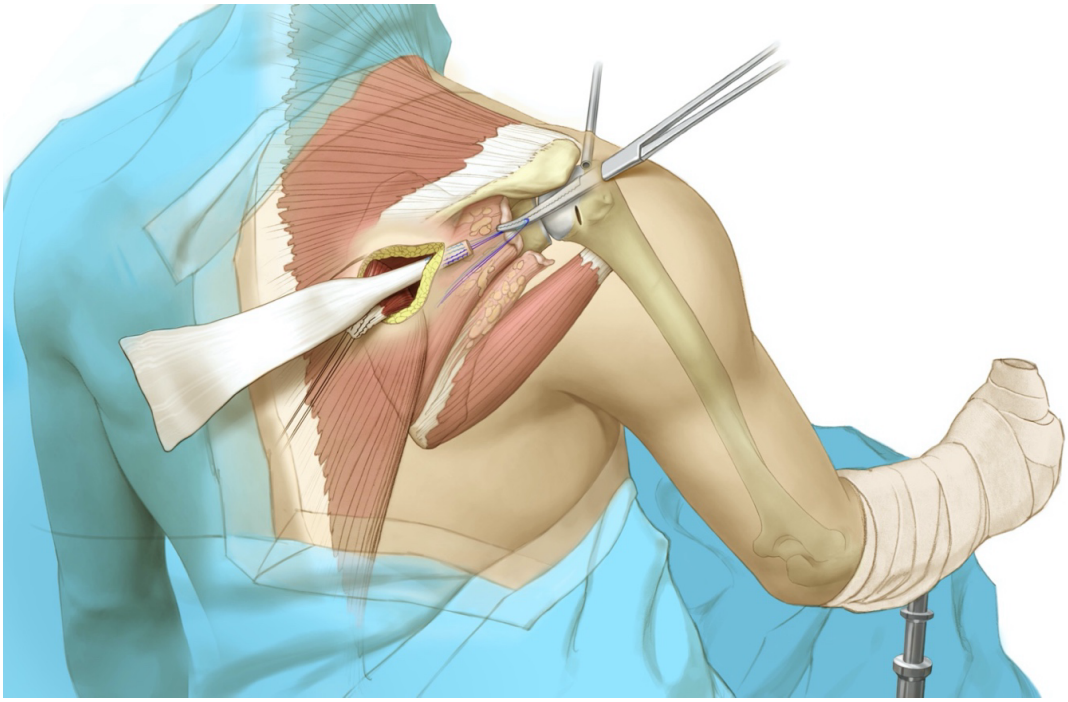
Rehabilitation Protocol for Lower Trapezius Tendon Transfer

This protocol is intended to guide clinicians and patients through the rehabilitation course for a lower trapezius tendon transfer. This protocol is time based (dependent on tissue healing) as well as criterion based. Specific intervention should be based on the needs of the individual and should consider exam findings and clinical decision making. The timeframes for expected outcomes contained within this guideline may vary based on surgeon's preference, additional procedures performed, and/or complications. If a clinician requires assistance in the progression of a post-operative patient, they should consult with the surgical team.

The interventions included within this protocol are not intended to be an inclusive list of exercises. Therapeutic interventions should be included and modified based on the progress of the patient and under the discretion of the clinician.

Why a Lower Trapezius Tendon Transfer?



When rotator cuff muscles are torn, an arthroscopic repair is a good option if the rotator cuff is reparable. In order to be reparable, the quality of the muscle must still be preserved and the tendon quality and length are good for the repair. However, when the rotator cuff tendon is degenerated and shortened, the healthy muscle tissue is replaced with fat and it cannot be effectively repaired.

As an alternative to repair in these cases, tendon transfers were developed to restore function of the shoulder. The lower trapezius transfer was developed specifically to restore external rotation function, to restore elevation through humeral head depression, and to avoid the need for a reverse total shoulder in the young, active population.

In the procedure, the lower trapezius tendon is released from the scapula and an achilles allograft is used to lengthen the tendon so that it can reach the shoulder joint. The transfer is complete when the tendon is attached to the supraspinatus and upper border of the infraspinatus.

