

Conservative Rehabilitation Guideline for Subacromial Impingement & Rotator Cuff Disorders (Tendinitis, Tendinosis, Partial Thickness Tear, Full Thickness Tear)

St. Francis Orthopaedic Institute and St. Francis Rehabilitation Center

*All information contained in this protocol is to be used as a general guideline only. Specific variations might be appropriate for each patient and might be specified by the physician. **Patients do not have to begin with phase 1 rehabilitation.** They can begin at whatever level of rehabilitation matches their current signs and symptoms, but most patients begin with phase 1 rehabilitation. **Achieving and maintaining a low level of pain and inflammation are the guiding principles in all stages of rehabilitation.***

SYMBOLS AND ABBREVIATIONS

AAFE, active-assistive forward elevation	MMT, manual muscle testing
AAROM, active-assistive range of motion	PFE, passive forward elevation
AASEP, assistive-to-active shoulder elevation progression	PNF, proprioceptive neuromuscular facilitation
AFE, active forward elevation	PRN, as needed
ADL, activity of daily living	PROM, passive range of motion
ER, external rotation	ROM, range of motion
FE, forward elevation	T-Band, Thera-Band (The Hygenic Corporation, Akron, OH)
IR, internal rotation	

Forward elevation, either active or passive, is the plane of motion in which an individual naturally lifts his or her arm that is anterior to the plane of the scapula and lateral to flexion.

PHASE 1

Goals

- °Initiate a therapeutic level of rotator cuff, deltoid, and scapular strengthening that does not increase inflammation or the level of reactivity of the shoulder
- °Educate the patient about modifying activity, controlling the inflammatory response, and using cryotherapy
- °Identify and address secondary factors contributing to current symptoms as long as they do not place the shoulder in impingement positions or exacerbate impingement symptoms
- °Decrease reactivity of the shoulder PRN through gentle AAROM
- °Use of the shoulder for pain-free ADLs below end ranges of motion

Exercises

Note: Patients might receive a cortical steroid injection in the subacromial bursa from their physicians to decrease their pain and inflammation and thus allow greater participation in their prescribed therapy programs. If patients present to therapy within 7 to 10 days of this injection, great care should be taken to prescribe exercises that are not beyond their described preinjection level of function.

Progression of the current level of exercise resistance and volume or advancement to challenging exercises should be done very slowly and cautiously. Often, several weeks of the same program is prudent before small advancements are made.

- °Comfortable AAROM exercises to relieve pain and to improve confidence are used if the level of reactivity of the shoulder is high
 - °Preferred exercises
 - °Pendulum

- Rope and pulley (elbows remain straight with the thumb up)
- Table step-back (Figure 1)
- Initiate base strengthening program as soon as the patient can perform it comfortably**
 - Includes rotator cuff, deltoid, and scapular strengthening performed at or below chest level
 - 2 times per day at most with light resistance and typically 30-50 repetitions
 - Yellow T-Band (initially) for ER (Figure 2) and IR
 - Initially, 4- to 6-foot band length and light pretension in a 3-6 inch arc of motion
 - Can use side-lying ER instead of T-Band ER to begin with
 - Yellow T-Band forward reach
 - Initially, 4- to 6-foot band length and light pretension
 - Start with the elbow bent and by the side and the band tied behind the patient
 - Reach **forward** with the hand at waist level, progressing to reaching **forward** at chest level (Figure 3)
 - Scapular strengthening emphasizing scapular retractions and scapular upward rotators
 - No prone FE, abduction, or ER strengthening**
- Initiate progressive overhead strengthening to improve AFE **ONLY when a tolerance to base strengthening is established and when the AASEP (described below) is comfortable**
 - It is a stepwise progression in difficulty of strengthening exercises from PFE to AFE against gravity
 - The goal of the progression is to achieve pain-free full AFE
 - Start with whatever level of exercise is challenging but not painful - some patients start with AFE**
 - If scapular or glenohumeral substitutions or pain are present, choose an easier exercise in the progression
 - Only the exercises that are most often used for these patients are listed below
 - Full motion AFE without weight is the goal of phase 1 for the AASEP**
 - Exercises are divided into 3 levels of difficulty
 1. Gravity-minimized exercises
 - T-Band supine FE
 - Must start the involved arm at 90° of elevation
 - Pull the arm into FE
 - Jackins supine reaching progression
 - Begin at 0° with the elbow bent and end at 90° of elevation with the elbow extended
 - Start with the assistance of a cane or wand

