Rehabilitation Guidelines for Small-Medium (<3 cm) Rotator Cuff Repairs in Adults

About the Rotator Cuff

The rotator cuff (RTC) is comprised of four muscles that surround the shoulder joint: the supraspinatus, infraspinatus, teres minor, and subscapularis. The RTC muscles serve several purposes: 1) assist in stabilization of the shoulder joint with movement; 2) produce shoulder joint rotation and elevation.

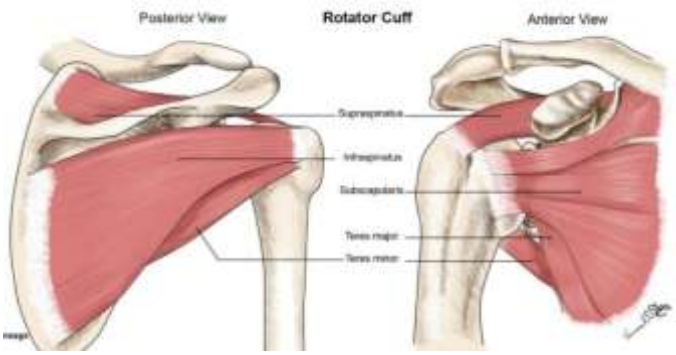

Image 1: Anatomy of the rotator cuff

Mechanism of Injury

Because of its location at the superior aspect of the shoulder joint, the most commonly injured RTC muscle is the supraspinatus. However, with repetitive overhead activity or traumatic injury, any of the four RTC muscles may be involved. A RTC tear can occur from a traumatic event, such as falling on an outstretched hand, or more commonly in a chronic degenerative fashion. Full thickness rotator cuff tears do not heal on their own and tend to increase in size over time.

A RTC tear commonly results in pain around the shoulder or at the lateral/outside side of the arm. A RTC injury may also be relatively pain-free for long periods of time depending on the mechanism of injury. Following an injury to the RTC, it may be difficult to lift or rotate the arm. Patients with RTC involvement often have difficulty sleeping or pain that wakes them at night. Patients often report weakness and fatigue of the involved shoulder.

Diagnosing a RTC Tear

There are several methods used to diagnose a RTC tear. Your healthcare provider will assess the shoulder through a physical exam. They will use evidence-based examination techniques to assess the performance of the RTC as well as the function of surrounding body regions.

Several diagnostic imaging procedures are also used to assess the RTC. Radiographic (x-ray) images are initially used to assess the bony alignment of the shoulder and evaluate for arthritis. Magnetic resonance imaging (MRI) may often be ordered to visualize the soft tissue structures, (muscles, tendons, and ligaments) and is highly accurate in diagnosing RTC injuries. Diagnostic ultrasound may also provide the opportunity to visualize the RTC muscles dynamically to assess their functionality.

Treatment Options for a RTC Tear

Treatment options are individualized to the patient, with consideration for age, activity level, and degree of impairment to daily function. Research shows that physical therapy based, non-operative treatment can provide long lasting pain relief and allow full return to previous activity levels depending on injury severity. Cortisone injections may also be used sparingly, although multiple injections may be associated with negative consequences.

If surgery is indicated, repair of the RTC involves re-attaching the torn tendon back to the bone. This repair is performed by placing sutures through the involved tendon(s) and securing them with anchors placed into the humerus. Factors that guide the decision for surgical repair include: 1) characteristics of the tear; 2) length of time from original injury; 3) sport/work requirements; 4) age; and 5) overall physical health.

