Reverse Total Shoulder Arthroplasty
Clinical Practice Guideline

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Background Information:
Reverse total shoulder arthroplasty is considered a surgical option when underlying glenohumeral joint arthritis is found with concomitant rotator cuff damage, complex fractures, or when failure of a conventional total shoulder replacement occurs with rotator cuff deficiency. Post-operative rehabilitation should emphasize certain key principles: joint protection, deltoid function, and range of motion expectations. Typically, the rotator cuff is absent or functioning at a minimal level. Therefore, it is important to review the post-operative note concerning rotator cuff integrity. If a positive ER lag sign is present in the initial strengthening phase then functional progression may be slower. Due to reverse orientation of the prothesis versus a conventional shoulder replacement, the deltoid becomes the prime mover for shoulder elevation to compensate for rotator cuff deficiency. This reverse orientation also places a higher risk of dislocation and should reflect protection as described in the below precautions. Altered joint arthrokinematics reduce functional gains for overhead motion and therefore should reflect realistic expectations. Most surgical options use a deltopectoral approach, however in some instances a superior approach is utilized and deltoid protection should be considered in rehabilitation. Progression through this guideline is time dependent on tissue healing as well as criterion-based concerning patient demographics and clinical assessment.

Precautions: the intended guidelines are used to reduce an extended inflammatory response, allow for proper tissue healing, and reduce chances of posterior instability:

- Proper sling use for 3-6 weeks (discharged by physician)
- Forward elevation should always be performed in scapular plane
- ROM should be gradual and never forced (avoid pain or pinching)
- No driving for 6 weeks
- Refrain from anterior capsule stretching
  -Avoid arm extension in all planes of motion (towel roll placed under arm)
  -Avoid Stretching ER at 90 degrees abduction
- Avoid combined motions of IR, Adduction and extension for 12 weeks
  -No behind the back stretches
- If Subscapularis repair then protect with ADL modifications for 12 weeks
  (go over every time with patient)
  -No supporting body weight or use of hand to push-up from chair
  -No IR behind the back (pulling up pants/belt/tucking in shirt/perineal care)
  -No shoulder IR activation/strengthening
- Long-Term: 15 lb weight limit to shoulder height & 10 lb weight limit above head

Biceps Tenodesis Precautions: In some cases, the long head of the biceps brachii could be involved which could lead to surgical repair. In these cases, this attachment site is surgically cut and reattached to the humerus. To ensure proper healing of this tendon particular guidelines should be followed.

- Limit ER to 40 degrees for 4-6 weeks
- Any biceps tension should be avoided for 6 weeks
- Avoid cross friction massage for 6 weeks
  (indirect gentle soft tissue mobilization can be utilized at 2 weeks)
- No isolated elbow flexion, straight-arm resisted shoulder flexion, or forearm supination for 8 weeks

Phase 1: Immediate Post-Surgical/Joint Protection Phase (0-6 weeks)

GOALS:
- Allow healing of soft tissue and maintain integrity of replaced joint
- Gradually increase shoulder PROM and increase AROM of elbow, wrist and hand
- Reduction of pain, inflammation, and muscular inhibition
- Independence with ADLs with modifications not to disrupt integrity of replaced joint

PRECAUTIONS:
- Proper sling use for 3-6 weeks even while sleeping (discharged by physician)
- PROM should be gradual and never forced (avoid pain or pinching)
- Limit use of involved UE: Avoid shoulder AROM and avoid lifting objects
- Towel roll placed underneath arm to avoid humeral extension for ROM & sleeping
- Do NOT bear weight through involved extremity
- No driving for 6 weeks

Post-Operative to 2 weeks	***Weeks 2 to 4***	***Weeks 4 to 6***
PROM ▪ Supine forward elevation to 90° in scapular plane ▪ Gentle ER to 20-30° (at 30° abd) -Avoid undue stress to anterior capsule (refrain from humeral extension- towel roll under arm) ▪ Avoid cross-body positions/horizontal adduction ▪ No IR ROM *Strengthening* ▪ Postural instructions with sling *Elbow/wrist/hand ROM as tolerated (follow precautions if biceps tenodesis performed)* *Modalities/cryotherapy PRN*	*PROM* ▪ Progress previous PROM *Strengthening* ▪ Begin submaximal deltoid ISOM in scapular plane (avoid shoulder extension/maintain neutral plane) -If biceps tenodesis- avoid biceps contraction with arm supported on arm rest & wrist in neutral *Elbow/wrist/hand ROM as tolerated (follow precautions if biceps tenodesis performed)* *Modalities/cryotherapy PRN*	*PROM* ▪ Supine forward elevation to 120° in scapular plane ▪ Gentle ER to 30-45° (at 30° abd) -Avoid undue stress to anterior capsule (refrain from humeral extension- towel roll under arm) ▪ Avoid cross-body positions/horizontal adduction ▪ No IR ROM *Strengthening* ▪ Continue previous ISOM ▪ Add resisted elbow/hand/wrist (if no biceps precautions) *Modalities/cryotherapy PRN*