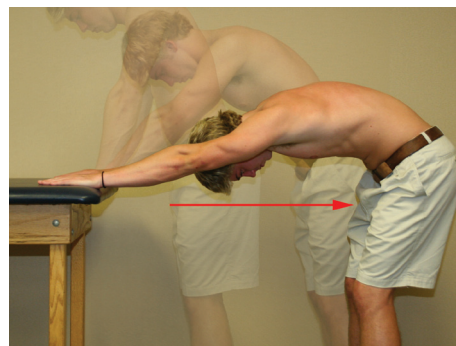


Figure 1. Table step-back exercise

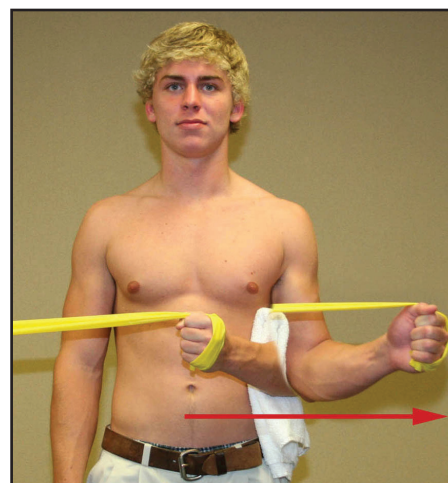


Figure 2. ER with an elastic band.

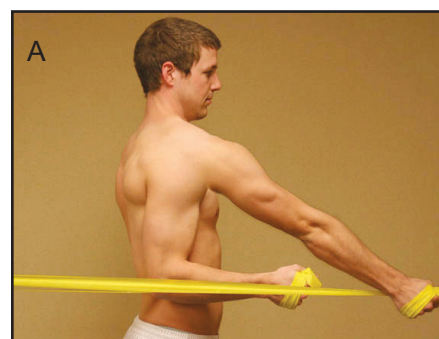


Figure 3. Forward reaching with an elastic band at waist level, A, and at chest level, B, which is more difficult.

- °Progress to active motion (Figure 4)
- °Can progress to using 1 to 2 pounds of weight
- °Can progress to the inclined position, continuing to reach to the ceiling
- 2. Assistive elevation exercises
 - °Rope-and-pulley AAFE (elbow straight, thumb up)
 - °Incline dusting (Figure 5)
 - °Wall-slide AAFE
- 3. Unsupported elevation exercises
 - °AFE (Figure 6)
- °Patient education
 - °Pathogenesis and rehabilitation process
 - °Importance of frequent use of ice
 - °Minimal use of the arm for provocative positions or recreational activities
 - °Ensure the level of pain is not increasing because of excessive use of the arm for ADLs, work, or recreation
- °Identify and address secondary factors contributing to current symptoms as long as they do not place the shoulder in impingement positions or exacerbate impingement symptoms. These might include, but are not limited to, assessing for and treating:
 - °Pectoralis minor tightness
 - °Scapular dyskinesia
 - °Spinal facet dysfunction or other cervical spine disorders
 - °Thoracic outlet syndrome
 - °Myofascial syndrome or other soft tissue disorders

Adjunctive Exercises

- °Modalities as needed to reduce resting or constant pain
 - °Cryotherapy and ice massage
 - °Electrical stimulation only in patients who are not responding well to standard phase 1 rehabilitation
- °Aquatic therapy acutely for pain-free AAROM and comfort
- °Aquatic therapy subacutely for progressive base rotator cuff, scapular, and deltoid strengthening

Interventions to Avoid

- °Exercises that result in severe immediate or delayed pain
- °Exercises that result in excessive guarding or splinting of muscles
- °Home or clinic exercises into straight-plane abduction or other exercises that place the shoulder in positions of impingement, such as horizontal adduction
- °Repetitive daily activity with affected extremity that provokes symptoms

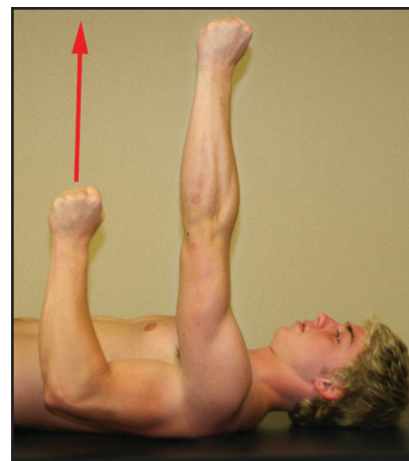


Figure 4. Supine active reaching from 0° to 90°.



