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

Clinical Guidelines for Medical Necessity Review

Version: 1
Effective Date: October 3, 2024

Important Notices

Notices & Disclaimers:

GUIDELINES ARE SOLELY FOR COHERE'S USE IN PERFORMING MEDICAL NECESSITY REVIEWS AND ARE NOT INTENDED TO INFORM OR ALTER CLINICAL DECISION-MAKING OF END USERS.

Cohere Health, Inc. ("**Cohere**") has published these clinical guidelines to determine the medical necessity of services (the "**Guidelines**") for informational purposes only, and solely for use by Cohere's authorized "**End Users**". These Guidelines (and any attachments or linked third-party content) are not intended to be a substitute for medical advice, diagnosis, or treatment directed by an appropriately licensed healthcare professional. These Guidelines are not in any way intended to support clinical decision-making of any kind; their sole purpose and intended use is to summarize certain criteria Cohere may use when reviewing the medical necessity of any service requests submitted to Cohere by End Users. Always seek the advice of a qualified healthcare professional regarding any medical questions, treatment decisions, or other clinical guidance. The Guidelines, including any attachments or linked content, are subject to change at any time without notice. This policy may be superseded by existing and applicable Centers for Medicare & Medicaid Services (CMS) statutes.

Other Notices:

Guideline Information:

Specialty Area: Diagnostic Imaging
Guideline Name: Cohere Medicare Advantage Policy - Computed Tomography (CT), Upper Extremity

Date of last literature review: 10/2/2024
Document last updated: 10/3/2024
Type: [**X**] Adult (18+ yo) | [**X**] Pediatric (0-17yo)

Table of Contents

Medical Necessity Criteria

Service: Computed Tomography (CT), Upper Extremity

Benefit Category

Diagnostic Services in Outpatient Hospital
Diagnostic Tests (other)

Please Note: This may not be an exhaustive list of all applicable Medicare benefit categories for this item or service.

Related CMS Documents

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

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

Recommended Clinical Approach

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 may be beneficial.

Evaluation of Clinical Harms and Benefits

Cohere Health uses the criteria below to ensure consistency in reviewing the conditions to be met for coverage of computed tomography (CT) of the upper extremity. This process helps to prevent both incorrect denials and inappropriate approvals of medically necessary services. Specifically, limiting incorrect approvals reduces the risks associated with unnecessary

procedures, such as complications from surgery, infections, and prolonged recovery times.

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.[2]
- 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.[3,4]
- 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.[5]
- 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.[6]
- 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.[7]
- CT is more sensitive in the detection of fractures in the extremities than conventional radiographic examinations, while delivering an equivalent dose of radiation.[8]
- 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.[9]
- 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.[10]
- Enhanced overall patient satisfaction and healthcare experience.

This policy includes provisions for expedited reviews and flexibility in urgent cases to mitigate risks of delayed access. Evidence-based criteria are employed to prevent inappropriate denials, ensuring that patients receive medically necessary care. The criteria aim to balance the need for effective treatment with the minimization of potential harms, providing numerous clinical benefits in helping avoid unnecessary complications from inappropriate care.

In addition, the use of these criteria is likely to decrease inappropriate denials by creating a consistent set of review criteria, thereby supporting optimal patient outcomes and efficient healthcare utilization.

Medical Necessity Criteria

Indications

➔ **Computed tomography (CT), upper extremity** is considered appropriate if **ANY** of the following is **TRUE**:
- ◆ Traumatic upper extremity injury (e.g., fracture, dislocation) that requires additional detail than is available with plain radiographs and **ANY** of the following is **TRUE**[11-13]:
  - Bony injury and **ANY** of the following is **TRUE**[14]:
    - ○ 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; **OR**
  - Suspected soft tissue injury (e.g., rotator cuff tear), and MRI and ultrasound are contraindicated or cannot be performed[11,13,15-16]; **OR**

