Charles E. Abrahamsen, MD
Board-Certified Orthopaedic Surgeon

(727) 724-6169

Belcher Point
1801 N. Belcher Rd Suite B
Clearwater, FL 33765
Fax (727) 791-0470

Rehabilitation Protocol for Rotator Cuff Surgery

Charles E. Abrahamsen, M.D.

Repairs of Small ($\leq$1cm) Rotator Cuff Tears with arthroscopic decompression

Note: This rehabilitation protocol is the result of an extensive effort of Dr. Abrahamsen and Yalcin Ekren, cert. MDT.PT, with over 40 years combined experience. This effort includes many hours of scientific review and collaboration. It is designed to assist you and your physical therapist to give you the knowledge and tools necessary for successful rehabilitation after your surgery.

1. **Goal:** to restore range of motion (ROM), strength, function, and confidence to the shoulder while avoiding the pain and swelling commonly caused by active use of the arm before scapulo- humeral rhythm has been restored. Also avoiding adhesions or scar tissue from prolonged immobilization. In addition, the protocol assists in education on proper arm positions and exercises as following the protocol helps avoid over-stressing the repair and promotes stronger tissue healing.

2. **Pre-op medical evaluation:** All patients must be evaluated by their primary care physician (PCP) within 3 months prior to surgery. Please contact your family doctor or internist to arrange for a preoperative medical evaluation (pre-op clearance) to ensure the surgery does not carry an undue risk. Diabetics should have their blood sugars under control (hemoglobin A1C levels <6.9%). Patients with inflammatory arthritis (e.g. rheumatoid arthritis) should contact their rheumatologist or PCP about reducing or discontinuing immunosuppressive medications several weeks before and after surgery.

3. **Personal preparation for surgery:** If you are a smoker, stopping for a few weeks before and after surgery will lessen risk of complications such as blood clots or pneumonia. Dental work and kidney or bladder problems and procedures should be taken care of prior to the knee replacement if possible, as these procedures can cause a temporary bacteremia (bacteria

in the bloodstream). Addressing these conditions prior to knee replacement lessens risk of infection after surgery.

4. **Facts:** The *supraspinatus* or "rotator cuff" muscle is normally weak, temporarily, following arthroscopic surgery to relieve impingement and repair the rotator cuff. Normal function of the supraspinatus muscle is necessary for pain free use of the arm when reaching, throwing, or lifting above waist level. Supraspinatus function can be restored with minimal pain or discomfort by ensuring that the elbow is supported and shoulder (trapezius) relaxed during range of motion and strengthening exercises—this is best accomplished in the supine position until supraspinatus strength is **at least 3+/5**. EMG evidence has shown that scaption resistance exercises strengthen all parts of the deltoid muscle—anterior, middle, and posterior.

5. **Precautions:** ***Trapezius spasm and dysfunction*** leads to superior placement of the arm against the underside of the acromion and delays recovery. ***Strengthening exercises*** are most successful when they are performed with no pain with submaximal effort, thereby promoting organized collagen fiber repair, while avoiding disorganized and stiff scar formation. Strengthening exercises also protect the rotator cuff repair when done with the elbow supported, shoulder in 30 degrees flexion and 30 deg abduction, then moving no further than to 30 degrees internal rotation and to 0 degrees external rotation in the 1st 2 phases of rehabilitation. ***Range Of Motion:*** Extremes of internal rotation and adduction are to be avoided in the 1st 4 weeks as they can put undue stress on the repair. ***Pain*** is usually sign of muscle dysfunction or stress on the repair (especially once the inflammatory phase of healing subsides 3-4 weeks post-op); it is best addressed by changing the speed, force, range, or direction of rehabilitation exercises, or by addressing trapezius takeover or spasm. ***Abduction exercises*** *are to be done in external rotation (thumb pointing up, or "filling can"); abduction exercises in internal rotation (thumb down, or "emptying can") are to be avoided, as they are usually painful.* ***"Walking the wall"*** exercise is, in our opinion, counterproductive for most patients. It is to be avoided because it is often done improperly by patients at home resulting in scapular substitution and pain.

REMINDER:

When the patient agrees to undergo arthroscopic shoulder surgery they willingly commit to a 3 to 4 month, vigorous, structured, rehabilitation program. They should understand that the end-result depends to a great extent on their discipline, motivation, and perseverance in performing their exercise program between therapy sessions. Without their commitment and energy, the surgery is assured to fail to meet their

expectations. With their cooperation and dedication they have an excellent chance to regain the strength, motion, and confidence in their shoulder to participate in a wide variety of activities, including throwing and racquet sports, lifting overhead, and repetitive use of the arm at shoulder level or above.