Based on anatomical, kinematic, and biomechanical studies, the lower trapezius transfer has been found to be the optimal transfer to reconstruct massive irreparable rotator cuff tear involving the posterior and superior portions of the rotator cuff. In addition to publications about the outcome of this transfer, there are numerous outcome studies confirming the reliability of the lower trapezius transfer.

Considerations for the Post-operative Lower Trapezius Tendon Transfer Rehabilitation Program
Respect the procedure. It is critical to the success of this surgery that the transferred tendon heal with the appropriate tension. Follow all range of motion, loading, and brace wearing instructions very carefully.

The lower trapezius has a new role. The lower trapezius has a new job of functioning like the rotator cuff to elevate and externally rotate the shoulder. It takes time to learn new movement patterns and activate transferred muscles correctly. Be patient and follow the protocol closely.

No Internal Rotation. Moving into internal rotation can overstretch the transferred tendon and affect the appropriate tension needed to maximize functional outcomes. Wear the brace as indicated, avoid reaching behind the back or placing hand on abdomen until cleared by surgeon. Physical therapists should not stretch the surgical arm into internal rotation.

Post-operative Complications
If you develop a fever, unresolving numbness/tingling, excessive drainage from the incision, uncontrolled pain or any other symptoms you have concerns about you should contact the surgical team.

PHASE I: MAXIMAL PROTECTION (0-8 WEEKS AFTER SURGERY)

Rehabilitation Goals	• Maximize protection of the transfer and facilitate healing • Follow bracing instructions closely. The arm must remain in a gunslinger sling to allow the transfer to heal at the appropriate tension • Patient education
Sling	• Remain fully immobilized in the sling at all times for the full 8 weeks
Precautions	• If removing sling for showering, keep arm at side with non-surgical arm supporting forearm in position of brace • No shoulder motion permitted • No weight bearing through surgical arm • No pushing and pulling
Interventions	• No formal physical therapy in this phase • Patient is allowed to move the elbow, wrist, and hand while in the brace, but absolutely no shoulder motion is permitted • Ice for pain and inflammation management
Criteria to Progress	• Appropriate healing time for tendon transfer (Not before 8 weeks, unless otherwise indicated by surgical team) • No complications with Phase I

PHASE II: ACTIVE ASSISTED/ACTIVE RANGE OF MOTION (8-16 WEEKS AFTER SURGERY)

Rehabilitation Goals	• Retrain transferred tendon functionally • Minimize post-operative stiffness while simultaneously protecting the tendon transfer • Begin to use arm within ranges of comfort for light ADLs – with the exception of motion into internal rotation, such as reaching hand behind the back • Reduce inflammation, minimize pain • Patient education emphasizing compliance of the post-operative protocol, specifically avoiding stretching and loading the tendon
Sling	• Sling can be gradually removed with physician's clearance

Precautions	• Once the sling is removed, active motion of the shoulder is allowed within ranges of comfort; avoiding stretching of the tendon • No stretching or passive range of motion at this time. Patient is cleared to use arm functionally to improve range of motion • Absolutely no internal rotation (for example, placing hand behind back or towards pants pocket). This can disrupt the correct tension of the transfer causing the procedure to fail • No weight bearing through surgical arm • No pushing or pulling
Interventions	*Range of motion/Mobility* • PROM: None. Do not stretch the arm • AAROM: Begin A/AAROM exercises to promote functional use of the surgical arm. Movements into scaption, ER, and a combination of both should be prioritized for retraining of the lower trapezius in its new role Supine Flexion AAROM (using contralateral UE), Supine AROM Flexion (initially to 90 degrees progressing to overhead ranges), Railing Slides, Standing Cane-Assisted Scaption, Towel Scaption Wall Slides ("V" pattern) *Strengthening* • Do not strengthen or load the operated arm • Core and hip strengthening is permitted, preventing any pushing or stress through the surgical arm Supine Core Alternating March *Conditioning* • Treadmill walking and stationary bike for cardiovascular health *Pool Therapy* • If available, active assisted range of motion is permitted in the pool within ranges of comfort. Feet must remain on the pool floor. Swimming is not permitted. Do not push or pull surgical arm or create resistance in the water
Criteria to Progress	• Appropriate healing time for tendon transfer (not before 16 weeks unless otherwise indicated by surgical team) • Minimal pain with AROM, appropriate recruitment of transferred tendon • No complications with Phase II

