



CLINICAL GUIDELINES

CMM-318: Shoulder Arthroplasty/Replacement/Resurfacing /Revision/ Arthrodesis

Version 1.0.2023
Effective May 31, 2023



eviCore healthcare Clinical Decision Support Tool Diagnostic Strategies: This tool addresses common symptoms and symptom complexes. Requests for individuals with atypical symptoms or clinical presentations that are not specifically addressed will require physician review. Consultation with the referring physician, specialist and/or individual's Primary Care Physician (PCP) may provide additional insight.

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Clinical guidelines for medical necessity review of Comprehensive Musculoskeletal Management Services.

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CMM-318: Shoulder Arthroplasty/ Replacement/ Resurfacing/ Revision/ Arthrodesis

Definitions**General Guidelines****Hemi- Arthroplasty- (Replacement)****Total- Shoulder- Arthroplasty- (Replacement)****Reverse- Total- Shoulder- Arthroplasty- (Replacement)****Shoulder- Resurfacing****Revision- of- Shoulder- Arthroplasty- (Replacement)****Shoulder- Arthrodesis****Procedure (CPT®) Codes****References**

Definitions

- **Anatomic total shoulder arthroplasty (replacement):** a surgical technique that involves replacing the humeral head and the glenoid. A total shoulder arthroplasty is typically the best option if the glenoid is damaged, but sufficient bone and rotator cuff remain to ensure that the glenoid component will last.
- **Hemi-arthroplasty (replacement):** a surgical technique that involves replacing the humeral head and not replacing the glenoid (socket), which is typically the best option if the glenoid does not have any arthritis or if there is some concern that the glenoid component might fail if it is replaced.
- **Non-surgical management** (with regard to the treatment of shoulder pain): any provider-directed non-surgical treatment that has been demonstrated in the scientific literature to be efficacious and/or is considered reasonable care in the treatment of shoulder pain. The types of treatment involved can include, but are not limited to: relative rest/activity modification, supervised physiotherapy modalities and therapeutic exercises, prescription and non-prescription medications, assistive devices (e.g., sling, splint, brace), and/or injections (e.g., steroid).
- **Prosthesis:** an artificial device used to replace a structural element within a joint to improve and enhance function.
- **Reverse total shoulder arthroplasty (replacement):** a surgical technique that 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 moment arm, to generate greater force, allowing it to act in place of an inadequate functioning or torn rotator cuff.
- **Revision of shoulder arthroplasty (replacement):** a surgical technique that involves surgical reconstruction or replacement due to failure or complication of previous shoulder arthroplasty.
- **Rotator cuff tear arthropathy:** a condition that results from **ALL** of the following:
 - ◆ Rotator cuff insufficiency (e.g., secondary to irreparable massive rotator cuff tear)
 - ◆ Advanced glenohumeral arthritis
 - ◆ Radiographically diminished acromio-humeral distance
- **Shoulder arthrodesis:** a surgical resection and fusion of the shoulder (glenohumeral) joint.
- **Shoulder arthroplasty/replacement:** an orthopaedic surgical procedure during which the articular surface of the shoulder joint is replaced, remodeled, or realigned.
- **Shoulder resurfacing:** a surgical technique that involves replacing the diseased part of the shoulder joint without replacing the humeral head. Resurfacing of the humeral head involves a prosthetic metal covering or cap to provide complete or partial coverage. It can be performed alone (hemi-resurfacing) or in combination with glenoid resurfacing (total or partial shoulder resurfacing).