Following repair of a small rotator cuff tear, physical therapy typically begins 1-2 weeks post-op. A physical therapist's treatment and supervision is recommended for optimal results. Physical therapy visits are typically 2-3 times a week in the 1st 4 weeks, then 2-3 times a week for the 2nd 4 weeks. The following exercise program should be followed **daily on your own, closely following your physical therapist's instructions,** to achieve the goals expected at the end of each time interval. This detailed protocol has been designed as a reference specifically for you and your physical therapist.

TIMING OF POST-SURGICAL VISITS:

1. WEEK 1 (6 days)- dressing change, suture removal (if necessary) & X-rays
2. WEEK 5 (ROM check)
3. WEEK 9 (strength check)

REHABILITATION PROGRAM

__References:__ 1. Rehabilitation of the Rotator Cuff: An Evaluation-Based Approach;
J Am Acad Orthop Surg, Vol 14, No 11, October 2006, 599-609.
2.Clinical Orthopaedic Rehabilitation, 2nd edition (2003)
By Steven B. Brotzman, MD and Kevin E. Wilk, PT.
3.Champ L. Baker, MD, et. al., Arthroscopic Rotator Cuff Repair,
Journal of Surgical Orthopaedic Advances 12(4):175-190, 2003
4.Orthopaedic Physical Assessment, 4th edition (2006)
by David J. McGee, RPT, PhD

IMMEDIATELY POST-OP

1. **ACTIVITY:** A ***shoulder immobilizer*** (sling with a strap to keep the arm against the body) is provided for comfort and to remind the patient they are not to attempt to reach with the operated arm until the doctor or physical therapist gives the "OK". It may be removed as needed for comfort. ***Sitting up*** in bed or chair is usually the most comfortable position, even to sleep. Put a bag of ***ice*** on the shoulder, covering the dressing with a towel to keep it dry. Change it every 4 hours. Some patients will have a thermos type ice machine, which is started at the coldest setting, then adjusted to comfort. Others will have synthetic ice bags that are part of the shoulder immobilizer. Gel pads rotated in the freezer or ice from a convenience store are good alternatives as well. Ice is important for 3 days after surgery to keep swelling and pain to a minimum. Prescription pain pills are provided and should be taken every 4 hours in the first 24 hours to prevent muscle spasm and subsequent pain (pain that can be difficult to control without hospitalization). You will have a doctor's visit 5-6 days after surgery to check the wounds and to make arrangements to start physical therapy.

2. **RANGE OF MOTION:** The patient should open and close their fist several times each hour while awake to prevent swelling and stiffness of the hand. If comfortable, they may begin removing the shoulder immobilizer the day after surgery to dangle their arm and straighten and bend the elbow. This should be done twice a day until the immobilizer is discontinued.
3. **WOUND CARE:** It is important to not get the dressing or incision wet. You may shower 48 hours after surgery if you cover your dressing with a plastic bag (or plastic wrap such as Saran Wrap or Glad Press'N'Seal), and waterproof tape. You may remove the dressing 3 days post-op; if there is any drainage, cover the incision(s) with a small gauze and tape from the drug store.
4. **GOAL:** The goal in the first 3 days after surgery is comfort. A good night's sleep is essential. Prescription sleeping pills are provided and should be used if necessary.

WEEKS 1&2—Begin Physical Therapy, Phase 1 (Protect Repair—Passive & AAROM, no forceful end range stretch)

1. **PAIN & SWELLING:** It is important to reduce pain and swelling throughout rehabilitation with the use of specific modalities, such as, ice pack, electrical stimulation, ultrasound, and mobilizations, as recommended by your physician or physical therapist. After 3 days ice is no longer necessary day and night and can be used as needed for pain control. If you have a shoulder immobilizer that comes with synthetic ice bags, the part of the immobilizer that holds the ice bags can be removed after 3 days. In general, ***heat*** helps with muscle spasm, especially *before* exercise; ***ice*** helps with pain & swelling, especially *after* exercise.
2. **ACTIVITY:** Gradually increase the time out of the immobilizer, as comfort allows. You may use the arm at waist level. Do not reach for anything until the doctor or therapist gives the OK. You may slowly raise your arm if your hand is touching your chest up to the level of your ear or face; do this laying flat on your back until it is comfortable to do sitting up.
3. **RANGE OF MOTION:** The shoulder immobilizer is for the patient's comfort. They may stop using it when it no longer helps them stay comfortable (typically by the end of Phase 1). Five to 7 days after surgery, begin active assisted and passive motion using counter top or thigh slides and rotation with the elbow supported, within the tolerance of comfort. Some pain during ROM exercises is acceptable, but **pain should subside within 20-30 minutes after each therapy or exercise session.** Tell your therapist if you are experiencing pain longer than 30 minutes after a PT session. ROM exercises may include pendulum, scaption, and external rotation to neutral (and extension in the 2nd half of Phase 1), but internal rotation behind the back and adduction should be avoided in the early phase of rehabilitation as they stress the rotator cuff repair and can compromise healing. The patient's elbow should be supported and the elbow anterior to the coronal plane of the shoulder during passive stretching.

