

## CT Upper Extremity (includes Arthrograms)

**CPT: 73200, 73201, 73202**

### IMPORTANT NOTES

- If MRI is Preferred CT cannot be authorized without a statement that MRI is not available, has been done but was not diagnostic, or that the patient cannot tolerate an MR examination

## CT ARTHROGRAM ORDERS

### Shoulder

Labral tear suspected MRI PREFERRED

- History of repeated overhead activities (Pitching baseball, serving in tennis)
- Deep shoulder pain, failed conservative management
- Shoulder instability on examination
- Shuman, WP, Kilcoyne, RF, Matsen, FA, Rogers, JV, Mack, LA Double-contrast computed tomography of the glenoid labrum Am. J. Roentgenol. 1983 141: 581-584

Prosthesis present

- Shoulder pain not responding to conservative management.
- loosening suspected

Post operative pain

- Labral repair
- Rotator cuff repair
- ACR Appropriateness Criteria Acute Shoulder Pain

## ROUTINE CT EXAMINATION ORDERED

### 1 Major Symptom or Complaint presented as primary indication

#### 1.1 Mass, soft tissue or bone MRI PREFERRED for SOFT TISSUE

##### 1.1.1 Prior imaging nondiagnostic (US or X-ray)

#### 1.2 Pain post trauma MRI PREFERRED

## 2 Working Diagnosis or Rule Out presented as primary indication

## 2.1 Brachial Plexus Pathology (Plexopathy) MRI of shoulder or C spine with contrast preferred.

2.1.1 Note Plexopathy refers to an abnormality of the complex of nerve roots exiting the spine and organizing into the nerves serving the arm, trunk or legs. Symptoms may include burning, tingling, or numbness in a circumferential or dermatomal distribution. The symptoms may radiate to the hand or remain localized in the neck.

## 2.1.2 Indications BOTH

### 2.1.2.1 History

#### 2.1.2.1.1 Breast or lung cancer

- Aliya Qayyum, A. David MacVicar, Anwar R. Padhani, Patrick Revell, and Janet E. S. Husband  
Symptomatic Brachial Plexopathy following Treatment for Breast Cancer: Utility of MR Imaging with  
Surface-Coil Techniques Radiology March 2000 214:837-842

#### 2.1.2.1.2 History of radiation therapy to the chest, breast or axilla

- Bowen, BC, Verma, A, Brandon, AH, Fiedler, JA Radiation-induced brachial plexopathy: MR and  
clinical findings AJNR Am J Neuroradiol 1996 17: 1932-1936

#### 2.1.2.1.3 Palpable mass in neck or shoulder area

#### 2.1.2.1.4 Trauma, including at birth

### 2.1.2.2 Symptoms of upper extremity

#### 2.1.2.2.1 Numbness

#### 2.1.2.2.2 Paresthesias

#### 2.1.2.2.3 Radiating pain

#### 2.1.2.2.4 Weakness

## References:

1. ACR Appropriateness Criteria Plexopathy p10 Accessed 12/28/08
2. Aliya Qayyum, A. David MacVicar, Anwar R. Padhani, Patrick Revell, and Janet E. S. Husband Symptomatic Brachial Plexopathy following Treatment for Breast Cancer: Utility of MR Imaging with Surface-Coil Techniques Radiology 2000 214: 837-842.
3. BC Bowen, A Verma, AH Brandon, and JA Fiedler Radiation-induced brachial plexopathy: MR and clinical findings AJNR Am. J. Neuroradiol., Nov 1996; 17: 1932 – 1936. Neurosurgical Focus Posted 04/02/2007 Accessed 1/4/09 @ [http://www.medscape.com/viewarticle/553963\\_1](http://www.medscape.com/viewarticle/553963_1)
4. Bowen B, Seidenwurm DJ, Davis P, et al, Expert Panel on Neurologic Imaging, American College of Radiology, Appropriateness Criteria, Plexopathy, accessed at [http://www.acr.org/SecondaryMainMenuCategories/quality\\_safety/app\\_criteria/pdf/ExpertPanelonNeurologicImaging/PlexopathyDoc12.asp](http://www.acr.org/SecondaryMainMenuCategories/quality_safety/app_criteria/pdf/ExpertPanelonNeurologicImaging/PlexopathyDoc12.asp) 12/28/08
5. Devin K. Binder, M.D., Ph.D.; Justin S. Smith, M.D., Ph.D.; Nicholas M. Barbaro, M.D Primary Brachial Plexus Tumors: Imaging, Surgical, and Pathological Findings in 25 Patients Neurosurgical Focus Medscape Radiology accessed 12/28/08
6. Edward Fathers, David Thrush, Susan M Huson, and Andrew Norman Radiation-induced brachial plexopathy in women treated for carcinoma of the breast Clinical Rehabilitation, Feb 2002; 16: 160 – 165.
7. Neoplastic Brachial Plexopathy Author: Mark A Wren, MD, MPH, Medical Director, Department of Physical Medicine and Rehabilitation, HealthSouth Rehabilitation Hospital of Texarkana eMedicine Specialties > Physical Medicine and Rehabilitation > Plexopathy Updated: Jan 19, 2010 Accesed 3/15/10
8. Vincent J. Miele, M.D.; John A. Norwig, A.T.C.; Julian E. Bailes, M.D. Sideline and Ringside Evaluation for Brain and Spinal Injuries
9. Walker, AT, Chaloupka, JC, de Lotbiniere, AC, Wolfe, SW, Goldman, R, Kier, EL Detection of nerve rootlet avulsion on CT myelography in patients with birth palsy and brachial plexus injury after trauma Am. J. Roentgenol. 1996 167: 1283-1287
10. T. Yoshikawa, N. Hayashi, S. Yamamoto, Y. Tajiri, N. Yoshioka, T. Masumoto, H. Mori, O. Abe, S. Aoki, and K. Ohtomo Brachial Plexus Injury: Clinical Manifestations, Conventional Imaging Findings, and the Latest Imaging Techniques RadioGraphics, October 1, 2006; 26(suppl\_1): S133 – S143.
11. A. TAVAKKOLIZADEH, A. SAIFUDDIN, and R. BIRCH Imaging of Adult Brachial Plexus Traction Injuries J Hand Surg Eur Vol., June 1, 2001; 26(3): 183 – 191

