

Rehabilitation Guidelines for Type I and Type II Rotator Cuff Repair and Isolated Subscapularis Repair

The anatomic configuration of the shoulder joint (glenohumeral joint) is often compared to that of a golf ball on a tee. This is because the articular surface of the round humeral head is approximately four times greater than that of the relatively flat shoulder blade face (glenoid fossa). This configuration provides less boney stability than a truer ball and socket joint, like the hip. The stability and movement of the shoulder is controlled primarily by the rotator cuff muscles, with assistance from the ligaments, glenoid labrum and capsule of the shoulder. The rotator cuff is a group of four muscles: subscapularis, supraspinatus, infraspinatus and teres minor (Figure 1).

Rotator cuff tears can occur from repeated stress or from trauma. Throwing a baseball can create up to 750 newtons of distractive force on the shoulder. This places a significant amount of stress on the rotator cuff while trying to dissipate this force. This stress and force may be even greater if there is improper form or mechanics while throwing. This repeated stress may lead to rotator cuff tears. Rotator cuff trauma also may result from falling on your arm, bracing your arm in an accident, arm tackling in football or any large sudden force applied to the arm. Most rotator cuff tears involve the supraspinatus

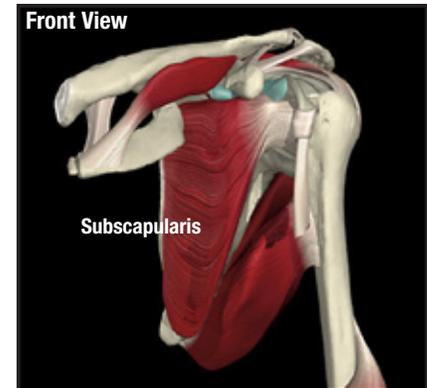
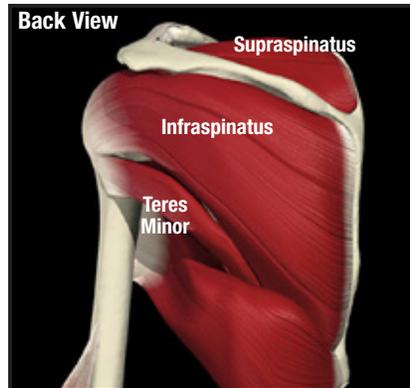


Figure 1 Rotator cuff anatomy

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and/or the infraspinatus. Occasionally isolated tears of the subscapularis can occur. This usually results from trauma rotating the shoulder outward. The rotator cuff tendons also undergo some degeneration with age. This process alone can lead to rotator cuff tears in older patients. Patients over 50 years of age are more susceptible to sustaining a significant rotator cuff tear from trauma.

Rotator cuff tears can be classified in various ways. The first classification is a partial thickness or a full thickness tear. Normal tendon thickness is 9 to 12 mm. Partial thickness tears start on one surface of the tendon, but do not progress through the depth of the tendon. These can be bursal surface tears or articular sided tears. The normal anatomy of the bursal and articular side of the rotator cuff is shown

(Figure 2). Bursal surface tears occur on the outer surface of the tendon and may be caused by repetitive impingement. Articular sided tears (Figure 3) occur on the inner surface of the tendon, and are most often caused by internal impingement or tensile stresses related to overhead sports. Full thickness or complete tears (Figure 4) extend from one surface of the tendon all the way through to the other surface of the tendon. Full thickness tears are often caused by trauma, such as falling on the arm. Since a portion of the tendon is completely disrupted, there also will be some tendon retraction. Retraction is movement of the tendon away from its insertion point back toward the muscle.

Typing of tears is determined through a collaborative clinical decision based on location of tear, tear size, tissue quality, and injury chronicity.

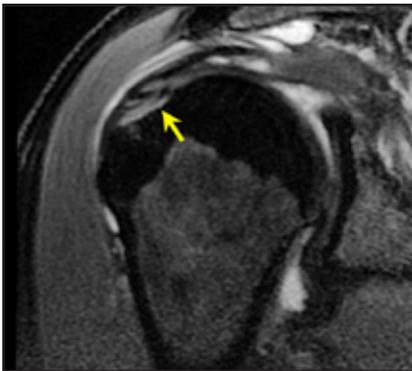


Figure 3 Coronal MRI image of an articular surface tear of the supraspinatus. Note the top black line has maintained continuity but the undersurface black line is disrupted.

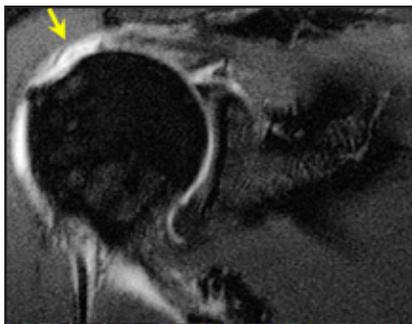


Figure 4 Coronal MRI image of a full thickness tear of the supraspinatus. Note the white fluid present where the dark tendon should be.

Surgical repair of a rotator cuff tear can be done arthroscopically or with a mini-open procedure. A review published in *The Journal of Bone and Joint Surgery* stated that equally successful outcomes can be attained from either technique. The primary goal of a rotator cuff repair is to restore the normal anatomy by approximating the rotator cuff tendon back to its normal attachment site on the greater tuberosity of the humerus. This is done by passing sutures through the tendon and then tying the tendon down to suture anchors that have been placed in the humerus.