4. **STRENGTHENING:** Strengthen the shoulder using yellow or red theraband and isometric exercises that the physical therapist shows you (e.g. scapular adduction, shoulder extension, and arm curls with free weights with elbow slightly abducted to avoid substitution). ***Forward flexion or scaption resistive exercises are to be avoided until Phase 3.*** The goal of strengthening in the early phase of rehabilitation is to center the humeral head in the glenoid fossa. The rotator cuff is protected during rotational resistance exercises by flexing and abducting the arm 30 degrees to the scapular plane and performing isometrics with manual resistance ("rhythmic stabilization"). ***Resistance exercises should be done in a mid range and should cause no pain.***
5. **WOUND CARE:** You may get the incisions wet, in a shower, 5 days after surgery, if there is no drainage. Do not soak the shoulder in a bathtub, hot tub, or swimming pool until at least 3 weeks after surgery. Don't be surprised if bruising develops 3 to 7 days after the operation in the upper arm or even to the elbow.
6. **GOALS:** Initial focus is on educating the patient on HEP and proper positioning for optimal tissue healing and to protect the repair. Begin early ROM exercises to avoid adhesions and promote healthy (linear, longitudinal) collagen formation resulting in strong, extensible scar tissue. Focus on minimizing load across the repair, decreasing pain, restoring function (keeping the hand close to the front of the body and avoiding substitution). By the end of this phase, the shoulder should move to 80-100 degrees flexion (scaption), and to 0 to 10 degrees external rotation when arm is abducted 30 degrees in the supine position, but may still be sore, stiff, and swollen. Do not be discouraged if some swelling persists.

WEEKS 3-8 Phase 2 (Begin AROM, submaximal isometrics, rhythmic stabilization, & PNF exercises in supine position with gravity eliminated)

1. **PAIN & SWELLING:** Continue to use necessary modalities as needed to promote healing and lessen muscle spasm/dysfunction.
2. **RANGE OF MOTION:** Increase ROM using the exercises your therapist recommends. Improve extension-adduction moving the hand behind the back toward the opposite buttock. Avoid pain after this motion by avoiding end stretch and humeral elevation ("substitution"). Moving the hand across the back, rather than up the middle of the back, avoids substitution during this phase.
3. **STRENGTHENING:** Continue with twice a day theraband exercises, cane press, free weight (not against gravity), and gain 3+ /5 strength with no substitution. Strengthening exercises should be done in pain free, mid-range. Introduce scapular stabilization exercises and closed kinetic chain exercises for muscle re-education. Also introduce isometric inferior glide exercise, avoiding superior glide between reps by bending the elbows if necessary in between reps.
4. **GOAL:** By the end of Phase 2 PROM of the shoulder should be 120-140 deg flexion (scaption) and 20-60 deg external rotation (in 30 deg abduction, supine). It is not unusual to still have some discomfort in the shoulder, which may limit motion. It is also not unusual to still have difficulty reaching behind the back (internal rotation/ extension), though the goal should be (PROM) thumb to middle of lower back. Not only should glenohumeral motion be re-established, but also

glenohumeral-scapulothoracic rhythm (1 deg ST motion for every 2 deg GH motion). Histologically, the goal in this phase is to organize new collagen tissue to promote strong tendon healing by applying slight tension to the repair and to avoid disorganized collagen (scar) with early protected ROM.

5. **ACTIVITY:** You may use the arm for personal hygiene as your comfort permits. You should begin tapering your use of prescription pain pills; 1/2 a pain pill is often adequate for pain control during the day, without the side effects of a full dose.

