

Shoulder Arthroplasty – Reverse Total

This protocol is intended to provide the clinician with a guideline for the postoperative rehabilitation course of a patient who has undergone **Reverse Total Shoulder Arthroplasty (rTSA)**. General time frames are given for reference to the average, but individual patients will progress at different rates depending on their age, comorbidities, pre-surgical range of motion, strength, health/functional status, rehabilitation compliance, learning barriers and complications. Specific time frames, restrictions and precautions are given to protect healing tissues and surgical reconstruction.

Shoulder Arthroplasty is considered when a patient has severe arthritis (either osteoarthritis or rheumatoid arthritis) at the glenohumeral joint that is significantly affecting functional range of motion as well as pain that is constant and moderate to severe. Along with arthritis, significant wear and tear on ligaments and tendons (specifically rotator cuff injury) can also be considered for this procedure. Shoulder Arthroplasty are also considered for proximal humerus fracture that are unable to be stabilized with an internal fixation. There are three types of shoulder arthroplasty: total shoulder arthroplasty (TSA), hemi shoulder arthroplasty (HAS), and reverse total shoulder arthroplasty (rTSA). The total shoulder arthroplasty replaces both the humeral head and the glenoid surface with a cemented all-polyethylene hardware whereas the humeral head only gets replaced in a hemi arthroplasty. For both, one must have good bone stock and rotator cuff muscles intact. If one rotator cuff muscle is full torn or two are partially torn, the surgeon may proceed with the procedure and repair them.

However, if there is not good bone stock and the rotator cuff injury is significant a reverse total shoulder arthroplasty preferred

Research has indicated that a reverse total shoulder arthroplasty has more favorable outcomes than TSA and HAS. As it is named, this procedure reverses the anatomy of the shoulder; the reverse shoulder arthroplasty uses a convex glenoid (hemispheric ball) and a concave humerus (articulating cup) to reconstruct the glenohumeral joint. With arthritis, conservative treatment will be performed first to see if this can be beneficial and/or to prepare for surgery.

In a reverse total shoulder arthroplasty, the humeral head and glenoid fossa are reconstructed with a convex glenoid (hemispheric ball) and a concave humerus (articulating cup). Usually, this surgery is performed when rotator cuff is unrepairable; however, teres minor may be repair. The surgeon will indicate this and slow progression of range of motion of shoulder ER must be taken.

Postoperative Guidelines

Surgical Indication

- Severe arthritis at glenohumeral joint with unrepairable rotator cuff
- Pseudoparesis of shoulder
- Comminuted proximal humerus fracture

Return to Work

The timeline for returning to work can vary depending on the type of work performed, various accommodations that may be available within your work environment, and any postoperative complications. Your surgeon will discuss the timeline for returning to work after consideration of these factors.

Shoulder Arthroplasty – Reverse Total

Phase I (surgery to 10-14 days after surgery)

| | |
|-------------------------------------|--|
| Rehabilitation appointments | <ul style="list-style-type: none"> • 1-2x/week or per therapist discretion |
| Rehabilitation goals and priorities | <ul style="list-style-type: none"> • Activities of daily living (ADLs) per restrictions • Post op dressings will be removed and continue to wear sling • Edema management • Pain management |
| Suggested therapeutic exercises | <ul style="list-style-type: none"> • PROM shoulder flexion and combined flexion and 20 degrees of ER (scaption) to 90 degrees. • Shoulder ER to 20 degrees • Recommend starting shoulder ROM immediately • Instruct immediately on squeezing ball with elbow flexion to activate deltoid • Thoracic extension and scapular retraction exercises well minimizing shoulder elevation • A/AA/PROM of elbow, forearm, and digits |
| Precautions | <ul style="list-style-type: none"> • No shoulder IR ROM • No reaching behind back for 10-12 weeks • No reaching across chest for 6 weeks • No lifting, pushing, or pulling more than 5 pounds with involved upper extremity • No weightbearing with involved upper extremity |
| Orthotic management | <ul style="list-style-type: none"> • Continue to wear sling for 6 weeks |
| Progression criteria | <ul style="list-style-type: none"> • Per pain tolerance |

