Appendix.

Rotator Cuff Repair (Arthroscopic, Mini-Open with Fair or Good Tissue Quality) With or Without Subacromial Decompression, Excision of the Distal Clavicle

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. In all cases, it is acceptable to advance the program more slowly than stated. If the patient experiences excessive pain, discontinue exercise until the physician is contacted. ***Achieving and maintaining a low level of pain and inflammation and protecting the surgical repair are the guiding principles in all stages of rehabilitation, even if less passive and active range of motion are accomplished.***

Symbols and Abbreviations

AAFE, active-assistive forward elevation
AAROM, active-assistive range of motion
AASEP, assistive to active arm elevation progression
AFE, active forward elevation
AROM, active range of motion
ER, external rotation
FE, forward elevation
IR, internal rotation
MMT, manual muscle test
NA, not applicable
PER, passive external rotation
PFE, passive forward elevation
PNF, proprioceptive neuromuscular facilitation
POD, postoperative day
POM, postoperative month
POW, postoperative week
PRN, as needed
PROM, passive range of motion
ROM, range of motion
T-Band, Thera-Band (The Hygenic Corporation, Akron, OH)
WNL, within normal limits
WFL, within functional limits

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

Staged Goals for Range of Motion

These are approximate targets for range of motion. Specific limits might be specified by the physician, especially if a subscapularis repair was performed.

	PFE	PER at 20° of Abduction	PER at 90° of Abduction	AFE
POD 1	60°	0°-20°	NA	NA
POW 1	80°-100°	10°-30°	NA	NA
POW 3	115°-130°	30°-45°	NA	NA
POW 6	130°-150°	45°-60°	45°-60°	45°-120°
POW 9	140°-165°	WNL	60°-80°	75°-145°
POW 12+	145°-WNL	WNL	WNL	115°-155°+

Phase 1

Goals

°Minimize pain and inflammatory response
°Maximally protect surgical repair
°Achieve staged ROM goals
°Educate patient about postoperative precautions
°Establish stable scapula

POD 1 to POW 6

°Elbow, wrist, and hand AROM with no weight
°Scapula elevations and retractions (no weight) in or out of sling
°Pendulum exercises
  °Lean over table a comfortable amount
  °Let arm hang down relaxed
  °Keep body still
  °As able, move arm in small comfortable circles only
°Upright PER in slight abduction until mild stretch and discomfort
  °7 to 12 repetitions 2 times per day
  °Preferred exercises
    °Sit with family member or therapist rotating the arm (Figure 5)
    °PER walk-around (stand with arm supported on table and rotate body) (Figure 6)
°PFE until mild stretch and discomfort
  °7 to 12 repetitions 2 times per day
  °Preferred exercises
    °Sit with family member or therapist lifting the arm (Figure 3)
    °Kinex KS2 (Kinex Medical Company, LLC, Waukesha, WI) continuous passive motion machine 10 to 20 minutes 2 to 4 times per day (Figure 18)
    °Table step-back exercise (Figure 2)
    °After achieving >110º of PFE, progress to self-assisted AAFE in the supine position, as tolerated (Figure 4)
°Ice for pain reduction
°Fit sling properly
  °Ensure sling provides slight lift to shoulder girdle and supports wrist
°Patient education
  °Primary focus of phase 1: encourage initial healing of the surgical repair
  °Use of sling as instructed by physician; typically, full time in community and when up for >5-10 minutes at home
  °Minimal use of arm for light waist-level activities, as comfortable
    °Ensure pain level is not increasing because of excessive use of arm for activities of daily living or work
  °Sleep in recliner
    °3 weeks (required)
    °6 weeks (preferred)

Figure 18. Passive forward elevation performed by the Kinex KS2 (Kinex Medical Company, LLC, Waukesha, WI) shoulder continuous passive motion machine

