SANFORD
ORTHOPEDICS
SPORTS MEDICINE

Rotator Cuff Repair Large to Massive (>5cm) Rehabilitation Guideline

This rehabilitation program is designed to return the individual to their activities as quickly and safely as possible. It is designed for rehabilitation following large to massive rotator cuff repairs. Modifications to this guideline may be necessary dependent on physician specific instruction, size and location of tear, tendons involved, acute vs. chronic condition, length of time immobilized, age, first versus revision, pre morbid function, tissue quality, fatty infiltration and atrophy, smoking, hypercholesterolemia and diabetes. This evidence-based large to massive rotator cuff repair physical therapy guideline is criterion-based; time frames and visits in each phase will vary depending on many factors- including patient demographics, goals, and individual progress. This guideline is designed to progress the individual through rehabilitation to full sport/ activity participation. The therapist may modify the program appropriately depending on the individual's goals for activity.

This guideline is intended to provide the treating clinician a frame of reference for rehabilitation. It is not intended to substitute clinical judgment regarding the patient's post-operative care based on exam/treatment findings, individual progress, and/or the presence of concomitant procedures or post-operative complications. If the clinician should have questions regarding post-operative progression, they should contact the referring physician.

General Guidelines/ Precautions:

- Immediate post-operative precautions expected
    - No movements beyond neutral extension
        1. Keep pillow or towel roll under the arm when lying on back
        2. Patient should always be able to see his/her elbow
    - No reaching behind back
    - No lifting, pulling or pushing of objects with the involved upper extremity
    - No pushing off with involved upper extremity during transfers
    - No active range of motion
    - No aggressive, painful passive range of motion or stretching that promotes muscle over-activity or spasm.
- Bracing generally for 6-8 weeks per physician approval
- Protected PROM considered during the first 6-8 weeks
- AROM initiated at 8 weeks within the range that shows good mechanics and no pain (weight of arm only).

- Strengthening initiated at week 12
- Return to sport (generally 6-9 months)
    - Physician approval
    - Full ROM
    - Strength within 10% of contra lateral side.
    - Shows confidence with sport specific training with pain 0-2 on NPRS.
    - Independent strength program recommended for at least one year post surgery
- Anatomic failure is associated with increasing age, poor tissue quality, fatty infiltration, atrophy, smoking, hypercholesterolemia and diabetes.
    - Anatomic failure tends to occur in the first 3-6 months.
- Special considerations that are not accounted for in below guideline:
    - Subscapular repair
        1. 0-4 weeks: ER to neutral
        2. 4-6 weeks: gentle passive ER from neutral to patient tolerance
        3. Extension limited to neutral for 6 weeks
        4. 6+ weeks: gentle stretching into ER
        5. No resisted IR for 12 weeks
    - Biceps tenodesis
        1. No active elbow flexion for 6 weeks

Updated 12/2016

Rotator Cuff Repair (Large to Massive) Rehabilitation Guideline (6-9 months to expected D/C)

Phase	Suggested Interventions	Goals/ Milestones for Progression
Phase I *Patient Education Phase* Prior to surgery	*Discuss:* Anatomy, existing pathology, post-op rehab schedule, bracing, precautions and expected progressions *Immediate Post-Operative instructions*: • Pendulum hang position • Pendulum forward/back and side to side with <7inch arc may be initiated at 2 weeks • Elbow, wrist and hand AROM with no weight	*Goals of Phase:* 1. Improve ROM and strength to tolerance prior to surgery. 2. Appropriate expectation framework for post-operative rehabilitation. *Criteria to Advance to Next Phase:* 1. Progress to Phase II post-operatively
Phase II *Maximum Protection Phase* Weeks 0-4 Expected visits: 2-4	*Discuss:* Anatomy, existing pathology, post-op rehab schedule, bracing, precautions, posture and expected progressions *Specific Instructions:* • No movements beyond neutral extension • No reaching behind back • No lifting, pulling or pushing including during transfers • No AROM of involved shoulder • No aggressive, painful PROM or stretching *Suggested Treatments:* Modalities as indicated: Edema and pain controlling treatments as needed Range of motion: • AROM: - Neck, elbow, wrist and hand - Scapular retraction/depression to neutral (elbow not behind back) - Active thoracic extension • PROM - Passive pendulum: forward/back, side/side. Less than 7 inch arc - Therapist assisted passive ER in supine • Manual therapy - Can initiate grade I-II glenohumeral mobs in the plane of the scapula. Directions include: posterior, anterior and long axis traction.	*Goals of Phase:* 1. Protect repair 2. Prevent contractures above and below shoulder joint 3. Manage inflammation and pain 4. Gradual improvements in passive range of motion per guidelines *Criteria to Advance to Next Phase:* 1. Controlled post-operative pain 2. PROM of ER in scapular plane: 20 degrees

