Rotator Cuff Repair Rehabilitation Guidelines

Critical Rehabilitation Principles

- Healing of a rotator cuff repair is influenced by the following factors:
    - Patient age – younger patients may heal better than older patients, but may be more susceptible to stiffness
    - Tear size – smaller tears heal better than larger tears
    - Tissue quality – repair of thicker, healthier tendon and acute tears is more successful than repair thin and frayed tissue in chronic tears
    - Tendon retraction – tendon that is not retracted far from the anatomic insertion footprint will heal more easily than one that is retracted, due to lower tension required for repair

- The first 6 weeks following rotator cuff repair are critical to the success of the rehabilitation. Emphasis needs to be on the protection of load across the repair so that the tendon can form a bridge of Type III collagen to bone. This bridge will be weak and will not withstand loading. Passive motion may be employed within range of motion limits to prevent stiffness and introduce gradual loading to the healing tendon to assist in fiber organization and maturation to Type I collagen. Pressure at the end of the range limitations (stretching) should be avoided for the first 6 weeks.

- Patients at a higher risk of stiffness include younger patients (< 50 years old) with smaller tears, prior adhesive capsulitis, diabetes, thyroid disorders, therefore patients with these risk factors should be carefully monitored for stiffness.

- Tendon integration into bone with Sharpey's fibers is not observed until 12 weeks postoperatively, therefore aggressive strengthening should be deferred until at least 12 weeks, and in the case of large/massive tears and/or poor tendon quality, perhaps as long as 16 weeks.

- Patient education at each stage of recovery about activity guidelines and rehabilitation principles is important for successful recovery.

- References

    - Thigpen C, Shaffer M, Gaunt B, Leggin B, Williams G and Wilcox R. The American Society of Shoulder and Elbow Therapists' consensus statement on rehabilitation following arthroscopic rotator cuff repair. *Journal of Shoulder and Elbow Surgery*. 2016 25(4):521-35.
    - Riboh JC, Garrigues GE. Early Passive Motion Versus Immobilization After Arthroscopic Rotator Cuff Repair. *Arthroscopy*. 2014 30(8):997-1005.

Our office will indicate on referral or surgery note whether the patient should follow the small/medium tear guidelines or the large/massive tear guidelines. If not indicated, please follow the large/massive protocol.

Phase I – 2 to 6 or 8 weeks postoperative (protective/healing phase)

Precautions and Activity Guidelines

- Wear sling at all times with abduction pillow in place, including sleep. Sling may be removed for basic hygiene, grooming, and exercises. After 2-3 weeks, sling may be removed for desk work while the arm is supported on an armrest.
- Sling wean:
    - Small/Medium tears – start at 4 weeks. Large/Massive tears – start at 6 weeks
    - Begin with removal of abduction pillow and sling off for short periods in a safe, controlled environment at home
    - Gradually increase time out of sling at home, and finally when out in the community over 2-4 weeks from beginning of sling weaning
- No active use of the operated arm on the ground (i.e. planks/push-ups), no weight bearing through the operated shoulder
- Avoid passive tension across repaired rotator cuff tendon(s) (i.e. no cross-body adduction for supraspinatus or infraspinatus repairs)
- Avoid ROM behind the back (i.e. no hand slides up the spine)
- Home exercises for shoulder passive ROM – deferred for 2 weeks for Small/Medium tears and 4 weeks for Large/Massive tears, within ROM restrictions in table below

Small/Medium Tears	Elevation	External Rotation	Sling
0-2 weeks	-	-	24/7 except for hygiene
2-4 weeks	0-90°	0-30°	24/7 except for hygiene and exercises
4-6 weeks	0-120°	0-45°	Slowly wean from sling

Large/Massive Tears	Elevation	External Rotation	Sling
0-4 weeks	-	-	24/7 except for hygiene
4-6 weeks	0-90°	0-30°	24/7 except for hygiene and exercises
6-8 weeks	0-120°	0-45°	Slowly wean from sling

- Isolated subscapularis repairs should be protected to 90° elevation and neutral (0° ER) for 3 weeks, and progress up to 30° ER from 3-6 weeks
- No pulley or cane-assisted elevation in this phase
- No driving while on narcotic pain medication
- Once weaned off pain medication, sling must be worn when driving unless otherwise cleared by our office
- May shower 5 days after surgery, suture removal 10-14 days postop
- No bathing/swimming until after suture removal and wounds healed
- Ice and elevation used in combination with medical for pain and swelling control
- Return to work as determined by MD/PT depending on work demands

Goals

- Patient education about the nature of surgery, associated precautions, and expected rehabilitation progression
- Protect rotator cuff repair and create an environment for optimal healing
- Control pain, swelling, and inflammation
- Achieve PROM limits established above
- Establish stable scapula

Exercises/PT Interventions

- Initial postoperative home exercises
    - Elbow, wrist, and hand AROM without weight
    - PROM (opposite arm assisted) for elbow flexion and supination for first 4 weeks if concomitant biceps tenodesis/tenotomy performed
    - Posture – Active seated and standing thoracic extension and scapular sets (retraction to neutral), depression and protraction, cervical ROM/upper trapezius stretch as needed
    - Pendulum – small circles with arm supported by non-operative arm for first 3 weeks, then unsupported for the remainder of the phase for small/medium repairs, continue supported pendulum for large/massive tears for all 6 weeks of phase I
- Home exercises (beginning at 2 weeks for small/medium tears and 4 weeks for large/massive tears)
    - Passive ROM – limit to 10 reps held for 10 seconds each to prevent constant load to rotator cuff repair, perform 3 times daily
        - Elevation – seated, standing, or table top-supported elevation in scapular plane within PROM limits; or supine self-assisted with nonoperative arm
        - ER – seated or supine self-assisted or wand-assisted ER in scapular plane within PROM limits
- Grade I/II mobilization as indicated for pain relief