WEEKS 8-12 Phase 3 (Begin Resistive Exercises)

1. **PAIN:** Continue to use modalities as needed. You should continue tapering your use of prescription pain pills and discontinuing their use by the end of Phase 3.
2. **RANGE OF MOTION:** Continue to increase AROM to improve quality of shoulder movement and eliminate substituted shoulder movement. Work on end-range movement and regain fully functional range (e.g. dressing & personal hygiene maneuvers returned to normal).
3. **STRENGTHENING:** Water exercises are encouraged in the 1st ½ of this phase. In the 2nd ½ of this phase you may use any exercise equipment available to you in your home, gym, and health club, such as pulleys or Nautilus-type machines. In the 2nd ½ of this phase isokinetic exercises may be begun by the physical therapist or trainer, as well as plyometric or sports-specific strengthening exercises. Avoid resistive exercises overhead (keep elbow below shoulder level). Use lower weight and a higher number of repetitions (20 to 30) to build endurance. Repetitions should be done slowly, and in a controlled fashion, until you are certain you can do the exercise comfortably. Try to exercise 1 hour a day (breaking it up into comfortable intervals), at least 3 to 5 times per week. We do not recommend "empty can" abduction or any other exercise that causes pain, stiffness or swelling. Initial focus should be on rotator cuff (peri-articular) and anterior deltoid strengthening (concentric and eccentric, pain-free range); as the patient progresses, closed chain exercises are beneficial. At the end of this phase the focus turns to advancing proprioceptive and neuromuscular activities necessary for specific activities or sports that the patient plans to resume.
4. **GOAL:** By the end of Phase 3, the range of motion of the shoulder should equal the normal side and feel well enough to resume light activities such as reaching. Do not attempt to lift anything heavy overhead. When lifting, don't reach and lift (keep the object close to your body), and check the weight before lifting to make sure it doesn't feel too heavy. You should have full ROM including reaching behind the back by the end of Phase 3.
5. **ACTIVITY:** You may use the arm to reach but not lift anything away from the body or above waist level until the doctor or therapist gives the OK (no substitution when raising the extended arm against gravity). You may swim, but no overhead stroke until the doctor or therapist says OK. Those patients who progress rapidly may be able to return to sports at the end of this phase if given their physical

therapist's or surgeon's OK. Try using a heating pad at home to reduce pain and loosen tight muscles before exercise.

WEEKS 13-24 Phase 4 (Activity Specific Training)

1. **PAIN:** Use non-narcotic pain pills such as Tylenol or Advil or Aleve as needed.
2. **STRENGTHENING:** Continue to use any exercise equipment available to you in your home, gym, and health club. Increase the weight and resistance on the exercise machines. Simulate and train in the sports you wish to participate in. Throwing and racquet sports are encouraged if power is kept sub-maximal so that the activity is pain-free. It's usually safe to begin unrestricted use of the arm at home and work by the end of this phase.
3. **GOAL:** By 4-6 mos, the shoulder should feel well enough to resume full unrestricted activities and sports including tennis, racquet ball, football, baseball, softball, basketball, soccer, wrestling, volleyball, boxing, and water and snow skiing as long as you don't experience pain during and after the activities.
4. **COMMENT:** It may take between 6 months and a year to regain full confidence in the operated shoulder. Confidence can only be regained by using the shoulder and subjecting it to the demands of the sport that you desire to return to.

ANSWERS TO COMMON QUESTIONS:

How long will I be in the hospital?

Surgery is performed as an outpatient. Patients go home 3-4 hours after surgery when they can eat and are comfortable.

How long does the surgery take to perform?

The surgery usually requires 1-2 hours to perform. Often there are spurs under the acromioclavicular joint that cause impingement, requiring an extra 15 minutes to remove a small portion of the end of the collar bone.

When can I drive a car?

When you feel safe and confident behind the wheel so you can avoid getting into an accident. Generally, driving is resumed within the first 2-4 weeks after surgery, but may take longer if you require pain medication frequently. Do not drive when you are taking pain pills.

When can I return to work or school?

Motivated people who have a sitting or desk job can usually be back at work by 2-4 weeks after surgery. Construction workers take 3-4 months.

What is the success rate of the surgery?

Over 90% of patients will have relief of pain and function equal to normal and will be able to return to full unrestricted activities.

Can I re-injure the shoulder?

Remember that the operation removes bone spurs that impinge on the rotator cuff and repairs tears in the rotator cuff but does not replace worn parts. Yet if you pay attention to discomfort in your shoulder you should be able to tell when you are overdoing it without re-injuring the shoulder.

Can my therapist watch the operation?

Yes, the therapist can call 724-6169, ext. 203, and let our medical assistant know that they would like to observe the surgery. It is a hospital policy that non-medical personnel are not permitted in the operating room; this includes family and friends.

If you have any more questions, please write them down in the space below and ask your physical therapist. Or you may call 724-6169 for our medical assistant, or ask Dr. Abrahamsen at your next office visit.