



Tri-Service Post-Operative Rehabilitation Guidelines

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Rotator Cuff Repair Rehabilitation

These guidelines were created as a framework for the post-operative rehabilitation program. They DO NOT substitute for any specific restrictions or requirements that are determined through the necessary shared decision-making and collaboration between the operating surgeon and treating rehabilitation team.

PHASE 1: Generally 0 to 5-8 Weeks Post-Op																					
GOALS:	1) Control pain and swelling 2) Protect the surgical repair 3) Protect wound healing 4) Normal elbow/wrist ROM 5) Begin early shoulder motion: PROM to 90° ABD and 90° FLEX for small and medium tears																				
PRECAUTIONS:	<ul style="list-style-type: none"> - NO lifting - NO push-ups or other sports participation - NO supporting of body weight by hands - NO AROM - Sling AT ALL TIMES except while performing rehab exercises x 4-8 weeks - For <u>subscapularis repair</u>: ER limited at Ortho's discretion 																				
ROM & SLING:	<ul style="list-style-type: none"> - Avoid gaining ROM too quickly by adhering to the following: <ul style="list-style-type: none"> • Forward FLEX: table slides in hammer grip only; progress as pain allows • Passive ER (i.e. with stick) per Ortho's direction • Modified pendulums; progress to full as tolerated <table border="1" style="width: 100%; text-align: center;"> <thead> <tr> <th>Tear Size</th> <th>Sling Use</th> <th>Begin PROM</th> <th>Begin AROM</th> </tr> </thead> <tbody> <tr> <td>Small 0 - 1 cm²</td> <td>4 weeks</td> <td>Immediate</td> <td>4 weeks</td> </tr> <tr> <td>Medium 1 - 3 cm²</td> <td>6 weeks</td> <td>Immediate</td> <td>6 weeks</td> </tr> <tr> <td>Large 3 - 5 cm²</td> <td>6 - 8 weeks</td> <td>6 - 8 weeks</td> <td>8 weeks</td> </tr> <tr> <td>Massive > 5 cm²</td> <td>6 - 8 weeks</td> <td>6 - 8 weeks</td> <td>8 weeks</td> </tr> </tbody> </table>	Tear Size	Sling Use	Begin PROM	Begin AROM	Small 0 - 1 cm ²	4 weeks	Immediate	4 weeks	Medium 1 - 3 cm ²	6 weeks	Immediate	6 weeks	Large 3 - 5 cm ²	6 - 8 weeks	6 - 8 weeks	8 weeks	Massive > 5 cm ²	6 - 8 weeks	6 - 8 weeks	8 weeks
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Massive > 5 cm ²	6 - 8 weeks	6 - 8 weeks	8 weeks																		
WOUND:	<ul style="list-style-type: none"> - Post-op dressing removed at PT eval - Shower at post-op day #3 																				

	<ul style="list-style-type: none"> - Submerge in water <u>after</u> wound is fully healed - Suture removal @ 7-14 days post-op by Ortho
MODALITIES:	<ul style="list-style-type: none"> - Cryotherapy <ul style="list-style-type: none"> • Hourly for 15 minutes for the first 24 hours <u>after</u> sensation is restored from nerve block • Continue use until acute inflammation is controlled • Once controlled, use 3x per day for 15 minutes or longer as tolerated - Soft tissue mobilization and other integrative medicine techniques <ul style="list-style-type: none"> • Soft tissue/trigger point work to the kinetic chain (i.e. cervical spine, scapula, and forearm)
REHABILITATION:	<ul style="list-style-type: none"> - Frequent use of cryotherapy and/or ice - Exercise prescription is dependent upon the tissue healing process and <u>individual</u> functional readiness in <u>all</u> stages. If any concerns or complications arise regarding the progress of any patient, PT should contact Ortho. - Healing of the RC tendon(s) to the humerus can take 8-12 weeks - As tolerated, progress rehabilitation exercises as wound healing occurs and the inflammatory response decreases
	<ul style="list-style-type: none"> - ROM exercises: <ul style="list-style-type: none"> • Shoulder PROM for small and medium tears only within listed ROM guidelines in non-impingement position (i.e. hammer grip) • Scapular retractions, shoulder shrugs, and scapular depressions • Modified pendulums in sling; progress to full pendulums after 3-5 days - Strengthening: <ul style="list-style-type: none"> • Hand squeezing exercises • Elbow/wrist AROM & grip strengthening with shoulder in neutral position at side • Gentle sub-maximal (“2-finger”) shoulder isometrics for shoulder FLEX, ADD, EXT, and ABD (no IR/ER) - Cardiovascular training: <ul style="list-style-type: none"> • Recumbent bike <u>while wearing sling</u> • NO running or high-impact activity for aerobic training
FOLLOW-UP:	<ul style="list-style-type: none"> - Supervised rehab: 1-2x per week - PT re-eval: ~10-14 days - Ortho re-eval: ~2 weeks