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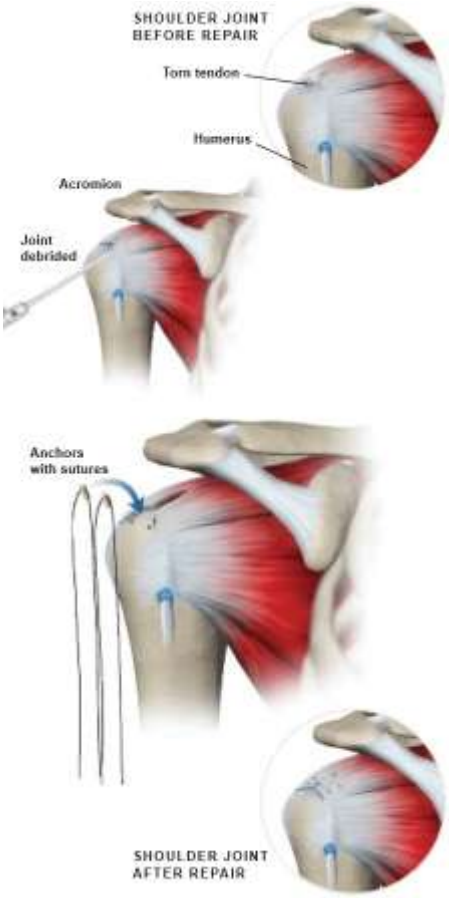

Image 2: Example of repair process

Rehabilitation Following Surgical Repair

All patients will undergo 6-9 months of physical therapy guided rehabilitation, divided into phases, focusing on intentionally progressing you back to your daily activities, hobbies, and sports. The progression through these phases is dependent on factors related to the surgical procedure performed, time out from surgery and the passing of objective functional tests guided by your physical therapist. Rehabilitation is affected by the quality of the tissue being repaired. Age, tear size, muscles involved, and tendon retraction (increased distance from the torn tendon to its attachment) will lengthen the progression of rehabilitation.

Larger tears (greater than 3cm) and the involvement of multiple muscle groups will create a greater area of healing tissue. Slowing the progression through rehabilitation phases will give these tissues time to heal without additional stress; therefore, the rehab process for larger tears progresses slower to increase the odds of adequate tissue healing. Additional precautions, like the use of a pillow between the sling and body, may be used to assist with the reduction of tissue stress post-operatively.

Phase I of rehabilitation focuses on decreasing pain and post-operative inflammation, increasing shoulder comfort, and preserving some range of motion through therapist-led mobility, where the shoulder is moved passively (without the patient utilizing recovering muscles). **Phases II and III** focus on developing increasing shoulder range of motion. During these phases, the patient is allowed to progressively assist in performing arm motion, until able to perform all motions without assistance. **In phase III**, RTC and progressive strengthening is initiated. This strengthening is progressed with the goal of performing all activities of daily living by the end of **phase IV**. During **phase V**, the patient transitions to developing speed and power of arm movements. It is in this phase that a progressive return to throwing program and sport-specific exercises can be initiated, under guidance of your sports medicine team.

In order to safely return to sport-specific activities, a patient must first achieve certain functional goals (see Appendix D for reference) and associated physician and sports medicine team approval. Once these goals have been achieved, your sports medicine team will continue to put you through criterion-based functional tests to determine the ability to safely return to sport. After satisfactory performance on these tests, you will progress through a return-to-sport program to return to pre-injury levels of performance. A referral to a strength and conditioning specialist may also be made to assist in returning you to pre-injury performance levels.

Rehabilitation Guidelines for Rotator Cuff Repair: Small-Medium Tear

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Rehabilitation Guidelines for Rotator Cuff Repair: Small-Medium Tear

Rehabilitation Guideline

Rotator cuff repairs (RCR) are commonly performed following a rotator cuff tear. The protocol outlined in this document is designed for the rehabilitation of general, small-medium RCR. When there are additional structures involved, or poor tissue quality, rehabilitation following surgery will need to be adjusted. Several common findings and adjustments to the rehabilitation protocol are included for consideration.