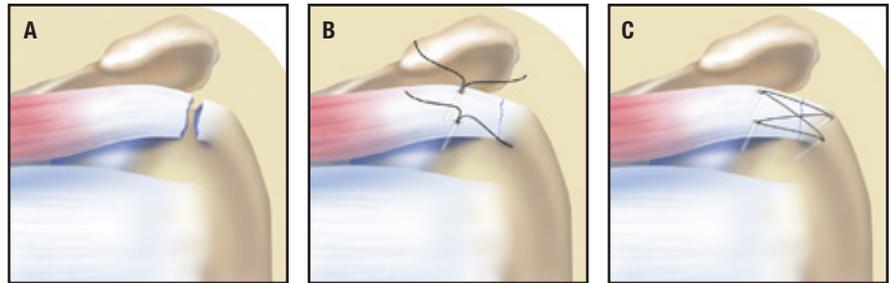


Figure 5 Rotator cuff repair technique using anchors and sutures. The tear (A) is approximated. Then suture anchors are placed on both sides of the tear (B and C). Finally the tendon is approximated back to the bone with various suture patterns to decrease focal stress.

Prior to bringing the tendon back to its insertion, the edges of the tear may need to be brought together, referred to as side-to-side repair or convergence (Figure 5). Not all rotator cuff tears are repairable. A tear may be unreparable if the tear is too large, there is too much retraction, or the tissue quality is too poor. The degree of success for tears that are repaired is related to various factors, including tear size, the number of tendons involved, patient age, associated injuries and post-operative rehabilitation.

Rehabilitation is vital to regaining motion, strength and function of the shoulder after surgery. Initially patients will use a sling to protect the repair site and allow healing of the tendon back to the bone. During this time, passive motion exercises are started to prevent the shoulder from getting stiff and losing mobility. The rehabilitation program will gradually progress to more strengthening and control type exercises. The rehabilitation guidelines will vary depending on the size of the tear, quality of the tissue, healing potential and surgical technique, as well as other patient factors including age, activity level and pre-and post-operative stiffness.

The rehabilitation guidelines for Type I and Type II tears of the supraspinatus or infraspinatus and isolated subscapularis tears are presented below in a criterion based progression. General time frames are given for reference to the average, but individual patients will progress at different rates depending on their age, associated injuries, pre-injury health status, rehabilitation compliance, injury severity and goals.

TYPE I TEARS

PHASE I (Surgery to 2 weeks after surgery)

Appointments	<ul style="list-style-type: none"> Rehabilitation appointments begin 5-8 days after surgery
Rehabilitation Goals	<ul style="list-style-type: none"> Patient education on pathology, procedure, rehabilitation expectations and expected time frame for return to function, precautions Normalize scapular positioning and mobility Reduce pain and swelling in the post-surgical shoulder Maintain active range of motion (AROM) of the elbow, wrist and neck Minimize loads placed over healing repair
Precautions	<ul style="list-style-type: none"> Standard sling utilization is: 6 weeks continuously (except for rehab and hygiene care), then weane from use. This may be modified from 4-8 weeks depending on the surgical procedure, tissue quality, healing potential and stiffness. The physician and physical therapist will be in communication on these items. No AROM No lifting or supporting body weight with hands Relative rest to reduce inflammation
Suggested Patient Education	<ul style="list-style-type: none"> Explain surgical procedure Importance of tissue healing to maximize functional outcomes Discuss modification of activities of daily living (ADLs) in order to follow post-operative precautions Absence of pain does not correlate with lack of stress on the repair
Suggested Therapeutic Exercise	<ul style="list-style-type: none"> Elbow, wrist and neck AROM Ball squeezes Passive range of motion (PROM) for forward elevation in the plane of the scapula with exercises demonstrated to have $\leq 15\%$ EMG activity level. <i>*See appendix for pictures and descriptions</i> <ul style="list-style-type: none"> Supine PROM Forward bow Towel press-up (progressing hands apart) Scapular protraction with ball on table Towel slide PROM for external rotation (ER) in $\sim 20^\circ$ of abduction with $\leq 15\%$ EMG activity level <ul style="list-style-type: none"> Supine PROM Supine active assisted ER with cane
Cardiovascular Fitness	<ul style="list-style-type: none"> Walking and/or stationary bike with sling on No treadmill Avoid running and jumping due to the repetitive traction forces that can occur at landing

Rehabilitation Guidelines for Rotator Cuff Repair Type I

Progression Criteria	<ul style="list-style-type: none"> • At least 14 days post-operative • Passive forward elevation 60-90° • Passive ER to 20° at 20° of abduction
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PHASE II (begin after meeting Phase I criteria, usually post-op weeks 2-4)

Appointments	<ul style="list-style-type: none"> • If PROM deficit is present with pain as primary barrier appointments should be 1 time per week until pain well controlled • If PROM deficit is present with stiffness as primary barrier appointments should be 2 times per week with home exercise program (HEP) performed at least 2-3 times per day
Rehabilitation Goals	<ul style="list-style-type: none"> • Progression of elevation in scapular plane and ER in 20-30° of abduction • Correct postural dysfunctions
Precautions	<ul style="list-style-type: none"> • Sling utilization will be determined by communication between physician and physical therapist. Typical sling use ranges from 4-8 weeks depending on surgical procedure, tissue quality, healing potential and stiffness. • No active abduction ROM for 8 weeks to protect repair and no external resistance to abduction and supraspinatus for 12 weeks
Suggested Therapeutic Exercise	<ul style="list-style-type: none"> • Progress forward elevation and passive ER using only exercise demonstrated to have $\leq 15\%$ EMG activity level. <i>*See appendix for pictures and descriptions</i> <ul style="list-style-type: none"> • Supported side lying shoulder flexion • Supine forward elevation with elastic band resistance from 90° • Small circle (20 cm) pendulums • Scapular strengthening • Sternal lift • Modified shoulder dump • Grade I and II joint mobilizations for pain relief as needed at all shoulder girdle joints GH, SC, AC, ST • Elbow, wrist, finger AROM and light strengthening • Ensure normal cervical spine, thoracic spine and hip mobility to facilitate kinetic chain upper extremity ROM
Cardiovascular Fitness	<ul style="list-style-type: none"> • Walking and stationary bike • No treadmill, elliptical or Stairmaster • Avoid running and jumping due to the repetitive traction forces that can occur at landing