PHASE 2: Generally 5-8 Weeks Post-Op

GOALS:	<ol style="list-style-type: none"> 1) AAROM for FLEX and ABD to 120° for small and medium tears 2) PROM for FLEX and ABD to 90° for large and massive tears 3) Progressing passive ER 4) Pain-free ADLs
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PRECAUTIONS:	<ul style="list-style-type: none"> - NO lifting > 10 lbs - NO overhead motions - Avoid impingement positions, moderate or higher level exertional activities with involved arm, and high impact aerobic training
ROM & SLING:	<ul style="list-style-type: none"> - Wean from sling - Progress ROM as tolerated
REHABILITATION:	<ul style="list-style-type: none"> - ROM exercises - Trunk stabilization (NWB) - Scapular strengthening emphasizing scapular retractors and upward rotators - Modalities PRN - Cardiovascular training: continue recumbent bike; progress to elliptical (no push/pull with surgical arm) and/or treadmill walking - Adjunct treatments to consider: dry needling, cervicothoracic manual therapy, aquatic walking with water at chest level or below (no UE movement or resistance; no swimming)
FOLLOW-UP:	<ul style="list-style-type: none"> - Supervised rehab: 2-4x per week as needed - PT re-eval: every 2 weeks - Ortho re-eval: 6 weeks
CRITERIA FOR PROGRESSION:	<ul style="list-style-type: none"> - Full ROM - Minimal pain and pain-free ADLs - D/C sling

PHASE 3: Generally 9-16 weeks Post-Op

GOALS:	<ol style="list-style-type: none"> 1) Normal ROM in all planes 2) Initiate strength training 3) Running progression protocol as indicated
PRECAUTIONS:	<ul style="list-style-type: none"> - Minimize pain and any inflammatory response
REHABILITATION:	<ul style="list-style-type: none"> - ROM exercises - Trunk stabilization (FWB) - Scapular strengthening emphasizing scapula retractions and upward rotators - Initiate strengthening as ROM normalizes, starting with high reps/low loads progressing to low reps/high loads - Modalities PRN - Cardiovascular training: continue recumbent bike, elliptical, and/or treadmill walking; consider initiating a running progression - Adjunct treatments to consider: dry needling, manual therapy to GH joint and cervicothoracic regions, aquatic walking with water at chest level or below (no UE movement or resistance; no swimming)

