

# MEDICAL POLICY



MEDICAL POLICY DETAILS	
Medical Policy Title	Shoulder Arthroplasty (Total, Partial, Reverse)
Policy Number	7.01.95
Category	Technology Assessment
Original Effective Date	06/21/18
Committee Approval Date	12/20/18, 12/19/19, 12/17/20, 04/15/21, 06/16/22, 06/22/23, 06/20/24
Current Effective Date	06/20/24
Archived Date	N/A
Archive Review Date	N/A
Product Disclaimer	<ul style="list-style-type: none"> <li>• Services are contract dependent; if a product excludes coverage for a service, it is not covered, and medical policy criteria do not apply.</li> <li>• If a commercial product (including an Essential Plan or Child Health Plus product), medical policy criteria apply to the benefit.</li> <li>• If a Medicaid product covers a specific service, and there are no New York State Medicaid guidelines (eMedNY) criteria, medical policy criteria apply to the benefit.</li> <li>• If a Medicare product (including Medicare HMO-Dual Special Needs Program (DSNP) product) covers a specific service, and there is no national or local Medicare coverage decision for the service, medical policy criteria apply to the benefit.</li> <li>• If a Medicare HMO-Dual Special Needs Program (DSNP) product DOES NOT cover a specific service, please refer to the Medicaid Product coverage line.</li> </ul>

## POLICY STATEMENT

- I. Based upon our criteria and assessment of the peer-reviewed literature, total shoulder arthroplasty has been medically proven to be effective and, therefore, is considered **medically necessary**, when **ALL** of the following criteria have been met:
  - A. Radiographic imaging and/or an advanced diagnostic procedure (e.g., MRI, CT scan) is conclusive for the presence of advanced destructive degenerative joint disease (e.g., osteoarthritis, rheumatoid arthritis, avascular necrosis) with marked narrowing of the joint space that correlates with the patient's reported symptoms and physical exam findings, including and **ANY** of the following:
    1. irregular joint surfaces;
    2. glenoid sclerosis;
    3. glenoid osteophyte changes;
    4. flattened glenoid; **or**
    5. cystic changes in the humeral head;
  - B. Patient has function-limiting pain (e.g., loss of shoulder function that interferes with the ability to carry out age-appropriate activities of daily living and/or demands of employment) for at least three (3) months;
  - C. Patient has failed provider-directed, non-surgical management of at least three (3) months' duration.
- II. Based upon our criteria and assessment of the peer-reviewed literature, total shoulder arthroplasty has not been proven to be effective and, therefore, is considered **not medically necessary**, for **ANY** other indication, condition, or when **ANY** of the following are present:
  - A. Active local or systemic infection;
  - B. Paralytic disorder of the shoulder (e.g., flail shoulder due to irreversible brachial plexus palsy, spinal cord injury, or neuromuscular disease);

