Cohere Medicare Advantage Policy - Computed Tomography (CT), Upper Extremity

Clinical Policy for Medical Necessity Review

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Important Notices

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Policy Information:

Specialty Area: Diagnostic Imaging
Policy Name: Computed Tomography (CT), Upper Extremity
Type: [**X**] Adult (18+ yo) | [**X**] Pediatric (0-17 yo)

Table of Contents

Important Notices **2**
Medical Necessity Criteria **4**
Service: Computed Tomography (CT), Upper Extremity **4**
Related CMS Documents 4
Description 4
Medical Necessity Criteria 4
Indications 4
Non-Indications 6
Level of Care Criteria 8
Evaluation of Clinical Harms and Benefits 9
Medical Evidence **11**
References **13**
Policy Revision History/Information **17**

Medical Necessity Criteria

Service: Computed Tomography (CT), Upper Extremity

Related CMS Documents

Please refer to the CMS Medicare Coverage Database for the most current applicable CMS National Coverage.[1]

- National Coverage Determination (NCD). Computed Tomography (220.1)

Description

Computed tomography (CT) of the upper extremity for trauma typically does not require contrast. Intravenous (IV) contrast is used if requested by the ordering provider and guided by the radiologist. Common reasons for using contrast include detecting infectious and inflammatory conditions, or suspected malignancy. In cases where internal joint derangement or cartilage loss is suspected but MRI is not feasible (e.g., due to an incompatible implanted device, inability to tolerate an MRI exam or metallic artifacts), intra-articular contrast can be beneficial.[1-4]

Medical Necessity Criteria

Indications

Computed tomography (CT), upper extremity is considered appropriate if **ALL** of the following are **TRUE**:

- Plain radiographs or ultrasound of the area of concern are nondiagnostic or inconclusive, and have been completed during the current episode of symptoms and/or change in symptoms; **AND**
- **ANY** of the following:
  - Acute traumatic upper extremity injury (e.g., fracture, dislocation) with **ALL** of the following[2-4]:
    - **ANY** of the following:
      - More detail is required than is available with plain radiographs; **OR**
      - Magnetic resonance imaging (MRI) is contraindicated; **AND**
    - **ANY** of the following:

- Bone injury and **ANY** of the following is **TRUE**:
  - Fracture (known) and additional detail needed; **OR**
  - Acute injury with occult fracture suspected; **OR**
  - Joint dislocation or instability; **OR**
  - Stress/insufficiency fracture (known) and follow-up imaging needed; **OR**
  - Stress/insufficiency fracture (suspected) with negative radiographs, when MRI cannot be performed or is contraindicated[5]; **OR**
- Suspected soft tissue injury (e.g., rotator cuff tear), when MRI cannot be performed or is contraindicated; **OR**

- Neoplastic conditions (including masses and mass-like conditions) requiring evaluation (e.g., for treatment planning, treatment response, or prognostication) and **ANY** of the following is **TRUE**[2-4]:
  - Malignant or aggressive primary bone tumor[2]; **OR**
  - Malignant or aggressive primary soft tissue tumor[2]; **OR**
  - Metastatic lesions of the upper extremity; **OR**
  - Nonsuperficial (deep) soft tissue mass[3]; **OR**
  - Soft tissue mass **AND** magnetic resonance imaging (MRI) or ultrasound is unable to be performed or is contraindicated[3]; **OR**
  - A primary bone tumor is suspected, and radiographs indicate **ANY** of the following[4]:
    - Radiograph is negative; **OR**
    - Benign features (osteoid osteoma is not suspected); **OR**
    - Osteoid osteoma is suspected; **OR**
    - Lesion is present on plain radiographs; **OR**
    - Indeterminate or aggressive appearance for malignancy; **OR**
    - Incidental osseous lesion on MRI or CT scan for unrelated indication; **OR**
  - Presence of a mass with **ANY** of the following[3]:
    - Absence of trauma; **OR**
    - Rapid growth; **OR**
    - Recurrence after prior surgery; **OR**
    - Nondiagnostic ultrasound or other inconclusive imaging; **OR**
  - Follow-up exam to further characterize a bone or soft tissue lesion diagnosed on the initial radiologic exam, including radiograph, ultrasound, magnetic resonance (MR), and nuclear medicine studies[4]; **OR**

