REVERSE TOTAL SHOULDER ARTHROPLASTY CLINICAL PRACTICE GUIDELINES

Background

Reverse total shoulder arthroplasty is indicated for patients who have continued pain and loss of function in the presence of advanced joint pathology and have failed conservative measures. The procedure involves replacing the head of the humerus and resurfacing the glenoid fossa while switching their positions in the shoulder. Care should be taken in regards to management of the subscapularis post operatively due to the subscapularis takedown procedure performed.

Disclaimer

Progression is time and criterion-based, dependent on soft tissue healing, patient demographics and clinician evaluation. If patient desires to return to sports, a prior conversation with physician is required as well as physician clearance to begin return to sport criteria. Return to sport likely only appropriate for previously active individuals. Low impact activities are the most appropriate, while activities that require higher demand of the upper extremity or come with a fall risk are less appropriate. If you are working with an Ohio State Sports Medicine patient and questions arise, please contact the author by calling our office at (614) 293-2385.

Summary of Recommendations

Precautions	• Sling use for 4-6 weeks
	• No internal rotation, cross body adduction, or extension x 12 weeks (Hand Behind Back Position)
	• Forward elevation in SCAPTION only for 4-6 weeks (rTSA is in most stable position at 30 deg ER)
	• No forced shoulder Flexion
	• No stretching into pain
	• Caution with end range motion – Do NOT push hard into end ranges
	• No supporting of body weight by hand on involved side (for example, pushing up from a chair) x 12 weeks
	• No driving for six weeks
	• Jogging may begin at 12 weeks
	• Long Term:
	  ○ No push-ups or bench press
	  ○ 15lb limit below shoulder height
	  ○ 10lb limit above shoulder height
	• Subscapularis Precautions (Confirm with Surgeon)
	  ○ No ER PROM past neutral for 4 weeks
	  ○ No Active IR for 8 weeks
	Check with surgeon's office if posterior instability precautions are indicated on referral or operative report

Outcome Tools	• Quick DASH • Simple Shoulder Test • American Shoulder and Elbow Surgeon's Shoulder Evaluation Short Form
Discharge Sling	• 4-6 weeks based on surgeon recommendation
Criteria to Initiate Plyometrics	• Within functional active shoulder ROM • Time: no earlier than 16 weeks • Pain-free ADL's and strengthening interventions • Proper scapular control during interventions • Strength 5/5 MMT and/or >90% of uninvolved shoulder with scapular musculature
Criteria for Return to Sport	• Patient is pain free with all ADLs and all rehab interventions • Completion of strengthening phase and plyometric phase • Strength 5/5 MMT or >90% of uninvolved shoulder with scapular musculature • Can begin at six months post-operatively with physician clearance • Most common sports to return: Swimming, Fitness, Golf, tennis, pickleball
Criteria for Discharge	• Patient is able to maintain pain-free shoulder AROM (typically 110-150° of elevation, with functional ER of about 30-50°) • Patient demonstrates proper shoulder mechanics • Patient has 4/5 MMT strength if returning to normal iADL's, 5/5 if returning to sport

Phase I: Post-operative – 2 weeks

- Continue home program including wrist/hand, pendulums, and shoulder blade squeezes

Phase II: Weeks 2-4

ROM	• Continue all exercises as above • Frequent cryotherapy application – 4-5 times a day for 15 to 20 minutes • NO SHOULDER IR, ADDUCTION, EXTENSION OR CROSS BODY MOVEMENT
Strengthening	• Begin submaximal pain-free deltoid isometrics in scapular plane (avoid shoulder extension when isolating posterior deltoid)
Goals to progress to Next Phase	• Enhance PROM • Restore active range of motion (AroM) of elbow/wrist/hand • Independent with activities of daily living (ADLs) with modifications

Phase III: Weeks 4-6

ROM	• Progress PROM • Forward scaption in supine to 120° • ER in scapular plane to tolerance, respecting soft tissue constraints (30-45°) • Continue frequent cryotherapy • NO SHOULDER IR, ADDUCTION OR CROSS BODY MOVEMENT
Strength	• Gentle resisted exercise of elbow, wrist, and hand • Discontinue use of sling at six weeks
Goals to Progress to Next Phase	• Patient tolerates shoulder PROM as outlined above • Patient tolerates elbow, wrist and hand AROM • Patient demonstrates the ability to isometrically activate all components of the deltoid and periscapular musculature in the scapular plane

Phase IV: Weeks 6-10

Precautions	• Continue to avoid shoulder hyperextension • In the presence of poor shoulder mechanics avoid repetitive shoulder AROM exercises/activity • Progressively work into flexion-based exercises but DO NOT FORCE • Restrict lifting of objects to no heavier than a coffee cup • No supporting of body weight by involved upper extremity
ROM	• Begin shoulder active assisted ROM/AROM progressing from supine to seated as tolerated in scaption and ER in the scapular plane • Gentle glenohumeral and scapulothoracic joint mobilizations as indicated (Grades I and II) • Patient may begin to use hand of involved extremity for feeding and light ADLs • Continue use of cryotherapy as needed • NO SHOULDER IR, ADDUCTION, EXTENSION OR CROSS BODY MOVEMENT
Strength	• Progress strengthening of elbow, wrist, and hand • Begin gentle glenohumeral ER submaximal pain-free isometrics • Initiate gentle scapulothoracic rhythmic stabilization and alternating isometrics in supine as appropriate. • Begin gentle periscapular and deltoid submaximal pain-free isotonic strengthening exercises, typically toward the end of the eighth week (Emphasis on high reps with low resistance)
Goals to progress to Next Phase	• Continue progression fo PROM • Gradually restore AROM • Control pain and inflammation • Re-stablish dynamic shoulder stability