## 2.2 Compartment Syndrome MRI PREFERRED

2.2.1 Pain with passive stretching of muscle

2.2.2 Pain, more severe than expected from trauma

2.2.3 Paresthesias

2.2.4 Pulseless Paralysis

### References

1. Tintinalli's Emergency Medicine: A Comprehensive Study Guide, 6th Edition; Judith Tintinalli et al Eds. Chapter 278 Compartment Syndromes Paul R Haller
2. Gustav Andreisek, Lawrence M. White, Marshall S. Sussman, Deanna L. Langer, Chirag Patel, Jason Wen-Shyang Su, Masoom A. Haider, and Jeff A. Stainsby T2\*-Weighted and Arterial Spin Labeling MRI of Calf Muscles in Healthy Volunteers and Patients With Chronic Exertional Compartment Syndrome: Preliminary Experience Am. J. Roentgenol., Oct 2009; 193:
3. eMedicine Specialties > Orthopedic Surgery > Trauma Compartment Syndrome, Lower Extremity: Workup Author: Stephen Wallace, MD, Staff, Department of Emergency Medicine, Eastern Idaho Regional Medical Center Coauthor(s): Stuart Goodman, MD, PhD, FRCSC, FACS, Associate Chairman, Professor, Department of Functional Restoration, Division of Orthopedic Surgery, Stanford University; Head, Division of Orthopedic Surgery, Stanford University Medical Center; Douglas G Smith, MD, Associate Professor, Department of Orthopedic Surgery, University of Washington, Harborview Medical Center Updated: Feb 9, 2009; accessed 4/8/10

## 2.3 Fracture suspected

2.3.1 Pain and/or swelling at site

2.3.2 x-ray nondiagnostic

## 2.4 Necrotizing Fasciitis [Two] [Automatic Expedited Review by Physician Reviewer if Criteria are not met]

2.4.1 Pain

2.4.2 Swelling

2.4.3 Fever

2.4.4 Warm, shiny or discolored skin over the affected area

2.4.5 Elevated WBC count (Leukocytosis)

2.4.6 Lymphangitis and/or Lymphadenitis.

### References:

1. Tubbs Robert J, Savitt Daniel L, Suner Selim, "Chapter 12. Extremity Conditions" (Chapter). Knoop KJ, Stack LB, Storrow AB, Thurman RJ: The Atlas of Emergency Medicine, 3e: <http://www.accessmedicine.com/content.aspx?aID=6003337>.
2. Fugitt JB, Puckett ML, Quigley MM, Kerr SM. Necrotizing fasciitis. RadioGraphics 2004;24 : 1472-1476