Adjunctive Exercises

°Therapist-assisted supine PROM within comfortable ROM to
  °Decrease muscle guarding
  °Gain patient confidence
  °Achieve staged PROM goals (no mobilizations)
°Cervical spine AROM
°Pain-control agents PRN
°Aquatic therapy for gentle pain-free AAROM (no swimming strokes) after incision has healed completely

Interventions to Avoid

°Home exercise glenohumeral PROM in planes other than PFE and PER
°Exercises that result in moderate or severe pain
°Exercises that result in excessive guarding or splinting of muscles
°Weighted exercises
°Cross-body adduction, reaching behind back, and active elevation of arm above waist level
°Repetitive activity with affected extremity

Phase 2

Goals

°Achieve staged ROM goals
°Minimize shoulder pain
°Begin to increase AROM, strength, and endurance
°Increase functional activities

POW 6 to 9

°Achieve staged ROM goals in FE
    °Preferred exercises
        °Rope-and-pulley exercise (elbows remain straight)
        °Patient-assisted supine AAFE exercise (use unaffected arm for assistance) (Figure 4)
°Achieve staged ROM goals in ER at 20° abduction using upright exercises
°Initiate horizontal adduction (Figure 8) and/or "sleeper" stretch (Figure 9) PRN
°Initiate supine hand-behind-head stretch (Figure 7)
    °Progress to gentle ER stretching in 70° to 90° of abduction
°Therapist-assisted PROM to achieve staged ROM goals with mobilizations PRN
°Initiate base strengthening progression
    °Includes standard rotator cuff, deltoid, and scapula strengthening program
    °2 times per day, at most, with light resistance and increasing repetitions
    °Yellow T-Band for ER and IR
        °5- to 6-foot band length and light or no pretension
        °Can use side-lying ER instead of T-Band
    °Yellow T-Band forward reach (Figure 15)
        °Initially, 5- to 6-foot band length and light or no pretension in a 3- to 6-inch arc of motion
        °Start with elbow bent and by the side and band tied behind patient
        °Reach **forward** with hand at waist level, progressing to reaching **forward** at chest level
        °**Do not initiate until forward reach at waist level without resistance is pain-free**
        °If forward reach is painful or difficult, replace with a "gravity-minimized" exercise from the AASEP (described below) until the forward reach can be done comfortably.
    °Scapula strengthening emphasizing scapula retractions and scapula upward rotators (chapter IV-2)
    °Low-level closed chain strengthening (chapter II-4)
    ° **No prone FE, abduction, or ER**
°Initiate the AASEP as comfortable (chapter II-4)
    °A stepwise progression in difficulty of strengthening exercises from PFE to AFE against gravity
    °Goal of the progression is to achieve pain-free full AFE

- °EMG demonstrates progressive activation of cuff and deltoid during the progression[17]
- °If scapula or glenohumeral substitutions or pain are present, choose an easier exercise in the progression
- °The order of the exercise sequence has some variability
- °Usually not all exercises need to be performed
- °Progression might not be completed until after POW 12
- °**Do not perform the base strengthening program or overhead strengthening progression until overall pain level is low. Ensure that these exercises do not increase signs and symptoms.**
- °Exercises are divided into 3 difficulty levels
  1. Gravity-minimized exercises
     - °Horizontal dusting (Figure 11)
       - °Perform straight ahead and perform at 20° angles medially and laterally if comfortable
     - °T-Band supine FE (Figure 19)
       - °Must start involved arm at 90° of elevation
       - °Pull arm into FE
     - °Side-lying gravity-eliminated AFE (Figure 20)
       - °Lie on uninvolved side
       - °Place involved arm on ironing board
       - °Slide hand on board
     - °Jackins supine reaching progression
       - °Begin at 0° with elbow bent and end at 90° of elevation with elbow extended
       - °Start with the assistance of a cane or wand (Figure 21)
       - °Progress to active motion (Figure 22)
       - °Can progress to using 1 to 2 lb of weight
       - °Can progress to inclined position, continuing to reach to ceiling (Figure 23)
  2. Assistive elevation exercises
     - °Rope-and-pulley AAFE
     - °Incline dusting (Figure 24)
     - °Standing AAFE (assistive elevation and descent via T-bar or unaffected arm)

Figure 19. Supine forward elevation with elastic band.

