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### Rotator Cuff Repair Rehabilitation Protocol

The following document is an evidence-based protocol for arthroscopic rotator cuff repair rehabilitation. The protocol is both chronologically and criterion based for advancement through four post-operative phases:

- Phase 1 – Maximum Protection
- Phase 2 – Active Range of Motion
- Phase 3 – Strength
- Phase 4 – Return-to-Activity

There are numerous principles of rotator cuff repair rehabilitation including:

- Initial post-operative immobilization period
- Emphasis on early shoulder PROM and joint mobility
- Gradual advancement of shoulder PROM, AAROM, and AROM
- Restoration of the stability of the shoulder
- Safe, progressive loading of the rotator cuff through shoulder, scapular, and total arm strengthening

There are multiple factors which affect rotator cuff repair rehabilitation including:

- Size, location, and type of tear
- Multiple tendon involvement
- Tissue quality
- Mechanism of injury
- Timing of surgery
- Surgical technique
- Concomitant repairs
- Individual patient characteristics

The physician will designate the rate of progression based on the rotator cuff repair protocol type:

- Type 1 – Faster rate of progression
  - Small tears (< 1 cm), good to excellent tissue quality, etc.
- Type 1A – Fastest rate of progression
  - Tenotomy, Distal Clavicle Resection, Subacromial Decompression
  - Sling worn until nerve block wears off, activities at waist height until 1<sup>st</sup> post-op visit, therapy begins after 1<sup>st</sup> post-op visit (~10 days), may progress as tolerated based at that time
- Type 1AA – Early focus on motion
  - Capsule release and/or manipulation under anesthesia
  - Start day after surgery and see 5 times per week for at least 2 weeks – frequency reviewed at 1<sup>st</sup> post-op visit
- Type 2 – Standard rate of progression
  - Medium tears (1-3 cm), fair to good tissue quality, etc.
- Type 3 – Slower rate of progression
  - Large (3-5 cm) to massive tears (> 5 cm), poor tissue quality, etc.

The physician may provide modifications to the rehabilitation program for significant concomitant repairs:

- Subscapularis repair
  - Limit shoulder external rotation PROM to 30° for 6 weeks post-operatively
  - No shoulder internal rotation strengthening for 12 weeks post-operatively
- Posterior rotator cuff repair – infraspinatus and teres minor
  - Limit shoulder internal rotation PROM to 30° for 6 weeks post-operatively
  - No shoulder external rotation strengthening for 12 weeks post-operatively
- Biceps Tenodesis and/or SLAP Repair
  - No active biceps for 6 weeks post-operatively



## Phase 1 – Maximum Protection

Type 1: Post-Operative Weeks 0-4

Type 2: Post-Operative Weeks 0-6

Type 3: Post-Operative Weeks 0-8

### Goals for Phase 1

- Minimize pain and inflammation
- Protect integrity of the repair
- Initiate shoulder PROM
- Prevent muscular inhibition

### Criteria for progression to Phase 2

- Minimal pain with Phase 1 exercises
- Passive shoulder flexion  $\geq 120^\circ$
- Passive shoulder abduction  $\geq 90^\circ$
- Passive shoulder internal and external rotation at  $45^\circ$  abduction in scapular plane  $\geq 45^\circ$  each

### Immobilization

- Immobilization in ABD sling for 4 weeks (Type 1), 6 weeks (Type 2 & 3), or per physician, therapist to transition patient out of sling

### Initial Post-Op Exercises

- Elbow, forearm, wrist, hand (grip) AROM exercises; pendulum (Codman's) exercise; scapular squeezes; upper trapezius stretching; postural correction
- Remove ABD sling 3 times per day for performance of HEP
- Cryotherapy to minimize pain and inflammation

### Post-Op Physical Therapy

- 1<sup>st</sup> physical therapy visit to occur 4 weeks post-op
  - Ensure appropriate fit in ABD sling and reinforce on proper use
  - Review initial post-operative exercises and reinforce on proper performance
  - PROM check performed
    - Goal  $90^\circ$  FLEX,  $90^\circ$  ABD,  $30^\circ$  IR and ER at  $45^\circ$  ABD
    - Limit  $120^\circ$  FLEX,  $90^\circ$  ABD,  $45^\circ$  IR and ER at  $45^\circ$  ABD
  - If **PASS** PROM check, begin follow-up in physical therapy at 6 weeks post-op
  - If **NOT** pass PROM check, begin follow-up in physical therapy immediately
    - Emphasis on early shoulder PROM and glenohumeral joint mobility

### Aquatics

- Utilize aquatics for patients who are significantly painful, stiff, or guarded
  - Initiate when surgical incisions have healed
  - Initiate buoyancy assisted ROM exercises within limitations
  - Consider alternating land- and aquatic-based physical therapy visits