Figure 5. Incline dusting.



Figure 6. Active forward elevation.

PHASE 2

Criteria to Begin

- °No pain with the arm at rest and symptoms limited to specific and predictable activities with or without pain at night
- °Pain-free tolerance to base strengthening program and the AASEP with only fatigue reported
- °**Note: Many patients, especially elderly patients or those with larger full-thickness tears may never progress to phase 2 rehabilitation or they may stay in phase 1 rehabilitation for at least 4 to 6 weeks.**

Goals

- °Progressively advance rotator cuff and scapular strength and endurance with a comprehensive strengthening program specific to the patient's evaluated deficits
- °Progressively normalize PROM and flexibility deficits, specifically deficits of the posterior capsule and pectoralis minor, that are **limited due to stiffness** into all planes of motion
- °Address core and lower extremity deficits because they might contribute to functional limitation
- °Allow pain-free return to normal household and low-demand occupational ADLs along with recreational sports that do not require repetitive or powerful overhead use of the arm

Exercises

- °Progress the base strengthening program established in phase 1
 - °Increase strength and endurance by increasing repetitions and resistance while still using the philosophy of relatively low resistance during rotator cuff strengthening and allowing no visible mechanical deviations
 - °Increase the size of ROM
 - °Perform 2 times per day to perceived level of fatigue
- °Progress the AASEP established in phase 1
 - °Achieve full-motion AFE without weight if that has not been achieved in phase 1
 - °Progress to AFE with very light resistance (typically 1 to 3 pounds)
- °Implement a home-based stretching program to normalize PROM and flexibility deficits that are limited due to stiffness into all planes of motion as long as impingement symptoms are not exacerbated
 - °Assess each plane of motion to determine if stretching is needed. Stretching should be performed ONLY if: (1) motion is limited more than the contralateral side and (2) the level of pain is minimal or none.
 - °If a particular ROM is limited only due to pain, then mechanical pinching or inflammation rather than stiffness is limiting the ROM. Home stretching would NOT be appropriate at this time
 - °Especially evaluate the posterior shoulder, forward elevation, and pectoralis minor
 - °Preferred posterior shoulder stretches include
 - °Horizontal adduction or cross-body stretching
 - °Sleeper stretch

Adjunctive Exercises

- °Aquatic therapy for progressive base rotator cuff, scapular, and deltoid strengthening
- °Closed kinetic chain exercises for shoulder girdle and core stabilization
- °Kinesthetic awareness drills
- °Lower extremity and core training if deficits are present and thought to contribute to the patient's signs and symptoms
- °Modified weight-training program PRN (when approved by physician)

- °Use high repetitions (15–25 repetitions) for at least 1 month and relatively light weight
- °Initially no chest training or deltoid training beyond rehabilitation exercises
- °Depending on the size of the tear and the level of symptoms, can progress to chest and shoulder training exercises that do not place a large load on the rotator cuff in provocative positions; for example, do not perform dips, behind-the-head-shoulder press, and heavy full-range dumbbell chest presses

Interventions to Avoid

- °Advanced strengthening or unrestricted return to overhead sports or weight training
- °Exercises that greatly increase signs and symptoms
- °Home or clinic exercises into straight-plane abduction
- °Highly repetitive rehabilitation activities with the arm positioned overhead

*Note: Most patients will be discharged at the completion of phase 2 to an independent home exercise program. This program will focus on progressive or maintenance shoulder girdle strengthening. **Only patients who require return to frequent participation in vigorous sports or moderate to heavy occupational demands should progress to phase 3. This level of exercise is not used for most patients with rotator cuff disease.***

PHASE 3

Criteria to Begin

- °Goals of returning to sports, heavy labor, or repetitive or heavy overhead work
- °No pain with the arm at rest and symptoms limited to specific and predictable high-level activities, such as competitive sports or high-demand occupations
- °Successfully normalize all PROM and capsular deficits
- °Pain-free tolerance to progressive base and overhead strengthening program with 5/5 MMT of the rotator cuff and scapular muscles
- °Physician approval