	Suggested Interventions	Goals/ Milestones for Progression
	- Thoracic PA mobs can be done: seated weeks 1-2. Can do prone weeks 2-4 if tolerated. *Other Activities:* HEP prescription	
Phase III *Healing/protective phase* Weeks 4-6 Expected visits: 2-4	*Specific Instructions:* • Continue with previous exercise program • Continue sling use unless resting at home • Continue precautions from previous phase • Avoid forward head rounded shoulder posture and promote thoracic extension *Suggested Treatments:* • PROM - Initiate self-assisted passive ER with a stick upright and/or supine. In supine limit extension with towel roll. - Initiate therapist assisted flexion PROM in supine - Progress supine passive ER with stick from 30 degrees to 60 degrees abduction per tolerance. - Gentle , passive, pain free supine IR in the plane of the scapula to 30 degrees • AROM/Strength - Scapular retraction and depression AROM - Elbow, wrist and hand AROM - Scapular retraction and depression AROM - Thoracic extension AROM - Scapular retraction and depression - Sub maximal pain free elbow flexion and extension isometrics with arm against the body so as to not resist against shoulder elevation • Manual therapy - Grade I and II joint mobs may be used for pain relief/relaxation (GH, AC, ST, SC) - Thoracic PA mobs as needed: seated or supine to tolerance *Exercise Examples:* - Passive pendulum - Self assisted passive, pain-free ER with a stick supine or upright -Scapular retraction	*Goals of Phase:* 1. Protect repair 2. Prevent contractures above and below shoulder joint 3. Manage inflammation and pain 4. Gradual improvement in PROM per guidelines 5. Toleration of progressed exercise program 6. Passive ER in plane of the scapula: 45 degrees 7. Passive ER at 60 degrees abduction: 45 degrees 8. Passive shoulder flexion 90 degrees *Criteria to Advance to Next Phase:* 1. Appropriate healing of the repair by adherence to precautions, immobilization guideline and exercise protocol 2. Manageable pain level

	Suggested Interventions	Goals/ Milestones for Progression
Phase IV *Minimal protection/mobility phase* Weeks 6-12 Expected visits: 6-15	*Specific Instructions:* -Avoid performing activities over shoulder height -Avoid sudden or ballistic movements -No aggressive strengthening -Avoid lifting, pulling or pushing of objects -Weaning from brace according to physician guidelines *Suggested Treatments:* • PROM - Initiate self-assisted passive supine flexion to tolerance (6 weeks) - Continue ER stretching from 30-90 degrees abduction - Initiate shoulder extension to tolerance (7 weeks) - At 10 weeks, initiate gentle IR stretching including behind the back • Manual therapy - Grade III-IV glenohumeral/scapulothoracic mobilizations for mobility as necessary • AAROM and AROM - Active warmup can be done prior to PT via UBE and or active ER/IR in plane of the scapula gravity minimized (8 weeks) - Initiate upright AAROM into flexion and scaption (pulleys or self-assisted) (8 weeks) - As quality of movement improves progress flexion/scaption from AAROM to AROM. - Progress ER AROM from upright to side lying to tolerance *Exercise Examples:* -Active warmup with non-resisted UBE, pendulum, or active upright internal/external rotation -PROM and low load/ long duration passive stretching into ER in varying degrees of abduction, into flexion and into scaption. -AAROM/AROM short arc motions in newly acquired range of motion - shoulder extension ROM to tolerance -pulleys or wall walks (thumb up with assist of contralateral arm when above 90 degrees) -Gentle IR behind the back (10 weeks) - Progression from AAROM to AROM in flexion as quality of movement improves	*Goals of Phase:* 1. Preserve integrity of the repair 2. Able to tolerate initiation and progression of active shoulder flexion and scaption without compensatory hiking 3. Restore functional PROM in all planes with normal movement patterns 4. Decrease pain and inflammation 5. Able to tolerate initiation of submaximal, pain free muscle activation exercises *Criteria to Advance to Next Phase:* 1. PROM total arc and flexion within 10 degrees of contra-lateral side 2. AROM shows no substitution patterns, appropriate scapula-thoracic rhythm and minimal (NPRS 0-2/10) to no pain in available range of motion