Rehabilitation Guidelines for Rotator Cuff Repair: Small-Medium Tear

Phase I: 0-4 weeks post-surgery	
Appointments	Surgeon/Physician Assistant follow-up: 7-10 days post-op Start Physical Therapy: 1 appointment @ 7-10 days post-surgery for activity modification review (then 1-2 visits per week starting 4-6 weeks post-op)
Precautions	Post-op Sling: worn at all times until cleared by physical therapist • Okay to remove for performance of home program as directed by a physical therapist Mobility: No active movement (particularly lifting/reaching) or aggressive passive movement/stretching • Specifically limit passive ROM to scaption (vs flexion) and external rotation
Rehabilitation Goals	• Protect surgical repair with consistent sling use • Minimize post-operative pain and reactive inflammation • Progress **passive** range of motion (ROM) within parameters below
Range of Motion	ALL passive movement • Flexion to 120^0 • External rotation to 45^o **Modifications for concomitant procedures:** • Subscapularis repair: o External rotation to neutral (0^o) only o No abduction • Biceps long-head tenodesis o No straight arm extension or horizontal abduction
Therapeutic Interventions *(Examples, but not limited to…)*	General post-operative education – emphasis on protection of repair • Sleeping positions while immobilized in sling: on back, with a pillow propped underneath the arm. Recliner chair may be recommended / best tolerated • Precautions: – High repair load in positions of relaxed arm-by-side position – NO active movement of arm – Intentional movements (no sudden movements) – Outline rehabilitation goals and timeline Management of post-operative inflammation: • Ice/cooling: up to 6x/day or as needed for pain (20 mins on every two hours PRN) Scapular activation and mobility • Isolated scapular PNF drills – Passive: therapist applied in side-lying – Active: patient performed **in sling** Hand/wrist and elbow/forearm AAROM/AROM (supine and seated in sling) • **Modifications for concomitant procedures:** – Biceps long-head tenodesis: no loaded elbow flexion or supination until 6 weeks post-op
Criteria for Progression to Next Rehabilitation Phase	✓ No sooner than 4 weeks ✓ Sling compliance and associated pain reduction ✓ Achieve **passive** ROM goals (see parameters above)

If multiple concomitant procedures done, default to highest precautions for protocol progression. Please consult surgeon for protocol.

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Rehabilitation Guidelines for Rotator Cuff Repair: Small-Medium Tear

Phase II: 4-8 weeks post-surgery	
Appointments	Surgeon/Physician Assistant follow-up: 6 weeks post-op Physical Therapy appointments: 1-2 visits per week (starting at 4-6 weeks post-op)
Precautions	Post-op Sling: worn at all times until cleared by physical therapist • Ok to remove for home program as directed by a physical therapist Mobility: No active movement (particularly lifting/reaching) or aggressive passive movement/stretching
Rehabilitation Goals	• Protect surgical repair with continued sling use (through week 6) • Progress **passive** range of motion (ROM) within parameters below • Begin submaximal rotator cuff (RTC) muscle activation
Range of Motion	PROM: • Flexion to 140^0 • External rotation to 60^o AAROM: (dowel, pulley, band-assisted) • Flexion to 120^0 • External rotation to 45^o **Modifications for concomitant procedures:** • Subscapularis repair: o External rotation to neutral (0^o) only o No abduction • Biceps long-head tenodesis o No straight arm extension or horizontal abduction
Therapeutic Exercises *(Examples, but not limited to…)*	Shoulder complex muscle activation: • Rotator cuff (RTC) muscle activation – Introduce in a neutral shoulder position at a submaximal level (~25% MVIC) – **Modifications for concomitant procedures:** ▪ Subscapularis repair: no resisted IR until week 12 • Scapular activation and mobility – Isolated scapular PNF drills ▪ Serratus anterior and lower trap activation focus if ROM is appropriate • Hand/wrist and elbow/forearm AROM and grip progressions – Light-resisted wrist flex/ext with UE supported – Light-resisted triceps extension, shoulder neutral – **Modifications for concomitant procedures:** ▪ Biceps long-head tenodesis: no isolated elbow flexion or supination until 6 weeks post-op Cardio • Upright bike – without UE support • Treadmill interval walking (in sling until week 6 to minimize arm swing) o Speed and incline progressions Post-op sling weaning *(see criteria below)* • Begin with 1 hour in home environment daily starting week 6 post-op – Progress 1-2 hours each day until pain-free with 4-6 hours out of sling at end of week 6
Criteria for Discontinuation of Sling	✓ No sooner than 6 weeks post-op ✓ No pain with arm resting at side for > 10 min ✓ Ability to maintain mobility restrictions / activity modifications without sling
Criteria for Progression to Next Rehabilitation Phase	✓ Full procedure-specific PROM / AAROM (within parameters above) ✓ Consistently out of sling for all ADL/IADL tasks without reactive pain or mobility loss