Rehabilitation Guidelines for Rotator Cuff Repair Type I

Progression Criteria	<ul style="list-style-type: none"> At least 8 weeks post-operative Passive forward elevation 90-120° Passive ER to 20-30° at 20° of abduction
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PHASE III (begin after meeting Phase II criteria, usually post-op weeks 8-12)

Appointments	<ul style="list-style-type: none"> If AROM deficit is present with lag signs surgeon should be notified re: concerns about repair integrity. Appointments should be 2 times per week until integrity has been determined and AROM goals met. If AROM deficit present without lag signs appointments should be 1 times per week until AROM goals met
Rehabilitation Goals	<ul style="list-style-type: none"> ROM goals for approximately 9 weeks <ul style="list-style-type: none"> Passive forward elevation to 130-155° Passive ER at 20° of abduction to at 30-45°. Passive ER at 90° of abduction to at 45-60° to full Controlled progression of active assistive range of motion (AAROM) and AROM. AROM initiation based on PROM goals, delayed 9 weeks post-op. Initiate light muscle performance activities Correct postural dysfunctions <ul style="list-style-type: none"> Active elevation 80-120° without compensation
Precautions	<ul style="list-style-type: none"> Wean out of the sling slowly starting post-op weeks 6-8 based on size of tear, integrity of tissue and repair, and surgeon preference No active abduction ROM for 8 weeks to protect repair and no external resistance to abduction and supraspinatus for 12 weeks
Suggested Patient Education	<ul style="list-style-type: none"> Appropriate progression of upper extremity use for light ADLs in pain free ROM starting with waist level activities, progression to shoulder level Avoid quick, sudden movements and heavy lifting Continued education on sleeping posture

Rehabilitation Guidelines for Rotator Cuff Repair Type I

Suggested Therapeutic Exercise	<ul style="list-style-type: none"> • AAOM for forward elevation and ER with exercises demonstrated to have $\leq 30\%$ EMG activity level. Generally in gravity minimized positions and/or short lever arm. <i>*See appendix for pictures and descriptions</i> <ul style="list-style-type: none"> • Cane assisted forward elevation • Wall ball roll • Active assisted forward elevation with fingers interlaced • Wall walks or slide • Aquatic exercise: slow speed elevation in scapular plane • ROM exercises in other planes can be initiated in latter half of this phase if significant ROM limitations are present (caution with passive tension over the repair) <ul style="list-style-type: none"> • ER at progressing angles of abduction • Internal rotation (IR) • Functional IR behind the back • Horizontal adduction • Progress AROM as demonstrated with good scapulothoracic mechanics and remaining pain free. Generally in upright position progressing from supported to unsupported elevation. <i>*See appendix for pictures and descriptions</i> <ul style="list-style-type: none"> • Pulley progression based on PROM and scapular control. Passive progressing to active assisted elevation with active lowering. • Short-lever arm forward elevation • Ipsilateral step-up shoulder flexion with a ball (both hands) • Ipsilateral step-up shoulder flexion with no ball • Active shoulder flexion
Cardiovascular Fitness	<ul style="list-style-type: none"> • Walking and stationary bike • No treadmill, elliptical, Stairmaster or swimming • Avoid running and jumping due to forces that can occur at landing
Progression Criteria	<ul style="list-style-type: none"> • Passive forward elevation to at least 140° to full • Passive ER at 20° of abduction to at least 30° to full. Passive ER at 90° of abduction to at least 75° to full. • Active elevation to at least 120° without compensation • Appropriate static and dynamic scapular positioning

Rehabilitation Guidelines for Rotator Cuff Repair Type I

PHASE IV (begin after meeting Phase III criteria, usually post-op months 3-5)

Appointments	<ul style="list-style-type: none"> • Rehabilitation appointments are 1 time every 2-3 weeks
Rehabilitation Goals	<ul style="list-style-type: none"> • Full P/AROM • Gradually restore shoulder strength, power, and endurance • Return to ADLs, work, and recreational activities that do not require heavy lifting, powerful movements, or repetitive overhead activities • Advance proprioceptive and dynamic neuromuscular control retraining
Precautions	<ul style="list-style-type: none"> • Post-rehabilitation soreness should alleviate within 12 hours of the activities • No lifting of objects more than 15-20 pounds with short lever arm • Lifting only light resistance with long lever arm • No sudden lifting, jerking, or pushing movements
Suggested Patient Education	<ul style="list-style-type: none"> • Gradual progression of stress to shoulder through ADLs, work, and recreational activities • Continue to avoid heavy lifting and quick, uncontrolled movements
Suggested Therapeutic Exercise	<ul style="list-style-type: none"> • Progression of strengthening with exercises demonstrated to have 30-49% EMG activity level. Generally in upright position with progression of lever arm and resistance. <ul style="list-style-type: none"> • Multi-plane shoulder AROM with a gradual increase in the velocity of movement while making sure to assess scapular rhythm • ER and IR at various angles of abduction • Prone series: rowing, horizontal abduction, extension • Dynamic stabilization • Open kinetic chain (OKC) proprioception awareness drills • Closed kinetic chain (CKC) progression • Bicep curls, triceps extensions, lat pull downs, wrist and forearm strengthening • Exercises should be progressive in terms of shoulder elevation range • Rhythmic shoulder stabilizations, starting with proximal perturbations • Shoulder mobilizations as needed • Core and lower body strengthening • Grade III and IV joint mobilizations as indicated to address capsular restrictions at all shoulder girdle joints GH, SC, AC, ST
Cardiovascular Fitness	<ul style="list-style-type: none"> • Walking, stationary bike and Stairmaster • No treadmill or swimming • May begin light jogging and running if the patient has normal (rated 5/5) rotator cuff strength in neutral and functional shoulder AROM
Progression Criteria	<ul style="list-style-type: none"> • Not all patients will progress to Phase V. Individuals that are involved in sports and physical labor will be progressed, those that are not should continue with progressive, low velocity loading. • Full shoulder AROM in all planes and multi-plane movements • MMT of 5/5 in neutral • Pain free during strengthening exercises • Negative impingement signs

