=5830&nbr=003865&string=elbow+AND+MRI