        - Known malignancy with unexpected, localized upper extremity pain or swelling; **OR**
        - Persistent palpable abnormality with nondiagnostic imaging (e.g., radiograph, ultrasound); **OR**
        - Routine surveillance of known malignancy; **OR**
    - Preoperative imaging for **ANY** of the following[6]:
        - Prior to shoulder arthroplasty[7,8]; **OR**
        - Prior to nonarthroplasty surgical management of glenohumeral osteoarthritis (e.g., arthroscopy, distal clavicle resection/excision) only when there is clinical concern for rotator cuff compromise, or when there is advanced glenoid wear[9]; **OR**
        - Prior to surgical management of congenital condition, injury, recurrent instability, malignancy, mass, infectious disorder, or vascular abnormality[10]; **OR**
    - The patient requires a CT with arthrogram and **ALL** of the following are **TRUE**:
        - **ANY** of the following:
            - Suspected shoulder labral tear; **OR**
            - Suspected rotator cuff tear; **AND**
        - **ALL** of the following:
            - Concern for rupture or tear based on clinical history, imaging, or physical exam; **AND**
            - Joint-specific orthopedic evaluation and maneuvers suggest a tear; **OR**
    - Diagnosis, surveillance, or follow-up of autoimmune, collagen vascular diseases, or inflammatory conditions (e.g., inflammatory arthritis) and MRI is contraindicated or cannot be performed[11]; **OR**
    - Vascular conditions, known or suspected, including **ANY** of the following:
        - Osteonecrosis, known or suspected, with negative radiographs, when MRI is contraindicated or cannot be performed[12]; **OR**
        - The patient requires evaluation for vascular malformation (with or without pain) due to **ANY** of the following findings[9]:
            - Diffuse or focal enlargement; **OR**
            - Discoloration; **OR**
            - Soft tissue mass; **OR**
            - Ulceration; **OR**
            - Vascular bruit or thrill; **OR**

- Infection or an infectious disorder, including **ANY** of the following:
  - Septic arthritis with **ANY** of the following:
    - Elevated laboratory markers (e.g., erythrocyte sedimentation rate (ESR), C-reactive protein (CRP)/CRP, white blood cell count); **OR**
    - Findings are suggestive of joint effusion or soft tissue swelling[13]; **OR**
    - Clinical history of **ANY** of the following:
      - Adjacent infection; **OR**
      - Diabetes; **OR**
      - Intravenous IV drug use; **OR**
      - Previous surgery on the suspected joint of concern (e.g., joint replacement/ligament, labral, meniscus repair); **OR**
    - Physical exam that supports suspicion of septic arthritis; **OR**
    - Positive joint aspiration; **OR**
    - Septic arthritis is suspected with normal initial radiographs[13]; **OR**
  - Osteomyelitis suspected and MRI cannot be performed or is contraindicated[13,14]; **OR**
  - Soft tissue infection suspected with **ANY** of the following:
    - Normal initial radiographs or with findings suggestive of joint effusion or soft tissue swelling; **OR**
    - History of puncture wound with possible retained foreign body; **OR**
    - High clinical suspicion of necrotizing fasciitis[15]; **OR**
- High clinical suspicion of gout in the absence of monosodium urate (MSU) crystals in synovial fluid (dual energy CT preferred)
- Postintervention evaluation when **ANY** of the following is **TRUE**:
  - Imaging after shoulder arthroplasty and **ALL** of the following are **TRUE**[10]:
    - **ANY** of the following:
      - More detail is required than is available with plain radiographs; **OR**
      - MRI is contraindicated; **AND**
    - **ANY** of the following:
      - Hardware fracture; **OR**
      - History of acute injury; **OR**
      - Metal-on-metal prosthesis with an adverse reaction to metal debris; **OR**
      - Trunnionosis (corrosion or metallosis), suspected; **OR**
      - Pain with **ANY** of the following (infection excluded):

        - Aseptic loosening; **OR**
        - Instability; **OR**
        - Osteolysis; **OR**
      - Periprosthetic fracture; **OR**
- Concern for rupture or tear of a tendon, ligament, or other soft tissue injury (including labrum tear) with **ALL** of the following:
  - MRI is contraindicated or could not be performed; **AND**
  - **ANY** of the following:
    - Symptoms were the direct result of a preceding acute injury **AND** surgery is being considered; **OR**
    - Joint-specific orthopedic evaluation and maneuvers suggest a tear; **OR**
    - **ALL** of the following:
      - Symptoms were not the direct result of a preceding acute injury (i.e., new symptoms that are not the result of a traumatic injury); **AND**
      - Surgery is being considered; **AND**
      - **ANY** of the following:
        - Documented failure of at least 6 weeks of conservative treatment within the past 6 months, including **ALL** of the following:
          - Anti-inflammatory medications, non-opioid analgesics, or prescription medications (e.g., oral steroids, neuropathic pain medications) if not contraindicated; **AND**
          - Physical therapy or a physician-prescribed home exercise program[A]; **OR**
      - Worsening of symptoms during the trial of conservative treatment; **OR**
- Radiographs are negative for osseous injury, an alignment abnormality is suspected based on physical examination, and **ALL** of the following are **TRUE**:
  - MRI and/or ultrasound are contraindicated or cannot be performed; **AND**
  - Radiographs that suggest **ANY** of the following:
    - Dislocation; **OR**
    - Syndesmotic injury; **OR**
    - Other ligamentous injury; **OR**