Figure 20. Side-lying, gravity-eliminated active forward elevation.

- °Standing assistive elevation and active independent eccentric lowering
- °Wall slide AAFE
  - °Ensure that patient is in FE and is not in flexion
  - °Must be pain-free and natural when performing

3. Unsupported elevation exercises
   - °Overhead wall taps
   - °AFE (Figure 25)

Adjunctive Exercises

- °Moist heat or ice
- °Modalities PRN
- °Aquatic exercises (chapter IV-9)
  - °AAROM
  - °AROM
  - °Light strengthening
- °Spine therapy assessment and mobilization if
  - °Nonneurogenic cervical or scapula pain or
  - °Limitation in end-range shoulder FE
- °Trunk stabilization and strengthening

POW 9 to POM 3

°Continue the previously described exercises, including completion of the AASEP progression, as comfortable
°Initiate functional IR AAROM and stretching as tolerated (Figure 10)
°Initiate AFE when the AASEP is complete
- °Only perform if full or nearly full AROM is possible and comfortable
- °Eventually progress to 1 to 3 lb for resistance, depending on body size

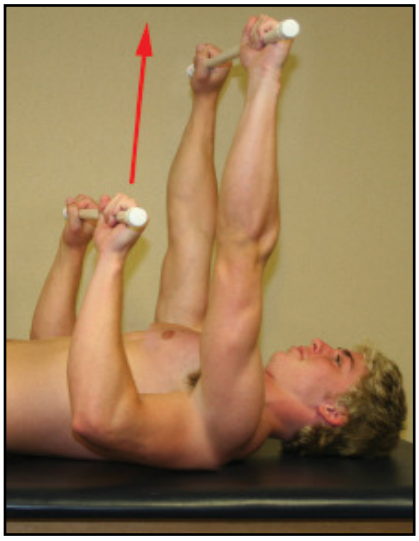

Figure 21. Jackins supine assistive reach.

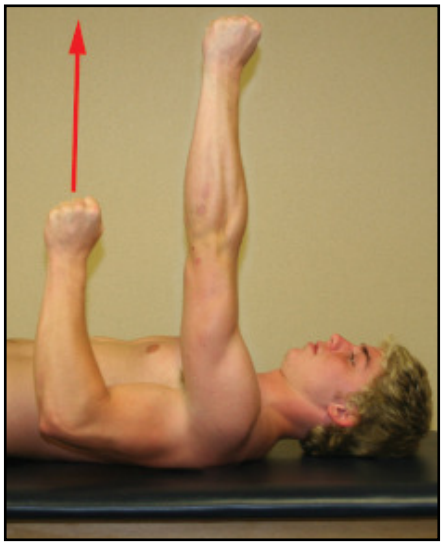

Figure 22. Jackins supine active reach.

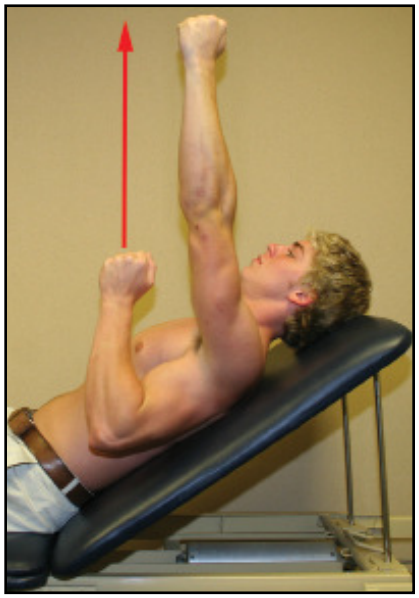

Figure 23. Jackins incline reach.