St. Francis Rehabilitation Center

Total Shoulder Arthroplasty or Humeral Head Replacement Rehabilitation Guideline With the Preoperative Diagnosis of Osteoarthritis or Avascular Necrosis

St. Francis Orthopaedic Institute and HPRC at St. Francis Rehabilitation Center

All information contained in this protocol is to be used as a general guideline only. Specific variations may be appropriate for each patient and may 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 shoulder elevation progression
AFE, active forward elevation
AROM, active range of motion
CPM, continuous passive motion
EMG, electromyography
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
ROM, range of motion
T-Band, Thera-Band
(The Hygenic Corporation, Akron, OH)
UE, upper extremity
WNL, within normal limits

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.

Staged Goals for Range of Motion

These are approximate targets for ROM. Specific limits might be specified by the physician. ***Emphasize PFE, which can be gained at a faster rate than the staged goals if comfortable. Because of the subscapularis repair, protect PER at 20° of abduction and 90° of abduction by not being forceful with stretching and by not exceeding the staged goals.***

	PFE	PER at 20° of Abduction	PER at 90° of Abduction	AFE
POW1	80°-100°	0°-15°	NA	NA
POW 3	115°-130°	20°-30°	NA	NA
POW 6	130°-145°	35°-50°	45°	90°-130°
POW 12	140°-155°	< 60°	< 70°	125°-155°
POM 5	WNL	< 60°	< 70°	145° +

Phase 1

Goals

°**Maximally protect repair (especially the subscapularis repair)**
°Ensure prosthetic or joint stability
°Control edema
°Achieve staged ROM goals, especially PFE
°Minimize pain and inflammatory response
°Educate patient about postoperative precautions

POW1 to POW 6

- °Elbow, wrist, and hand AROM with no weight – starts POD 1
- °Edema control PRN, including edema glove, Tubigrip, and retrograde massage – starts POD 1
- °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 only small comfortable circles
- °PFE until mild stretch and mild discomfort
  - °7 to 12 repetitions starting with 2-4 times per day
  - °**Emphasize gaining ROM in this plane**
  - °Preferred exercises
    - °Sit with family member or therapist lifting the arm (Figure 1)
    - °Table step-back exercise (Figure 2)
    - °Kinex KS2 shoulder CPM (10 to 20 minutes 2-4 timers per day) as ordered by the physician (Figure 3)
    - °After achieving >110º of PFE, progress to self-assisted AAFE in the supine position, as tolerated
- °Upright PER at 20° of abduction until mild stretch and +/- discomfort
  - °7 to 12 repetitions starting with 2 times per day
  - °ROM limits might be specified by physician
  - °**Protect ROM in this plane – do not exceed staged goals, no forceful stretching**
- °Preferred exercises
  - °Sit with family member or therapist rotating the arm
  - °PER walk-around (stand with arm supported on table and rotate body) (Figure 4)
- °Ice for pain reduction
  - °Fit sling properly, providing a lift to the shoulder girdle
- °Patient education
  - °Use of sling as instructed by physician
    - °Typically, full time in community and when up for more than 5 to 10 minutes at home
  - °Can use 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

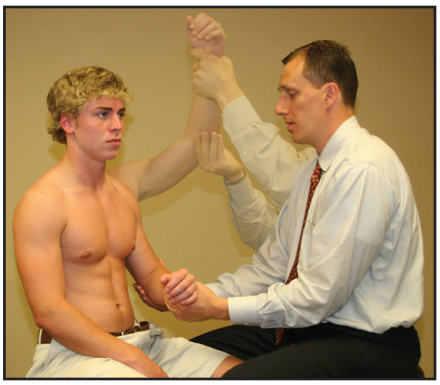

Figure 1. Assisted PFE (assistant typically stands diagonally in front of patient).