Shoulder Arthroplasty – Reverse Total

Phase II (3 weeks after surgery)

| | |
|-------------------------------------|---|
| Rehabilitation appointments | <ul style="list-style-type: none"> • 1-2x/week or per therapist discretion |
| Rehabilitation goals and priorities | <ul style="list-style-type: none"> • Activities of daily living (ADLs) per restrictions • Edema management • Pain management • Address soft tissue muscular restrictions through manual therapy (upper trap, infraspinatus, pectoralis minor and major, and subscapularis) • NMES to deltoid muscle to increase strength in quick fibers to increase stability of shoulder |
| Suggested therapeutic exercises | <ul style="list-style-type: none"> • Shoulder isometrics for deltoid strengthening • Continue thoracic and scapular retraction exercises (postural exercises) |
| Precautions | <ul style="list-style-type: none"> • No shoulder IR ROM • No reaching behind back for 10-12 weeks • No reaching across chest for 6 weeks • No lifting, pushing, or pulling more than 5 pounds with involved upper extremity • No weightbearing with involved upper extremity |
| Orthotic management | <ul style="list-style-type: none"> • Continue to wear sling |
| Progression criteria | <ul style="list-style-type: none"> • Per pain tolerance |

Shoulder Arthroplasty – Reverse Total

Phase III (4 weeks after surgery)

| | |
|-------------------------------------|--|
| Rehabilitation appointments | <ul style="list-style-type: none"> • 1-2x/week or per therapist discretion |
| Rehabilitation goals and priorities | <ul style="list-style-type: none"> • Activities of daily living (ADLs) per restrictions • Edema management • Pain management • Progress muscular restrictions with P/AROM along with mobilization |
| Suggested therapeutic exercises | <ul style="list-style-type: none"> • Progress PROM shoulder elevation to 110-120 degrees as well as PROM ER to 30-45 degrees • Initiate grip and pinch strengthening |
| Precautions | <ul style="list-style-type: none"> • No resisted shoulder IR if subscapularis is repaired • No combined shoulder ABD to 90 and shoulder ER • No lifting, pushing, or pulling more than 5 pounds with involved upper extremity • No weightbearing with involved upper extremity |
| Orthotic management | <ul style="list-style-type: none"> • Continue to wear sling |
| Progression criteria | <ul style="list-style-type: none"> • Per pain tolerance. • Progress exercises when good posture is completed with exercises |

Shoulder Arthroplasty – Reverse Total

Phase IV (6 weeks after surgery)

| | |
|-------------------------------------|--|
| Rehabilitation appointments | <ul style="list-style-type: none"> • 1-2x/week or per therapist discretion |
| Rehabilitation goals and priorities | <ul style="list-style-type: none"> • Activities of daily living (ADLs) per restrictions • Edema management • Pain management |
| Suggested therapeutic exercises | <ul style="list-style-type: none"> • Initiate AAROM shoulder • Initiate shoulder isometrics. If subscapularis/infraspinatus/teres minor were repaired, initiate shoulder ER/IR isometrics at 8 weeks |
| Precautions | <ul style="list-style-type: none"> • No combined shoulder ABD to 90 and shoulder ER • No lifting, pushing, or pulling more than 5 pounds with involved upper extremity • No weightbearing with involved upper extremity |
| Orthotic management | <ul style="list-style-type: none"> • Wean from sling. Wear sling in public or at-risk activities |
| Progression criteria | <ul style="list-style-type: none"> • Per pain tolerance. • Progress exercises when good posture is completed with exercises |

Shoulder Arthroplasty – Reverse Total

Phase V (8 weeks after surgery)

| | |
|-------------------------------------|---|
| Rehabilitation appointments | <ul style="list-style-type: none"> • 1-2x/week or per therapist discretion |
| Rehabilitation goals and priorities | <ul style="list-style-type: none"> • Activities of daily living (ADLs) per restrictions • Facilitation of functional activities with good posture |
| Suggested therapeutic exercises | <ul style="list-style-type: none"> • Initiate AROM of shoulder (short lever arm) • Initiate shoulder ER and IR isometrics • Progress scapular postural exercises with light resistance |
| Precautions | <ul style="list-style-type: none"> • No lifting, pushing, or pulling more than 5 pounds with involved upper extremity • No weightbearing with involved upper extremity |
| Orthotic management | <ul style="list-style-type: none"> • Discontinue sling |
| Progression criteria | <ul style="list-style-type: none"> • Per pain tolerance. • Progress exercises when good posture is completed with exercises |