Rehabilitation Guidelines for Rotator Cuff Repair Type I

PHASE V (begin after meeting Phase IV criteria, usually 18-22 weeks after surgery)

Appointments	<ul style="list-style-type: none"> • Rehabilitation appointments are once every 2-3 weeks
Rehabilitation Goals	<ul style="list-style-type: none"> • Normalize muscular strength, power and endurance • Return to high demand activities • Complete return to sport training • Develop strength and control for movements required for sport/work • Develop work capacity cardiovascular endurance for sport/work
Precautions	<ul style="list-style-type: none"> • Post-rehabilitation soreness should alleviate within 12 hours of the activity • Avoid activities that result in substitution patterns • Avoid exercises that generate a large increase in load compared to previous exercises
Suggested Patient Education	<ul style="list-style-type: none"> • Importance of gradual controlled overload to shoulder including appropriate rest/recovery time • Specific technique and modification for weight lifting and overhead activities
Suggested Therapeutic Exercise	<ul style="list-style-type: none"> • Continue shoulder mobilizations, stretching and PROM exercises as needed per impairments • Rotator cuff strengthening in 90° of shoulder abduction as well as in provocative positions and work/sport specific positions, including eccentric strengthening, endurance and velocity specific exercises. Increasing use of $\geq 50\%$ EMG activity level exercises. • Progressive return to weight lifting program starting with relatively lightweight and high repetitions (15-25). Increase weight while decreasing reps over 6-12 weeks. • Core and lower body strengthening • Throwing program, swimming program or overhead racquet program as needed after successful period of plyometric training program • Transition to upper extremity prevention/maintenance program such as Throwers Ten Program
Cardiovascular Fitness	<ul style="list-style-type: none"> • Design to use sport/work specific energy systems
Progression Criteria	<ul style="list-style-type: none"> • The patient may return to sport after receiving clearance from the orthopedic surgeon and the sports rehabilitation provider. Return to sport decisions are based on meeting the goals of this phase.

TYPE II TEARS

PHASE I (Surgery to 3 weeks after surgery)

Appointments	<ul style="list-style-type: none"> • Rehabilitation appointments begin 5-8 days after surgery
Rehabilitation Goals	<ul style="list-style-type: none"> • Patient education on pathology, procedure, rehabilitation expectations and expected time frame for return to function, precautions • Normalize scapular positioning and mobility • Reduce pain and swelling in the post-surgical shoulder • Maintain AROM of the elbow, wrist and neck • Minimize loads placed over healing repair
Precautions	<ul style="list-style-type: none"> • Use sling continuously except while doing therapy • No AROM • No lifting or supporting body weight with hands • Relative rest to reduce inflammation
Suggested Patient Education	<ul style="list-style-type: none"> • Explain surgical procedure • Importance of tissue healing to maximize functional outcomes, including sling use • Discuss modification of ADLs and sleeping posture in order to follow post-operative precautions • Absence of pain does not correlate with lack of stress on the repair
Suggested Therapeutic Exercise	<ul style="list-style-type: none"> • Elbow, wrist and neck AROM • Ball squeezes • PROM for forward elevation in the plane of the scapula to maximum of 70°. Passive motion should be relatively pain free and assessed for compensation or guarding. Exercises demonstrated to have ≤ 15% EMG activity level. <i>*See appendix for pictures and descriptions</i> <ul style="list-style-type: none"> • Supine PROM • Forward bow • Scapular protraction with ball on table • Towel slide • PROM for ER in ~20° of abduction with ≤ 15% EMG activity level <ul style="list-style-type: none"> • Supine PROM • Supine active assisted ER with cane
Cardiovascular Fitness	<ul style="list-style-type: none"> • Walking and/or stationary bike with sling on • No treadmill, elliptical or hiking • Avoid running and jumping due to the repetitive traction forces that can occur at landing
Progression Criteria	<ul style="list-style-type: none"> • At least 3 weeks post-operative • Passive forward elevation 50-60° • Passive ER to 10-15° at 20° of abduction

Rehabilitation Guidelines for Rotator Cuff Repair Type II

PHASE II (begin after meeting Phase I criteria, usually 3-4 weeks after surgery)

