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2024 Computed Tomography (CT) Upper Extremities

Diagnostic Imaging

CT-UpperEXT-HH

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Table of Contents

CT General Contraindications

Computed tomography (CT) may be contraindicated for **ANY** of the following:

- Allergy to contrast (if contrast is used)
- Pregnancy
- Renal impairment and dialysis unmanageable (if contrast is used)

References: [1] [38]

Preamble: Pediatric Diagnostic Imaging

HealthHelp's clinical guidelines for the Diagnostic Imaging program, are intended to apply to both adults and pediatrics (21 years of age or younger), unless otherwise specified within the criteria.

Computed Tomography (CT) Arm

NCD 220.1
See also, **NCD 220.1**: Computed Tomography at https://www.cms.gov/medicare-coverage-database/search.aspx *if applicable to individual's healthplan membership*.

CT Arm Guideline

Computed tomography (CT) of the arm (long-bones, non-joint) is considered medically appropriate when a X-ray is completed and the documentation demonstrates **ANY** of the following:

1. Arm-specific pathology evaluation, when **magnetic resonance imaging (MRI) is contraindicated or unavailable** and **ANY** of the following:
    a. Injury or trauma is suspected or known and **ANY** of the following:
        i. Fracture is known from prior imaging (eg, X-ray, CT), ligamentous or tendon injury is suspected, **AND** surgery maybe required.
        ii. Fracture is suspected for evaluation of **ANY** of the following:
            A. Complete fracture risk is high with conservative therapy.
            B. Delayed or non-union fracture, when there is **NO** healing demonstrated between 2 sets of X-rays. (*__NOTE__: *CT is preferred.*)

C. Insufficiency, occult or stress fracture is suspected and X-rays taken 10 to 14 days or longer after injury or clinical assessment are negative, non-diagnostic or indeterminate.

D. Pathologic fracture **OR** impending fracture suspected or at risk, based on prior X-ray or computed tomography (CT).

iii. Tendon, muscle rupture or ligament injury is suspected, based on mechanism of injury and physical findings **AND** ultrasound is non-diagnostic or indeterminate.

b. Pain in the upper extremity (joint or muscle), with conservative management (eg, physical therapy) evaluation, MRI is **contraindicated or unavailable OR** requested as CT arthrogram with **ALL** of the following: (**NOTE**: *Indication does **NOT** apply to young children [age is less than 5]*.)

i. Attempted within the last 6 months, for at least 4 weeks **AND** symptoms persist or worsen.

ii. Symptoms progress or worsen during course of conservative management

References: [4] [28] [5] [34]

2. Avascular necrosis is suspected or known, **magnetic resonance imaging (MRI) is contraindicated or unavailable** and **ANY** of the following:

a. Osteonecrosis is known **AND** X-rays are complete, to evaluate contralateral joint.

b. Prior X-ray or CT is non-diagnostic or indeterminate, suggesting osteonecrosis.

c. Symptomatic, high risk (eg, alcohol abuse, glucocorticosteroid use, glycogen storage disease, renal transplant, sickle cell anemia) and prior X-rays are normal.

References: [15]

3. Cancer in the upper extremity is known and **ANY** of the following:

a. National Comprehensive Cancer Network (NCCN) surveillance (*See **Surveillance** section*)

b. Primary cancer is known, for follow-up, when active treatment was received in the last year.

c. Staging, restaging, recurrence or metastasis

References: [4] [6] [32] [14]

4. Foreign body evaluation **AND BOTH** ultrasound **AND** X-ray are non-diagnostic or indeterminate.
References: [4] [8]

5. Inflammatory condition (eg, capitellar osteochondritis, crystalline arthropathy, hemarthrosis, polymyositis rheumatoid arthritis) is suspected or known, **MRI is contraindicated or unavailable** and **ANY** of the following:
    a. Arthropathies (eg, crystalline arthropathy, rheumatoid arthritis) and **ANY** of the following:
        i. Advanced rheumatoid arthritis (eg, bone deformity, bone erosion near joints, unstable joint) and X-ray is non-diagnostic or indeterminate for follow-up evaluation.
        ii. Crystalline arthropathy and **ANY** of the following;
            A. Extra-articular crystal deposits (eg, bursa or tendon) are known.
            B. Rheumatological work-up (c-reactivce protein [CRP], erythrocyte sedimenation rate [ESR]) is competed **AND** joint aspiration is non-diagnostic or indeterminate **OR contraindicated or unavailable**.
        iii. Early rheumatoid arthritis (between a few weeks and one year into progression) for follow-up evaluation
        iv. Prior imaging is abnormal, non-diagnostic or indeterminate.
        v. Single joint imaging, initial, for diagnosis or response to therapy.
        vi. Diagnosis is **UNKNOWN** and treatment has **NOT** started **OR** to determine change in treatment.
    b. Myopathies (eg, dermatomyositis, immune-mediated necrotizing myopathy, polymyositis) is suspected or known, for diagnosis or biopsy planning.

    References: [4] [31] [13] [31]

6. Infection (eg, abscess, bursitis, osteomyelitis, septic arthritis) is suspected or known and **ANY** of the following: (*__NOTE__: *MRI and nuclear medicine scans are recommended for acute infection. CT is better at demonstrating chronic infections, as well as detecting soft tissue gas and foreign bodies*.)
    a. Infection or abscess is clinically suspected (eg, elevated complete blood count [CBC], CRP, ESR or joint aspiration is positive), symptomatic (eg, fever, pain, swelling) **AND** prior X-ray or ultrasound is negative.
    b. Ulcer (eg, diabetic, ischemic, pressure, traumatic) is **NOT** improving with treatment **AND** deep or bone infection is suspected.
    c. Ultrasound or X-ray is abnormal, non-diagnostic or indeterminate.

    References: [4] [21]

7. Mass, lesion or cyst evaluation and X-ray or ultrasound is non-diagnostic or indeterminate. (*__NOTE__: *CT is recommended for bone calcification **OR** if bone involvement is suspected. MRI is the preferred imaging for all other masses.)*
   References: [4] [14] [6]
8. Osteochondral lesion (defects, fractures, osteochondritis dissecans) is suspected or known, based on mechanism of injury or physical findings.
   References: [4]
9. Peri-procedural imaging to guide pre-procedure planning or post-operative complications.
   References: [4]
10. Prior CT upper extremity imaging is non-diagnostic or indeterminate. (*__NOTE__: *One follow-up is appropriate to evaluate for changes since preceding imaging finding[s]. Further surveillance is appropriate when lesion is specified as "highly suspicious" or there is a change since last exam.*)
    References: [4]
11. Synovial chondromatosis or loose bodies, with joint pain or mechanical symptoms, are demonstrated on prior X-ray or ultrasound.
    References: [4]
12. Vascular malformations are suspected or known **AND** results will change management **AND/OR** pre-operative planning. (*__NOTE__: *MRI Is preferred. CTA is also approvable for initial evaluation*)
    References: [4] [17]

Computed Tomography (CT) Elbow

NCD 220.1
See also, **NCD 220.1**: Computed Tomography at https://www.cms.gov/medicare-coverage-database/search.aspx *if applicable to individual's healthplan membership*.

CT Elbow Guideline

Computed tomography (CT) of the elbow is considered medically appropriate when a X-ray is completed and the documentation demonstrates **ANY** of the following: [4]

1. Elbow-specific pathology evaluation and **ANY** of the following:
   a. Injury or trauma is suspected or known, **MRI is contraindicated or unavailable** and **ANY** of the following:

i. Elbow instability, with provocative orthopedic tests[1].

ii. Fracture is known from prior imaging (eg, X-ray, CT), ligamentous or tendon injury is suspected, **AND** surgery maybe required.

iii. Fracture is suspected for evaluation of **ANY** of the following:

A. Complete fracture risk is high with conservative therapy.

B. Delayed or non-union fracture, when there is **NO** healing demonstrated between 2 sets of X-rays. (*__NOTE__: *CT is preferred.*)

C. Insufficiency, occult or stress fracture is suspected and X-rays taken 10 to 14 days or longer after injury or clinical assessment are negative, non-diagnostic or indeterminate.