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- C. One or more uncontrolled or unstable medical conditions that would significantly increase the risk of morbidity (e.g., cardiac, pulmonary, liver, genitourinary, or metabolic disease; hypertension, abnormal serum electrolyte levels);
  - D. Charcot joint.
- III. Based upon our criteria and assessment of the peer-reviewed literature, hemi-arthroplasty (replacement) of the shoulder has proven to be medically effective and, therefore, is considered **medically necessary**, when **ALL** of the associated criteria have been met:
- A. Arthritic Conditions with Inadequate Bone Stock and Avascular Necrosis (AVN);
  - B. Radiographic imaging and/or an advanced diagnostic procedure (e.g., MRI, CT scan) is conclusive for the presence of **EITHER** of the following, which correlates with the patient's reported symptoms and physical exam findings:
    - 1. arthritic conditions in which the glenoid bone stock is inadequate to support a glenoid prosthesis; **or**
    - 2. avascular necrosis without glenoid involvement;
  - C. Patient has function-limiting pain (e.g., loss of shoulder function that interferes with the ability to carry out age-appropriate activities of daily living and/or demands of employment) for at least three (3) months;
  - D. Patient has failed provider-directed, non-surgical management of at least three (3) months' duration.
- IV. Based upon our criteria and assessment of the peer-reviewed literature, hemi-arthroplasty (replacement) has been medically proven to be effective and, therefore, is considered **medically necessary**, when radiographic imaging or an advance diagnostic study (e.g., MRI, CT scan) is conclusive for the presence of a proximal humerus fracture that is not amenable to internal fixation.
- V. Based upon our criteria and assessment of the peer-reviewed literature, hemi-arthroplasty (replacement) has not been medically proven to be effective and, therefore, is considered **not medically necessary** for **ANY** other indication, condition, or when **ANY** of the following criteria are present:
- A. Active local or systemic infection;
  - B. Paralytic disorder of the shoulder (e.g., flail shoulder due to irreversible brachial plexus palsy, spinal cord injury, or neuromuscular disease);
  - C. One or more uncontrolled or unstable medical conditions that would significantly increase the risk of morbidity (e.g., cardiac, pulmonary, liver, genitourinary, or metabolic disease, hypertension, abnormal serum electrolyte levels);
  - D. Charcot joint;
  - E. Advanced destructive degenerative joint disease (e.g., rheumatoid arthritis or osteoarthritis) resulting in marked narrowing of the joint space;
  - F. Rotator cuff tear arthropathy (e.g., severe rotator cuff tearing and end-stage arthritic disease).
- VI. Based upon our criteria and assessment of the peer-reviewed literature, reverse total shoulder arthroplasty (replacement) has been medically proven to be effective and, therefore, is considered **medically necessary**, for **ANY** of the following conditions when **ALL** of the associated criteria have been met:
- A. Rotator Cuff Pathology Related, Glenoid Retroversion and/or Posterior Humeral Head Subluxation;
  - B. Performed for **ANY** of the following reasons:
    - 1. Dysfunctional rotator cuff, with severe glenohumeral arthritis and limited ability to actively flex the upper extremity to 90 degrees against gravity (e.g., rotator cuff tear arthropathy);
    - 2. Pseudo paralysis from an unreparable rotator cuff tear (e.g., active forward flexion less than 90 degrees with full passive motion);
    - 3. Failed hemi-arthroplasty, with a dysfunctional rotator cuff that is unreparable;
    - 4. Failed total shoulder replacement, with a dysfunctional rotator cuff that is unreparable; **or**
    - 5. Glenoid retroversion and/or posterior humeral head subluxation as demonstrated on imaging by **EITHER** of the following:
      - a. Subluxation > 50% on x-rays or advanced imaging; **or**
      - b. Walch Classification B2, B3, or C on CT (refer to Policy Guideline Section)

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- C. Physical exam findings demonstrate that the individual has functional use of the deltoid muscle;
  - D. Patient has function-limiting pain (e.g., loss of shoulder function that interferes with the ability to carry out age-appropriate activities of daily living and/or demands of employment) for at least three (3) months;
  - E. Patient has failed at least three (3) months of provider-directed non-surgical management.
- VII. Based upon our criteria of the peer-reviewed literature, reverse shoulder arthroplasty (replacement) has been medically proven to be effective and therefore, is considered **medically necessary**, for reconstruction after tumor resection and shoulder fracture not amenable to other repair/reconstruction techniques when performed for **EITHER** of the following reasons:
- A. Reconstruction after a tumor resection; **or**
  - B. Radiographic imaging and/or an advanced diagnostic study (i.e., MRI, CT) is conclusive for the presence of a shoulder fracture that is not repairable or cannot be reconstructed with other techniques.
- VIII. Based upon our criteria and assessment of the peer-reviewed literature, reverse total shoulder arthroplasty (replacement) has not been medically proven to be effective and, therefore, is considered **not medically necessary** for **ANY** other indication, condition, or when **ANY** of the following criteria are present:
- A. Active local or systemic infection;
  - B. Paralytic disorder of the shoulder (e.g., flail shoulder due to irreversible brachial plexus palsy, spinal cord injury, or neuromuscular disease);
  - C. Deltoid deficiency (e.g., axillary nerve palsy);
  - D. One or more uncontrolled or unstable medical conditions that would significantly increase the risk of morbidity (e.g., cardiac, pulmonary, liver, genitourinary, or metabolic disease, hypertension, abnormal serum electrolyte levels);
  - E. Charcot joint.
- IX. Based upon our criteria and assessment of the peer-reviewed literature, revision of shoulder arthroplasty (replacement) has been medically proven to be effective and, therefore, is considered **medically necessary** for an individual who has previously undergone a hemi or total shoulder arthroplasty, and when **EITHER** of the following criteria have been met:
- A. The presence of **ANY** of the following:
    - 1. recurrent prosthetic dislocation unresponsive to a reasonable course of non-surgical care;
    - 2. instability of the components;
    - 3. aseptic loosening;
    - 4. periprosthetic infection;
    - 5. periprosthetic fracture; **or**
  - B. Patient has unexplained function-limiting pain (e.g., loss of shoulder function that interferes with the ability to carry out age-appropriate activities of daily living and/or demands of employment) for greater than six (6) months and that is unresponsive to provider-directed, non-surgical management.
- X. Based upon our criteria and assessment of the peer-reviewed literature, revision of shoulder arthroplasty (replacement) has not been medically proven to be effective and, therefore, is considered **not medically necessary** for the treatment of **ANY** other indication or condition, including Charcot joint.