Appointments	<ul style="list-style-type: none"> • If PROM deficit is present with pain as primary barrier appointments should be 1 time per week until pain well controlled • If PROM deficit is present with stiffness as primary barrier appointments should be 2 times per week with HEP performed at least 3 times per day
Rehabilitation Goals	<ul style="list-style-type: none"> • Progression of elevation in scapular plane • Correct postural dysfunctions
Precautions	<ul style="list-style-type: none"> • Sling utilization continuously for 6 weeks except for physical therapy and daily hygiene. • Modifications may be made by communication between physician and physical therapist. Typical sling use ranges from 6-8 weeks depending on surgical procedure, tissue quality, healing potential, and stiffness. • No AROM
Suggested Therapeutic Exercise	<ul style="list-style-type: none"> • Progress passive forward elevation and passive ER using only exercise demonstrated to have $\leq 15\%$ EMG activity level. <i>*See appendix for pictures and descriptions</i> <ul style="list-style-type: none"> • Supported side lying shoulder flexion • Supine forward elevation with elastic band resistance from 90° • Small circle (20 cm) pendulums • Scapular strengthening • Sternal lift • Modified shoulder dump • Grade I and II joint mobilizations for pain relief as needed at all shoulder girdle joints GH, SC, AC, ST • Elbow, wrist, finger AROM and light strengthening • Ensure normal cervical spine, thoracic spine, and hip mobility to facilitate kinetic chain upper extremity ROM
Cardiovascular Fitness	<ul style="list-style-type: none"> • Walking and stationary bike • No treadmill or Stairmaster • Avoid running and jumping due to the repetitive traction forces that can occur at landing
Progression Criteria	<ul style="list-style-type: none"> • At least 8 weeks post-operative • Passive forward elevation 60-90° • Passive ER to 20° at 20° of abduction

PHASE III (begin after meeting Phase II criteria, usually 8-9 weeks after surgery)

Appointments	<ul style="list-style-type: none"> • Appointments should be 2 times per week until integrity has been determined and AROM goals met • If AROM deficit present without lag signs appointments should be 1 time per week until AROM goals met
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Rehabilitation Guidelines for Rotator Cuff Repair Type II

Rehabilitation Goals	<ul style="list-style-type: none"> • ROM goals for approximately 10 weeks <ul style="list-style-type: none"> • Passive forward elevation to at 120-145° • Passive ER at 20° of abduction to 25-35°. Passive ER at 90° of abduction to at 40-60° • Controlled progression of AAROM and AROM. AROM initiation based on PROM goals, delayed 9 weeks post-op • Initiate light muscle performance activities • Correct postural dysfunctions • Active elevation 80-100° without compensation
Precautions	<ul style="list-style-type: none"> • Sling use as needed. • No active abduction ROM for 9-10 weeks to protect repair and no external resistance to abduction and supraspinatus for 14 weeks • If AROM deficit is present with lag signs surgeon should be notified re: concerns about repair integrity
Suggested Patient Education	<ul style="list-style-type: none"> • Appropriate progression of upper extremity use for light ADLs in pain free ROM starting with waist level activities, progression to shoulder level • Avoid quick, sudden movements and heavy lifting
Suggested Therapeutic Exercise	<ul style="list-style-type: none"> • AAROM for forward elevation and ER with exercises demonstrated to have $\leq 30\%$ EMG activity level. Generally in gravity minimized positions and/or short lever arm. <i>*See appendix for pictures and descriptions</i> <ul style="list-style-type: none"> • Cane assisted forward elevation • Wall ball roll • Active assisted forward elevation with fingers interlaced • Wall walks or slide • Aquatic exercise: slow speed elevation in scapular plane • ROM exercises in other planes can be initiated in latter half of this phase if significant ROM limitations are present (caution with passive tension over the repair) <ul style="list-style-type: none"> • ER at progressing angles of abduction • IR • Functional IR behind the back • Horizontal adduction
Cardiovascular Fitness	<ul style="list-style-type: none"> • Walking and stationary bike • No treadmill, Stairmaster or swimming • Avoid running and jumping due to forces that can occur at landing
Progression Criteria	<ul style="list-style-type: none"> • Passive forward elevation to at least 140-150° • Passive ER at 20° of abduction to at least 30° to full. Passive ER at 90° of abduction to at least 70° to full • Active elevation to at least 120° without compensation • Appropriate static and dynamic scapular positioning

Rehabilitation Guidelines for Rotator Cuff Repair Type II

PHASE IV (begin after meeting Phase III criteria, usually 14-16 weeks after surgery)

Appointments	<ul style="list-style-type: none"> • Rehabilitation appointments are once every 1-2 weeks
Rehabilitation Goals	<ul style="list-style-type: none"> • Normal (rated 5/5) rotator cuff strength and endurance at 90° of shoulder abduction and scaption • Advance proprioceptive and dynamic neuromuscular control retraining • Correct postural dysfunctions with work and sport specific tasks • Develop strength and control for movements required for work or sport
Precautions	<ul style="list-style-type: none"> • Post-rehabilitation soreness should alleviate within 12 hours of the activities
Suggested Therapeutic Exercise	<ul style="list-style-type: none"> • Multi-plane shoulder AROM with gradual increase in the velocity of movement being sure to assess scapular rhythm • Shoulder mobilizations as needed • Rotator cuff strengthening in 90° of shoulder abduction, and overhead (beyond 90° of shoulder abduction) • Scapular strengthening and dynamic neuromuscular control in OKC and CKC positions • Core and lower body strengthening
Cardiovascular Fitness	<ul style="list-style-type: none"> • Walking, stationary bike, and Stairmaster • No treadmill or swimming • The patient may begin running if they have normal (rated 5/5) strength for the shoulder internal rotators and external rotators at 30° of shoulder abduction and normal shoulder AROM
Progression Criteria	<ul style="list-style-type: none"> • Not all patients will progress to Phase V. Individuals that are involved in sports and physical labor will be progressed, those that are not should continue with progressive, low velocity loading. • Full shoulder AROM in all planes and multi-plane movements • Manual muscle testing (MMT) of 5/5 in neutral • Pain free during strengthening exercises • Negative impingement signs