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Post-op Rotator Cuff Repair: Sling Weaning Progression

Day 1	Out of sling for **1 hour** / In sling for 1 hour – repeat Continue to sleep in the sling
Day 2	Out of sling for **2 hour** / In sling for 1 hour – repeat Continue to sleep in the sling
Day 3	Out of sling for **3 hour** / In sling for 1 hour – repeat Continue to sleep in the sling
Day 4	Out of sling for **4 hour** / In sling for 1 hour – repeat Continue to sleep in the sling
Day 5	Out of sling for **5 hour** / In sling for 1 hour – repeat Continue to sleep in the sling
Day 6	Out of sling for **6 hour** / In sling for 1 hour – repeat Continue to sleep in the sling
Day 7	Out of sling for **full day**, but use as needed Continue to sleep in the sling
Day 8	Full day out of sling (including sleeping out of sling)

***If you notice shoulder soreness that lasts longer than 24 hours, repeat the previous day before progressing hours out of the sling.*

***If you have a job that requires more manual specific labor / use of your arms, it is recommended that during this weaning process you still wear your sling at work.*

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Rehabilitation Guidelines for Rotator Cuff Repair: Small-Medium Tear

Phase III: 8-10 weeks post-surgery	
Appointments	Physical Therapy appointments: 1 visit per week
Precautions	Limit any sudden lifting, reaching, pulling, pushing or jerking motions Load restrictions: no lifting greater than 10-15 lbs
Rehabilitation Goals	• Progress to full passive ROM and increase AAROM and AROM in flexion and ER (see parameters below) • Promote healing of soft tissue • Initiate low load with RTC muscle activation

Range of Motion	PROM: full / symmetrical to non-surgical UE in all planes
	AAROM: (dowel, pulley, band-assisted)
	• Flexion to 160^0 +
	• External rotation to 80^{o+}
	AROM:
	• Flexion to 140^0 +
	• External rotation to 60^0 +
	Modifications for concomitant procedures:
	• Subscapularis repair:
	  ○ PROM external rotation to 30^o only
	  ○ PROM abduction to 45^o only

Therapeutic Exercises
(Examples, but not limited to…)
 	
Consider use of fist grip emphasis with early phase RTC mm activation and load to promote proximal glenohumeral joint stability
	Post-op sling weaning:
	• Progress out of sling activity to include ADL tasks / light activity with the shoulder below 30^o flexion at week 8
	
	Early phase strengthening:
	• Rotator cuff (RTC) muscle activation
	  – Introduce in a neutral shoulder position at a submaximal level (~50% + MVIC with increased isometric hold duration)
	  – Side-lying / seated RTC AROM progressions
	  – Side-lying shoulder scaption to 90^o
	• Scapular activation and mobility
	  – Prone scapular retraction
	  – Unloaded, supine serratus punches & seated shoulder shrugs
	• Hand/wrist and forearm/elbow complex progressions
	  – Initiate light-resisted elbow flexion and light-resisted forearm supination at **8 weeks**
	
	Late phase strengthening:
	• Rotator cuff (RTC) muscle activation
	  – Introduce in a neutral shoulder position at a submaximal level (~75% + MVIC with increased isometric hold duration)
	  – Band-resisted RTC strengthening
	  – Side-lying shoulder abduction to 90^o
	  – Side-lying shoulder horizontal abduction to neutral
	  – Seated/standing shoulder scaption AROM to 90^o
	• Scapular activation and mobility
	  – Light load (<10 lbs) single arm suitcase carries
	  – Supine / standing loaded serratus punches
	• Hand/wrist and forearm/elbow complex progressions
	  – Introduction of grip variety with all RTC activation and strength progressions
	  – Consider rate of force development focus with isolated grip strength tasks