PHASE III: INITIAL STRENGTHENING (16-24 WEEKS AFTER SURGERY)

Rehabilitation Goals	• Continue to retrain transferred tendon functionally • Continue to use arm within ranges of comfort for ADLs • Improve scapular muscle activation • Patient education emphasizing compliance of post-operative protocol, specifically over-stretching and over-loading the tendon
Sling	• Discontinue
Precautions	• Gradual progression of lifting activities • No supporting of body weight by hands and arms • No aggressive stretching in all planes • Internal rotation is allowed once cleared by surgeon but no aggressive movements behind the back is permitted • No stretching into internal rotation, including manual stretching by physical therapist
Interventions	*Range of motion/Mobility* • PROM: None. Do not stretch the arm • A/AAROM: Continue with exercises to promote functional use of the surgical arm. Movements into scaption, ER, and a combination of both should be prioritized for retraining of the lower trapezius in its new role

	Strengthening • Initiation of gentle strengthening with low level resistance bands Supine: Supine Resisted Band ER (unilateral; isometric progressing to isotonic), Supine Bilateral Resisted Band ER (isotonic), Supine Press-Up (towel roll progressing to band; to 90 degrees progressing to overhead ranges), Supine Resisted Horizontal Abduction (isometric; at 90 degrees progressing to overhead ranges) Standing: Standing Resisted Band ER with elevation, Standing Row • Core and hip strengthening, while continuing to protect the surgical arm • Postural training and education *Conditioning* • Walking, jogging and stationary bike for cardiovascular health *Pool Therapy* • If available, range of motion is permitted in the pool within ranges of comfort. Swimming is still not permitted until Phase IV, feet must remain on the pool floor. Okay to perform breaststroke motion using upper extremities only
Criteria to Progress	• Good mechanics with active motion • No compensation when performing light resistance exercises • Ability to perform light, non-repetitive activities of daily living or work tasks without pain or difficulty

PHASE IV: ADVANCED STRENGTHENING (24+ WEEKS AFTER SURGERY)

Rehabilitation Goals	• Maintain pain-free ROM • Progress strength, endurance and motor control exercises • Enhance functional use of upper extremity • Gradual return to strenuous work/sport activity
Precautions	• No forceful or heavy lifting • Avoid falling • Avoid activities that are painful • No range of motion restrictions at this time
Interventions **Continue with Phase II-VI interventions*	*Strengthening* • Progressive strengthening, progressing to weights. Focus on low weights, high reps; proximal motor control and muscle endurance T and Y, Bicep Curl, Tricep Extension, Wall Push-Up • Proprioceptive training, including initiation of closed chain activities Quadruped alternating isometrics, ball stabilization on wall, PNF - D1 diagonal lifts, PNF – D2 diagonal lifts • Progress core and hip strengthening *Conditioning* • Walking, jogging and stationary bike for cardiovascular health *Pool Therapy* • Continue with pool exercises progressing toward swimming. Focusing on breaststroke motion
Criteria to Progress	• Last stage-no additional criteria

Return-to-Sport	• For the recreational or competitive athlete, return-to-sport decision making should be individualized and based upon factors including level of demand on the upper extremity, contact vs non-contact sport, frequency of participation, etc. We encourage close discussion with the referring surgeon prior to advancing to a return-to-sport rehabilitation program

References:

1. de Marinis, R., Marigi, E. M., Atwan, Y., Velasquez Garcia, A., Morrey, M. E., & Sanchez-Sotelo, J. (2024). Lower Trapezius Transfer Improves Clinical Outcomes With a Rate of Complications and Reoperations Comparable to Other Surgical Alternatives in Patients with Functionally Irreparable Rotator Cuff Tears: A Systematic Review. Arthroscopy : the journal of arthroscopic & related surgery : official publication of the Arthroscopy Association of North America and the International Arthroscopy Association, 40(3), 950–959.

2. Wagner ER, Elhassan BT. Surgical Management of Massive Irreparable Posterosuperior Rotator Cuff Tears: Arthroscopic-Assisted Lower Trapezius Transfer. Curr Rev Musculoskelet Med. 2020 Oct;13(5):592-604.