MILESTONES TO PROGRESS TO PHASE 2:
1. Shoulder PROM program tolerable
2. Elbow, wrist, and hand AROM tolerable
3. Ability to ISOM activate deltoid and periscapular musculature

Phase 2: AROM & Early Strengthening Phase (6-12 weeks)

GOALS:

- Restore PROM and gradually progress AROM
- Control pain and inflammation
- Allow continual healing of soft tissue and avoid overstress
- Reestablish dynamic glenohumeral stability

PRECAUTIONS:

- Avoid sudden jerky movements and heavy lifting (no heavier than coffee cup)
- PROM should be gradual and never forced (avoid pain or pinching)
- Towel roll placed underneath arm to avoid humeral extension for ROM & sleeping
- Do NOT bear weight through involved extremity
- In the presence of poor shoulder mechanics avoid repetitive AROM exercises

<table>
<tr><th>Post-Operative 6 to 8 weeks</th><th>9 to 12 weeks</th></tr>
<tr><td>PROM
Continue PROM (avoid pain)
Gentle IR to belt-line in scapular plane (30 °abd)
-No horizontal adduction/cross body movements
-No IR behind the back
Patient can begin light ADLs and feeding with hand
Gentle glenohumeral & scapulothoracic joint mobilizations PRN (grades 1 & 2)
AAROM & AROM
Forward elevation, ER, and IR in scapular plane (avoid IR activation if subscapularis repair)
Initiate supine then progress to seated and standing (Ex: Lawn chair progression)
Initiate assisted shoulder pulleys in scaption only if patient has > 90° PROM
Strengthening
Being gentle glenohumeral ER & IR submaximal ISOM (initially at 25%; no IR if subscapularis repair)
If biceps tenodesis- avoid biceps contraction with arm supported on arm rest & wrist in neutral
Progress strengthening of elbow, wrist, hand
(if no biceps precautions)
<u>End of 8th week</u>: begin periscapular and deltoid isotonic exercise
Neuromuscular Reeducation
Initiate supine scapulothoracic and glenohumeral rhythmic stabilization
-Initiate in neutral plane
-Consider biceps and subscapularis precautions if present</td><td>ROM
Continue previous ROM and progression of functional movement patterns
Gentle IR to belt-line in scapular plane (30 °abd)
-No horizontal adduction/cross body movements
-No IR behind the back
Strengthening
Initiate supine scaption with resistance (1-3 lb weights)
-Progression to multiple trunk flexion angles (Ex: Lawn Chair Progression)
Low resistive isotonic ER & IR
(no IR if subscapularis precautions)</td></tr>
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MILESTONES TO PROGRESS TO PHASE 3:

1. Gradually improving function of shoulder
2. Ability to isotonically activate deltoid and periscapular musculature demonstrating gradual improvements in strength

Phase 3: Moderate Strengthening Phase (12+ weeks)

GOALS:

- Gradual restoration of shoulder strength and endurance with previous program
- Progressive return to functional activities with involved UE
- Progress to gentle resisted flexion/elevation in standing

PRECAUTIONS:

- No lifting of objects heavier than 6 lbs
- No quick/sudden lifting or pushing movements

Post-Operative 12+ weeks	***4+ Months***
ROM ▪ Continue to maintain previous ROM ▪ Gentle progression of IR *Strengthening* ▪ Continue with previous PREs ▪ Progress to gentle resisted flexion/elevation in standing ▪ If supscapularis repair begin progressing IR strengthening	Typically, patient is on a HEP that is performed 3-4 x per week with emphasis on the following: ▪ Continued strength gains ▪ Continued with progression toward return to recreational/functional activity within limits -This should be identified by progress made in physical therapy and outlined by surgeon *Functional Activity (<u>6 months</u>)* ▪ Return to recreational hobbies, gardening, and sports activity -Can only participate of they do so prior to surgery (prior experience) -***Recommended***: low-demand activity such as recreational fitness, swimming/water aerobics, running, cycling, and golf -***Not recommended***: Baseball/softball, racquetball/squash, lacrosse, singles tennis, horseback riding, fencing, weight training, handball, contact sports

CRITERIA TO DISCHARGE FROM PHYSICAL THERAPY

1. Able to maintain pain-free shoulder AROM
   (typically 80-120° forward elevation/scaption; functional ER ~30°)
2. Patient able to demonstrated proper scapulohumeral rhythm/shoulder mechanics with elevation

References:

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