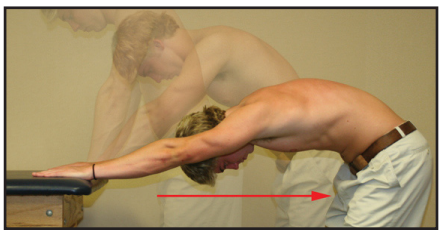

Figure 2. Table step-back exercise.

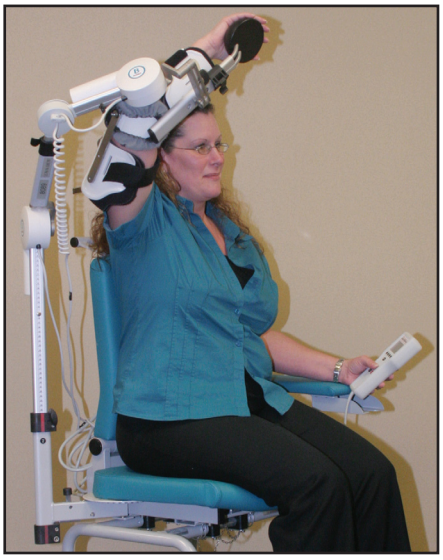

Figure 3. The Kinex KS2 shoulder CPM.

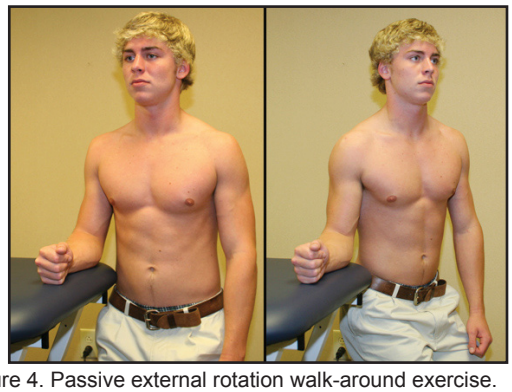

Figure 4. Passive external rotation walk-around exercise.

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

°Glenohumeral PROM, except PFE and PER, for home exercise
°Forceful PER stretching to protect the subscapularis repair
°Exercises that result in moderate or severe pain
°Exercises that result in excessive guarding or splinting of muscles
°Weighted exercises and the upper body ergometer

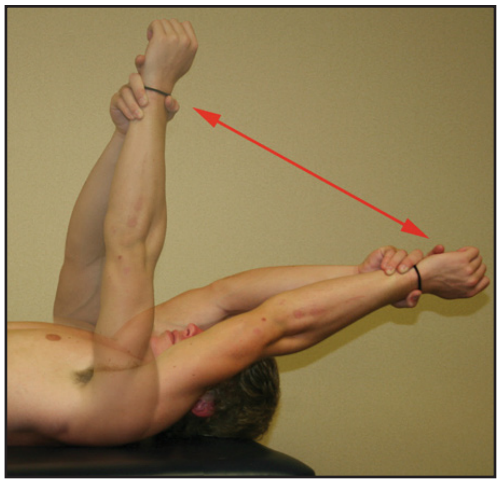

Figure 5. Self-assisted supine active-assisted forward elevation (hand-assisted exercise preferred).

Phase 2

Goals

°Protect the subscapularis repair
°Ensure prosthetic or joint stability
°Achieve staged ROM goals, especially PFE
°Begin to increase AROM, strength, and endurance
°Increase functional activities

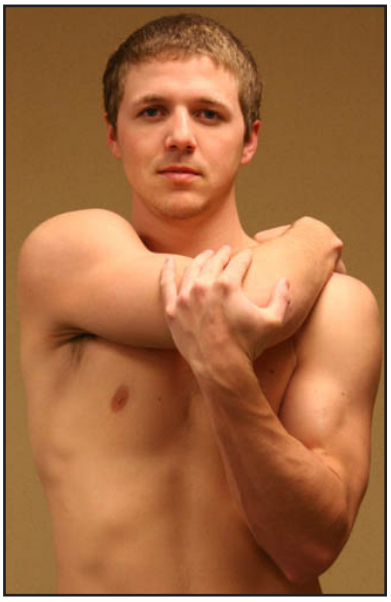

Figure 6. Horizontal adduction stretch.