➤ **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
 - **B3:** monoconcave and posterior wear with >15° retroversion or >70% posterior humeral head subluxation, or both
- ◆ **Type C:**
 - **C1:** dysplastic glenoid with >25° 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°

General Guidelines

Application of Guideline

- The determination of medical necessity for the performance of shoulder surgery is always made on a case-by-case basis.
- For advanced imaging indications prior to shoulder arthroplasty/replacement surgery refer to **MS-12: Osteoarthritis** and **MS-19: Shoulder**
- For advanced imaging indications following shoulder arthroplasty/replacement surgery refer to **MS-16: Post-Operative Joint Replacement Surgery** and **MS-19: Shoulder**

Hemi-Arthroplasty (Replacement)

Hemi-Arthroplasty (Replacement) Indications

- Hemi-arthroplasty (replacement) is considered **medically necessary** when **ALL** of the following criteria have been met:
 - ◆ Function-limiting pain (e.g., loss of shoulder function which interferes with the ability to carry out age appropriate activities of daily living and/or demands of employment) for at least three (3) months
 - ◆ Failure of at least three (3) months of provider-directed non-surgical management

- ◆ Radiographic imaging and/or an advanced diagnostic procedure (i.e., MRI, CT scan) is conclusive for the presence of **ANY** of the following and correlates with the individual's reported symptoms and physical exam findings:
 - Arthritic conditions in which the glenoid bone stock is inadequate to support a glenoid prosthesis
 - Avascular necrosis without glenoid involvement
- Hemi-arthroplasty (replacement) is considered **medically necessary** when radiographic imaging and/or an advanced diagnostic study (i.e., MRI, CT scan) is conclusive for the presence of a proximal humerus fracture that is not amenable to internal fixation.
- ◆ **Note:** Criteria for duration and severity of symptoms, physical examination findings, and provider-directed non-surgical management are not required to be met for the presence of a proximal humerus fracture that is not amenable to internal fixation.

Hemi-Arthroplasty (Replacement) Non-Indications

- Hemi-arthroplasty (replacement) is considered **not medically necessary** for **ANY** other indication or condition, including when **ANY** of the following are present:
 - ◆ Active local or systemic infection
 - ◆ Paralytic disorder of the shoulder (e.g., flail shoulder due to irreversible brachial plexus palsy, spinal cord injury, or neuromuscular disease)
 - ◆ One or more uncontrolled or unstable medical conditions that would significantly increase the risk or morbidity (e.g., cardiac, pulmonary, liver, genitourinary, or metabolic disease; hypertension; abnormal serum electrolyte levels)
 - ◆ Charcot joint
 - ◆ Advanced destructive degenerative joint disease (i.e., rheumatoid arthritis or osteoarthritis) resulting in marked narrowing of the joint space
 - ◆ Rotator cuff tear arthropathy (i.e., severe rotator cuff tearing and end-stage arthritic disease)

Total Shoulder Arthroplasty (Replacement)

Total Shoulder Arthroplasty (Replacement) Indications

- Total shoulder arthroplasty (replacement) is considered **medically necessary** when **ALL** of the following criteria have been met:
 - ◆ Function-limiting pain (e.g., loss of shoulder function which interferes with the ability to carry out age appropriate activities of daily living and/or demands of employment) for at least three (3) months
 - ◆ Failure of at least three (3) months of provider-directed non-surgical management
 - ◆ Radiographic imaging and/or an advanced diagnostic procedure (i.e., MRI, CT scan) is conclusive for the presence of advanced destructive degenerative joint disease (i.e., osteoarthritis, rheumatoid arthritis, avascular necrosis) that correlates with the individual's reported symptoms and physical exam findings including marked narrowing of the joint space and **ONE OR MORE** of the following:
 - Irregular joint surfaces
 - Glenoid sclerosis
 - Glenoid osteophyte changes
 - Flattened glenoid
 - Cystic changes in the humeral head

Total Shoulder Arthroplasty (Replacement) Non-Indications

- Total shoulder arthroplasty (replacement) is considered **not medically necessary** for **ANY** other indication or condition, including when **ANY** of the following are present:
 - ◆ Active local or systemic infection
 - ◆ Paralytic disorder of the shoulder (e.g., flail shoulder due to irreversible brachial plexus palsy, spinal cord injury, or neuromuscular disease)
 - ◆ One or more uncontrolled or unstable medical conditions that would significantly increase the risk or morbidity (e.g., cardiac, pulmonary, liver, genitourinary, or metabolic disease; hypertension; abnormal serum electrolyte levels)
 - ◆ Charcot joint

Reverse Total Shoulder Arthroplasty (Replacement)