Phase V: Weeks 10-12

ROM	• Continue with above exercises and functional activity progression • NO SHOULDER IR, ADDUCTION OR CROSS BODY MOVEMENT
Strength	• Begin supine forward flexion scaption with light weights of 1-3 pounds at varying degrees of trunk elevation as appropriate (ie, supine to sitting/standing) • Progress to gentle glenohumeral ER isotonic strengthening exercises
Goals to Progress to Next Phase	• Improving function of shoulder • Patient demonstrates the ability to isotonically activate all components of the deltoid and periscapular musculature and is gaining strength

Phase VI: Weeks 12+

Precautions	• No lifting of objects heavier than six-ten pounds with the operative upper extremity • No sudden lifting or pushing activities
ROM	• Continue to maintain gains • Begin progressing IR as tolerated • Begin progressing horizontal adduction as tolerated

Strength	• Continue with the previous program as indicated
	• Progress to gentle resisted flexion, elevation in standing as appropriate
	• Typically the patient is on a HEP at this stage, to be performed 3-4 times per week, with the focus on:
	  ○ Continued strength gains focusing on upper trapezius, latissimus dorsi and posterior deltoid
	  ○ Continued progression toward a return to functional and recreational activities within limits, as identified by progress made during rehabilitation and outlined by surgeon and physical therapist

Goals to Progress to next phase if appropriate	• Patient is able to maintain pain-free shoulder AROM (typically 110°-150° of elevation, with functional ER of about 30-50°) • Patient demonstrates proper shoulder mechanics • Patient demonstrates at least 90% on uninvolved shoulder scapular musculature strength tested via handheld dynamometry • Patient has received physician clearance

Phase VII: Weeks 16+ (Goal is to return to sport at 6 months)

Precautions	• PHYSICIAN CLEARANCE TO BEGIN • No lifting greater than 15 lbs below shoulder height and 10 lb above shoulder height • Do not overload internal rotation or cross body horizontal adduction
ROM	• Patient should have close to their maximum range of motion at this time • Continue to maintain gains with IR as tolerated
Strength	• Continue with progressive strengthening • Progress resisted rotational movements and cross body adduction • Begin perturbations in various degrees and planes
Sport Specifics	• Begin increasing speed of movement • Double hand plyometrics first (typically starting with under six pounds) • Typically should take at least three weeks to progress through double arm plyometrics before progressing to single arm plyometrics • Incorporate sport specific movement patterns
Criteria for Discharge form Physical Therapy	• Patient is able to maintain pain free shoulder AROM (typically 110°-150° of elevation, with functional ER of about 30°-50°) • Patient demonstrates proper shoulder mechanics • Patient has 5/5 strength and/or >90% of the uninvolved scapular musculature strength

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Completion date: December 2023

References

Bourdreau S, Bourdreau E, Higgins LD, and Wilcox RB. Rehabilitation Following Reverse Total Shoulder Arthropoplasty. *Journal of Orthopaedic and Sports Physical Therapy.* 2007; 37(12): 734-743.

Bullock, GS et al. A systematic Review of Proposed Rehabilitation Guidelines Following Anatomic and Reverse Shoulder Arthroplasty. *Journal of Orthopaedic and Sports Physical Therapy.* 2019; 49(5): 337-346. doi:10.2519/jospt.2019.8616

Geyer, S., Siebler, J., Eggers, F. *et al.* Influence of sportive activity on functional and radiographic outcomes following reverse total shoulder arthroplasty: a comparative study. *Arch Orthop Trauma Surg* **143**, 1809–1816 (2023). https://doi.org/10.1007/s00402-022-04344-1

Howard, M.C., Trasolini, N.A. & Waterman, B.R. Optimizing Outcomes After Reverse Total Shoulder Arthroplasty: Rehabilitation, Expected Outcomes, and Maximizing Return to Activities. *Curr Rev Musculoskelet Med* **16**, 145–153 (2023). https://doi.org/10.1007/s12178-023-09823-5

Kozak T, Bauer S, Walch G, Al-Karawi S, Blakeney W. An update on reverse total shoulder arthroplasty: current indications, new designs, same old problems. EFORT Open Rev. 2021 Mar 1;6(3):189-201. doi: 10.1302/2058-5241.6.200085. PMID: 33841918; PMCID: PMC8025709.

Lee, Jonathan, et al. "Accelerated rehabilitation following reverse total shoulder arthroplasty." *Journal of Shoulder and Elbow Surgery* 30.9 (2021): e545-e557.

Pereira, Vitor C., et al. "Clinical and functional results of reverse total shoulder arthroplasty and postoperative rehabilitation protocol." *Cureus* 14.3 (2022).

Wolff AL, Rosenzweig L. Anatomical and biomechanical framework for shoulder arthroplasty rehabilitation. *Journal of Hand Therapy*. 2017; 30:167-174. https://doi.org/10.1016/j. jht.2017.05.009