FOLLOW-UP:	<ul style="list-style-type: none"> - Supervised rehab: 1-2x per week as needed - PT re-eval: every 2 weeks - Ortho re-eval: 12 weeks
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PHASE 4: Generally 4-6 Months Post-Op	
GOALS:	<ol style="list-style-type: none"> 1) Pain-free ADLs 2) Shoulder strength equal bilaterally 3) Meet occupational requirements at 4-6 months 4) Pain-free functional/sports drills
REHABILITATION:	<ul style="list-style-type: none"> - Advanced specific, functional, and individualized training to achieve Phase 4 goals (i.e. lift, pull, carry, and climb in unloaded/loaded conditions)
FOLLOW-UP:	<ul style="list-style-type: none"> - Supervised rehab: 1-2x per week as needed with gradual transition to home program - PT re-eval: monthly - Ortho re-eval: ~6 months post-op
MISCELLANEOUS:	<ul style="list-style-type: none"> - Pass Service fitness test at 9-12 months - Progress activities for return to sport/collision sports or aggressive military training (i.e. airborne school) based on the patient's functional performance and endurance. This time period will be directed by the Ortho Surgeon and the Physical Therapist. This may require between 6-12 months before cleared without restrictions.

References:

- Brotzman SB. Clinical Orthopaedic Rehabilitation. *Elsevier*. 2011.
- Denard PJ, Ladermann A, Burkhart SS. Prevention and management of stiffness after arthroscopic rotator cuff repair: systemic review and implications for rotator cuff healing. *Arthroscopy: The Journal of Arthroscopic and Related Surgery*. 2011; 27(6): 842-848.
- Dockery ML, Wright TW, LaStayo PC. Electromyography of the shoulder: an analysis of passive modes of exercise. *Orthopedics*. 1998; 21(11): 1181-1184.
- Ellsworth AA, Mullaney M, Tyler TF, et al. Electromyography of selected shoulder musculature during un-weighted and weighted pendulum exercises. *North American Journal of Sports Physical Therapy*. 2006; 1(2): 73-79.
- Kluczynski MA, Isenburg MM, Marzo JM, Bisson LJ. Does early versus delayed active range of motion affect rotator cuff healing after surgical repair: a systematic review and meta-analysis. *American Journal of Sports Med*. 2016; 44(3): 785-791.
- Lee BG, Cho NS, Rhee YG. Effect of two rehabilitation protocols on range of motion and healing rates after arthroscopic rotator cuff repair: aggressive versus limited early passive exercises. *Arthroscopy: The Journal of Arthroscopic and Related Surgery*. 2012; 28(1): 34-42.

- Li S, Sun H, Luo X, Wang K et al. The clinical effect of rehabilitation following arthroscopic rotator cuff repair: a meta-analysis of early versus delayed passive motion. *Medicine*. 2018; 97(2).
- Littlewood C, Bateman M, Clark D, Selfe J, et al. Rehabilitation following rotator cuff repair: a systematic review. *Shoulder & Elbow*. 2015; 7(2): 115-124.
- Saul KR, Hayon S, Smith TL, et al. Postural dependence of passive tension in the supraspinatus following rotator cuff repair: a simulation analysis. *Clinical Biomechanics*. 2011; 26: 804-810.
- Sheps DM, Silveira A, Beaupre L, Styles-Tripp F, et al. Early active motion versus sling immobilization after arthroscopic rotator cuff repair: a randomized control trial. *Arthroscopy*. 2019; 35(3): 749-760.
- Saltzman BM, Zuke WA, Go B, Mascarenhas R, et al. Does early motion lead to a higher failure rate or better outcomes after arthroscopic rotator cuff repair? A systematic review of overlapping meta-analyses. *J Shoulder Elbow Surgery*. 2017; 26(9): 1681-1691.
- Shen C, Tang ZH, Hu JZ, Zou GY, et al. Does immobilization after arthroscopic rotator cuff repair increased tendon healing? A systematic review and meta-analysis. *Arch Orthop Trauma Surg*. 2014; 134(9): 1279-85.
- Thigpen CA, Shaffer MA, Gaunt BW, Leggin BG, Williams GR, Wilcox RB. The American Society of Shoulder and Elbow Therapists' consensus statement on rehabilitation following arthroscopic rotator cuff repair. *J Shoulder Elbow Surg*. 2016; 25: 521-535.