### Manual Therapy

- Initiate pain dominant glenohumeral joint mobilization (grade 1-2)
- Initiate scar mobilization, soft tissue mobilization, lymph edema massage
- Initiate other shoulder, scapular, and cervicothoracic manual therapy techniques as needed

### PROM

- Initiate manual shoulder PROM in all planes of motion within limitations
  - Limit  $120^\circ$  FLEX,  $90^\circ$  ABD,  $45^\circ$  IR and ER at  $45^\circ$  ABD
  - Avoid sustained end range stretching

### AAROM

- Initiate shoulder ER AAROM with wand at  $45^\circ$  ABD
- Initiate shoulder FLEX and ABD AAROM
  - Table slides, U.E. Ranger, physio-ball, wand, etc.
  - Avoid pulleys

### Modalities

- Utilize cryotherapy, thermotherapy, and electrical modalities as needed



## Phase 2 – Active Range of Motion

Type 1: Post-Operative Weeks 4-10

Type 2: Post-Operative Weeks 6-12

Type 3: Post-Operative Weeks 8-14

### Goals for Phase 2

- Minimize pain and inflammation
- Restore full shoulder PROM
- Restore full shoulder AROM
- Initiate sub-maximal rotator cuff activation and neurodynamic stabilization exercises
  - No shoulder shrug sign with elevation AROM

### Criteria for Progression to Phase 3

- Minimal pain with Phase 2 exercises
- Full shoulder PROM with minimal pain
- Full shoulder AROM with minimal pain
- Demonstrate neurodynamic stabilization of the shoulder
  - No evidence of shoulder shrug with elevation AROM

### Aquatics

- Continue aquatics for patients who are significantly painful, stiff, or guarded

### Stretching

- Initiate shoulder stretching exercises in all planes of motion as tolerated

### Manual Therapy

- Continue pain dominant glenohumeral joint mobilization (grade 1-2) as needed
- Initiate stiffness dominant glenohumeral joint mobilization (grade 3-4) as needed
  - Utilize stiffness dominant glenohumeral joint mobilization (grade 3-4) to facilitate specific AROM and PROM deficits
- Continue scar mobilization, soft tissue mobilization, lymph edema massage as needed
- Continue other shoulder, scapular, and cervicothoracic manual therapy techniques as needed

### PROM

- Continue manual shoulder PROM in all planes of motion as tolerated
  - Initiate sustained end range stretching

### AAROM

- Continue shoulder ER AAROM with wand at 45° ABD
  - Progress from 45° to 60° to 90° ABD
- Continue shoulder FLEX and ABD AAROM
  - Table slides, wall slides, U.E. Ranger, physioball, wand, pulleys, etc.

### AROM

- Initiate shoulder AROM in all planes of motion as tolerated
  - Gradually progress from gravity reduced to full gravity positions
  - Gradually progress from below shoulder height to above shoulder height
  - Consider single-planar and multi-planar movement patterns
- Do **NOT** exercise through shoulder shrug sign

### Strengthening

- Initiate sub-maximal shoulder isometrics for FLEX, ABD, EXT, IR, and ER
- Initiate light isotonic scapular strengthening
  - supine press, serratus press outs, prone row, etc.
- Initiate light isotonic biceps and triceps strengthening
- Initiate sub-body weight closed-chain strengthening exercises
  - Wall press outs, countertop press outs, etc.
- Avoid sub-body weight suspension training exercises
  - TRX, GTS, assisted chin or dip machine, etc.
- Do **NOT** exercise through shoulder shrug sign

### Neuromuscular Control

- Initiate sub-maximal rhythmic stabilization drills
  - Gradually progress shoulder FLEX from 100° to 90° to 60° to 30°
  - Gradually progress shoulder IR and ER from 30° to 60° to 90° ABD

### NMES

- Utilize NMES to facilitate rotator cuff and scapular activation and strengthening

### Modalities

- Utilize cryotherapy, thermotherapy, and electrical modalities as needed



## Phase 3 – Strength

Type 1: Post-Operative Weeks 10-18

Type 2: Post-Operative Weeks 12-20

Type 3: Post-Operative Weeks 14-22

### Goals for Phase 3

- Minimize pain and inflammation
- Maintain full shoulder PROM and AROM
- Improve shoulder, scapular, and total arm strength
- Improve neurodynamic
- stabilization of the shoulder
- No shoulder shrug sign with strengthening exercises

### Criteria for Progression to Phase 4

- Minimal pain with Phase 3 exercises
- Full, pain free shoulder PROM and AROM
- Shoulder, scapular, and total arm strength  $\geq$  80% of the uninvolved side (4/5)