Shoulder Arthroplasty – Reverse Total

Phase VI (10 weeks after surgery)

| | |
|-------------------------------------|---|
| Rehabilitation appointments | <ul style="list-style-type: none"> • 1x/week or per therapist discretion |
| Rehabilitation goals and priorities | <ul style="list-style-type: none"> • Activities of daily living (ADLs) per restrictions • Facilitation of functional activities with good posture |
| Suggested therapeutic exercises | <ul style="list-style-type: none"> • Continue to progress shoulder AROM (short and long lever arm motion) • Progressive resistance strengthening |
| Precautions | <ul style="list-style-type: none"> • Avoid resisted shoulder IR and ADD with shoulder extension |
| Progression criteria | <ul style="list-style-type: none"> • Per pain tolerance. • Progress exercises when good posture is completed with exercises |

Shoulder Arthroplasty – Reverse Total

Phase VI (12-16 weeks after surgery)

| | |
|-------------------------------------|---|
| Rehabilitation appointments | <ul style="list-style-type: none">• 1x/week or per therapist discretion |
| Rehabilitation goals and priorities | <ul style="list-style-type: none">• Return to all functional activities and progress to return to leisure and heavy work activities |
| Suggested therapeutic exercises | <ul style="list-style-type: none">• Continue to progress strengthening |
| Precautions | <ul style="list-style-type: none">• No restrictions.• Avoid resisted shoulder IR and ADD with shoulder extension |
| Progression criteria | <ul style="list-style-type: none">• Per pain tolerance and physician guidance• Expected ROM: AROM shoulder flexion 105-140 and shoulder ER 30-45 degrees |

Shoulder Arthroplasty – Total and Hemi

Additional Notes

*It is advised to perform PROM sooner instead of immobilization for 2 to 4 weeks. This will depend on surgical procedure and surgeon will need to make this clear in orders or post-operative note.

*Addressing soft tissue muscular restrictions early will help continue progression of shoulder elevation. Restrictors to arm elevation are pectoralis minor, infraspinatus, levator scapulae, and subscapularis.

*Addressing deltoid strength is essential to the rehabilitation process especially for reverse shoulder arthroplasty. The deltoid will not only perform elevation of the shoulder but will act as a compressor of the humeral head for stability and correct alignment with full elevation of the shoulder.

*About 80% of patients are able to return to sports or leisure activities. Total shoulder arthroplasty has the highest rate of return when both hemiarthroplasty and reverse total shoulder arthroplasty.

*For total/hemi shoulder arthroplasty, there is a risk for dislocation with combined shoulder ABD and ER. For reverse shoulder arthroplasty, the risk for dislocation is with shoulder ADD and IR in conjunction with extension. These motions are should not be performed until 12 weeks post op. Yet, these motions are not advised to perform with resistance after 12 weeks to maintain the surgical benefits.

*It is significantly beneficial for conservative management (therapy) to be performed pre-operatively if possible. Patient will

References

- Bandholm, T. & Kehlet, H. (2012). Physiotherapy exercises after fast track THA and TKA; Time for a reconsideration?. *Arch Physical and Rehabilitation* 93:1292-4.
- Baldwin, K. et al. (2013, Nov). What's new in orthopaedic rehabilitation? *Journal of Bone and Joint Surgery* 95-A (22) : 2071-7.
- Boudreau, S., Boudreau, E.D., Higgins, L.D., & Wilcox, R.B. (2007, Dec). Rehabilitation following reverse total shoulder arthroplasty. *Journal of Orthopaedic Sports Physical Therapy* 37(12):734-43. DOI: 10.2519/jospt.2007.2562.
- Bozic, K.J. et al. (2010). The influence of procedure volumes and standardization of care on quality and efficiency in total joint replacement surgery. *JBJS* 92-A(11):2643- 52.
- Brameier, D.T., Hirscht, A., Kowalsky, M.S., & Sethi, P.M. (2018, Oct). Rehabilitation strategies after shoulder arthroplasty in young and active patients. *Clinical Sports Medicine* 37(4):569-583. DOI: 10.1016/j.csm.2018.05.007.
- Bryant, D., Litchfield, R., Sandow, M., Gartsman, G., Guyatt, G., & Kirkley, A. (2005, Sep). A comparison of pain, strength, range of motion, and functional outcomes after hemiarthroplasty and total shoulder arthroplasty in patients with osteoarthritis of the shoulder. A systematic review and meta-analysis. *Journal of Bone Joint Surgery America* 87(9):1947-56. DOI: 10.2106/JBJS.D.02854.
- Cho, C.H., Kim, D.H., & Song, K.S. (2017, Sep). Reverse shoulder arthroplasty in patients with rheumatoid arthritis: A systemic review. *Clinical Orthopaedic Surgery* 9(3):325-331. DOI: 10.4055/cios.2017.9.3.325.
- Den Hartog, D. et al. (2010, May). Primary Hemiarthroplasty versus conservative treatment for comminuted fractures of the proximal humerus in the elderly (procon): A multicenter randomized controlled trial. *BMC Musculoskeletal Disorders* 11:97. DOI: 10.1186/1471-2474-11-97.