POW 6 to POM 3

°Achieve staged ROM goals in FE
  °**Continue to emphasize increasing ROM in this plane**
  °Preferred exercises
    °Rope-and-pulley in forward elevation (elbows straight)
    °Patient-assisted supine AAFE exercise (use unaffected arm for assistance) (Figure 5)
°**Discontinue ROM exercises for PER** at 20° abduction unless ROM is less than 35° to 40°
°Initiate horizontal adduction (Figure 6) and/or "sleeper" stretch **PRN**
°Goals of obtaining functional flexibility at POM 3
°Initiate supine hand-behind-head stretch **PRN** (Figure 7)
  °To facilitate the PROM necessary to comb hair by POM 3
°Functional IR AAROM stretching **PRN** using opposite hand to assist (Figure 8)
  °Typically, do not start before POW 8 and only then to help patient reach small of back during phase 2
°Therapist-assisted PROM to achieve staged ROM goals with mobilizations PRN
°Initiate base strengthening progression
  °Includes standard rotator cuff, deltoid, and scapula strengthening program

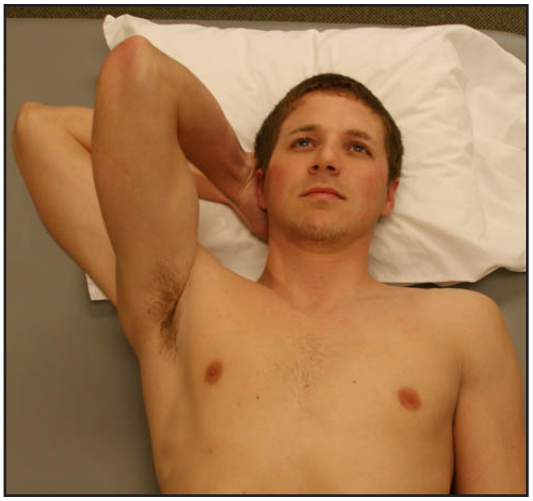

Figure 7. Supine hand-behind-head stretch.

- °2 times per day, at most, with light resistance and increasing repetitions (generally 25-40)
- °Yellow T-Band for ER and IR
  - °5-foot to 6-foot band length and light or no pretension in a 3-inch to 6-inch arc of motion
  - °**Be especially careful and gentle with IR because of subscapularis repair.** Wait to begin if painful.
  - °Can use side-lying ER instead of T-Band
- °Yellow T-Band forward reach (Figure 9)
  - °Initially, 5-foot to 6-foot band length and light or no preten sion with progressive tension as tolerated
  - °Reach forward with hand at waist level, progressing to reaching forward at chest level
  - °**Do not initiate until active forward reach at waist level is pain-free**
  - °If forward reach is painful or difficult, replace with a "gravi ty-minimized" exercise from the AASEP (described below) until the forward reach can be done comfortably
- °Scapula strengthening emphasizing scapula retractions and scapula upward rotators
- °**No prone FE, abduction, or ER**

°Initiate the AASEP as comfortable

- °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, deltoid, and scapula upward rotators during the progression
- °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.
  Choose an exercise that is comfortable and can be performed without deviations but that is fatiguing.
- °**Ensure that these exercises do not increase pain**
- °Exercises are divided into 3 difficulty levels

1.Gravity-minimized exercises

- °Horizontal dusting (Figure 10)
  - °Perform straight ahead
  - °Perform at 20º angles medially and laterally, if comfortable
- °T-Band supine FE (Figure 11)
  - °Must start involved arm at 90° of elevation
  - °Pull arm into FE
- °Side-lying gravity-eliminated AFE
  - °Lie on uninvolved side
  - °Place involved arm on ironing board
  - °Slide hand on board