Goals

- °Normalize dynamic strength and endurance of the rotator cuff and scapula
- °Full return to recreational or high-demand occupational ADLs
- °Discharge when functional goals are met
- °Transition to maintenance home exercise program

Exercises

- °Advance base strengthening progression and AFE
 - °Increase elastic resistance and increase up to 50 reps in all planes
 - °Larger, more functional full arc of motion
 - °Increase speed to replicated functional activity without losing eccentric control
 - °AFE up to 5 pounds depending on body size and functional demands
- °Initiate the advanced strengthening progression **PRN**
 - °**Strict criteria to start the program listed above**
 - °**Exercise principles**
 - °Decrease the amount of external stabilization provided to the shoulder girdle

- Integrate functional patterns, including abduction and ER
- Increase speed of movements
- Integrate kinesthetic awareness drills into strengthening activities
- Include the entire kinetic chain
- Decrease rest time to improve endurance
- Initiate prone strengthening PRN
- Train larger upper extremity muscles wisely

◦Sample exercises

- Prone rotator cuff strengthening: light weight with emphasis on the scapula (Figure 7)
- T-Band standing PNF-type patterns (Figure 8)
- T-Band 90°/90° ER and IR with or without arm support
- T-Band simulation of batting, golf, or tennis forehand and backhand
- Weighted shoulder shrugs
- Dumbbell overhead shoulder press **PRN**
 - Place hands in front of the shoulder with the elbows bent and naturally reach overhead
 - Sets of 15 to 20 repetitions with 3 pounds or more 3 to 7 times a week
- Initiate progressive replication of demanding ADLs & work
- Can begin interval throwing program or return to tennis program (**when approved by physician**)
- Initiate modified return to heavy weight-training program (**when approved by physician**)

Adjunctive Exercises

- Initiate plyometric program (**PRN for overhead athletes and if approved by physician**)
 - Can begin after 2-3 weeks of advanced strengthening
 - Do not begin until 5/5 MMT for the rotator cuff and scapula
 - Use only 2 to 3 times per week
 - Begin with a beach ball/tennis ball & progress to weighted balls
- Progressions
 - 2-handed tosses
 - Waist level
 - Overhead
 - Diagonally
 - 1-handed drop-and-catch drills
 - 1-handed tosses, varying the amount of
 - Abduction
 - Arm support

Interventions to Avoid

- Any rehab activity that is significantly more demanding than daily or expected recreational activities**
- Any exercise that significantly increases signs and symptoms

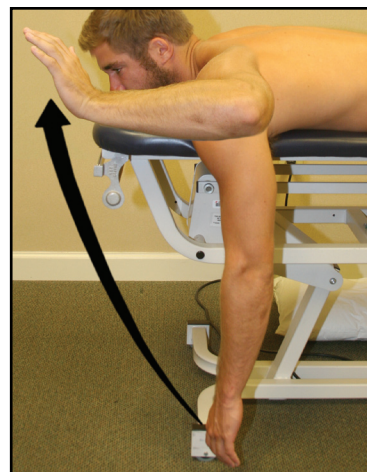


Figure 7. Prone hang to external rotation near 90° of abduction without support.

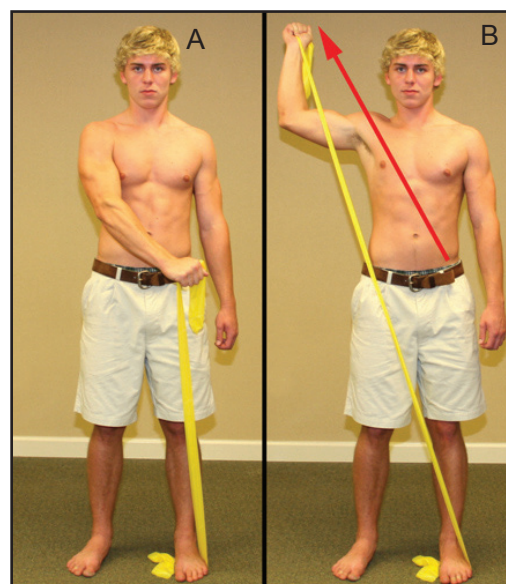


Figure 8A and B. T-Band standing PNF-type patterns.