## POLICY GUIDELINE

### Walch Classification of Glenoid Morphology

Type A: Centered humeral head, concentric wear, no subluxation of the humeral head

A1: minor central erosion

A2: major central erosion, humeral head protruding into the glenoid cavity

Type B: Humeral head subluxated posteriorly, biconcave glenoid with asymmetric wear

B1: narrowing of the posterior joint space, subchondral sclerosis, osteophytes

B2: biconcave aspect of the glenoid with posterior rim erosion and retroverted glenoid

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B3: monoconcave and posterior wear with  $>15^\circ$  retroversion or  $>70\%$  posterior humeral head subluxation, or both

Type C: C1: dysplastic glenoid with  $>25^\circ$  retroversion regardless of the erosion

C2: biconcave, posterior bone loss, posterior translation of the humeral head

Type D: Glenoid anteversion or anterior humeral head subluxation  $<40^\circ$

### **DESCRIPTION**

Total shoulder replacement, also known as total shoulder arthroplasty (TSA), is a surgical procedure for treating the severe pain and stiffness that often result at the end stage of various forms of arthritis or degenerative joint disease of the shoulder joint. The primary goal of shoulder replacement surgery is pain relief, with the secondary benefits of restoring motion, strength, and function, and helping patients return to an activity level as near to normal as possible. Painful shoulder arthritis refers to the disappearing of the normally smooth cartilage surfaces of the shoulder, which permit the ball and socket to smoothly glide against one another. This disappearance of cartilage covering results in a “bone on bone” joint and can be quite painful. Thus, new surfaces provide the answer for restoration of comfort. The actual surgery involves replacing the damaged humeral head (or joint “ball”) with a metal ball and putting a new smooth plastic surface on the glenoid (called the “socket”). Metal on a plastic surface (rather than metal on metal) is the hallmark of virtually all shoulder replacement implant systems.

Partial shoulder replacement, also known as shoulder hemiarthroplasty, is a surgical procedure during which the upper bone in the arm (humerus) is replaced with a prosthetic metal implant, and the other half of the shoulder joint (glenoid or socket) is left intact. Hemiarthroplasty is a highly technical procedure. There are two types of hemiarthroplasties—stemmed hemiarthroplasty and resurfacing hemiarthroplasty. The surgeon determines the type of procedure to perform, based on the nature of the injury and the condition of the shoulder.

Reverse shoulder arthroplasty involves replacing both the humeral head and the glenoid, but the ball and socket are reversed to improve muscle function. This allows the deltoid muscle, which has a longer movement arm, to generate greater force, allowing it to act in place of an inadequately functioning or torn rotator cuff.