- Evaluation of **ANY** of the following uncategorized/miscellaneous symptoms when applicable, when MRI cannot be performed or is contraindicated:
  - Marrow abnormalities[12,16]; **OR**
  - Joint-specific orthopedic evaluation and maneuvers suggest a tear; **OR**
  - Persistent joint/muscle pain or weakness unresponsive to conservative treatment, as indicated by **ALL** of the following[17,18]:
    - Nondiagnostic or indeterminate imaging (e.g., radiographs, ultrasound); **AND**
    - Symptoms were not the direct result of a preceding acute injury (i.e., new symptoms but they are not the result of a traumatic injury); **AND**
    - Documented failure of at least 6 weeks of conservative treatment within the past 6 months, including **ALL** of the following:
      - Anti-inflammatory medications, nonopioid analgesics, or prescription medications (e.g., oral steroids, neuropathic pain medications) if not contraindicated; **AND**
      - Physical therapy or a provider-directed home exercise program (HEP)[A]; **OR**
- Repeat imaging (defined as a repeat request following recent imaging of the same anatomic region with the same or similar modality) will be considered reasonable and necessary if **ALL** of the following are **TRUE**:
  - There are no established guidelines; **AND**
  - **ANY** of the following:
    - There are new or worsening symptoms not addressed in the guidelines, such that repeat imaging would influence treatment; **OR**
    - There is need for a one-time clarifying follow-up of a prior indeterminate finding; **OR**
    - In the absence of change in symptoms, there is an established need for monitoring which would influence management.

Non-Indications

Computed tomography (CT), upper extremity is not considered appropriate if **ANY** of the following is **TRUE** if contrast is used:

- The patient has undergone advanced imaging of the same body part within 3 months without undergoing treatment or developing new or

worsening symptoms.[19]

*NOTE: CT in patients with claustrophobia should be requested at the discretion of the ordering provider.
**NOTE: CT in pregnant patients should be requested at the discretion of the ordering provider and obstetric care provider.
***NOTE: The referring professional and radiologist should discuss the risks in patients with chronic or worsening kidney disease or severe renal failure.

[A]**Provider-directed home exercise program (HEP)** should include[20]:
- Patient education of prescribed exercises with written instructions,
- Documentation of patient compliance with the HEP.

Disclaimer on Radiation Exposure in Pediatric Population

Due to the heightened sensitivity of pediatric patients to ionizing radiation, minimizing exposure is paramount. At Cohere, we are dedicated to ensuring that every patient, including the pediatric population, has access to appropriate imaging following accepted guidelines. Radiation risk is dependent mainly on the patient's age at exposure, the organs exposed, and the patient's sex, though there are other variables. The following technical guidelines are provided to ensure safe and effective imaging practices:

Radiation Dose Optimization: Adhere to the lowest effective dose principle for pediatric imaging. Ensure that imaging protocols are specifically tailored for pediatric patients to limit radiation exposure.[21,22]

Alternative Modalities: Prioritize non-ionizing imaging options such as ultrasound or MRI when clinically feasible, as they are less likely to expose the patient to ionizing radiation. For instance, MRI or ultrasound should be considered if they are more likely to provide an accurate diagnosis than CT, fluoroscopy, or radiography.[21,22]

Cumulative Dose Monitoring: Implement systems to track cumulative radiation exposure in pediatric patients, particularly for those requiring multiple imaging studies. Regularly reassess the necessity of repeat imaging based on clinical evaluation.[21,22]

CT Imaging Considerations: When CT is deemed the best method for achieving a correct diagnosis, use the lowest possible radiation dose that still yields reliable diagnostic images.[21,22]

Cohere Imaging Gently Guideline

The purpose of this guideline is to act as a potential override when clinically indicated to adhere to Imaging Gently and Imaging Wisely guidelines and As Low As Reasonably Possible (ALARA) principles.