- Aquatic therapy after 4 weeks (Small/Medium) or 6 weeks (Large/Massive) with shoulders totally submerged, slow active motion within ROM limits with cues such as “don’t let the water ripple”
- No ROM behind the back or cross-body adduction past midline in this phase

Criteria to Progress to Phase II

- Surgical repair in early healing by adhering to precautions and immobilization guidelines
- Staged PROM goals achieved
- Minimal to no pain

Phase II – 6 or 8 weeks to 12 weeks postoperative (motion recovery phase)

Precautions and Activity Guidelines

- Discontinue sling by the end of week 6-8 and may use arm actively at waist level with minimal weight – “nothing heavier than a coffee cup”, and not at or above shoulder height until able to do so with normalized mechanics and no pain
- No supporting of body weight by hands and arms
- No excessive behind the back movement
- PROM progressed towards normal, AAROM initiated and progressing towards AROM gradually
- As AROM is restored, ensure proper biomechanics of elevation with avoidance of “scapular shrug”
- Avoid inferior glides and distraction until after 12 weeks

Goals

- Continued protection of healing tissue with slow progression of activity (exercises and ADL’s from waist level first, and then slowly in more elevated positions)
- Restore full PROM
- Normalize AROM without over-stressing healing tissue
- Minimize pain and inflammation (may ice after exercise)

Exercises/PT Interventions

- Continue thoracic extension and scapular set (retraction to neutral plus depression) prior to any passive or active exercise for optimal positioning
- PROM to tolerance with gentle overpressure in all planes; may begin very gentle cross-body adduction and hand slide up spine, etc., in range without muscle splinting/guarding; may begin ER at 90° abduction in scapular plane
- Integrate grade 3/4 glenohumeral mobilization in anterior/posterior direction only, as needed prior to PROM

- AAROM: cane assisted forward elevation while supine – begin with bent elbow, progress to straight as able to control the short lever arm through range without pain; progress to inclined table top AROM (bent then straight elbow); progress to vertical supported on wall (bent then straight elbow); then vertical unsupported
- AROM: ER while laying on side; prone extension to hip (not past 20° extension) with end range scapular retraction; supine serratus punches; supine long lever arm motion in controlled range from balanced position
- Aquatic: no range restrictions; may add cross-body adduction and may progress as directed by MD/PT
- Submaximal isometrics for ER, IR, abduction, flexion, extension as indicated if not tolerating active motion progression
- Rhythmic stabilization in balanced position (90° elevation while supine) with submaximal force, gradually increase force and move out of balanced position - 60°, 120°, 150° of elevation
- Manually-resisted scapular protraction and retraction while laying on side

Criteria to Progress to Phase III

- Full passive ROM
- AROM with normalized mechanics for elevation without scapular shrug or other substitution patterns
- Pain level less than 2/10 with exercise and ADLs

Phase III – 3 to 6 months postoperative (active range of motion)

Precautions and Activity Guidelines

- Use of the arm at and above shoulder level may occur with light weight, as long as mechanics for elevation remain normalized
- Lifting up to 10 lbs. below shoulder level is allowed
- Normalization of ADLs, work, and recreational activity – gradual return, particularly for repetitive and overhead activities
- Gradual progression of exercises to restore strength, endurance, and work/sport specific movement
- Resistance exercises should only be initiated when there is full AROM with normalized mechanics

Goals

- Full AROM with normalized mechanics in all planes
- Normalized muscle strength in the rotator cuff, scapular stabilizers, and shoulder primary movers
- Return to ADLs, work and recreational activities without pain or disability

Exercises/PT Interventions

- UBE for active warm-up
- Continued end range stretching and mobilization as needed, particularly posterior capsule (cross-body adduction, sleeper stretch with scapula stabilized, ER > 90° for throwers/tennis)
- Rotator cuff strengthening: “full can” scaption, initially to 90°, then throughout range, no weight, to max 3-5 lbs. resistance; ER/IR strengthening with hand weights or theraband, initially below shoulder level, progressing to above shoulder level as needed for work or sport; emphasize high repetitions (30-50) with low resistance (1-5 lbs.), progress in increments of one pound when 30-50 reps are easy and painless
- Scapular stabilization exercises: Extension to hip and horizontal abduction with ER, either prone with hand weights or standing with theraband; serratus presses in supine with hand weight; serratus wall presses with shoulder in neutral and in ER, then progress to weight bearing on incline when well-controlled without scapular winging
- May begin biceps curls with weight at this point if a biceps tenodesis was performed in addition to the rotator cuff repair
- Deltoid: forward raises and lateral raises with bent elbow to 90° with light hand weight
- Use of weight-lifting machines (chest press, lat pull downs, seated row…) only anterior to the plane of the body; incorporate scapular work to end range; low resistance and high reps
- Combined muscle patterns: PNF diagonals progressing from supine to standing, seated on ball for core added, progressing resistance from none to theraband or hand weight
- Aquatics: may do full motion for all exercises, with cupped hand, progressing to use of gloves or paddle for added resistance and then increasing speed of movement
- Advanced strengthening activities useful for overhead athletes or heavy laborers: plyoball chest passes on minitramp; body blade ER neutral, 90° elevation in scapular plane; sports specific arm movement simulation with theraband or body blade (i.e. tennis swing)

Criteria for Return to Work/Sport

- Clearance from physician
- Pain-free at rest and minimal pain with the work or sport specific activity simulation
- Sufficient ROM and strength with normalized mechanics for the activity