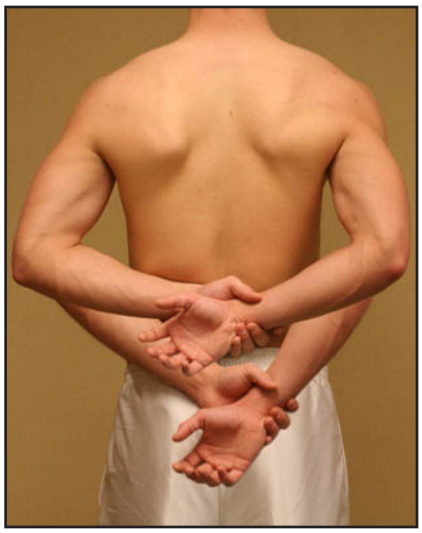

Figure 8. Functional internal rotation stretching with the unaffected hand assisting.

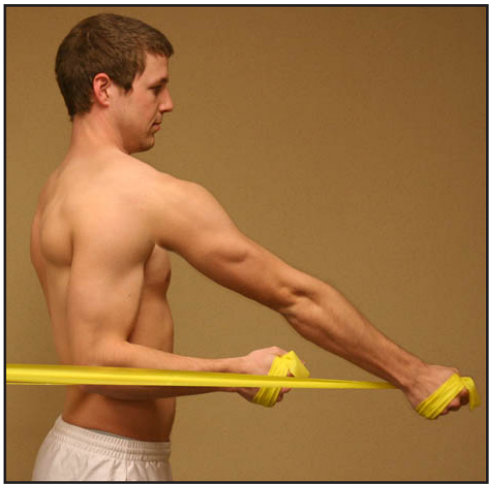

Figure 9. Forward reaching with an elastic band at waist level.

°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
°Progress to active motion (Figure 12)
°Can progress to using 1 to 2 pounds (0.45-0.90 kg) of weight
°Can progress to inclined position, continuing to reach to ceiling

2. Assistive elevation exercises
°Rope-and-pulley AAFE
°Incline dusting (Figure 13)
°Standing AAFE (assistive elevation and descent via T-bar or unaffected arm)
°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 14)

°Initiate AFE when the AASEP is complete
°Only perform if full or near full AROM is possible and comfortable
°Eventually progress to 1 to 3 lbs (0.45-1.36kg) for resistance depending on body size

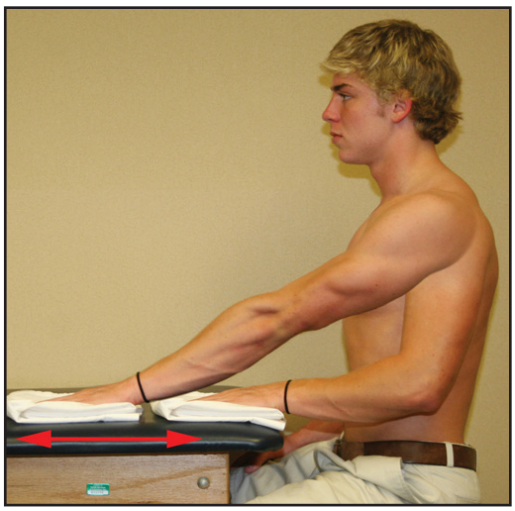
Figure 10. Horizontal dusting.


Figure 11. Supine forward elevation with an elastic band.