Reverse Total Shoulder Arthroplasty (Replacement) Indications

- Reverse total shoulder arthroplasty (replacement) is considered **medically necessary** when **ALL** of the following criteria have been met:
 - ◆ Function-limiting pain (e.g., loss of shoulder function which interferes with the ability to carry out age appropriate activities of daily living and/or demands of employment) for at least three (3) months duration
 - ◆ The individual must possess functional use of the deltoid muscle
 - ◆ At least 90° of passive shoulder range of motion (elevation/flexion)
 - ◆ Failure of at least three (3) months of provider-directed non-surgical management
 - ◆ Presence of **ANY** of the following:

- Deficient rotator cuff with severe glenohumeral arthropathy and limited ability to actively flex the upper extremity to 90° against gravity (i.e., rotator cuff tear arthropathy)
 - Pseudoparalysis from an irreparable rotator cuff tear (i.e., active forward flexion less than 90 degrees with full passive motion)
 - Failed hemi-arthroplasty or total shoulder replacement with a deficient rotator cuff that is non-repairable
 - Required reconstruction after a tumor resection
 - Shoulder fracture that is not repairable or cannot be reconstructed with other techniques
 - Glenoid retroversion and/or posterior humeral head subluxation as demonstrated on imaging by **EITHER** of the following:
 - Subluxation > 50% on x-rays or advanced imaging, **OR**
 - B2, B3, or C (Walch Classification) on CT
- Reverse total shoulder arthroplasty (replacement) is considered **medically necessary** for reconstruction after a tumor resection or when radiographic imaging and/or an advanced diagnostic study (i.e., MRI, CT scan) is conclusive for the presence of a shoulder fracture that is not repairable or cannot be reconstructed with other techniques. Criteria for duration and severity of symptoms, physical examination findings, and provider-directed non-surgical management are not required to be met.

Reverse Total Shoulder Arthroplasty (Replacement) Non-Indications

- Reverse total shoulder arthroplasty (replacement) is considered **not medically necessary** for **ANY** other indication or condition, including when **ANY** of the following are present:
- ◆ Active local or systemic infection
 - ◆ Paralytic disorder of the shoulder (e.g., flail shoulder due to irreversible brachial plexus palsy, spinal cord injury, or neuromuscular disease)
 - ◆ Deltoid deficiency (e.g., axillary nerve palsy)
 - ◆ One or more uncontrolled or unstable medical conditions that would significantly increase the risk or morbidity (e.g., cardiac, pulmonary, liver, genitourinary, or metabolic disease; hypertension; abnormal serum electrolyte levels)
 - ◆ Charcot joint

Shoulder Resurfacing

Shoulder Resurfacing Non-Indications

- Shoulder resurfacing (total, hemi, or partial resurfacing) is considered **experimental, investigational, or unproven (EIU)**.

Revision of Shoulder Arthroplasty (Replacement)

Revision of Shoulder Arthroplasty (Replacement) Indications

- Revision of shoulder arthroplasty (replacement) is considered **medically necessary** for an individual who has previously undergone a hemi or total shoulder arthroplasty and when **ANY** of the following criteria have been met:
 - ◆ Presence of **ANY** of the following:
 - Recurrent prosthetic dislocation not responsive to a reasonable course of non-surgical care
 - Instability of the components
 - Aseptic loosening
 - Periprosthetic infection
 - Periprosthetic fracture
 - ◆ Unexplained function-limiting pain (e.g., loss of shoulder function which interferes with the ability to carry out age appropriate activities of daily living and/or demands of employment) for greater than six (6) months unresponsive to provider-directed non-surgical management

Revision of Shoulder Arthroplasty (Replacement) Non-Indications

- Revision of shoulder arthroplasty (replacement) is considered **not medically necessary** for the treatment of **ANY** other indication or condition, including Charcot joint.