D. Pathologic fracture **OR** impending fracture suspected or at risk, based on prior X-ray or computed tomography (CT).

iv. Tendon, muscle rupture or ligament injury is suspected, based on mechanism of injury and physical findings **AND** ultrasound is non-diagnostic or indeterminate.

b. Joint prosthesis or replacement is known, **AND** joint prosthesis loosening **OR** dysfunction (eg, pseudotumor formation) is suspected.

c. Pain in the upper extremity (joint or muscle) with conservative management (eg, physical therapy) evaluation , MRI is **contraindicated or unavailable** and **ANY** of the following: (**NOTE**: *Indication does **NOT** apply to young children [age is less than 5]*.)

i. Attempted within the last 6 months, for at least 4 weeks **AND** symptoms persist or worsen.

ii. Symptoms progress or worsen during course of conservative management

d. Tendon tear (biceps), with provocative orthopedic tests[2].

References: [4] [28] [27] [33] [5] [2017 ACR Appropriateness Criteria Chronic Extremity Joint Pain-Suspected Inflammatory Arthritis] [35]

2. Avascular necrosis is suspected or known, **magnetic resonance imaging (MRI) is contraindicated or unavailable** and **ANY** of the following:

[1]Orthopedic tests include milking maneuver, posterolateral rotatory drawer test, push-up test, tabletop relocation test, valgus stress, varus stress

[2]Orthopedic tests include biceps squeeze test, bicipital aponeurosis (BA) flex test, hook test, passive forearm pronation test, Reverse Popeye sign (*__NOTE__: *For reverse popeye sign, If finding is acute, evaluation for surgical correction.*)

a. Osteonecrosis is known **AND** X-rays are complete, to evaluate contralateral joint.

b. Prior X-ray or CT is non-diagnostic or indeterminate, suggesting osteonecrosis.

c. Symptomatic, high risk (eg, alcohol abuse, glucocorticosteroid use, glycogen storage disease, renal transplant, sickle cell anemia) and prior X-rays are normal.

References: [15]

3. Cancer in the upper extremity is known and **ANY** of the following:

   a. National Comprehensive Cancer Network (NCCN) surveillance (*See **Surveillance** section*)

   b. Primary cancer is known, for follow-up, when active treatment was received in the last year.

   c. Staging, restaging, recurrence or metastasis

   References: [4] [6] [32] [14]

4. Foreign body evaluation **AND BOTH** ultrasound **AND** X-ray are non-diagnostic or indeterminate.
   References: [4] [8]

5. Inflammatory condition (eg, capitellar osteochondritis, crystalline arthropathy, hemarthrosis, polymyositis rheumatoid arthritis) is suspected or known, **MRI is contraindicated or unavailable** and **ANY** of the following:

   a. Arthropathies (eg, crystalline arthropathy, rheumatoid arthritis) and **ANY** of the following:

      i. Advanced rheumatoid arthritis (eg, bone deformity, bone erosion near joints, unstable joint) and X-ray is non-diagnostic or indeterminate for follow-up evaluation.

      ii. Crystalline arthropathy and **ANY** of the following;

         A. Extra-articular crystal deposits (eg, bursa or tendon) are known.

         B. Rheumatological work-up (c-reactivce protein [CRP], erythrocyte sedimenation rate [ESR]) is competed **AND** joint aspiration is non-diagnostic or indeterminate **OR contraindicated or unavailable**.

      iii. Early rheumatoid arthritis (between a few weeks and one year into progression) for follow-up evaluation

      iv. Prior imaging is abnormal, non-diagnostic or indeterminate.

      v. Single joint imaging, initial, for diagnosis or response to therapy.

vi. Diagnosis is **UNKNOWN** and treatment has **NOT** started **OR** to determine change in treatment.

b. Myopathies (eg, dermatomyositis, immune-mediated necrotizing myopathy, polymyositis) is suspected or known, for diagnosis or biopsy planning.

References: [4] [31] [13] [31]

6. Infection (eg, abscess, bursitis, osteomyelitis, septic arthritis) is suspected or known and **ANY** of the following: (*__NOTE__: *MRI and nuclear medicine scans are recommended for acute infection. CT is better at demonstrating chronic infections, as well as detecting soft tissue gas and foreign bodies*.)

   a. Infection or abscess is clinically suspected (eg, elevated complete blood count [CBC], CRP, ESR or joint aspiration is positive), symptomatic (eg, fever, pain, swelling) **AND** prior X-ray or ultrasound is negative.

   b. Ulcer (eg, diabetic, ischemic, pressure, traumatic) is **NOT** improving with treatment **AND** deep or bone infection is suspected.

   c. Ultrasound or X-ray is abnormal, non-diagnostic or indeterminate.

   References: [4] [21]

7. Mass, lesion or cyst evaluation and X-ray or ultrasound is non-diagnostic or indeterminate. (*__NOTE__: *CT is recommended for bone calcification **OR** if bone involvement is suspected. MRI is the preferred imaging for all other masses.)*
   References: [4] [14] [6]

8. Osteochondral lesion (defects, fractures, osteochondritis dissecans) is suspected or known, based on mechanism of injury or physical findings.
   References: [4]

9. Peripheral neurogenic condition or entrapment (eg, Charcot joint) is suspected or known, **MRI is contraindicated or unavailable** and **ANY** of the following:

   a. Conservative management (eg, physical therapy) evaluation and **EITHER** of the following:

      i. Attempted within the last 6 months, for at least 4 weeks **AND** symptoms persist or worsen.

      ii. Symptoms progress or worsen during course of conservative management

   b. Electromyogram or nerve conduction study is non-diagnostic or indeterminate.

   c. Ultrasound or X-ray is non-diagnostic or indeterminate.

   References: [19] [12]

10. Peri-procedural imaging to guide pre-procedure planning or post-operative complications.
References: [4]

11. Prior CT upper extremity imaging is non-diagnostic or indeterminate. (*__NOTE__: *One follow-up is appropriate to evaluate for changes since preceding imaging finding[s]. Further surveillance is appropriate when lesion is specified as "highly suspicious" or there is a change since last exam.*)
References: [4]

12. Synovial chondromatosis or loose bodies, with joint pain or mechanical symptoms, are demonstrated on prior X-ray or ultrasound.
References: [4]

13. Vascular malformations are suspected or known **AND** results will change management **AND/OR** pre-operative planning. (*__NOTE__: *MRI Is preferred. CTA is also approvable for initial evaluation*)
References: [4] [17]

Computed Tomography (CT) Hand

NCD 220.1
See also, **NCD 220.1**: Computed Tomography at https://www.cms.gov/medicare-coverage-database/search.aspx *if applicable to individual's healthplan membership*.

CT Hand Guideline

Computed tomography (CT) of the hand is considered medically appropriate when a X-ray is completed and the documentation demonstrates **ANY** of the following:

1. Hand-specific pathology evaluation and **ANY** of the following:
    a. Injury or trauma is suspected or known, **MRI is contraindicated or unavailable** for **ANY** of the following:
        i. Fracture is known from prior imaging (eg, X-ray, CT), ligamentous or tendon injury is suspected, **AND** surgery maybe required.
        ii. Fracture is suspected for evaluation of **ANY** of the following:
            A. Complete fracture risk is high with conservative therapy.
            B. Delayed or non-union fracture, when there is **NO** healing demonstrated between 2 sets of X-rays. (*__NOTE__: *CT is preferred.*)

C. Insufficiency, occult or stress fracture is suspected and X-rays taken 10 to 14 days or longer after injury or clinical assessment are negative, non-diagnostic or indeterminate.