Rehabilitation Guidelines for Rotator Cuff Repair Type II

PHASE V (begin after meeting Phase IV criteria, usually 20-24 weeks after surgery)

Appointments	<ul style="list-style-type: none"> • Rehabilitation appointments are 1 time every 2-3 weeks
Rehabilitation Goals	<ul style="list-style-type: none"> • Normal (rated 5/5) rotator cuff strength at 90° abduction • Normal (rated 5/5) supraspinatus strength • Advance proprioceptive and dynamic neuromuscular control retraining • Correct postural dysfunctions with work and sport specific tasks • Develop strength and control for movements required for sport/work • Develop work capacity cardiovascular endurance for sport/work
Precautions	<ul style="list-style-type: none"> • Post-rehabilitation soreness should alleviate within 12 hours of the activities
Suggested Therapeutic Exercise	<ul style="list-style-type: none"> • Multi-plane shoulder AROM with a gradual increase in the velocity of movement being sure to assess scapular rhythm • Shoulder mobilizations, as needed • Rotator cuff strengthening in 90° of shoulder abduction in provocative and/or sport/work specific positions, including eccentric strengthening, endurance and velocity specific exercises • Scapular strengthening and dynamic neuromuscular control in overhead positions and work or sport specific positions • Sport and work specific strengthening • Core and lower body strengthening • Begin education in sport specific biomechanics with an initial program for throwing, swimming or overhead racquet sports as needed • Transition to a specific throwing program or swimming program once the patient can demonstrate good control with the desired mechanics
Cardiovascular Fitness	<ul style="list-style-type: none"> • Use exercise to replicate energy systems needed for work or sport
Progression Criteria	<ul style="list-style-type: none"> • The patient may return to sport after receiving clearance from the orthopedic surgeon and the sports rehabilitation provider. Return to sport decisions are based on meeting the goals of this phase

Isolated Subscapularis Repair

PHASE I (surgery to 2 weeks after surgery)

Appointments	<ul style="list-style-type: none"> Rehabilitation appointments begin 5-8 days after surgery
Rehabilitation Goals	<ul style="list-style-type: none"> Reduce pain and swelling in the post-surgical shoulder Maintain AROM of elbow, wrist and neck Protect healing of repaired tissues
Precautions	<ul style="list-style-type: none"> Use sling continuously except while doing therapy Relative rest to reduce inflammation
Suggested Therapeutic Exercise	<ul style="list-style-type: none"> Elbow, wrist and neck AROM Ball squeezes Completely PROM for flexion and abduction (0° - 50°)
Cardiovascular Fitness	<ul style="list-style-type: none"> Walking, stationary bike with sling on. No Treadmill, Stairmaster or swimming Avoid running and jumping due to the forces that can occur at landing
Progression Criteria	<ul style="list-style-type: none"> 14 days after surgery

PHASE II (begin after meeting Phase I criteria, usually 2 weeks after surgery)

Appointments	<ul style="list-style-type: none"> Rehabilitation appointments are 1-2 times per week
Rehabilitation Goals	<ul style="list-style-type: none"> Controlled restoration of PROM and/or AAROM Correct postural dysfunctions
Precautions	<ul style="list-style-type: none"> Continue use of sling for sleep and activities during the first 6 weeks, weaning out of the sling slowly based on the safety of the environment after 6 weeks No ER motion beyond neutral for the first 6 weeks (protect repair) No resisted IR for the first 6 weeks (protect repair)
Suggested Therapeutic Exercise	<ul style="list-style-type: none"> PROM and/or AAROM for the shoulder as tolerated for flexion and abduction Gentle shoulder mobilizations as needed Isometric rotator cuff strengthening in non-provocative positions. No internal rotator or subscapularis strengthening Scapular strengthening with arm in neutral Cervical spine and scapular AROM Postural exercises Core strengthening
Cardiovascular Fitness	<ul style="list-style-type: none"> Walking and stationary bike. No treadmill, Stairmaster or swimming Avoid running and jumping until athlete has full rotator cuff strength in a neutral position due to forces that can occur at landing
Progression Criteria	<ul style="list-style-type: none"> 6 weeks after surgery

Rehabilitation Guidelines for Isolated Subscapularis Repair

PHASE III (begin after meeting Phase II criteria, usually 6 weeks after surgery)

Appointments	<ul style="list-style-type: none"> • Rehabilitation appointments are 1 time every 1-2 weeks
Rehabilitation Goals	<ul style="list-style-type: none"> • Full AROM in all planes • Normal (rated 5/5) strength for IR/ER at 0° abduction • Correct postural dysfunction
Precautions	<ul style="list-style-type: none"> • Begin ER ROM past neutral and resisted IR gradually to assess response and allow for progress adaptation
Suggested Therapeutic Exercise	<ul style="list-style-type: none"> • IR/ER isotonic with theraband or weights that begin at 0° abduction and gradually increases abduction as strength improves • OKC shoulder rhythmic stabilizations in supine at 90° elevation (stars or alphabet) • Gentle CKC shoulder and scapular stabilization drills • Proprioceptive neuromuscular facilitation (PNF) patterns • Side lying shoulder flexion • Scapular strengthening • AROM, AAROM and/or PROM as needed • Core strengthening • Begin trunk and hip mobility exercises
Cardiovascular Fitness	<ul style="list-style-type: none"> • Walking and stationary bike. No treadmill, Stairmaster or swimming • Avoid running and jumping until athlete has full rotator cuff strength in a neutral position due to forces that can occur at landing
Progression Criteria	<ul style="list-style-type: none"> • Full AROM (equal to uninvolved) and normal (rated 5/5) strength for IR/ER at 30° abduction