## 2.5 Osteomyelitis suspected MRI Preferred

### 2.5.1 Pain or Fever AND One

#### 2.5.1.1 C reactive Protein elevated

#### 2.5.1.2 Elevated ESR

#### 2.5.1.3 Fever

#### 2.5.1.4 Leukocytosis

#### 2.5.1.5 Positive Blood Cultures

### References:

1. Parsonnet Jeffrey, "Chapter 120. Osteomyelitis" (Chapter). Fauci AS, Braunwald E, Kasper DL, Hauser SL, Longo DL, Jameson JL, Loscalzo J: Harrison's Principles of Internal Medicine, 17th Edition: <http://www.accessmedicine.com/content.aspx?aID=2893649>.
2. Alok Kapoor, Stephanie Page, Michael LaValley, Daniel R. Gale, and David T. Felson Magnetic Resonance Imaging for Diagnosing Foot Osteomyelitis: A Meta-analysis Arch Intern Med, Jan 2007; 167: 125 – 132.
3. J. Herman Kan, Melissa A. Hilmes, Jeffrey E. Martus, Chang Yu, and Marta Hernanz-Schulman Value of MRI After Recent Diagnostic or Surgical Intervention in Children with Suspected Osteomyelitis Am. J. Roentgenol., Nov 2008; 191: 1595 – 1600.
4. Kuo-Chen Lee, Yi-Ting Tsai, Chih-Yuan Lin, and Chien-Sung Tsai Vertebral osteomyelitis combined streptococcal viridans endocarditis Eur. J. Cardiothorac. Surg., Jan 2003; 23: 125.
5. D Allen, S Ng, K Beaton, and D Taussig Sternal osteomyelitis caused by Aspergillus fumigatus in a patient with previously treated Hodgkin's disease J. Clin. Pathol., Aug 2002; 55: 616 – 618.
6. M Ida, H Watanabe, A Tetsumura, and T Kurabayashi CT findings as a significant predictive factor for the curability of mandibular osteomyelitis: multivariate analysis Dentomaxillofac. Radiol., Mar 2005; 34: 86 – 90.
7. Jyri K. Koort, Tatu J. Mäkinen, Juhani Knuuti, Jari Jalava, and Hannu T. Aro Comparative 18F-FDG PET of Experimental Staphylococcus aureus Osteomyelitis and Normal Bone Healing J. Nucl. Med., Aug 2004; 45: 1406 – 1411.
8. Susan A. Connolly, Leonard P. Connolly, Laura A. Drubach, David Zurakowski, and Diego Jaramillo MRI for Detection of Abscess in Acute Osteomyelitis of the Pelvis in Children Am. J. Roentgenol., Oct 2007; 189: 867 – 872.

## 2.6 Palpable gap in muscle or tendon MRI PREFERRED

## 2.7 Stress fracture, suspected BOTH

### 2.7.1 Localized Pain

### 2.7.2 Nondiagnostic Repeat X-ray at least 7 days after onset of symptoms

## 2.8 Tumor, suspected

### 2.8.1 Lesion on prior imaging

### 2.8.2 Pain

### 3 Abnormal Physical Exam Finding presented as primary indication

3.1 Palpable gap in muscle or tendon MRI PREFERRED

3.2 Pulseless paralysis

### 4 Abnormal Lab or Imaging presented as primary indication

4.1 Mass, soft tissue or bone MRI PREFERRED for SOFT TISSUE

4.1.1 Prior imaging nondiagnostic (US or X-ray)

## 5 Significant Prior Medical History presented as primary indication

### 5.1 Fracture, known

#### 5.1.1 Evaluation of Nonunion

#### 5.1.2 For treatment planning

### 5.2 Osteomyelitis Known MRI PREFERRED

#### 5.2.1 Interval follow up during and after treatment

#### 5.2.2 Preoperative

#### 5.2.3 Worsening clinical situation

#### References:

1. Parsonnet Jeffrey, "Chapter 120. Osteomyelitis" (Chapter). Fauci AS, Braunwald E, Kasper DL, Hauser SL, Longo DL, Jameson JL, Loscalzo J: Harrison's Principles of Internal Medicine, 17th Edition: <http://www.accessmedicine.com/content.aspx?aID=2893649>.
2. Alok Kapoor, Stephanie Page, Michael LaValley, Daniel R. Gale, and David T. Felson Magnetic Resonance Imaging for Diagnosing Foot Osteomyelitis: A Meta-analysis Arch Intern Med, Jan 2007; 167: 125 – 132.
3. J. Herman Kan, Melissa A. Hilmes, Jeffrey E. Martus, Chang Yu, and Marta Hernanz-Schulman Value of MRI After Recent Diagnostic or Surgical Intervention in Children with Suspected Osteomyelitis Am. J. Roentgenol., Nov 2008; 191: 1595 – 1600.
4. Kuo-Chen Lee, Yi-Ting Tsai, Chih-Yuan Lin, and Chien-Sung Tsai Vertebral osteomyelitis combined streptococcal viridans endocarditis Eur. J. Cardiothorac. Surg., Jan 2003; 23: 125.
5. D Allen, S Ng, K Beaton, and D Taussig Sternal osteomyelitis caused by Aspergillus fumigatus in a patient with previously treated Hodgkin's disease J. Clin. Pathol., Aug 2002; 55: 616 – 618.
6. M Ida, H Watanabe, A Tetsumura, and T Kurabayashi CT findings as a significant predictive factor for the curability of mandibular osteomyelitis: multivariate analysis Dentomaxillofac. Radiol., Mar 2005; 34: 86 – 90.
7. Jyri K. Koort, Tatu J. Mäkinen, Juhani Knuuti, Jari Jalava, and Hannu T. Aro Comparative 18F-FDG PET of Experimental Staphylococcus aureus Osteomyelitis and Normal Bone Healing J. Nucl. Med., Aug 2004; 45: 1406 – 1411.
8. Susan A. Connolly, Leonard P. Connolly, Laura A. Drubach, David Zurakowski, and Diego Jaramillo MRI for Detection of Abscess in Acute Osteomyelitis of the Pelvis in Children Am. J. Roentgenol., Oct 2007; 189: 867 – 872.

### 5.3 Prosthesis for positioning and alignment

#### 5.3.1 X-ray nondiagnostic

### 5.4 Tumor, known

#### 5.4.1 Interval routine follow up of primary or metastatic tumor

#### 5.4.2 New or worsening symptoms