D. Pathologic fracture **OR** impending fracture suspected or at risk, based on prior X-ray or computed tomography (CT).

iii. Tendon, muscle rupture or ligament injury is suspected, based on mechanism of injury and physical findings **AND** ultrasound is non-diagnostic or indeterminate.

b. Pain in the upper extremity (joint or muscle) with conservative management (eg, physical therapy) evaluation , MRI is **contraindicated or unavailable** and **ANY** of the following: (**NOTE**: *Indication does **NOT** apply to young children [age is less than 5]*.)

i. Attempted within the last 6 months, for at least 4 weeks **AND** symptoms persist or worsen.

ii. Symptoms progress or worsen during course of conservative management

References: [4] [28] [36] [5] [2017 ACR Appropriateness Criteria Chronic Extremity Joint Pain-Suspected Inflammatory Arthritis]

2. Avascular necrosis is suspected or known, **magnetic resonance imaging (MRI) is contraindicated or unavailable** and **ANY** of the following:

a. Osteonecrosis is known **AND** X-rays are complete, to evaluate contralateral joint.

b. Prior X-ray or CT is non-diagnostic or indeterminate, suggesting osteonecrosis.

c. Symptomatic, high risk (eg, alcohol abuse, glucocorticosteroid use, glycogen storage disease, renal transplant, sickle cell anemia) and prior X-rays are normal.

References: [15]

3. Cancer in the upper extremity is known and **ANY** of the following:

a. National Comprehensive Cancer Network (NCCN) surveillance (*See **Surveillance** section*)

b. Primary cancer is known, for follow-up, when active treatment was received in the last year.

c. Staging, restaging, recurrence or metastasis

References: [4] [6] [32] [14]

4. Foreign body evaluation **AND BOTH** ultrasound **AND** X-ray are non-diagnostic or indeterminate.

References: [4] [8]

5. Inflammatory condition (eg, capitellar osteochondritis, crystalline arthropathy, hemarthrosis, polymyositis rheumatoid arthritis) is suspected or known, **MRI is contraindicated or unavailable** and **ANY** of the following:
    a. Arthropathies (eg, crystalline arthropathy, rheumatoid arthritis) and **ANY** of the following:
        i. Advanced rheumatoid arthritis (eg, bone deformity, bone erosion near joints, unstable joint) and X-ray is non-diagnostic or indeterminate for follow-up evaluation.
        ii. Crystalline arthropathy and **ANY** of the following;
            A. Extra-articular crystal deposits (eg, bursa or tendon) are known.
            B. Rheumatological work-up (c-reactivce protein [CRP], erythrocyte sedimenation rate [ESR]) is competed **AND** joint aspiration is non-diagnostic or indeterminate **OR contraindicated or unavailable**.
        iii. Early rheumatoid arthritis (between a few weeks and one year into progression) for follow-up evaluation
        iv. Prior imaging is abnormal, non-diagnostic or indeterminate.
        v. Single joint imaging, initial, for diagnosis or response to therapy.
        vi. Diagnosis is **UNKNOWN** and treatment has **NOT** started **OR** to determine change in treatment.
    b. Myopathies (eg, dermatomyositis, immune-mediated necrotizing myopathy, polymyositis) is suspected or known, for diagnosis or biopsy planning.

    References: [4] [31] [13] [31]

6. Infection (eg, abscess, bursitis, osteomyelitis, septic arthritis) is suspected or known and **ANY** of the following: (*__NOTE__: *MRI and nuclear medicine scans are recommended for acute infection. CT is better at demonstrating chronic infections, as well as detecting soft tissue gas and foreign bodies*.)
    a. Infection or abscess is clinically suspected (eg, elevated complete blood count [CBC], CRP, ESR or joint aspiration is positive), symptomatic (eg, fever, pain, swelling) **AND** prior X-ray or ultrasound is negative.
    b. Ulcer (eg, diabetic, ischemic, pressure, traumatic) is **NOT** improving with treatment **AND** deep or bone infection is suspected.
    c. Ultrasound or X-ray is abnormal, non-diagnostic or indeterminate.

    References: [4] [21]

7. Mass, lesion or cyst evaluation and X-ray or ultrasound is non-diagnostic or indeterminate. (*__NOTE__: *CT is recommended for bone calcification **OR** if bone involvement is suspected. MRI is the preferred imaging for all other masses.)*
   References: [4] [14] [6]
8. Osteochondral lesion (defects, fractures, osteochondritis dissecans) is suspected or known, based on mechanism of injury or physical findings.
   References: [4]
9. Peripheral neurogenic condition or entrapment (eg, Charcot joint) is suspected or known, **MRI is contraindicated or unavailable** and **ANY** of the following:
   a. Conservative management (eg, physical therapy) evaluation and **EITHER** of the following:
      i. Attempted within the last 6 months, for at least 4 weeks **AND** symptoms persist or worsen.
      ii. Symptoms progress or worsen during course of conservative management
   b. Electromyogram or nerve conduction study is non-diagnostic or indeterminate.
   c. Ultrasound or X-ray is non-diagnostic or indeterminate.

   References: [19] [12]
10. Peri-procedural imaging to guide pre-procedure planning or post-operative complications.
    References: [4]
11. Prior CT upper extremity imaging is non-diagnostic or indeterminate. (*__NOTE__: *One follow-up is appropriate to evaluate for changes since preceding imaging finding[s]. Further surveillance is appropriate when lesion is specified as "highly suspicious" or there is a change since last exam.*)
    References: [4]
12. Synovial chondromatosis or loose bodies, with joint pain or mechanical symptoms, are demonstrated on prior X-ray or ultrasound.
    References: [4]
13. Vascular malformations are suspected or known **AND** results will change management **AND/OR** pre-operative planning. (*__NOTE__: *MRI Is preferred. CTA is also approvable for initial evaluation*)
    References: [4] [17]

Computed Tomography (CT) Shoulder

NCD 220.1
See also, **NCD 220.1**: Computed Tomography at https://www.cms.gov/medicare-coverage-database/search.aspx *if applicable to individual's healthplan membership*.

CT Shoulder Guideline

Computed tomography (CT) of the shoulder is considered medically appropriate when a X-ray is completed and the documentation demonstrates **ANY** of the following:

1. Shoulder specific pathology evaluation and **ANY** of the following:
    a. Brachial plexopathy is suspected, based on mechanism of injury **OR** electromyography/nerve conduction study (EMG/NCS) results **AND MRI is contraindicated or unavailable**. (*__NOTE__: *Chest MRI is preferred; depending on the suspected injury location, a neck and/or shoulder MRI may be appropriate.*)
    b. Injury or trauma is suspected or known and **ANY** of the following:
        i. Dislocation of the shoulder and **EITHER** of the following:
            A. **MRI is contraindicated or unavailable** and **ANY** of the following:
                I. Age is 14 years to 40 years old
                II. Bankart lesion is demonstrated on X-ray.
                III. Dislocations are recurrent.
                IV. Glenoid or humeral bone loss is demonstrated on X-ray.
                V. Rotator cuff tear is suspected.
            B. Glenoid bone stock evaluation **OR** size of Hills-Sachs lesion
        ii. Fracture is known from prior imaging (eg, X-ray, CT), ligamentous or tendon injury is suspected, **AND** surgery maybe required.
        iii. Fracture is suspected for evaluation of **ANY** of the following:
            A. Complete fracture risk is high with conservative therapy.
            B. Delayed or non-union fracture, when there is **NO** healing demonstrated between 2 sets of X-rays. (*__NOTE__: *CT is preferred.*)

C. Insufficiency, occult or stress fracture is suspected and X-rays taken 10 to 14 days or longer after injury or clinical assessment are negative, non-diagnostic or indeterminate.