PHASE IV (begin after meeting Phase III criteria, usually 12 weeks after surgery)

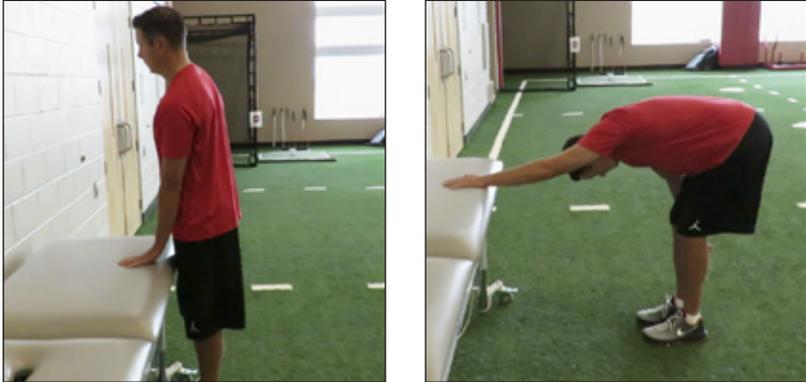
Appointments	<ul style="list-style-type: none"> • Rehabilitation appointments are 1 time every 2-3 weeks
Rehabilitation Goals	<ul style="list-style-type: none"> • Normal (rated 5/5) rotator cuff strength and endurance at 90° abduction and scaption • Advance proprioceptive and dynamic neuromuscular control retraining • Correct postural dysfunctions with work and sport specific tasks • Develop strength and control for movements required for work or sport
Precautions	<ul style="list-style-type: none"> • Post-rehab soreness should alleviate within 12 hours of the activities

Rehabilitation Guidelines for Isolated Subscapularis Repair

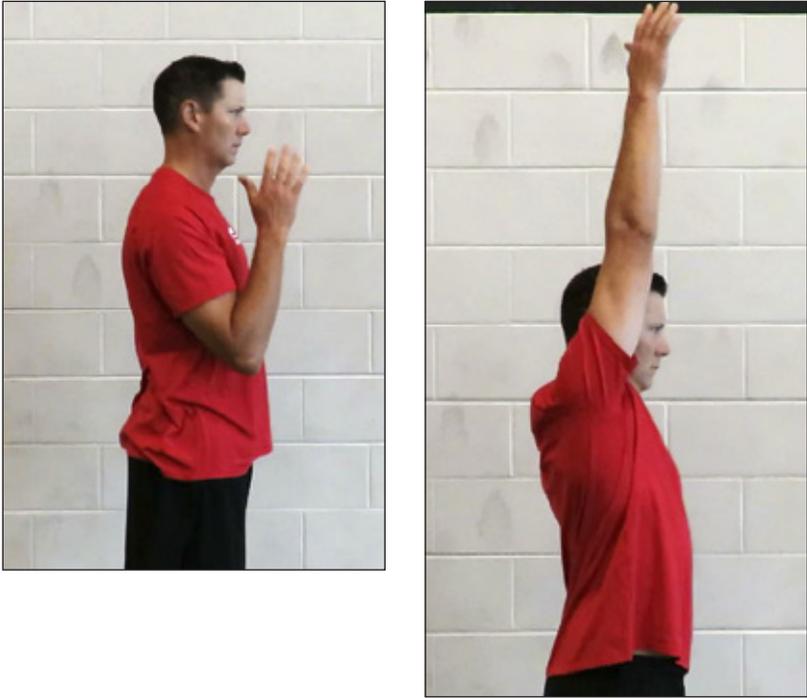
Suggested Therapeutic Exercise	<ul style="list-style-type: none"> • Multi-plane AROM with gradual increase in velocity of movement - assessing scapular rhythm • Shoulder mobilizations as needed • Rotator cuff strengthening in at 90° abduction and overhead • Scapular strengthening and dynamic neuromuscular control in OKC and CKC positions • Core and lower body strengthening • At about 16-18 weeks, begin education in sport specific biomechanics with initial program for throwing – low velocity, focusing on movement control (air throws and light toss)
Cardiovascular Fitness	<ul style="list-style-type: none"> • Walking, stationary bike, Stairmaster. No treadmill or swimming • May begin light jogging and running if patient has full rotator cuff strength in neutral and normal AROM
Progression Criteria	<ul style="list-style-type: none"> • Full AROM in all planes and multi-plane movements • Normal (rated 5/5) strength at 90° abduction • Negative impingement signs

PHASE V (begin after meeting Phase IV criteria, usually 16 to 18 weeks after surgery)

Appointments	<ul style="list-style-type: none"> • Rehabilitation appointments are 1 time per week every 2-3 weeks
Rehabilitation Goals	<ul style="list-style-type: none"> • Normal (rated 5/5) rotator cuff strength at 90° abduction • Advance proprioceptive and dynamic neuromuscular control retraining • Correct postural dysfunctions with work and sport specific tasks • Develop strength and control for movements required for sport/work • Develop work capacity cardiovascular endurance for sport/work
Precautions	<ul style="list-style-type: none"> • Post-rehab soreness should alleviate within 12 hours of the activities
Suggested Therapeutic Exercise	<ul style="list-style-type: none"> • Multi-plane AROM with gradual increase in velocity of movement - assessing scapular rhythm • Shoulder mobilizations as needed • Rotator cuff strengthening in at 90° abduction, provocative positions and sport/work specific positions - including eccentric strengthening, endurance and velocity specific exercises • Scapular strengthening and dynamic neuromuscular control in overhead positions and work/sport specific positions • Sport and work specific strengthening • Core and lower body strengthening • Throwing program, swimming program or overhead racquet program, as needed
Cardiovascular Fitness	<ul style="list-style-type: none"> • Design to use work or sport specific energy systems
Progression Criteria	<ul style="list-style-type: none"> • The patient may return to sport after receiving clearance from the orthopedic surgeon and the sports rehabilitation provider. This will be based on meeting the goals of this phase