Level of Care Criteria

Inpatient or Outpatient

CPT/HCPCS Code	Code Description
73200	Computed tomography (CT), upper extremity; without contrast material
73201	Computed tomography (CT), upper extremity; with contrast material
73202	Computed tomography (CT), upper extremity; without contrast material, followed by contrast material(s) and further sections
76380	Computed tomography, limited or localized follow-up study

Disclaimer: S Codes are non-covered per CMS guidelines due to their experimental or investigational nature.

Evaluation of Clinical Harms and Benefits

Clinical determinations for Medicare Advantage beneficiaries are made in accordance with 42 CFR 422.101 guidance outlining CMS's required approach to decision hierarchy in the setting of NCDs/LCDs identified as being "not fully established". When clinical coverage criteria are "not fully established" Medicare Advantage organizations are instructed to create publicly accessible clinical coverage criteria based on widely-accepted clinical guidelines and/or scientific studies backed by a robust clinical evidence base. Clinical coverage criteria provided by Cohere Health in this manner include coverage rationale and risk/benefit analysis.

The potential clinical harms of using these criteria may include:

- CT imaging uses ionizing radiation in the form of x-rays, and while such routine x-rays use low levels of ionizing radiation, this form of radiation is known to increase the risk of cancer.[23]
- Young children are more sensitive to radiation than adults and even the low-dose radiation of CT may pose a significant cancer risk to pediatric patients. In growing children, the thyroid gland, breast tissue, and gonads are particularly sensitive to radiation.[24,25]
- The contrast agent, or dye, employed in some CT scans of the extremities has been linked to renal dysfunction (contrast-induced nephropathy). Patients undergoing consecutive scans, or patients with cirrhosis, hypotension, or peritoneal carcinomatosis may be predisposed to contrast-induced nephropathy.[26]
- Contrast agents may also produce adverse anaphylactoid or non-anaphylactoid reactions. Women, infants, older adults, and Individuals with medical conditions such as diabetes, asthma, or thyroid disorders may be predisposed to contrast induced allergic reactions.[27]
- Increased healthcare costs and complications from the inappropriate use of emergency services and additional treatments.

The clinical benefits of using these criteria include:

- CT may aid in surgical planning following whole-body trauma, by enabling triage through the simultaneous consideration of extremity and intracavitary injuries.[28]
- CT is more sensitive in the detection of fractures in the extremities than conventional radiographic examinations, while delivering an equivalent dose of radiation.[29]
- For patients for whom magnetic resonance imaging (MRI) is unavailable or contraindicated, CT scanning can serve as an alternative when a suspected extremity fracture is not detectable on an x-ray.[30]
- CT is the standard reference imaging modality for visualizing bone damage, including bone erosions in rheumatoid arthritis (RA), but lacks sensitivity for soft-tissue changes, including synovitis and tenosynovitis.[31]
- Enhanced overall patient satisfaction and healthcare experience.

Medical Evidence

Dong et al. (2023) reviewed the central role of various imaging modalities in identifying the precise orientation and planning the surgical intervention needed for peripheral nerve injuries (PNIs), as well as monitoring the progression of PNIs and evaluating treatment outcomes. PNIs are more common in upper limbs, and locating the site of injury can be challenging. Computed tomography (CT) is of primary use in identifying bony abnormalities that may be contributing to nerve injuries, such as bone spurs, fractures, or joint dislocations. CT myelography, which involves the injection of a contrast dye, is used to visualize nerves on the CT scan.[32]

Dreizin et al. (2022) reviewed the role of CT and computed tomography angiography (CTA) in trauma and salvaging a threatened or mangled extremity. When reviewing CT scans to assess complications around the amputation site, close attention should be paid to signs such as surgical wound opening, ulceration, infection, post-surgical blood collections, lingering bone fragments, abnormal bone growth, excessive scarring, and the maintenance of vascular function. Damage control techniques involve swift actions to manage bleeding and restore blood circulation. Early implementation of fasciotomies may be required, along with immediate temporary realignment and stabilization using splints, traction, or external fixation. The measures aim to safeguard the repaired blood vessels and ensure a smooth connection without tension.[33]