D. Pathologic fracture **OR** impending fracture suspected or at risk, based on prior X-ray or computed tomography (CT).

iv. Labral tear (eg, superior labral anterior to posterior complex [SLAP] lesions) or instability, with provocative orthopedic tests and an **MRI is contraindicated or unavailable OR**[3] CT arthogram is requested.

v. Rotator cuff is weak on exam, conservative management is attempted but symptoms persist or worsen **AND MRI is contraindicated or unavailable OR** requested as CT arthrogram.

vi. Tendon, muscle rupture or ligament injury is suspected, based on mechanism of injury and physical findings **AND** ultrasound is non-diagnostic or indeterminate.

vii. Tendon tear (biceps, infraspinatus, subscapularis, supraspinatus, teres minor), with provocative orthopedic tests and **MRI is contraindicated or unavailable OR**[4,5,6] CT artrogram is requested.

c. Joint prosthesis or replacement is known, **AND** joint prosthesis loosening **OR** dysfunction (eg, pseudotumor formation) is suspected.

d. Pain in the upper extremity (joint or muscle) with conservative management (eg, physical therapy) evaluation , MRI is **contraindicated or unavailable** and **ANY** of the following: (**NOTE**: *Indication does **NOT** apply to young children [age is less than 5]*.)

i. Attempted within the last 6 months, for at least 4 weeks **AND** symptoms persist or worsen.

ii. Symptoms progress or worsen during course of conservative management

References: [4] [7] [3] [28] [16] [2] [5] [30] [2] [11] [26] [23] [2017 ACR Appropriateness Criteria Chronic Extremity Joint Pain-Suspected Inflammatory Arthritis]

[3]Orthopedic tests include anterior load and shift, apprehension test, clunk test, crank test, grind test, jerk test, O'Brien's test, posterior load and shift test, sulcus sign.

[4]Orthopedic tests for supraspinatus tendon includes drop arm test, empty can test, full can test, Hawkins or Neer test

[5]Orthopedic tests for supscapularis tendons include bear hug test, belly press off test, internal rotation lag, lift-off test, Napoleon test.

[6]Orthopedic tests for biceps, infraspinatus, subscapularis, suprasinatus, Teres minor tendons include external rotation lag sign at 0 and 90 degrees, hornblower's test, pain or weakness with resisted external rotation tests, popeye sign (acute or for elevation of surgical correction.

2. Avascular necrosis is suspected or known, **magnetic resonance imaging (MRI) is contraindicated or unavailable** and **ANY** of the following:
    a. Osteonecrosis is known **AND** X-rays are complete, to evaluate contralateral joint.
    b. Prior X-ray or CT is non-diagnostic or indeterminate, suggesting osteonecrosis.
    c. Symptomatic, high risk (eg, alcohol abuse, glucocorticosteroid use, glycogen storage disease, renal transplant, sickle cell anemia) and prior X-rays are normal.

    References: [15]
3. Cancer in the upper extremity is known and **ANY** of the following:
    a. National Comprehensive Cancer Network (NCCN) surveillance (*See **Surveillance** section*)
    b. Primary cancer is known, for follow-up, when active treatment was received in the last year.
    c. Staging, restaging, recurrence or metastasis

    References: [4] [6] [32] [14]
4. Foreign body evaluation **AND BOTH** ultrasound **AND** X-ray are non-diagnostic or indeterminate.
    References: [4] [8]
5. Inflammatory condition (eg, capitellar osteochondritis, crystalline arthropathy, hemarthrosis, polymyositis rheumatoid arthritis) is suspected or known, **MRI is contraindicated or unavailable** and **ANY** of the following:
    a. Arthropathies (eg, crystalline arthropathy, rheumatoid arthritis) and **ANY** of the following:
        i. Advanced rheumatoid arthritis (eg, bone deformity, bone erosion near joints, unstable joint) and X-ray is non-diagnostic or indeterminate for follow-up evaluation.
        ii. Crystalline arthropathy and **ANY** of the following;
            A. Extra-articular crystal deposits (eg, bursa or tendon) are known.
            B. Rheumatological work-up (c-reactivce protein [CRP], erythrocyte sedimenation rate [ESR]) is competed **AND** joint aspiration is non-diagnostic or indeterminate **OR contraindicated or unavailable**.
        iii. Early rheumatoid arthritis (between a few weeks and one year into progression) for follow-up evaluation
        iv. Prior imaging is abnormal, non-diagnostic or indeterminate.

v. Single joint imaging, initial, for diagnosis or response to therapy.

vi. Diagnosis is **UNKNOWN** and treatment has **NOT** started **OR** to determine change in treatment.

b. Myopathies (eg, dermatomyositis, immune-mediated necrotizing myopathy, polymyositis) is suspected or known, for diagnosis or biopsy planning.

References: [4] [31] [13] [31]

6. Infection (eg, abscess, bursitis, osteomyelitis, septic arthritis) is suspected or known and **ANY** of the following: (*__NOTE__: *MRI and nuclear medicine scans are recommended for acute infection. CT is better at demonstrating chronic infections, as well as detecting soft tissue gas and foreign bodies*.)

   a. Infection or abscess is clinically suspected (eg, elevated complete blood count [CBC], CRP, ESR or joint aspiration is positive), symptomatic (eg, fever, pain, swelling) **AND** prior X-ray or ultrasound is negative.

   b. Ulcer (eg, diabetic, ischemic, pressure, traumatic) is **NOT** improving with treatment **AND** deep or bone infection is suspected.

   c. Ultrasound or X-ray is abnormal, non-diagnostic or indeterminate.

   References: [4] [21]

7. Mass, lesion or cyst evaluation and X-ray or ultrasound is non-diagnostic or indeterminate. (*__NOTE__: *CT is recommended for bone calcification **OR** if bone involvement is suspected. MRI is the preferred imaging for all other masses.)*
   References: [4] [14] [6]

8. Osteochondral lesion (defects, fractures, osteochondritis dissecans) is suspected or known, based on mechanism of injury or physical findings.
   References: [4]

9. Peripheral neurogenic condition or entrapment (eg, Charcot joint) is suspected or known, **MRI is contraindicated or unavailable** and **ANY** of the following:

   a. Conservative management (eg, physical therapy) evaluation and **EITHER** of the following:

      i. Attempted within the last 6 months, for at least 4 weeks **AND** symptoms persist or worsen.

      ii. Symptoms progress or worsen during course of conservative management

   b. Electromyogram or nerve conduction study is non-diagnostic or indeterminate.

   c. Ultrasound or X-ray is non-diagnostic or indeterminate.

   References: [19] [12]

10. Peri-procedural imaging to guide pre-procedure planning or post-operative complications.
References: [4]

11. Prior CT upper extremity imaging is non-diagnostic or indeterminate. (*__NOTE__: *One follow-up is appropriate to evaluate for changes since preceding imaging finding[s]. Further surveillance is appropriate when lesion is specified as "highly suspicious" or there is a change since last exam.*)
References: [4]

12. Synovial chondromatosis or loose bodies, with joint pain or mechanical symptoms, are demonstrated on prior X-ray or ultrasound.
References: [4]

13. Vascular malformations are suspected or known **AND** results will change management **AND/OR** pre-operative planning. (*__NOTE__: *MRI Is preferred. CTA is also approvable for initial evaluation*)
References: [4] [17]

Computed Tomography (CT) Wrist

NCD 220.1
See also, **NCD 220.1**: Computed Tomography at https://www.cms.gov/medicare-coverage-database/search.aspx *if applicable to individual's healthplan membership*.

CT Wrist Guideline

Computed tomography (CT) of the wrist is considered medically appropriate when a X-ray is completed and the documentation demonstrates **ANY** of the following:

1. Wrist specific pathology evaluation and **ANY** of the following
    a. Injury or trauma is suspected or known, **MRI is contraindicated or unavailable** and **ANY** of the following:
        i. Fracture is known from prior imaging (eg, X-ray, CT), ligamentous or tendon injury is suspected, **AND** surgery maybe required.
        ii. Fracture is suspected for evaluation of **ANY** of the following:
            A. Complete fracture risk is high with conservative therapy.
            B. Delayed or non-union fracture, when there is **NO** healing demonstrated between 2 sets of X-rays. (*__NOTE__: *CT is preferred.*)

C. Insufficiency, occult or stress fracture is suspected and X-rays taken 10 to 14 days or longer after injury or clinical assessment are negative, non-diagnostic or indeterminate.