### **RATIONALE**

In a systematic review and meta-analysis, Carter and colleagues (2012) characterized the change in generic and shoulder-specific health-related quality-of-life (QOL) measures resulting from TSA. These investigators identified published studies reporting pre-operative and post-operative health related QOL outcomes for patients receiving TSA. Health-related QOL measures were identified, and meta-analysis was used to calculate standardized mean differences (SMD)s<sup>1</sup> reflective of the effect size, and 95% confidence interval (CI) for each scale. A total of 20 studies (1,576 TSAs) met the inclusion criteria. Outcome measures were analyzed after an average post-operative follow-up duration of 3.7 +/- 2.2 years. The Short Form-36 demonstrated significant improvement in physical component summary scores (SMD = 0.7,  $p < 0.001$ ), but not in mental component summary scores (SMD = 0.2,  $p = 0.37$ ). Significant improvements were observed in the visual analog scale score for pain (SMD = -2.5,  $p < 0.001$ ) and scores on three shoulder-specific measures: the Constant score (SMD = 2.7,  $p < 0.001$ ), the American Shoulder and Elbow Surgeons score (SMD = 2.9,  $p < 0.001$ ), and the Simple Shoulder Test (SMD = 2.3,  $p < 0.001$ ). The authors concluded that TSA leads to significant improvement in scores for function and pain. Shoulder-specific measures of function consistently showed the greatest degree of improvement, with large effect sizes. They noted that TSA also leads to significant improvements in overall physical well-being, with a moderate-to-large effect size.

In a multi-centered retrospective study, Favard and colleagues evaluated the rate of complications and the functional improvement with different types of shoulder arthroplasties after a minimum follow-up of eight years. A total of 198 shoulders, including 85 with primary osteoarthritis (OA) of the shoulder, 76 with rotator cuff tears, 19 with avascular necrosis, and 18 with rheumatoid arthritis (RA), were included in this study. Arthroplasties included 104 anatomic TSAs, 77 reverse arthroplasties, and 17 hemiarthroplasties. Ten patients had their arthroplasty revised, and 134 patients with TSA were able to be present at the final follow-up or provide information on their case. Function was evaluated by the Constant-Murley score, and loosening was evaluated by standard radiographs. In the group with primary OA of the

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shoulder, there were eight complications (11 %), including six (8.3 %) requiring implant revision. In the group of rotator cuff arthropathies, there were nine (14.7 %) with complications, including four (6.5 %) requiring implant revision. In the group with RA, there was one complication, but no surgical revision was necessary. There were no complications in the group with avascular necrosis. Glenoid migration occurred in 28.5 % of anatomic TSAs, and 3.4 % of reverse arthroplasties. This difference was significant ( $p < 0.001$ ). The Constant-Murley score was significantly improved in all etiologies. The authors concluded that glenohumeral arthropathies can be successfully treated by arthroplasty. Anatomic TSA was shown to be associated with a high risk of glenoid loosening at radiographic follow-up, which made them hesitate to use the cemented polyethylene implant, especially in young patients.

In a Cochrane review, Singh et al. determined the benefits and potential harm associated with surgery for shoulder OA. These investigators performed a systematic review of clinical trials of adults with shoulder OA, comparing surgical techniques (TSA, hemiarthroplasty, implant type and fixation) to placebo, sham surgery, non-surgical modalities, and no treatment. They also reviewed trials that compared various surgical techniques, identifying patient-reported outcomes (pain, function, quality of life, etc.) or revision rates. They calculated the risk ratio for categorical outcomes and mean differences for continuous outcomes with 95% CI. There were no controlled trials of surgery versus placebo or non-surgical interventions. A total of seven studies with 238 patients were included. Two studies compared TSA to hemiarthroplasty ( $n = 88$ ). Researchers noted significantly worse scores on the 0 to 100 American Shoulder and Elbow Surgeons scale (mean difference, -10.05 at 24 to 34 months; 95 % CI: -18.97 to -1.13;  $p = 0.03$ ) and a non-significant trend toward higher revision rate in hemiarthroplasty compared to TSA (relative risk 6.18; 95 % CI: 0.77 to 49.52;  $p = 0.09$ ). With one study providing data ( $n = 41$ ), no differences were noted between groups for pain scores (mean difference 7.8; 95 % CI: -5.33 to 20.93), quality of life on Medical Outcomes Study Short-Form 36 physical component summary (mean difference 0.80; 95 % CI: -6.63 to -8.23), or adverse events (relative risk 1.2; 95 % CI: 0.4 to 3.8). The authors concluded that TSA was associated with better shoulder function, with no other demonstrable clinical benefits compared to hemiarthroplasty. They stated that more studies are needed, to compare clinical outcomes between them and comparing shoulder surgery to sham, placebo, and other non-surgical treatment options.

