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 neuromuscular stabilization 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
- Timing of surgery
- Multiple tendon involvement
- Surgical technique
- Tissue quality
- Concomitant repairs
- Mechanism of injury
- Individual patient characteristics

The physician will determine the appropriate rate of progression in rehabilitation for each patient by designating a specific rotator cuff repair protocol type:

- Type 1 – Faster rate of progression
  - Small tears (< 1 cm), good to excellent tissue quality, etc.
- 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 rotator cuff 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
  - No active biceps for 6 weeks post-operatively
- 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 ≥ 120°
- Passive shoulder abduction ≥ 90°
- Passive shoulder internal and external rotation at 45° abduction in scapular plane ≥ 45° each

Immobilization
- Immobilization in ABD sling for 6 weeks or per physician

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
- 1st 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° FLEX, 90° ABD, 30° IR and ER at 45° ABD
    - Limit 120° FLEX, 90° ABD, 45° IR and ER at 45° 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° FLEX, 90° ABD, 45° IR and ER at 45° ABD
  - Avoid sustained end range stretching

AAROM
- Initiate shoulder ER AAROM with wand at 45° ABD
- Initiate shoulder FLEX and ABD AAROM
  - Table slides, U.E. Ranger, physioball, 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, countoppress 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 ≥ 80% of the uninvolved side (4/5)
- Shoulder internal and external rotation isokinetic strength ≥ 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

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 ≥ 90% of the uninvolved side (4+/5)

OR
- Shoulder internal and external rotation isokinetic strength ≥ 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 ≤ 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
References


This protocol was reviewed and updated by Dan Reznichek, DPT, MS, SCS, LAT, Rebecca Yde, PT, DPT, and Shawn Hennigan, MD on January 8, 2015.