D. Pathologic fracture **OR** impending fracture suspected or at risk, based on prior X-ray or computed tomography (CT).

E. Scaphoid fracture is suspected and snuffbox pain is present.

iii. Ligamentous injury is suspected or known, with provocative orthopedic examination tests and **MRI is contraindicated or unavailable**[7,8].

iv. Tendon, muscle rupture or ligament injury is suspected, based on mechanism of injury and physical findings **AND** ultrasound is non-diagnostic or indeterminate.

v. Triangular fibrocartilage complex tear, with provocative orthopedic examination tests and **MRI is contraincicated or unavailable**[9].

b. Joint prosthesis or replacement is known, **AND** joint prosthesis loosening **OR** dysfunction (eg, pseudotumor formation) is suspected. [24]

c. Pain in the upper extremity (joint or muscle) with conservative management (eg, physical therapy) evaluation , MRI is **contraindicated or unavailable** and **ANY** of the following: (**NOTE**: *Indication does **NOT** apply to young children [age is less than 5]*.)

i. Attempted within the last 6 months, for at least 4 weeks **AND** symptoms persist or worsen.

ii. Symptoms progress or worsen during course of conservative management

References: [4] [15] [28] [36] [5] [9] [10] [24] [2017 ACR Appropriateness Criteria Chronic Extremity Joint Pain-Suspected Inflammatory Arthritis]

2. Avascular necrosis is suspected or known, **magnetic resonance imaging (MRI) is contraindicated or unavailable** and **ANY** of the following:

a. Osteonecrosis is known **AND** X-rays are complete, to evaluate contralateral joint.

b. Prior X-ray or CT is non-diagnostic or indeterminate, suggesting osteonecrosis.

c. Symptomatic, high risk (eg, alcohol abuse, glucocorticosteroid use, glycogen storage disease, renal transplant, sickle cell anemia) and prior X-rays are normal.

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[7]Orthopedic tests include the following for scaphoid ligament: scapholunate ballottment test, Watson test (scaphoid shift test)

[8]Orthopedic tests include the following for lunotriquetral ligament: derby relocation test, Regan test (lunnotriquetral ballottment test)

[9]Orthopedic tests include press test, ulnar foveal sign/test and ulnocarpal stress test

References: [15]

3. Cancer in the upper extremity is known and **ANY** of the following:
    a. National Comprehensive Cancer Network (NCCN) surveillance (*See **Surveillance** section*)
    b. Primary cancer is known, for follow-up, when active treatment was received in the last year.
    c. Staging, restaging, recurrence or metastasis

    References: [4] [6] [32] [14]

4. Foreign body evaluation **AND BOTH** ultrasound **AND** X-ray are non-diagnostic or indeterminate.
    References: [4] [8]

5. Inflammatory condition (eg, capitellar osteochondritis, crystalline arthropathy, hemarthrosis, polymyositis rheumatoid arthritis) is suspected or known, **MRI is contraindicated or unavailable** and **ANY** of the following:
    a. Arthropathies (eg, crystalline arthropathy, rheumatoid arthritis) and **ANY** of the following:
        i. Advanced rheumatoid arthritis (eg, bone deformity, bone erosion near joints, unstable joint) and X-ray is non-diagnostic or indeterminate for follow-up evaluation.
        ii. Crystalline arthropathy and **ANY** of the following;
            A. Extra-articular crystal deposits (eg, bursa or tendon) are known.
            B. Rheumatological work-up (c-reactivce protein [CRP], erythrocyte sedimenation rate [ESR]) is competed **AND** joint aspiration is non-diagnostic or indeterminate **OR contraindicated or unavailable**.
        iii. Early rheumatoid arthritis (between a few weeks and one year into progression) for follow-up evaluation
        iv. Prior imaging is abnormal, non-diagnostic or indeterminate.
        v. Single joint imaging, initial, for diagnosis or response to therapy.
        vi. Diagnosis is **UNKNOWN** and treatment has **NOT** started **OR** to determine change in treatment.
    b. Myopathies (eg, dermatomyositis, immune-mediated necrotizing myopathy, polymyositis) is suspected or known, for diagnosis or biopsy planning.

    References: [4] [31] [13] [31]

6. Infection (eg, abscess, bursitis, osteomyelitis, septic arthritis) is suspected or known and **ANY** of the following: (*__NOTE__: *MRI and nuclear medicine scans are recommended for acute infection. CT is better at demonstrating chronic infections, as well as detecting soft tissue gas and foreign bodies*.)
    a. Infection or abscess is clinically suspected (eg, elevated complete blood count [CBC], CRP, ESR or joint aspiration is positive), symptomatic (eg, fever, pain, swelling) **AND** prior X-ray or ultrasound is negative.
    b. Ulcer (eg, diabetic, ischemic, pressure, traumatic) is **NOT** improving with treatment **AND** deep or bone infection is suspected.
    c. Ultrasound or X-ray is abnormal, non-diagnostic or indeterminate.

    References: [4] [21]

7. Mass, lesion or cyst evaluation and X-ray or ultrasound is non-diagnostic or indeterminate. (*__NOTE__: *CT is recommended for bone calcification **OR** if bone involvement is suspected. MRI is the preferred imaging for all other masses.)*
    References: [4] [14] [6]

8. Osteochondral lesion (defects, fractures, osteochondritis dissecans) is suspected or known, based on mechanism of injury or physical findings.
    References: [4]

9. Peripheral neurogenic condition or entrapment (eg, Charcot joint) is suspected or known, **MRI is contraindicated or unavailable** and **ANY** of the following:
    a. Conservative management (eg, physical therapy) evaluation and **EITHER** of the following:
        i. Attempted within the last 6 months, for at least 4 weeks **AND** symptoms persist or worsen.
        ii. Symptoms progress or worsen during course of conservative management
    b. Electromyogram or nerve conduction study is non-diagnostic or indeterminate.
    c. Ultrasound or X-ray is non-diagnostic or indeterminate.

    References: [19] [12]

10. Peri-procedural imaging to guide pre-procedure planning or post-operative complications.
    References: [4]

11. Prior CT upper extremity imaging is non-diagnostic or indeterminate. (*__NOTE__: *One follow-up is appropriate to evaluate for changes since preceding imaging finding[s]. Further surveillance is appropriate when lesion is specified as "highly suspicious" or there is a change since last exam.*)

References: [4]

12. Synovial chondromatosis or loose bodies, with joint pain or mechanical symptoms, are demonstrated on prior X-ray or ultrasound.
References: [4]

13. Vascular malformations are suspected or known **AND** results will change management **AND/OR** pre-operative planning. (*__NOTE__: *MRI Is preferred. CTA is also approvable for initial evaluation*)
References: [4] [17]

Extremity Cancer Surveillance

Surveillance imaging (after cancer treatment) of the extremity is considered medically appropriate when the documentation demonstrates **ANY** of the following:

Bone Cancer Surveillance

NCCN Bone Cancer Version 1.2025

Bone cancer surveillance includes **ANY** of the following:

1. Chondrosarcoma surveillance for **ANY** of the following:
    a. Atypical cartilaginous tumor surveillance with **ALL** of the following:
        i. Chest imaging every 6 to 12 months for 2 years, then annually as clinically indicated
        ii. Primary site X-rays and/or cross-sectional imaging magnetic resonance imaging (MRI) (with and without contrast) or computed tomography (CT) (with contrast) every 6 to 12 months for 2 years, then annually as clinically indicated
    b. Low-grade, extracompartmental appendicular tumor, grade I axial tumors or high-grade (grade II or III, clear cell or extracompartmental) tumors surveillance with **ALL** of the following:
        i. Chest imaging every 3 to 6 months, may include CT at least every 6 months for 5 years, then annually for at least 10 years, as clinically indicated
        ii. Primary site X-rays and/or cross-sectional imaging MRI (with and without contrast) or CT (with contrast) as clinically indicated.
2. Chordoma surveillance with **ALL** of the following:

a. Chest imaging every 6 months, with CT included, annually for 5 years, then annually thereafter as clinically indicated

b. Imaging of primary site, timing and modality (eg, MRI ± CT [both with contrast], X-ray) as clinically indicated up to 10 years