	Suggested Interventions	Goals/ Milestones for Progression
	-As quality of movement improves initiate and progress AROM endurance training in flexion, scaption, IR and ER -Progress from 10 to 30 reps, 1–3 sets 1x/day- 3x/week as tolerated -Endurance work should be in a pain free arc that avoids substitution patterns. -Progress ER from upright to side lying AROM -Scapular exercise 10 weeks -Inferior glide isometric: (Shoulder girdle depression while hand rests comfortably on a table) -Low row isometric: (scapular depression with extension near neutral) -Scapular exercises: 10-12 weeks. 0-light resistance -Row, supine protraction, prone extension, scapular clock, side lying external rotation with scapular setting and no external resistance -Sub-max pain-free GH isometrics at 10 weeks -Flexion near neutral -IR/ ER in the neutral position -Isotonics -Supported biceps and triceps (8 weeks) -Progress to unsupported biceps/triceps at 10weeks -Rhythmic stabilization progression: -Supine ER/IR in the neutral position 8 weeks -Supine flexion/extension 90 degrees 10-12weeks -Ball on table 10-12 weeks	
Phase V *Strengthening and proprioceptive Phase* Weeks 12+ Expected visits: 5-12	*Specific Instructions:* • Avoid sudden lifting, jerking, pushing or pulling movements • No uncontrolled movements • Avoid heavy lifting especially above shoulder height (weight lifted must not cause pain or compensatory hiking) *Suggested Treatments:* • Active warmup • Continue with ROM and stretching as needed • Continue biceps and triceps strengthening • Continue proprioception and kinesthetic awareness • Scapulothoracic, glenohumeral, rotator cuff strengthening	*Goals of Phase:* 1. Facilitate and maintain functional ROM and quality of movement 2. Tolerate progression of program for muscular strength, power and endurance. *Criteria to Advance to Next Phase:* 1. Strength: 4+/5-5/5 or 75%-90% of contra lateral side with hand held dynamometer tested at 22-24 weeks 2. Full ROM in all planes with normal movement mechanics 3. Pain free with basic ADLs and phase V strengthening 4. Quick DASH <10% disability

	Suggested Interventions	Goals/ Milestones for Progression
	• Pain management based on education on appropriate progression of activity *Exercise Examples:* Flexibility: • Continue with end range stretching and manual therapy as needed to restore full total arc and flexion ROM Strength: • Biceps curls, triceps press down • 30-30 ER and IR • Row • Supine serratus punch or dynamic hug • Shoulder flexion, initially only to 90 • Prone or bent over horizontal abduction in external rotation • Scaption, initially to 90 degrees • Straight arm row Exercises that can be added at 18 weeks • 90-90 ER and IR in overhead athletes • Prone scaption • Progression to overhead flexion and scaption as tolerated in absence of impingement symptoms or substitution patterns • PNF patterns • Advance CKC exercises over time form partial to full weight bearing exercises Proprioception and kinesthetic awareness: • Ball on wall, rhythmic stabilization, body blade	
Phase VI *Advanced Movement and Impact Phase* Months 6-9 months	*Specific Instructions:* • With Overhead athletes, initiate phase III progressing to IV of Sanford Overhead Athlete Rehab Guideline • Initiate Sanford Interval Throwing Program	Return to Sport: • Orthopedic approval • Full, non-painful ROM with no compensatory mechanisms • Strength: MMT 5/5 or 90% of contra lateral side with hand held dynamometer or isokinetic machine • Special considerations for overhead athletes: -Successful progression of interval throwing program to 180ft with no pain. -Consider throwing mechanics assessment -ER/IR Ratio >80%

	Suggested Interventions	Goals/ Milestones for Progression
		-Hand held dynamometry at 90 abduction within 10% of contralateral side - Quick DASH or Kerlin Jobe score -Successful completion of Return to Performance Program (if available). • Other possible tests -Kinesthetic awareness testing within 7 degrees -Seated shot put for power (6lb medicine ball): 85% of contra lateral side - Closed Kinetic Chain Upper Extremity Stability test: (Males 21 touches, Females 23 touches)

**NOTE: Progression of functional activities should be performed only as pain and proper biomechanics allow. Emphasis should be on proper mechanics and limiting compensatory mechanisms with exercises and activities.

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❖ In designing the current protocol, the following protocols were reviewed:
- Gunderson Lutheran Sports Medicine (George Davies)
- Moon Shoulder Group Vanderbilt University
- Brigham and Women's Hospital Department of Rehabilitation Services
- The American Society of Shoulder and Elbow Therapists Arthroscopic Rotator Cuff Repair Rehabilitation Guide

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