Adjunctive Exercises

°Cryotherapy
°Modalities as needed
°Aquatic exercises
°AAROM, AROM, Light strengthening
°Spine therapy assessment and mobilization if
°Non-neurogenic cervical or scapula pain or
°Limitation in end-range shoulder FE
°Golf chipping and putting when physician allows

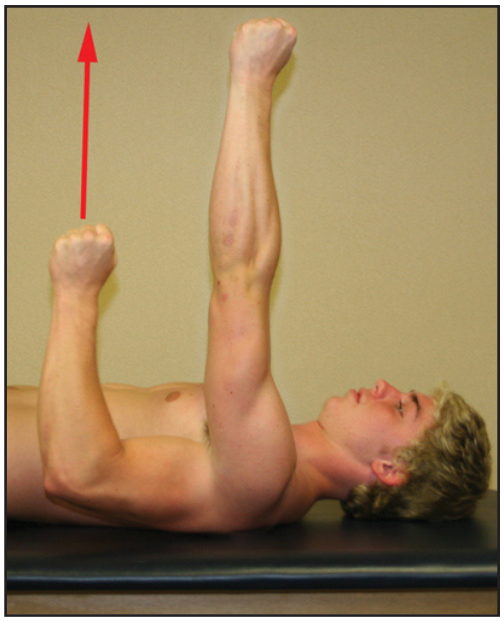
Figure 12. Supine active reaching from 0°-90°.

Phase 2 Interventions to Avoid

°**Initiating strengthening exercises if PROM is behind staged goals**
°Initiating base strengthening program or overhead strengthening progression before overall pain level is low
°Exercises that greatly increase signs and symptoms
°Heavy lifting with elbows away from body

°The upper extremity ergometer
°Strengthening into straight-plane abduction
°Prone FE, abduction, or ER


Figure 13. Inclined dusting.

Phase 3

Goals

°Functional AROM and PROM
°Normalize strength, and endurance
°Return to activities of daily living, work, and recreation

POM 3 to 5+

°PROM, stretching as needed, and warm-up stretching to achieve **functional** PROM and staged goals. Functional IR braline is allowed for females.
  °Some patients will need an extensive amount of phase 2 stretching that will be the primary thrust of phase 3 rehabilitation
  °Some patients will need almost no PROM or stretching because functional PROM already will be achieved
°Continue base and elevation strengthening program
  °Progress T-Band color very gradually
  °Continue progressive AFE as previously described
°**Discharge when functional goals are met**
°Individualized return to recreational activities and demanding work activities as determined **by the physician** to protect the longevity of the prosthesis
  °Return-to-golf program and recreational swimming generally are allowed at this time but still require physician approval
  °Tennis when physician allows
  °**Return to demanding recreational activities including throwing sports and upper body weight training, as well as occupations requiring repetitive lifting and or moderate to heavy lifting, are extremely individualized and must be determined by the physician after counseling the patient. Begin only with specific approval by the physician.**

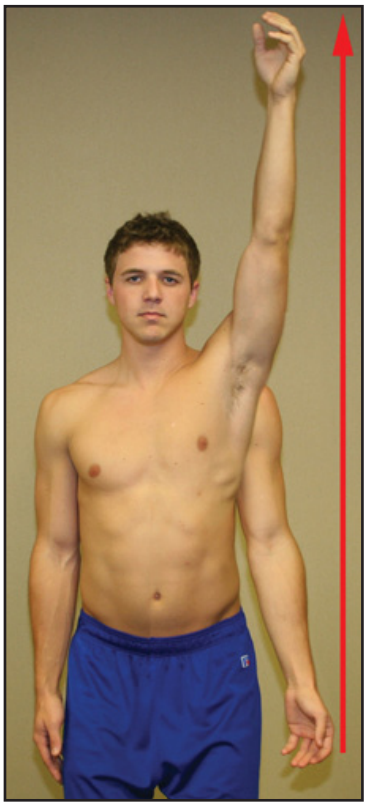
Figure 14. Active forward elevation.

Adjunctive Exercises

°Therapist-assisted stretching and mobilizations PRN

Interventions to Avoid

°Any rehabilitation activity that is much more demanding than daily or expected activities
°Any rehabilitation activity that is a moderate to large increase in demand compared with previous rehabilitation
°Any rehabilitation activity that results in a pain level high enough that the patient needs to use modalities
°Strengthening in straight plane-abduction
°The upper extremity ergometer