3. Ewing Sarcoma after primary treatment completed and stable/improved disease, surveillance with **ALL** of the following:

a. Chest imaging with X-ray or CT: every 3 months

b. Primary site imaging with MRI ± CT (both with contrast) and X-ray, increase intervals after 24 months and after 5 years, annually as clinically indicated (indefinitely) (*__NOTE__: *Consider PET/CT [head-to-toe] and/or bone scan.*)

4. Giant cell tumor of the bone surveillance with **ALL** of the following:

a. Chest imaging every 6 to 12 months for 4 years, then annually thereafter as clinically indicated

b. Surgical site imaging as clinically indicated (eg, CT and/or MRI, both with contrast, X-ray)

5. Osteosarcoma surveillance with primary site and chest imaging (using same imaging that was done for initial work-up) for **ANY** of the following: (*__NOTE__: *Consider PET/CT [head-to-toe] and/or bone scan*.)

a. Image every 3 months for years 1 and 2

b. Image every 4 months for year 3

c. Image every 6 months for years 4 and 5

d. Image annually for year 6 and thereafter, as clinically indicated

Soft Tissue Sarcoma Surveillance

NCCN Soft Tissue Sarcoma Version 3.2024

Soft tissue sarcoma surveillance includes **ANY** of the following: *__NOTE__: *Contrasted imaging is preferred; for long term surveillance to minimize radiation exposure, X-rays or MRI may be substituted.*

1. Desmoid tumor (aggressive fibromatosis) imaging surveillance includes **ANY** of the following:

a. CT or MRI every 3 to 6 months for 2 to 3 years, then every 6 to 12 months thereafter

b. Ultrasound may be considered for select locations (eg, abdominal wall) for long-term follow-up

2. Retroperitoneal/intra-abdominal, after resection imaging surveillance includes CT or MRI (consider PET/CT) every 3 to 6 months for 2 to 3 years, then every 6 months for the next 2 years, then annually.
3. Stage IA/IB tumor surveillance includes **ALL** of the following:
    a. Chest imaging with CT (+contrast) or MRI (± contrast) as clinically indicated
    b. Magnetic resonance imaging (MRI) at baseline and periodically (frequency based on estimated recurrence)
4. Stage II/III resectable with acceptable functional outcomes surveillance includes **ANY** of the following:
    a. Chest imaging with CT (+contrast) or MRI (± contrast) at end of treatment and periodic imaging of primary site (based on estimated risk of locoregional recurrence)
    b. Chest imaging and imaging of primary site with CT (+contrast) or MRI (± contrast) as clinically indicated
5. Stage II, III or select stage IV (any T, N1, M0), resectable with adverse functional outcomes **OR** unresectable primary disease surveillance imaging includes **ANY** of the following:
    a. Baseline and periodic imaging of primary site as clinically indicated
    b. Chest imaging with CT (+contrast) or MRI (± contrast) as clinically indicated
6. Stage IV synchronous disease imaging surveillance includes **ANY** of the following:
    a. Chest and other known metastatic sites imaging with CT (+contrast) or MRI (± contrast) as clinically indicated
    b. MRI (± contrast) (preferred) and/or CT (+ contrast) at baseline and periodically (frequency based on estimated recurrence)

CT Upper Extremities Procedure Codes

Table 1. CT Upper Extremity Associated Procedure Codes

CODE	DESCRIPTION
73200	Computed tomography, upper extremity; without contrast material
73201	Computed tomography, upper extremity; with contrast material(s)
73202	Computed tomography, upper extremity; without contrast material, followed by contrast material(s) and further sections

CT Upper Extremities Summary of Changes

CT Upper Extremities guideline had following version changes from 2023 to 2024:

- Added the following to keep in line with current research:
  - Indications under "Avascular necrosis"
  - Indications under "Dislocation of the shoulder"
  - Indications under "Inflammatory condition"
  - "Joint prosthesis" indication
  - "Pediatric osteoid osteoma" indication
  - "Prior CT upper extremity imaging" indication
  - "Vascular formation" indication
- Removed the following as research no longer supports the indication:
  - Indications under "Rotator cuff"
  - Indications under "Triangular fibrocartilage"
- Mid-cycle update: added Pediatric Preamble and pediatric indications

CT Upper Extremity Definitions

Abscess is a swollen area within body tissue, containing an accumulation of pus.
Apprehension test, also known as the crank test, assesse the integrity of the gleohumeral joint capsule and anterior instability of the glenohumeroal joint. It is also used to check for shoulder dislocation.
Avascular necrosis is localized death of bone tissue due to impaired or disrupted blood supply (as from traumatic injury or disease).
Bankart lesion is the name for a tear that happens in the lower rim of the labrum. Once the labrum is torn, it's much easier for the humerus to slip out of its socket.
Bear Hug test tests for tears in the subscapularis muscle by asking a patient to press the palm of the affected arm against the opposite shoulder, through shoulder external rotation. It is positive if the individual cannot hold their palm to their shoulder, or they have trouble holding on.
Belly Press test tests for subscapularis muscle dysfunction by asking a patient to press the palm of the hand against the abdomen, through shoulder internal rotation. It is positive if the patient compensates the movement through started wrist flexion, shoulder adduction and shoulder extension.

Biceps squeeze test is performed with the elbow supported in 60 to 80 degrees of flexion and the forearm is pronated. The examiner squeezes the distal biceps muscle. The test is positive when there is no supination of the forearm or wrist.

Bicipital aponeurosis flex test is performed by clenching the fist, supinating the forearm with the elbow at a 75 degree flexion, and palmar flexes the wrist.

Brachial plexopathy Brachial plexopathy is a type of peripheral neuropathy that occurs when the brachial plexus is damaged. The brachial plexus is a group of nerves that run from the lower neck to the upper shoulder. These nerves send signals from the spine to the shoulder, arm, and hand.

Bursitis is swelling of the fluid filled sac or sac-like cavity that reduces friction between moving parts in the joints.

Capitellar osteochondritis is a condition that affects the outside surface of the elbow that involves a separation of a segment of cartilage and the underlying bone. The bone underneath the joint's cartilage is damaged due to lack of blood flow, causing pain.

Carpal tunnel syndrome is a condition where the median nerve is compressed as it passes through the carpal tunnel (the opening in the wrist that is formed by the carpal bones on the bottom of the wrist and the transverse carpal ligament across the top of the wrist).

Charcot joint is a progressive, degenerative condition that affects one or more joints especially of the foot or ankle, is marked by bone fragmentation, swelling, redness, pain, and joint deformity, and typically occurs following loss of nerve sensation associated with various diseases (such as diabetes, syphilis, and spina bifida).

Clunk test evaluates the glenoid labrum in people with shoulder pain. It is used to identify superior anterior and posterior glenoid labral tears of the shoulder joint.

Computed tomography (CT) refers to a computerized X-ray imaging procedure in which a three-dimensional image of a body structure is revealed through a series of cross-sectional images or "slices."

Conservative management is an approach to treating pain utilizing non-surgical treatment options such as physical therapy, medication and injections, for a designated time, usually 4 to 6 weeks.

Crank test, also known as the compression rotation test or labral crank test, is a physical examination maneuver used to identify glenoid labral tears in the shoulder joint and assess unstable superior labral anterior posterior (SLAP) lesions.

Crystalline arthropathy is a joint disorder caused by deposits of crystals in joints and the soft tissues around it.

Cyst is a closed sac having a distinct membrane and developing abnormally in a cavity or structure of the body.

Delayed union fracture is healing of a fracture that takes longer than expected, usually 4 to 6 months, that is demonstrated between 2 sets of X-rays.

Derby relocation test is performed with the apprehension test. The shoulder is bent to 90 degrees of abduction with maximal external rotation until apprehension is felt. The examiner uses pressure from anterior to posterior directed at the humeral head. It is positive when relief from pain is felt.

