Total Shoulder Arthroplasty - Dr. Lehman, MD

This protocol is based The American Society of Shoulder and Elbow Therapists' consensus statement on rehabilitation for anatomy total shoulder arthroplasty (1). This program is an evidence-based and soft tissue healing dependent program allowing patients to progress to vocational and sports-related activities as quickly and safely as possible. Individual variations will occur depending on surgical technique and the patient's response to treatment. **See surgeon's operative note for specific range of motion restrictions especially EXTERNAL ROTATION**. Please contact us at 1-800-362-9567 ext. 58600 if you have questions or concerns.

Phase I: 0-6 weeks	**Immediate Post Operative Maximum Protection Phase**
Goals	• Protect the subscapularis tendon repair • Decrease joint effusion and soft tissue edema • Decrease pain
Restrictions	• No lifting, pushing, and pulling
Sling	• Continue with wearing Sling Shot brace until directed otherwise by surgeon.
PROM/ AAROM/AROM	• Review operative note for "safe zone" of external rotation • No active range of motion • AAROM/PROM flexion and abduction to tolerance
Strengthening	• Rehabilitation specialists should select exercises that demonstrate less than 15% maximum voluntary isometric contraction (MVIC) on electromyography for the subscapularis as these guidelines have been proposed as a safe level of activation following rotator cuff repair • See "Treatment Interventions" section below for exercises that fall below 15%. **Considerations**: Per the consensus statement supine exercises soon after the anatomic total shoulder arthroplasty are challenging due to: • If the arm is not well supported in the plane of the scapulae, there may be painful strain across the healing incision, anterior joint capsule, and subscapularis tendon • Many patients are challenged with getting in and out of supine position without weightbearing on the surgical arm • Finding a place to sit to do range of motion is likely more convenient than lying, which may assist with home exercises compliance
Treatment Interventions	**The exercises listed below are <15% MVIC for subscapularis (2):** • Pulley-assisted elevation: 8% • Table Slide: 10% • Prone Shoulder Flexion: 12% • Seated Row: 14% • Wall-Assisted External Rotation: 15% • **Supine-assisted elevated was found to be higher than the recommended level: 24%** **See Table 1 listed below for % MVIC ranking of each exercise for the subscapularis**
Modalities	• As needed for pain control

Phase II: 6-12 weeks	Range of Motion Phase
Goals	• Gradually restore range of motion • Expected range of motion varies based on preoperative diagnosis of Anatomy Total Shoulder Arthroplasty • Anatomy Total Shoulder Arthroplasty have been shown to achieve 140-150 degrees of scapular elevation, 50-60 degrees of external rotation at the side, and internal rotation to the upper lumbar spine (3)
Restrictions	• See Operative Note for specific external rotation range of motion limits • No lifting greater than 1 lb (“a cup of coffee”) • Avoid excess overpressure to protect healing joint • Closed kinetic chain in both weight-bearing and non-weightbearing positions are not indicated
Range of Motion	• AROM/AAROM/PROM: no restrictions except ER based on operative note
Strengthening	• **Active range of motion exercises with no lifting >1 lb**
Treatment Interventions	**Active Assisted Range of Motion** • Wall walks • Pulleys: elevation/flexion • Seated AAROM with dowel **Active Range of Motion** • Sidelying external rotation • Supine shoulder flexion • Sidelying shoulder abduction • Prone I, Prone Y, and Prone T • Prone horizonal abduction with external rotation • Scapular retraction • Supine serratus punch

Phase III: 12+ Weeks	Strength Phase
Goals	• Restore end range mobility of the shoulder in all planes • Increase rotator cuff strength to 5/5 • A gradual return to prior level such as golf, tennis, and swimming is allowed, with full return to play restricted until post operative month 6 to allow for subscapular tendon healing
Restrictions	• No weight restrictions • Heavy impact loading such as bench press, wood chopping, and use of a sledgehammer is not advised (1)
Range of Motion	• As tolerated
Strengthening	• Strengthening exercises may progress gradually using light hand weight or elastic band resistance • Closed kinetic chain exercises are now permitted including planks, yoga poses, and quadruped exercises
Treatment Interventions	• Closed kinetic chain exercises including planks, quadruped shoulder stabilization exercises, ball on wall, lateral reaches on wall, etc. • Continue with phase 2 exercises as needed • Scaption • Overhead press • PNF D1/D2 stabilization • Bicep strengthening • 90/90 external rotation strengthening • Body blade exercises

Table 1. Subscapularis pooled means (range) of percent MVIC ranking of exercise. Copied from Reference (2)

Exercise	**% Maximum Voluntary Isometric Contraction**
Pulley Assisted Elevation	8%
Table Slide	10%
Prone Shoulder Flexion	12%
Seated Row	14%
Wall-Assisted External Rotation	15%
Upright Bar-Assisted Elevation	24%
Upright Bar-Assisted External Rotation	27%
Forward Punch	35%
Internal Rotation: 0° of Abduction	40%
Internal Rotation: 45° of Abduction	53%
External Rotation: 0° of Abduction	57%
External Rotation: 90° of Abduction	57%
Dynamic Hug	58%
Diagonal	60%
Internal Rotation: 90° of Abduction	65%
Low Row	69%
High Row	74%
Standing Row	81%
Resisted Shoulder Extension	97%
Resisted Active Elevation/Flexion	99%

*******If you have any questions regarding how to perform the exercise see Reference 2.

References

1. Kennedy, J. S., Garrigues, G. E., Pozzi, F., Zens, M. J., Gaunt, B., Phillips, B., ... & Tate, A. R. (2020). The American Society of Shoulder and Elbow Therapists' consensus statement on rehabilitation for anatomic total shoulder arthroplasty. *Journal of shoulder and elbow surgery*, *29*(10), 2149-2162.

2. Edwards, P. K., Ebert, J. R., Littlewood, C., Ackland, T., & Wang, A. (2017). A systematic review of electromyography studies in normal shoulders to inform postoperative rehabilitation following rotator cuff repair. *journal of orthopaedic & sports physical therapy*, *47*(12), 931-944.

3. Kiet, T. K., Feeley, B. T., Naimark, M., Gajiu, T., Hall, S. L., Chung, T. T., & Ma, C. B. (2015). Outcomes after shoulder replacement: comparison between reverse and anatomic total shoulder arthroplasty. *Journal of Shoulder and Elbow Surgery*, *24*(2), 179-185.