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Rehabilitation Guidelines for Rotator Cuff Repair: Small-Medium Tear

	Cardio: appropriate to begin jogging at 8-10 weeks per PT and physician clearance **Modifications for concomitant procedures:** • Subscapularis repair: no resisted IR until week 12
Criteria for Progression to Next Rehabilitation Phase	✓ Full, procedure-specific PROM, AAROM and AROM in all planes (see parameters above) ✓ Tolerance to early and late-phase strengthening without reactive pain > 2/10

Phase IV: 10-16 weeks post-surgery	
Appointments	Surgeon/Physician Assistant follow-up: 12 weeks post-op Physical Therapy appointments: 1 visit every other week
Precautions	Limit any sudden lifting, reaching, pulling, pushing or jerking motions • Load restrictions: no lifting greater than 10-15 lbs
Rehabilitation Goals	• Progress to full ROM (see parameters below) • Progress RTC muscle load tolerance
Range of Motion	PROM & AAROM: full / symmetrical to non-surgical UE in all planes AROM: • Flexion to 160^0 + • External rotation to 80^0 + **Modifications for concomitant procedures:** • Subscapularis repair: ○ AROM external rotation to 30^o only ○ AROM abduction to 90^o only
Therapeutic Exercises ***(Examples, but not limited to…)*** ***Consider use of fist grip emphasis with progressive RTC mm load to promote proximal glenohumeral joint stability***	Strengthening • Rotator cuff (RTC) muscle activation – Progress isometric shoulder ER in planes of increasing shoulder abduction – Progress band-resisted RTC strengthening in planes of increasing shoulder abduction – Long-lever stability holds: supine serratus hold / side-lying T hold • Scapular activation and mobility – Low load, low volume closed-kinetic-chain progressions ▪ Incline plank ▪ Quadraped plank • Hand/wrist and forearm/elbow complex progressions – Progress rate of force development focus with isolated grip strength tasks in all planes of shoulder mobiltiy Cardio: appropriate to begin linear speed progressions as tolerated **Modifications for concomitant procedures:** • Subscapularis repair: no resisted IR until week 12
Criteria for Progression to Next Rehabilitation Phase	✓ Full, procedure-specific AROM in all planes (see parameters above) ✓ Tolerance to all strengthening and load progressions without reactive pain > 2/10 ✓ Shoulder IR and ER strength to at least 60% LSI (compared to non-operative limb) ✓ Completion of ADLs without pain

Rehabilitation Guidelines for Rotator Cuff Repair: Small-Medium Tear

Phase V: 16-24 weeks post-surgery	
Appointments	Physical Therapy appointments: 1 visit every 2-3 weeks Surgeon/Physician Assistant follow-up: 6 months post-op
Precautions	Avoid activities that create substitution patterns for muscle activation
Therapeutic Exercises	Strengthening: • Rotator cuff (RTC) muscle activation – Progressive weight, band and cable-resisted RTC loading at increasing angles of shoulder abduction – Forward scaption and lateral raises with progressive load – W position and overhead carry progressions • Scapular activation and mobility – Progress closed-kinetic-chain volume and load as tolerated ▪ Full plank and side plank progressions ▪ Fwd/rev bear crawl tasks Plyometrics: (if appropriate strength and motor control criteria met – **Appendix E)** • Double arm med ball drills o Med ball slams, med ball scoop toss, med ball chest pass o Med ball rotational throws • Single arm plyo ball drills o Plyo ball overhead wall dribbles o Reverse D2 pattern throws Cardio: appropriate to participate in team-based conditioning as appropriate
Rehabilitation Goals / Criteria for Return to Sport	See **Appendix E**

***Important to continue participation in ongoing preventative strength, power and motor control exercises at return to sport**

All physical therapy appointment frequencies are recommendations only. Your physical therapy provider will work with you to select an appointment frequency that best fits your individual needs.

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