Dermatomyositis is a rare disease that causes muscle inflammation and skin rash. Symptoms include a red or purple rash on sun exposed skin and eyelids, calcium deposits under the skin, muscle weakness, and trouble talking or swallowing.

Dislocation is a separation of two bones where they meet at a joint. This injury can be very painful and can temporarily deform and immobilize the joint.

Drop Arm test is a physical exam that assesses a person's ability to maintain humeral joint motion. It can help determine if a person has a rotator cuff tear, specifically of the supraspinatus. The test can also help diagnose sub-acromial pain syndrome (shoulder impingement).

Electromyogram (EMG) is a test that converts the electrical activity associated with functioning skeletal muscle into a visual record or into sound used to diagnose neuromuscular disorders and in biofeedback training.

Empty can test is an orthopedic test that assesses the integrity of the supraspinatus muscle and tendon in the shoulder. The test isolates the supraspinatus muscle from other rotator cuff muscles.

External rotation lag sign (ERLS) is a clinical test that assesses the integrity of the supraspinatus and infraspinatus tendons in the shoulder.

Full Can Test is used to assess the function of Supraspinatus muscle and tendon of the shoulder complex.

Glycogen storage disease is a rare metabolic disorder that prevents the body from storing or breaking down glycogen, a type of sugar. GSD affects the liver, muscles, and other parts of the body, depending on the type.

Grind test involves the examiner passively rotating the individual's shoulder while feeling for palpable crepitus. Crepitus is a grinding, clicking, or cracking sensation that can be felt when the surface of the cartilage is irregular, such as with shoulder arthritis. A positive result from the subacromial grind test is the presence of palpable crepitus.

Hemarthrosis is a hemorrhage into a joint.

Hill-Sachs lesion is a compression fracture in the humeral head, or upper arm bone, that occurs when the glenoid rim dislocates, such as during an anterior shoulder dislocation. The dislocation causes the arm bone to slip out of its socket and compress against the socket's rim, creating a dent in the head of the humerus.

Hook test is is a clinical sign used to diagnose distal biceps tendon ruptures or tears. The test is performed during a physical exam by inserting a finger near the elbow and hooking it around the tendon. If the finger cannot be hooked, the tendon has detached from the bone.

Hornblower's Sign tests for teres minor tears. It is performed with the individual seated or standing and the examiner places the person's arm to 90° in the scapular plane and flexes the

elbow to 90°. The individual is then asked to externally rotate against resistance. The test is positive if the person is unable to perform external rotation.

Impingement syndrome (shoulder) is a painful condition that occurs when the rotator cuff tendon in the shoulder is pinched or rubs against nearby tissue and bone.

Indeterminate findings are inconclusive or insufficient for treatment planning.

Insufficiency fracture are a subtype of stress fractures commonly associated with osteoporosis and Vitamin D deficiency.

Internal Rotation Lag Sign tests for rotator cuff tears of the subscaplularis tendon. It is performed with the individual is seated with examiner behind them and the affected arm is brought into maximal internal rotation behind the back (dorsum of the person's hand against the lumbar region). The examiner controls the individual's arm at the elbow and wrist/hand, which is passively brought into 20 degrees of extension taking the forearm and hand away from the back. The person is instructed to actively maintain this position as the examiner releases the wrist but maintains support at the elbow. A lag is indicative of a subscapularis tendon tear.

Ischemia is a deficient supply of blood to a body part (such as the heart or brain) due to obstruction of the inflow of arterial blood.

Jerk test is used to assess the stability of the glenohumeral joint in the shoulder. It can also be used to confirm or rule out posteroinferior labral lesions. A painful jerk test can predict the success of nonoperative treatment for posteroinferior instability.

Labrum is a rim of soft tissue or fibrous cartilage that surrounds the socket of a ball and socket joint to make it more stable. A labrum gives more support to hold the bones in their proper places. The ligaments that help hold the joint together attach to the labrum.

Lift-off test is performed by placing the dorsum of the hand against the lumbar spine and attempt to pull their own hand away. The positive test is defined by the inability to move the hand away from the spine.

Load and shift test is one of the hallmark physical examination maneuvers for assessing laxity and instability of the shoulder. It is typically performed with the arm slightly abducted while the examiner supports the patient's arm with one hand to aid in relaxation.

Lunotriquetral Ballottement Test (Regan Test) is used to evaluate the integrity of the lunotriquetral ligament of the wrist joint. The goal of the test is to control the lunate and triquetrum separately so that they can be moved in relation to each other.

Magnetic resonance imaging (MRI) is a non-invasive diagnostic technique that produces computerized images of internal body tissues and is based on nuclear magnetic resonance of atoms within the body induced by the application of radio waves.

Milking maneuver places valgus stress on the medial (or ulnar) collateral ligament of the elbow in a throwing position. The test evaluates the elbow's anterior and posterior bundle of the ulnar collateral ligament. It also assesses the posterior band of the medial ulnar collateral ligament.

Napoleon test is used to diagnose subscapularis tendon tears. It is performed by lying supine with the hand on the belly. The examiner holds the hand and shoulder to prevent compensatory

movement. The person is asked to move the elbow upward, while the examiner tries to externally rotate the arm while the person tries to keep their hand on the sholder.

Neer test is a medical exam that assesses whether shoulder pain and limited range of motion may be caused by rotator cuff impingement, or pinching of tissue. The test is designed to reproduce symptoms of rotator cuff impingement by flexing the shoulder and applying pressure.

Nerve conduction study (NCS) is a test that measures how fast an electrical impulse moves through the nerve and can identify nerve damage.

Non-diagnostic is a result that does not lead to a confirmed diagnosis.

Non-union fracture is demonstrated by no healing between two sets of x-rays. Incomplete healing by 6 to 8 months is non-union.

Occult means the problem was hidden, not immediately apparent, or cannot be detected with clinical methods alone.

Occult fracture is a suspected broken bone that doesn't show up on X-rays.

Osteochondral is relating to or composed of bone and cartilage.

Osteochondritis dissecans is a joint disorder in which a segment of bone and cartilage starts to separate from the rest of the bone after repeated stress or trauma. The fragment may stay in place or fall into the joint space.

Osteomyelitis is an infectious, inflammatory disease of bone. It is often painful, bacterial in origin and may result in the death of bone tissue.

Osteonecrosis is localized death of bone tissue due to impaired or disrupted blood supply.

Pathological fracture is a broken bone caused by disease, often by the spread of cancer to the bone.

Pediatric approximate ages are defined by the US Department of Health (USDH), the Food and Drug Administration (FDA), and the American Academy of Pediatrics (AAP) as the following:

- Infancy, between birth and 2 years of age
- Childhood, from 2 to 12 years of age
- Adolescence, from 12 to 21 years of age, further defined by the AAP into:
    1. Early (ages 11–14 years)
    2. Middle (ages 15–17 years),
    3. Late (ages 18–21 years)
    4. Older ages may be appropriate for children with special healthcare needs.

Polymyositis is a rare, inflammatory disease that causes muscles to become inflamed and weak, and can affect muscles all over the body. It's one of a group of diseases called inflammatory myopathies, which involve chronic muscle inflammation and weakness. The cause of polymyositis is unknown, but it's thought to be an autoimmune disorder, possibly triggered by a viral infection of muscle tissue.

Popeye sign is a pronounced bulging muscle in the distal aspect of the biceps region of the arm. It is clinically apparent with a complete long head of biceps tendon tear which causes distal migration of the long head of biceps muscle.

Posterolateral Rotatory Drawer Test of the elbow assesses for posterolateral rotatory instability of the elbow in the posterior cruciate ligament. It determines the amount of rotation of the tibial tubercle compared to the distal femur.

Press test is for triangular fibrocartilage complex (TFCC) diagnosis. It is performed with the person seated, lifting their body weight out of the chair, using thier extended wrists. Pain during the test indicates a positive result.