<p>Forward Bow</p>	<p>Place hand of surgical extremity on a table. Step backwards from the stationary hand while simultaneously bending at the waist.</p> 
<p>Towel Press-Up</p>	<p>Supine, mimic a chest press holding onto a towel. Progress EMG activity by moving hands further apart.</p> 
<p>Scapular Protraction with Ball on Table</p>	<p>Stand next to a table with hand on a ball at chest level. Patient slides hand over the ball allowing the ball to roll away from their body at a 45° from the frontal plane.</p> 

<p>Towel Slide</p>	<p>Stand next to the table at waist level with hand on towel. Slide hand on the table top away from body at a 45° angle from the frontal plane. Squat as you slide to reach further. Progress by sliding hand directly forward and backward in sagittal plane.</p> 
<p>Supine Forward Elevation with Elastic Band Resistance From 90°</p>	<p>Start with surgical arm flexed to 90° and elbow extended. Actively move arm into forward elevation to approximately 160°, lengthening the band. Surgical arm then slowly returned to starting position with assistance from band.</p> 
<p>Sternal Lift</p>	<p>Start with head and trunk flexed. Move into thoracic extension and scapular retraction. Cue to “get tall” and push sternum up and out.</p> 

<p>Modified Shoulder Dump</p>	<p>While shoulder is in sling, bend forward letting the shoulder blade rotate out. Then stand up and squeeze shoulder blade toward the spine.</p> 
<p>Short Lever Arm Forward Elevation</p>	<p>Elevate arm, starting with the elbow bent to at least a 90° and then extending gradually as you reach up.</p> 

**Ipsilateral Step-Up
Shoulder Flexion
with No Ball**

Stand with ipsilateral foot of the surgical arm on a step and the other on the floor. Shift weight forward and step onto the step while elevating same arm overhead.



**Ipsilateral Step-Up
Shoulder Flexion
with Ball**

Stand with ipsilateral foot of the surgical arm on a step and the other on the floor. Hold a light ball in both hands. Shift weight forward and step onto the step while elevating both arms overhead.



Rehabilitation Guidelines for Rotator Cuff Repair and Isolated Subscapularis Repair

These rehabilitation guidelines were developed collaboratively between UW Health Sports Rehabilitation and UW Health Sports Medicine physicians.

Updated 12/2017

References

1. Wilk KE, Reinold MM, Dugas JR, Arrigo CA, Moser MW, Andrews JR. Current concepts in the recognition and treatment of superior labral (SLAP) lesions. *J Orthop Sports Phys Ther.* May 2005;35(5):273-291.
2. Burkhart SS, Morgan CD, Kibler WB. Shoulder injuries in overhead athletes. The “dead arm” revisited. *Clin Sports Med.* Jan 2000;19(1):125-158.
3. Wolf BR, Dunn WR, Wright RW. Indications for repair of full-thickness rotator cuff tears. *Am J Sports Med.* Jun 2007;35(6):1007-1016.
4. Kuhn JE, Dunn WR, Ma B, et al. Interobserver agreement in the classification of rotator cuff tears. *Am J Sports Med.* Mar 2007;35(3):437-441.
5. Nho SJ, Shindle MK, Sherman SL, Freedman KB, Lyman S, MacGillivray JD. Systematic review of arthroscopic rotator cuff repair and mini-open rotator cuff repair. *J Bone Joint Surg Am.* Oct 2007;89 Suppl 3:127-136.
6. Abrams JS. Arthroscopic approach to massive rotator cuff tears. *Instr Course Lect.* 2006;55:59-66.
7. Boes MT, McCann PD, Dines DM. Diagnosis and management of massive rotator cuff tears: the surgeon’s dilemma. *Instr Course Lect.* 2006;55:45-57.
8. Thigpen CA, Shaffer MA, Gaunt BW, Leggin BG, Williams GR, Wilcox RB. (2016). The American Society of Shoulder and Elbow Therapists’ consensus statement on rehabilitation following arthroscopic rotator cuff repair. *Journal of Shoulder and Elbow Surgery*, 25(4), 521-535.
9. Hsu JE, Horneff JG, Gee AO. (2016). Immobilization After Rotator Cuff Repair: What Evidence Do We Have Now?. *Orthopedic Clinics of North America*, 47(1), 169-177.
10. Edwards PK, Ebert JR, Littlewood C, Ackland T, Wang A (2017). A Systematic Review of Electromyography Studies in Normal Shoulders to Inform Postoperative Rehabilitation Following Rotator Cuff Repair. *JOSPT*, 47 (12), 931-944.
11. PM R. 2010 Feb;2(2):132-41. doi: 10.1016/j.pmrj.2010.01.002. Electromyographical assessment of passive, active assistive, and active shoulder rehabilitation exercises. Uhl TL1, Muir TA, Lawson L.
12. Wells, Samuel N., Schilz, Jodi R., Uhl, Tim L., Gurney, A. Burke. *Journal of Exercise Physiology online*, v. 19, no. 3, p. 70-99.

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