The available evidence from retrospective, uncontrolled trials indicate that use of the reverse shoulder arthroplasty in patients with rotator cuff deficiency may result in improved shoulder function in comparison with hemiarthroplasty. Short-term outcomes also appear adequate for salvage situations, such as failed shoulder arthroplasty and complicated fractures of the humerus.

According to the evidence-based guidelines of the American Academy of Orthopaedic Surgeons published in March 2020, there is strong evidence that anatomic TSA produces more favorable function and pain relief in the short-to mid-term follow-up, when compared to hemiarthroplasty, for the treatment of glenohumeral osteoarthritis. These guidelines also recommend, in the absence of reliable evidence, that clinicians use either anatomic TSA or reverse TSA for the treatment of glenohumeral joint osteoarthritis in select patients with excessive glenoid bone loss and/or rotator cuff dysfunction.

### **CODES**

- *Eligibility for reimbursement is based upon the benefits set forth in the member's subscriber contract.*
- *CODES MAY NOT BE COVERED UNDER ALL CIRCUMSTANCES. PLEASE READ THE POLICY AND GUIDELINES STATEMENTS CAREFULLY.*
- *Codes may not be all inclusive as the AMA and CMS code updates may occur more frequently than policy updates.*
- *Code Key: Experimental/Investigational = (E/I), Not medically necessary/ appropriate = (NMN).*

#### **CPT Codes**

<b>Code</b>	<b>Description</b>
23470	Arthroplasty, glenohumeral joint; hemiarthroplasty
23472	Arthroplasty, glenohumeral joint; total shoulder (glenoid and proximal humeral replacement [e.g., total shoulder])

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<b>Code</b>	<b>Description</b>
23474	Revision of total shoulder arthroplasty, including allograft when performed; humeral and glenoid component

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<b>Code</b>	<b>Description</b>
None	

**ICD10 Codes**

<b>Code</b>	<b>Description</b>
M05.00 - M05.9	Rheumatoid arthritis (code range Felty's syndrome)
M12.511 - M12.519	Traumatic arthropathy, shoulder (code range)
M19.011 - M19.019	Osteoarthritis, localized, primary, shoulder region (code range)
M19.111 - M19.119	Post-traumatic osteoarthritis, shoulder (code range)
M19.211 - M19.219	Osteoarthritis, localized, secondary, shoulder region (code range)
M24.811 - M24.819	Other specific joint derangement of shoulder, not elsewhere classified [crepitus] (code range)
M87.021 - M87.029	Idiopathic aseptic necrosis of humerus [head] (code range)
S42.001K - S42.199P	Malunion or nonunion of fracture of shoulder (code range)
S42.201A - S42.496S	Fracture of humerus (code range)
T84.018A - T84.019A	Broken internal joint prosthesis [shoulder] (code range)
T84.028A - T84.029A	Dislocation of other and unspecified internal joint prosthesis (code range)
T84.038A - T84.039A	Mechanical loosening of other or unspecified prosthetic joint [shoulder] (code range)
T84.59XA	Infection and inflammatory reaction due to other internal joint prosthesis [shoulder]

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\*Key Article

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**CMS COVERAGE FOR MEDICARE PRODUCT MEMBERS**

Based on our review, Shoulder Arthroplasty is not addressed in specific National or Regional Medicare coverage determinations or policies.