### OR

- Shoulder internal and external rotation isokinetic strength  $\geq$  80% of the uninvolved side
  - 30° / 30° / 30° position if NOT overhead athlete or physical laborer
  - 90° / 90° position if overhead athlete of physical laborer
- Demonstrate neurodynamic stabilization of the shoulder
  - No shoulder shrug sign with strengthening exercises

### Stretching

- Continue shoulder stretching exercises as needed

### Manual Therapy

- Continue stiffness dominant glenohumeral joint mobilization (grade 3-4) as needed
- Continue other shoulder, scapular, and cervicothoracic manual therapy techniques as needed

### PROM

- Continue manual shoulder PROM as needed

### Strengthening

- Initiate gradual progression of isotonic rotator cuff strengthening exercises
  - Gradually progress from gravity reduced to full gravity positions
  - Gradually progress from below shoulder height to above shoulder height
  - Gradually progress internal and external rotation from 30° to 60° to 90° abduction and from supported to unsupported conditions
  - Consider single-planar and multi-planar movement patterns
- Progress isotonic scapular strengthening exercises
  - Progress from isolated to functional movement patterns
- Progress isotonic biceps and triceps strengthening exercises
  - Progress from isolated to functional movement patterns
- Progress closed-chain strengthening exercises
  - Gradually progress from sub-body weight to full body weight positions
  - Gradually progress from stable to unstable surfaces
- Initiate gradual progression of sub-body weight suspension training exercises
  - TRX, GTS, assisted chin or dip machine, etc.
- Do **NOT** exercise through shoulder shrug sign

### Neuromuscular Control

- Progress rhythmic stabilization exercises to more functional positions and dynamic movement patterns
  - Gradually progress from mid-range to end range positions
  - Gradually progress from open-chain to closed-chain positions
- Initiate gradual progression of other neuromuscular control exercises
  - Body blade, wall dribbles, ball flips, plyoback, etc.

### Core Stabilization

- Incorporate core integrated exercises with strengthening and neuromuscular control progression

### NMES

- Utilize NMES to facilitate rotator cuff and scapular activation and strengthening

### Modalities

- Utilize cryotherapy, thermotherapy, and electrical modalities as needed



## Phase 4 – Return to Activity

Type 1: Post-Operative Weeks 18+

Type 2: Post-Operative Weeks 20+

Type 3: Post-Operative Weeks 22+

### Goals for Phase 4

- Minimize pain and inflammation
- Maintain full shoulder PROM and AROM
- Restore shoulder, scapular, and total arm strength, power, and endurance
- Restore neurodynamic stabilization of the shoulder
- Safe and effective return to previous level of function for occupational, sport, or desired activities

### Criteria for Return to Activity

- Minimal pain with phase 4 exercises
- Full, pain free hip PROM and AROM
- Shoulder, scapular, and total arm strength  $\geq$  90% of the uninvolved side (4+/5)

### OR

- Shoulder internal and external rotation isokinetic strength  $\geq$  90% of the uninvolved side
- 30°/30°/30° position if NOT overhead athlete or physical laborer
- 90°/90° position if overhead athlete or physical laborer
- Demonstrate neurodynamic stabilization of the shoulder
- Successful completion of return-to-sport testing if athlete
- Successful completion of functional capacity evaluation if physical laborer
- Disability Arm Shoulder Hand Index score  $\leq$  15% disability

### Stretching

- Continue shoulder stretching exercises as needed

### Manual Therapy

- Continue stiffness dominant glenohumeral joint mobilization (grade 3-4) as needed
- Continue other shoulder, scapular, and cervicothoracic manual therapy techniques as needed

### PROM

- Continue manual shoulder PROM as needed

### Strengthening

- Continue Phase 3 strengthening exercises
- Consider specific demands of occupational, sport, or desired activities

### Neuromuscular Control

- Continue Phase 3 neuromuscular control exercises
- Consider specific demands of occupational, sport, or desired activities

### Core Stabilization

- Continue incorporate core integrated exercises with strengthening and neuromuscular control progression

### Sport-Specific Training Program

- Initiate interval sport programs
  - Baseball, softball, football, swimming, volleyball, tennis, golf, etc.
- Transition to Athletic Republic program if competitive or recreational athlete with specific goals for return-to-sport

### Weight Lifting

- Initiate traditional weight lifting exercises
  - Educate patient to strengthen prime movers **AND** secondary stabilizers
  - Educate patient to balance anterior **AND** posterior musculature

### Work Specialty Rehabilitation Program

- Transition to work re-conditioning if physical laborer
- Transition to work re-conditioning if specific occupational demands
  - Lifting requirements, overhead tasks, repetitive tasks, tool or machine work, etc.

### Modalities

- Utilize cryotherapy, thermotherapy, and electrical modalities as needed

### HEP

- Establish HEP for long-term self-management



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