Shoulder Arthrodesis

Shoulder Arthrodesis Indications

- Shoulder Arthrodesis is considered **medically necessary** when **ALL** of the following criteria are met:
 - ◆ Function-limiting pain (e.g., loss of shoulder function which interferes with the ability to carry out age appropriate activities of daily living and/or demands of employment) for at least three (3) months duration
 - ◆ Failure of at least three (3) months of provider-directed non-surgical management and is not a candidate for alternative treatments
 - ◆ Radiographic imaging and/or advanced diagnostic procedure (i.e., MRI, CT scan, EMG/NCV, etc.) is conclusive for the presence of **ANY** of the following and correlates with the individual's reported symptoms and physical exam findings:
 - Irreparable deltoid and rotator cuff deficiency
 - Failed total shoulder arthroplasty
 - Joint infection
 - Reconstruction after tumor resection
 - Brachial plexus palsy
 - Recurrent shoulder instability, which has failed previous repair/reconstruction
 - Paralytic disorder in infancy

Shoulder Arthrodesis Non-Indications

- Shoulder Arthrodesis is considered **not medically necessary** for **ANY** other indication or condition, including when **ANY** of the following are present:
 - ◆ Deficient functional scapulothoracic motion
 - ◆ Paralysis of the trapezius, levator scapulae, and serratus anterior
 - ◆ Charcot joint
 - ◆ Ipsilateral elbow arthrodesis
 - ◆ Contralateral shoulder arthrodesis

Procedure (CPT®) Codes

This guideline relates to the CPT® code set below. Codes are displayed for informational purposes only. Any given code's inclusion on this list does not necessarily indicate prior authorization is required.

CPT®	Code Description/Definition
23330	Removal of foreign body, shoulder; subcutaneous
23333	Removal of foreign body, shoulder; deep (subfascial or intramuscular)
23334	Removal of prosthesis, includes debridement and synovectomy when performed; humeral or glenoid component
23335	Removal of prosthesis, includes debridement and synovectomy when performed; humeral and glenoid components (e.g. total shoulder)
23400	Scapulopexy (e.g. Sprengels deformity or for paralysis)
23470	Arthroplasty, glenohumeral joint; hemiarthroplasty
23472	Arthroplasty, glenohumeral joint; total shoulder (glenoid and proximal humeral replacement [e.g. total shoulder])
23473	Revision of total shoulder arthroplasty, including allograft when performed; humeral or glenoid component
23474	Revision of total shoulder arthroplasty, including allograft when performed; humeral and glenoid component
23800	Arthrodesis, glenohumeral joint
23802	Arthrodesis, glenohumeral joint; with autogenous graft (includes obtaining graft)
23929	Unlisted procedure, shoulder

This list may not be all inclusive and is not intended to be used for coding/billing purposes. The final determination of reimbursement for services is the decision of the health plan and is based on the individual's policy or benefit entitlement structure as well as claims processing rules.