References

- Ho, C.-Y.C., Sole, G., Munn, J. (2009, Oct). The effectiveness of manual therapy in the management of musculoskeletal disorders of the shoulder: A systematic review. *Manual Therapy* 14(5),463-474.
- Jarrett, C.D., Brown, B.T., & Schmidt, C.C. (2013, Jul). Reverse shoulder arthroplasty. *Orthopaedic Clinical North America* 44(3):389-408, x. DOI: 10.1016/j.ocl.2013.03.010.
- Haik, M.N.1., Albuquerque-Sendín, F., Silva, C.Z., Siqueira-Junior, A.L., Ribeiro, I.L., Camargo, P.R. (2014, Jul). Scapular kinematics pre-post thoracic thrust manipulation in individuals with and without shoulder impingement symptoms. *Journal of Orthopaedic Sports Physical Therapy* 44 (7) : 475-487.
- Littlewood, C. et al. (2020, Apr 23). Rehabilitation following shoulder arthroplasty in the united kingdom national health service: A survey of publicly facing information. *Musculoskeletal Care*. DOI: 10.1002/msc.1468. Online ahead of print.
- Liu, J.N. (2018, Jan). Return to sport after shoulder arthroplasty: A systematic review and meta-analysis. *Knee Surgery Sports Traumatology Arthroscopic* 26(1):100-112. DOI: 10.1007/s00167-017-4547-1.
- Marsh, D.W. (2006, Aug). Management of shoulder hemiarthroplasty in a patient with rheumatoid arthritis. *Journal of Orthopaedic Sports Physical Therapy* 36(8):600-10. DOI: 10.2519/jospt.2006.2226.
- Mintken, P.E.1., Cleland, J.A., Carpenter, K.J., Bieniek, M.L., Keirns, M., Whitman, J.M. (2010, Jan). Some factors predict successful short -term outcomes in individuals with shoulder pain receiving cervicothoracic manipulation: A single -arm trial . *Journal of Orthopaedic Sports Physical Therapy* 90 (1) : 26-42.
- Shukla, D.R., McAnany, S., Kim, J., Overley, S., & Parsons, B.O. (2016, Feb). Hemiarthroplasty versus reverse shoulder arthroplasty for treatment of proximal humeral fractures: A meta-analysis. *Journal of Shoulder Elbow Surgery* 25(2):330-40. DOI: 10.1016/j.jse.2015.08.030.
- Tirefort, J. et al. (2019, Mar 20). Postoperative mobilization after rotator cuff repair: Sling versus no sling : A Randomized Prospective Study. *JBJS* 111(6) 494-503
- Wagner, E.R., Solberg, M.J., & Higgins, L.D. (2018, Nov). The utilization of formal physical therapy after shoulder arthroplasty. *Journal of Orthopaedic Sports Physical Therapy* 48(11):856-863. DOI: 10.2519/jospt.2018.8176.
- Uschok, S., Herrmann, S. Pauly, S., Perka, C., Greiner, S. (2018, Oct). Reverse shoulder arthroplasty: The role of physical therapy on the clinical outcome in the mid-term to long-term follow-up. *Arch Orthopaedic Trauma Surgery* 138(10):1347-1352. DOI: 10.1007/s00402-018-2977-y.
- Zarkadas, P.C., Throckmorton, T.Q., Dahm, D.L., Sperling, J., Schleck, C.D., Cofield, R. (2011, Mar). Patient reported activities after shoulder replacement: Total and hemiarthroplasty. *Journal of Shoulder Elbow Surgery* 20(2):273-80. DOI: 10.1016/j.jse.2010.06.007.

These rehabilitation guidelines were developed collaboratively between UW Health and UnityPoint Health - Meriter Rehabilitation and the UW Health Orthopedic Surgeons.

Content is for informational purposes only and does not replace the guidance, diagnostic or treatment options or educational materials your healthcare provider gives you. Call your health provider immediately if you think you may have a medical emergency. Always seek the advice of your health provider prior to starting any new treatment and contact them immediately with any medical emergency.