- Detection, screening, or surveillance of neoplasms, masses, and cysts of an upper extremity, and **ANY** of the following is **TRUE**[17]:
  - Malignant or aggressive primary tumor[17]; **OR**
  - A bone tumor is suspected with indeterminate or aggressive appearance of an incidental osseous lesion on MRI or radiographs for unrelated indication[18]; **OR**
  - Presence of a mass with **ANY** of the following[19]:
    - Absence of trauma; **OR**
    - Rapid growth; **OR**
    - Recurrence after prior surgery; **OR**
    - Non-diagnostic ultrasound or other inconclusive imaging; **OR**
  - Known malignancy and **ANY** of the following is required:
    - Monitor response to treatment; **OR**
    - Surveillance after treatment or surgery; **OR**
    - Non-diagnostic ultrasound or other inconclusive imaging; **OR**
  - Follow-up exam to further characterize a bone or soft tissue lesion diagnosed on initial imaging study[18-19]; **OR**
- Infectious disorder, including **ANY** of the following:
  - Septic arthritis is suspected with initial radiographs that are normal or with findings suggestive of joint effusion or soft tissue swelling; **OR**
  - Osteomyelitis suspected[20]; **OR**
  - Soft tissue infection suspected with **ANY** of the following[20]:
    - 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; **OR**
- Vascular conditions, known or suspected, when ultrasound and MRI are contraindicated or inconclusive; **OR**
- Evaluation of **ANY** of the following uncategorized/miscellaneous symptoms when applicable:
  - Marrow abnormalities[21-22]; **OR**
  - Pain or weakness of an upper extremity as indicated by **ALL** of the following[15,23]:

        - Nondiagnostic or indeterminate imaging (e.g. radiographs, US); **AND**
        - Failure of conservative management (e.g., rest, analgesics, physical therapy, oral or injectable corticosteroids) must be documented for a period of greater than 3 months; **AND**
        - Concern for rupture or high-grade tear based on **ALL** of the following:
            - Clinical history; **AND**
            - Physical exam; **OR**
    - Screening, surveillance, or follow-up of autoimmune, collagen vascular diseases, or inflammatory conditions (e.g., inflammatory arthritis)[24]; **OR**
- Repeat imaging (defined as repeat request following recent imaging of the same anatomic region with the same modality), in the absence of established guidelines, will be considered reasonable and necessary if **ANY** of the following is **TRUE**:
    - New or worsening symptoms, such that repeat imaging would influence treatment; **OR**
    - 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:
    - If contrast is used, history of anaphylactic allergic reaction to iodinated contrast media.

*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.

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.[25-26]

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.[25-26]

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.[25-26]

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.[25-26]

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

Procedure Codes (CPT/HCPCS)

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: G, S, I, and N Codes are non-covered per CMS guidelines due to their experimental or investigational nature.

Medical Evidence

Dong et al. (2023) review 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.[27]

Drezin et al. (2022) review 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.[28]

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.[29]

References

1. Centers for Medicare & Medicaid Services. National Coverage Determination (NCD) 220.1. Computed Tomography. Published March 12, 2008. Accessed September 23, 2024. https://www.cms.gov/medicare-coverage-database/view/ncd.aspx?NCDId=176
2. Berrington de Gonzalez A, Pasqual E, Veiga L. Epidemiological studies of CT scans and cancer risk: the state of the science [published correction appears in Br J Radiol. 2022 Jul;95(1135):20210471c. doi: 10.1259/bjr.20210471.c]. *Br J Radiol*. 2021;94(1126):20210471. doi:10.1259/bjr.20210471. PMID: 34545766.
3. Frush DP, Donnelly LF, Rosen NS. Computed tomography and radiation risks: what pediatric health care providers should know." *Pediatrics.* 2003;112(4): 951-957. PMID: 14523191.
4. 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. PMID: 17448753.
5. 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. PMID: 26238629.
6. Morzycki A, Bhatia A, Murphy KJ. Adverse reactions to contrast material: a Canadian update. *Can Assoc Radiol J*. 2017 May;68(2):187-93. PMID: 27745988.
7. 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. PMID: 35230918; PMCID: PMC8906352.
8. 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. PMID: 31742428; PMCID: PMC6948070.
9. 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. PMID: 31461322.