Saliken et al. (2015) performed a systematic review of glenohumeral instability related to traumatic anterior shoulder dislocation. Among the primary risk factors contributing to recurrent instability are glenoid and Hill-Sachs bone loss. The efficacy of arthroscopic Bankart repairs is notably impacted by the extent of bone loss, with larger degrees of bone loss correlating with higher failure rates. The review addressed optimal imaging techniques for quantifying glenohumeral bone loss. Various imaging modalities such as radiography, CT scans, and MRI scans are utilized; however, there is currently no universally accepted gold standard method. The authors concluded that radiography serves as a valuable tool in screening patients for significant glenoid bone loss, while CT imaging, employing methods such as the Glenoid Index or Pico Method, demonstrates substantial evidence supporting its

efficacy in accurately quantifying glenoid bone loss. Further research is needed to establish the optimal imaging modality and method for precisely quantifying glenohumeral bone loss.[34]

References

1. Centers for Medicare & Medicaid Services. National Coverage Determination (NCD). Computed tomography (220.1). Revision Effective Date March 12, 2008. https://www.cms.gov/medicare-coverage-database/view/ncd.aspx?NCDd=176
2. Torabi M, Lenchik L, Beaman FD, et al. Acute hand and wrist trauma. ACR appropriateness criteria [Internet] American College of Radiology (ACR). Updated 2018. http://www.acr.org
3. Shyu JY, Khurana B, Soto JA, et al. Major blunt trauma. ACR appropriateness criteria [Internet] American College of Radiology (ACR). Updated 2019. http://www.acr.org
4. Laur O, Ha AS, Bartolotta RJ, et al. Acute shoulder pain. ACR appropriateness criteria [Internet] American College of Radiology (ACR). Updated 2024. http://www.acr.org
5. Morrison WB, Deely D, Fox MG, et al. Stress (fatigue/insufficiency) fracture, including sacrum, excluding other vertebrae. ACR appropriateness criteria [Internet] American College of Radiology (ACR). Updated 2024. http://www.acr.org
6. Mehta N, McCormick JR, Garrigues GE. Preoperative planning and its role in anatomic total shoulder arthroplasty. *Seminars in Arthroplasty:* JSES 2024 Mar 1 (Vol. 34, No. 1, pp. 242-251)
7. Rainey J, Hameed D, Sodhi N, Malkani AL, Mont MA. Use of computed tomography for shoulder arthroplasty: A systematic review. *J Orthop.* 2024;59:30-35. Published 2024 May 13. doi:10.1016/j.jor.2024.05.007
8. Liuzza LG, Abdelshahed MM, Oh C, et al. Comparison of radiographs and computed tomography (CT) imaging for preoperative evaluation and planning for shoulder arthroplasty. *Seminars in Arthroplasty*: JSES 2021 Sep 1 (Vol. 31, No. 3, pp. 395-401)
9. American Academy of Orthopaedic Surgeons. Management of Glenohumeral Joint Osteoarthritis Evidence-Based Clinical Practice Guideline. www.aaos.org/gjocpg. Published March 23, 2020

10. Horneff III JG, López VM. Preoperative planning for anatomic total shoulder arthroplasty. *JAAOS-Journal of the American Academy of Orthopaedic Surgeons*. 2022 Oct 1;30(19):e1207-16
11. Subhas N, Wu F, Fox MG, et al. Chronic extremity joint pain, suspected inflammatory arthritis, crystalline arthritis, or erosive osteoarthritis. ACR appropriateness criteria [Internet] American College of Radiology (ACR). Updated 2022. http://www.acr.org
12. Ha AS, Chang EY, Bartolotta RJ, et al. Osteonecrosis. ACR appropriateness criteria [Internet] American College of Radiology (ACR). Updated 2022. http://www.acr.org
13. Pierce JL, Perry MT, Wessell DE, et al. Suspected osteomyelitis, septic arthritis, or soft tissue infection (excluding spine and diabetic foot). ACR appropriateness criteria [Internet] American College of Radiology (ACR). Updated 2022. http://www.acr.org
14. Walker EA, Fox MG, Blakenbaker DG, et al. Imaging after total knee arthroplasty. ACR appropriateness criteria [Internet] American College of Radiology (ACR). Updated 2023. http://www.acr.org
15. Wei XK, Huo JY, Yang Q, Li J. Early diagnosis of necrotizing fasciitis: Imaging techniques and their combined application. *Int Wound J*. 2024;21(1):e14379. doi:10.1111/iwj.14379
16. American College of Radiology (ACR). ACR–SPR–SSR practice parameter for the performance and interpretation of magnetic resonance imaging (MRI) of the shoulder - resolution 32. Published 2020. https://www.acr.org/-/media/ACR/Files/Practice-Parameters/mr-shldr.pdf
17. Thomas JM, Chang EY, Ha AS, et al. Chronic elbow pain. ACR appropriateness criteria [Internet] American College of Radiology (ACR). Updated 2022. http://www.acr.org
18. Stensby JD, Fox MG, Nacey N, et al. Chronic hand and wrist pain. ACR appropriateness criteria [Internet] American College of Radiology (ACR). Updated 2023. http://www.acr.org
19. Wasser EJ, Prevedello LM, Sodickson A, Mar W, Khorasani R. Impact of a real-time computerized duplicate alert system on the utilization of computed tomography. *JAMA Intern Med*. 2013;173(11):1024-1026.