Pseudotumor is a medical term that means "false tumor". It's an abnormality that looks like a tumor, such as a temporary swelling.

Pushup test tests the muscle strength and endurance of the chest and arms.

Recurrent is when a disease is occurring often or repeatedly.

Reverse Popeye sign is a medical term that describes a bulge in the arm that occurs when the proximal muscle belly retracts due to a loss of counter traction. It's also known as a "reverse Popeye deformity" because the muscle-tendon unit "balls up" due to a lack of distal tension.

Rheumatoid arthritis (RA) is an autoimmune disease (usually chronic) that is characterized by pain, stiffness, inflammation, swelling and sometimes destruction of the joints.

Rotator Cuff Weakness tests for rotator cuff injury, The examiner begins by placing the injured arm behind the back, with the back of the hand resting on the lower back. The individual tries to raise their arm off of their back. If pain or weakness is felt when trying to lift the hand off of the back, that is a sign of a possible be rotator cuff injury.

Scaphoid (or carpal navicular) is one of the eight small bones of the wrist joint. This bone, shaped similar to that of a cashew nut or kidney bean, is located between the base of the thumb and the radius bone of the forearm. The scaphoid coordinates the motion and position of all of the other wrist bones.

Scaphoid Shift test (Watson Test) is a diagnostic test for instability in the wrist. It is a provocative maneuver used to examine the dynamic stability of the scaphoid and reproduce an individual's symptoms. It is used to diagnose scapholunate interosseous ligament instability (SLIL).

Scapholunate Ballotment test is used to evaluate the integrity of the scapholunate ligament of the wrist joint. The lunate is firmly stabilized with the thumb and index finger of one hand, while the scaphoid, held with the other hand is displaced dorsally and palmarly with the other hand. A positive result elicits pain, crepitus, and excessive mobility of the scaphoid.

Septic arthritis is an infection in the joint (synovial) fluid and joint tissues.

Snuffbox test is formed by three tendons and the scaphoid (navicular) bone. The radial border of the snuffbox is formed by the abductor pollicis longus and the extensor pollicis brevis tendons while the ulnar border is formed by the extensor pollicis longus tendon and the floor of the

scaphoid (navicular) bone. To perform this test, the examiner should apply compression in the anatomical snuffbox which will also compress the scaphoid (navicular) bone.

Spondylarthropathy is an inflammatory arthritis affecting the spine.

Staging in cancer is the process of determining how much cancer is within the body (tumor size) and if it has metastasized (spread).

Stress fracture is a tiny crack in a bone caused by repetitive force, often from overuse — such as repeatedly jumping up and down or running long distances.

Sulcus sign is an orthopedic test that evaluates the shoulder for glenohumeral instability. The test is performed by applying downward force to the patient's arm while they are sitting or standing. If the test is positive, a dimple appears beneath the acromion, which is called a sulcus.

Superior Labrum Anterior to Posterior (SLAP) lesion is an injury to the labrum of the shoulder, which is the ring of cartilage that surrounds the socket of the shoulder joint. These tears are common in overhead throwing athletes and laborers involved in overhead activities.

Supraspinatus test, tests the affected arm by moving it into 90 degrees of abduction in the plane of the scapula (approximately 30 degrees of forward flexion), full internal rotation with the thumb pointing down as if emptying a beverage can.

Synovial chondromatosis is a type of non-cancerous tumor that arises in the lining of a joint.

Triangular Fibrocartilage Complex (TFCC) is a structure in the wrist that connects the bones in the forearm to the bones in the wrist. The TFCC is made up of ligaments, tendons, and cartilage. It stabilizes the wrist and keeps the radius and ulna stable when the hand grasps an object or the forearm rotates. The TFCC also acts as a shock absorber.

Ulcerated is a break in the skin or mucous membrane with loss of surface tissue, disintegration and necrosis of epithelial tissue and often pus.

Ulnar fovea sign helps identify the source of ulnar-sided wrist pain. The test involves eliciting tenderness in the ulnar fovea region, which is bounded by the ulnar styloid process, the flexor carpi ulnaris tendon, the distal volar surface of the ulnar, and the pisiform bone. A positive ulnar fovea sign indicates tenderness in the ulnar fovea.

Ulnocarpal stress test, also known as the TFCC stress test or ulnar carpal stress test, is a medical test that evaluates the integrity of the triangular fibrocartilage complex (TFCC). The test is used to diagnose ulnar-sided wrist pain and is sensitive for ulnar impaction syndrome (UIS). A positive test result indicates the presence of ulnar-sided wrist pathology and pain with the maneuver.

Ultrasound is the diagnostic or therapeutic use of ultrasound and especially a noninvasive technique involving the formation of a two-dimensional image used for the examination and measurement of internal body structures and the detection of bodily abnormalities.

Valgus stress sign is a test of medial collateral ligament integrity, where a passive force is exerted on a joint that, in the presence of ligamentous insufficiency, would cause the medial joint space to open.

Varus stress sign is a test of lateral collateral ligament integrity, where a passive force is exerted on a joint that, in the presence of ligamentous insufficiency, would cause the lateral joint space to open (eg, lateral collateral ligament of the knee and radial collateral ligament of the elbow).

CT Upper Extremities References

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Disclaimer section

Purpose

The purpose of the HealthHelp's clinical guidelines is to assist healthcare professionals in selecting the medical service that may be appropriate and supported by evidence to safely improve outcomes. Medical information is constantly evolving, and HealthHelp reserves the right to review and update these clinical guidelines periodically. HealthHelp reserves the right to include in these guidelines the clinical indications as appropriate for the organization's program objectives. Therefore the guidelines are not a list of all the clinical indications for a stated procedure, and associated Procedure Code Tables may not represent all codes available for that state procedure or that are managed by a specific client-organization.

Clinician Review

These clinical guidelines neither preempt clinical judgment of trained professionals nor advise anyone on how to practice medicine. Healthcare professionals using these clinical guidelines

are responsible for all clinical decisions based on their assessment. All Clinical Reviewers are instructed to apply clinical indications based on individual patient assessment and documentation, within the scope of their clinical license.

Payment

The use of these clinical guidelines does not provide authorization, certification, explanation of benefits, or guarantee of payment; nor do the guidelines substitute for, or constitute, medical advice. Federal and State law, as well as member benefit contract language (including definitions and specific contract provisions/exclusions) take precedence over clinical guidelines and must be considered first when determining eligibility for coverage. All final determinations on coverage and payment are the responsibility of the health plan. Nothing contained within this document can be interpreted to mean otherwise.

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National and Local Coverage Determination (NCD and LCD)

NOTICE
To ensure appropriate review occurs to the most current NCD and/or LCD, always defer to https://www.cms.gov/medicare-coverage-database/search.aspx.

Background

National Coverage Determinations (NCD) and Local Coverage Determinations (LCD) are payment policy documents outlined by the Centers for Medicare and Medicaid Services (CMS) and the government's delegated Medicare Audit Contractors (MACs) that operate regionally in jurisdictions.
CMS introduced variation between different jurisdictions/Medicare Audit Contractors (MACs) and their associated covered code lists with the transition to ICD 10. The variation resulted in jurisdictions independently defining how codes are applied for exclusions, limitations, groupings, ranges, etc. for the medical necessity indications outlined in the NCD and LCD. Due to this

variation, there is an inconsistent use/application of codes and coverage determinations across the United States between the different MACs.
In addition, **WITHOUT** notice, CMS can change the codes that indicate medical necessity and the format of the coverage determinations/associated documents (eg, Articles). This is an additional challenge for organizations to keep up with ongoing, unplanned changes in covered codes and medical necessity indications.

Medical Necessity Codes

Due to the variation in code application between jurisdictions/MACs and that updates can happen without notification, HealthHelp is not able to guarantee full accuracy of the codes listed for any Coverage Determination, and advises that prior to use, the associated Coverage Determination Articles are reviewed to ensure applicability to HealthHelp's programs and any associated NCDs and LCDs.

For Internal Use Only:

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