10. 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. PMID: 30880357
11. Expert Panel on Musculoskeletal Imaging, Torabi M, Lenchik L, et al. ACR appropriateness criteria - acute hand and wrist trauma. *J Am Coll Radiol*. 2019 May;16(5S):S7-S17. doi: 10.1016/j.jacr.2019.02.029. PMID: 31054760.
12. Expert Panel on Major Trauma Imaging, Shyu JY, Khurana B, et al. ACR appropriateness criteria - major blunt trauma. *J Am Coll Radiol*. 2020 May;17(5S):S160-S174. doi: 10.1016/j.jacr.2020.01.024. PMID: 32370960.
13. Expert Panel on Musculoskeletal Imaging, Amini B, Beckmann NM, et al. ACR appropriateness criteria - shoulder pain, traumatic. *J Am Coll Radiol*. 2018 May;15(5S):S171-S188. doi: 10.1016/j.jacr.2018.03.013. PMID: 29724420.
14. Expert Panel on Musculoskeletal Imaging, Bencardino JT, Stone TJ, et al. ACR appropriateness criteria - stress (fatigue/insufficiency) fracture, including sacrum, excluding other vertebrae. *J Am Coll Radiol*. 2017 May;14(5S):S293-S306. doi: 10.1016/j.jacr.2017.02.035. PMID: 28473086.
15. Expert Panel on Musculoskeletal Imaging, Stensby JD, Fox MG, et al. ACR appropriateness criteria - chronic hand and wrist pain. Updated 2023. Accessed July 1, 2024. https://acsearch.acr.org/docs/69427/Narrative/.
16. Expert Panel on Musculoskeletal Imaging, Nacey N, Fox MG, et al. ACR appropriateness criteria - chronic shoulder pain: 2022 update. *J Am Coll Radiol*. 2023 May;20(5S):S49-S69. doi: 10.1016/j.jacr.2023.02.017. PMID: 37236752.
17. Expert Panel on Musculoskeletal Imaging, Stanborough R, Demertzis JL, et al. ACR appropriateness criteria - malignant or aggressive primary musculoskeletal tumor-staging and surveillance: 2022 update. *J Am Coll Radiol*. 2022 Nov;19(11S):S374-S389. doi: 10.1016/j.jacr.2022.09.015. PMID: 36436964.
18. Expert Panel on Musculoskeletal Imaging, Bestic JM, Wessell DE, et al. ACR appropriateness criteria - primary bone tumors. *J Am Coll Radiol*. 2020 May;17(5S):S226-S238. doi: 10.1016/j.jacr.2020.01.038. PMID: 32370967.
19. Expert Panel on Musculoskeletal Imaging, Garner HW, Wessell DE, et al. ACR appropriateness criteria - soft tissue masses: 2022 update. *J Am Coll Radiol*. 2023 May;20(5S):S234-S245. doi: 10.1016/j.jacr.2023.02.009. PMID: 37236746.

20. Expert Panel on Musculoskeletal Imaging, Pierce JL, Perry MT, et al. ACR appropriateness criteria - suspected osteomyelitis, septic arthritis, or soft tissue infection (excluding spine and diabetic foot): 2022 update. *J Am Coll Radiol*. 2022 Nov;19(11S):S473-S487. doi: 10.1016/j.jacr.2022.09.013. PMID: 36436971.
21. Expert Panel on Musculoskeletal Imaging, Ha AS, Chang EY, et al. ACR appropriateness criteria - osteonecrosis: 2022 update. *J Am Coll Radiol*. 2022 Nov;19(11S): S409-S416. doi: 10.1016/j.jacr.2022.09.009. PMID: 36436966.
22. American College of Radiology (ACR), Society of Pediatric Radiology (SPR), Society of Skeletal Radiology (SSR). ACR–SPR–SSR practice parameter for the performance and interpretation of magnetic resonance imaging (MRI) of the shoulder - resolution 32. Published 2020. Accessed September 23, 2024. https://www.acr.org/-/media/ACR/Files/Practice-Parameters/mr-shldr.pdf.
23. Expert Panel on Musculoskeletal Imaging, Thomas JM, Chang EY, et al. ACR appropriateness criteria - chronic elbow pain. *J Am Coll Radiol*. 2022 Nov;19(11S):S256-S265. doi: 10.1016/j.jacr.2022.09.022. PMID: 36436956.
24. Expert Panel on Musculoskeletal Imaging, Subhas N, Wu F, et al. ACR appropriateness criteria - chronic extremity joint pain - suspected inflammatory arthritis, crystalline arthritis, or erosive osteoarthritis: 2022 update. *J Am Coll Radiol.* 2023 May;20(5S):S20-S32. doi: 10.1016/j.jacr.2023.02.020. PMID: 37236743.
25. The Image Gently Alliance. Procedures - image gentle and CT scans. Updated 2014. Accessed September 23, 2024. https://www.imagegently.org/Procedures/Computed-Tomography.
26. National Cancer Institute. Radiation risks and pediatric computed tomography (CT): A guide for health care. Updated September 4, 2018. Accessed September 23, 2024. https://www.cancer.gov/about-cancer/causes-prevention/risk/radiation/pediatric-ct-scans.
27. Dong Y, Alhaskawi A, Zhou H, et al. Imaging diagnosis in peripheral nerve injury. *Front Neurol*. 2023 Sep 14;14:1250808. doi: 10.3389/fneur.2023.1250808. PMID: 37780718; PMCID: PMC10539591.
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. PMID: 35230918; PMCID: PMC8906352.
29. 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. PMID: 26187270; PMCID: PMC4506419.

Clinical Guideline Revision History/Information

Original Date: October 3, 2024		
Review History		