References

1. American Academy of Orthopaedic Surgeons (AAOS). *Management Of Glenohumeral Joint Osteoarthritis Evidence-Based Clinical Practice Guideline*. Rosemont: American Academy of Orthopaedic Surgeons; 2020 Mar 23:1-76.<https://www.aaos.org/gjocpg>.
2. Armitage J, Faber K, Drosdowech D, et al. Humeral head bone defects: Remplissage, allograft and arthroplasty. *Orthop Clin North Am*.2010; 41:417-425.
3. Boileau P, Chuinard C, Roussanne Y, et al. Reverse shoulder arthroplasty combined with a modified latissimus dorsi and teres major tendon transfer for shoulder pseudoparalysis associated with dropping arm. *Clin Orthop Relat Res*.2008;466(3):584-593.
4. Burgess D, McGrath M, Bonutti P, et al. Shoulder resurfacing. *J Bone Joint Surg Am*.2009; 91(5):1228-1238.
5. Canale S, Beaty J. Campbell's Operative Orthopaedics 11th ed., 483-524, 2007.
6. Collin P, Hervé A, Walch G, Boileau P, Muniandy M, Chelli M. Mid-term results of reverse shoulder arthroplasty for glenohumeral osteoarthritis with posterior glenoid deficiency and humeral subluxation. *J Shoulder Elbow Surgery*. 2019;28(10):2023-2030. doi:10.1016/j.jse.2019.03.002.
7. Cuff D, Pupello D, Nazeem V, et al. Reverse shoulder arthroplasty for the treatment of rotator cuff deficiency. *J Bone Joint Surg Am*. 2008;90(6):1244-1251.
8. Ernstbrunner L, Suter A, Catanzaro S, et al. Reverse Total Shoulder Arthroplasty for Massive Irreparable Rotator Cuff Tears Before the Age of 60 Years. *J Bone Joint Surg Am*. 2017; 99:1721-9.
9. Grassi, F., Murena, L., Valli, I., et al. Six-year experience with the Delta III reverse shoulder prosthesis. *J Orthop Surg*. 2009;17(2):151-156.
10. Harreld KL, Puskas BL, Frankle MA. Massive rotator cuff tears without arthroplasty: when to consider reverse shoulder arthroplasty. *Instr Course Lect*. 2012; 61:143-56.
11. Lollino N, Pellegrini A, Paladini P, et al. Gleno-Humeral arthritis in young patients: clinical and radiographic analysis of humerus resurfacing prosthesis and meniscus interposition. *Musculoskelet Surg*. 2011;95(1):59-63.
12. Martin T, Iannotti J. Reverse total shoulder arthroplasty for acute fractures and failed management after proximal humeral fractures. *Orthop Clin North Am*. 2008;39(4):451-457.
13. McFarland E, Huri G, Hyun Y, Petersen S, Srikumaran U. Reverse Total Shoulder Arthroplasty without Bone-Grafting for Severe Glenoid Bone Loss in Patients with Osteoarthritis and Intact Rotator Cuff. *J Bone Joint Surg*. 2016;98(21):1801-1807. doi:10.2106/jbjs.15.01181.
14. Middernacht B, De Roo P, Van Maele G, et al. Consequences of scapular anatomy for reversed total shoulder arthroplasty. *Clin Orthop Relat Res*. 2008;46(6):1410-1418.
15. Mizuno N, Denard P, Raiss P, Walch G. Reverse Total Shoulder Arthroplasty for Primary Glenohumeral Osteoarthritis in Patients with a Biconcave Glenoid. *J Bone Joint Surgery Am*. 2013;95(14):1297-1304. doi:10.2106/jbjs.l.00820.
16. National Institute for Health and Care Excellence (NICE). *Shoulder resurfacing arthroplasty*. July 2010. <http://www.nice.org.uk/guidance/ipg354/evidence/shoulder-resurfacing-arthroplasty-interventional-procedures-overview2>.
17. Pritchett J: Long-term results and patient satisfaction after shoulder resurfacing. *J Shoulder Elbow Surg*. 2011;20(5):771-777.
18. Reineck, J., Krishnam, S., Burkhead, W. Early glenohumeral arthritis in the competing athlete. *Clin J Sport Med*. 2008;27:803-819.
19. Roy J, Macdermid, J, Goel D, et al. What is a successful outcome following reverse total shoulder arthroplasty? *Open Orthop J*. 2010;23(4):157-163.
20. Sears B, Johnston P, Ramsey M, Williams G. Glenoid Bone Loss in Primary Total Shoulder Arthroplasty: Evaluation and Management. *J AAOS*. 2012;20(9):604-613. doi:10.5435/jaaos-20-09-604.
21. Tibbetts R, Wirth M. Shoulder arthroplasty for the young, active patient. *Instr Course Lect*. 2011;60:99-104.
22. Virk M, Yip M, Liuzza L et al. Clinical and radiographic outcomes with a posteriorly augmented glenoid for Walch B2, B3, and C glenoids in reverse total shoulder arthroplasty. *J Shoulder Elbow Surg*. 2020;29(5):e196-e204. doi:10.1016/j.jse.2019.09.031.
23. Wagner ER, Houdek MT, Schlek C, et al. Increasing Body Mass Index Is Associated with Worse Outcomes After Shoulder Arthroplasty. *J Bone Joint Surg Am*. 2017; 99:929-937.