doi:10.1001/jamainternmed.2013.543

20. Argent R, Daly A, Caulfield B. Patient involvement with home-based exercise programs: Can connected health interventions influence adherence? *JMU*. 2018 Mar 1;6(3):e8518
21. The Image Gently Alliance. Procedures - cardiac imaging. Updated 2014. https://www.imagegently.org/Procedures/Cardiac-Imaging
22. National Cancer Institute. Radiation risks and pediatric computed tomography (CT): A guide for health care. Updated September 4, 2018. https://www.cancer.gov/about-cancer/causes-prevention/risk/radiation/pediatric-ct-scans
23. Berrington de Gonzalez A, Pasqual E, Veiga L. Epidemiological studies of CT scans and cancer risk: the state of the science. *Br J Radiol*. 2021;94(1126):20210471. doi:10.1259/bjr.20210471
24. Frush DP, Donnelly LF, Rosen NS. Computed tomography and radiation risks: What pediatric health care providers should know. *Pediatrics.* 2003;112(4): 951-957. doi:10.1542/peds.112.4.951
25. Rice HE, Frush DP, Farmer D et al. Review of radiation risks from computed tomography: Essentials for the pediatric surgeon. *J Pediatr Surg* 2007;42(4): 603-607. doi:10.1016/j.jpedsurg.2006.12.009
26. Hong SI, Ahn S, Lee YS et al. Contrast-induced nephropathy in patients with active cancer undergoing contrast-enhanced computed tomography. *Support Care Cancer*. 2016 Mar;24:1011-7. doi:10.1007/s00520-015-2875-6
27. Morzycki A, Bhatia A, Murphy KJ. Adverse reactions to contrast material: a Canadian update. *Can Assoc Radiol J*. 2017 May;68(2):187-93. doi:10.1016/j.carj.2016.05.006
28. Dreizin D, Smith EB, Champ K, et al. Roles of trauma CT and CTA in salvaging the threatened or mangled extremity. *Radiographics*. 2022 Mar-Apr;42(2):E50-E67. doi: 10.1148/rg.210092
29. Allen GM, Wilson DJ, Bullock SA, et al. Extremity CT and ultrasound in the assessment of ankle injuries: Occult fractures and ligament injuries. *Br J Radiol*. 2020 Jan;93(1105):20180989. doi: 10.1259/bjr.20180989
30. Kellock TT, Khurana B, Mandell JC. Diagnostic performance of CT for occult proximal femoral fractures: A systematic review and

meta-analysis. *AJR Am J Roentgenol*. 2019 Dec;213(6):1324-1330. doi: 10.2214/AJR.19.21510

31. Østergaard M, Boesen M. Imaging in rheumatoid arthritis: the role of magnetic resonance imaging and computed tomography. *Radiol Med*. 2019;124(11):1128-1141. doi:10.1007/s11547-019-01014-y
32. Dong Y, Alhaskawi A, Zhou H, et al. Imaging diagnosis in peripheral nerve injury. *Front Neurol*. 2023 Sep 14;14:1250808. dDoi: 10.3389/fneur.2023.1250808
33. Dreizin D, Smith EB, Champ K, et al. Roles of trauma CT and CTA in salvaging the threatened or mangled extremity. *Radiographics*. 2022 Mar-Apr;42(2):E50-E67. doi: 10.1148/rg.210092
34. Saliken DJ, Bornes TD, Bouliane MJ, et al. Imaging methods for quantifying glenoid and Hill-Sachs bone loss in traumatic instability of the shoulder: A scoping review. *BMC Musculoskelet Disord*. 2015 Jul 18:16:164. doi: 10.1186/s12891-015-0607-1

Policy Revision History/Information

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Review History		
Version 2	10/02/2025	Annual review Reworded and rearranged medical necessity criteria for improved usability and organization. Updated medical evidence section for clarity. Updated Repeat Imaging criteria Added new reference (#19)