

**Rehabilitation Protocol:
Reverse Total Shoulder**

Department of Orthopaedic Surgery

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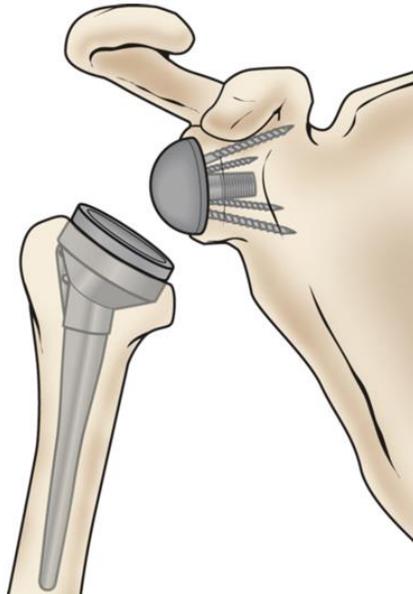
Department of Rehabilitation Services

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Overview

The reverse total shoulder arthroplasty (rTSA) uses the deltoid as a replacement for the rotator cuff during elevation and abduction of the humerus. RTSA is indicated when there is a combination of a degenerative glenohumeral joint and an irreparable massive rotator cuff tear or rotator cuff arthropathy in a patient who is unable to actively elevate the arm above 90°. These conditions are most often seen in an elderly population. RTSA is also considered in patients with proximal humeral nonunion fractures, acute fractures, revision arthroplasties and pseudoparalysis. An intact deltoid is critical to the successful outcome of rTSA.

The goal of rTSA is to restore deltoid tension and treat the underlying degeneration of the joint. With a nonfunctioning rotator cuff, the humeral head translates superiorly during contraction of the deltoid. The rTSA reverses the normal relationship between the scapular and humeral components, increasing the deltoid moment arm and deltoid tension to compensate for rotator cuff deficiency. With a rTSA the rotator cuff (RC) is either absent or minimally functional, therefore the rehabilitation approach for a patient following rTSA is distinctly different than the rehabilitation following a traditional total shoulder arthroplasty (TSA). Precautions for the rTSA are not only distinctly different than those for TSA but are also dependent upon the surgical approach.

There are two surgical approaches to rTSA. One medializes the center of rotation, this is the approach primarily used at Lahey, the other lateralizes it. The choice of approach is dependent upon surgeon preference as well as several factors including proximal humeral bone loss, scapular anatomy, and surgical diagnosis (e.g., rotator cuff arthropathy vs failed arthroplasty). It is important to clarify the surgical approach with the surgeon prior to initiating post-operative rehabilitation.

There is a higher risk of shoulder dislocation following rTSA than conventional TSA. If rTSA prostheses dislocate, they do so with combined internal rotation, adduction and extension.

Patients can expect 80° to 140° of active elevation following rTSA, depending upon the underlying pre-operative pathology of the shoulder. Complications of rTSA include instability, infection and neurovascular injury.

◀ **Phase I Immediate Post Surgical Phase**
Day 1 to Week 6

Goals

- Patient and family independent with joint protection
- Passive range of motion (PROM)
- Assisting with putting on and taking off sling/clothing
- Assisting with home exercise program (HEP)
- Cryotherapy

Precautions

- Sling is worn for 3-4 weeks. (May be extended to 6 weeks if rTSA is a revision surgery)
- While lying supine, the elbow should be supported by towel roll to avoid shoulder extension. Patient should be instructed “to always be able to visualize their elbow while lying supine”.
- **NO** Active Range of Motion (AROM)
- **NO** lifting of objects with operative arm
- Important to clarify surgical approach
- With the Lateral Surgical approach ER to neutral only
- Keep incision clean and dry (**NO** soaking/wetting for 2 weeks)
- **NO** Whirlpool, Jacuzzi, ocean or lake wading for 4 weeks

Therapeutic Exercise

Days 1 to 4

- Begin PROM in supine
 - Scaption to 90°
 - External Rotation (ER) in the scapula plane to 20°-30°
With the Lateral Surgical approach ER to neutral only
 - No internal Rotation (IR) ROM
- Pendulum exercise with-in 24-48 hours
- Active assistive ROM of the cervical spine, elbow, wrist and hand
- Pain free scapula isometric retraction
- Insure that patient is independent in bed mobility, transfers and ambulation
- Instruct patient and family in proper positioning, protection and written Home Exercise Program (HEP)
- Frequent cryotherapy application 4-5 times a day for about 20 minutes

Protective Phase**Days 5-21****Therapeutic Exercise**

- Continue all exercises as above
- Begin submaximal pain-free deltoid isometrics in the scapula plane (Avoid shoulder extension)
- Continue frequent Cryotherapy 4-5 times day for about twenty minutes
- **NO** strengthening or resistance until 6 weeks

Weeks 3-6**Therapeutic Exercise**

Progress exercise listed above

Progress PROM:

- Flexion and elevation in the scapular plane to 120°
- ER in scapula plane to tolerance, respecting soft tissue constraints
- With the Lateral Surgical approach initiate ER to tolerance at 4 – 6 weeks post op

Gentle resisted exercise of the elbow, wrist and hand

Continue cryotherapy

Precautions

At 4 weeks when sling is discontinued

- Encourage normal arm swing and use of arm for light ADL's (feeding, writing)

Criteria to progress to Phase II

- Patient tolerates PROM and AROM and demonstrates isometric contraction of all components of the deltoid and periscapular muscles

◀ **Phase II – Active ROM/Early strengthening phase**
Week 6-8

Goals

- Continue progression of PROM (full PROM is not expected)
- Gradually restore AROM
- Control pain and inflammation
- Allow for continued soft tissue healing
- Re-establish dynamic shoulder and scapula stability

Precautions

- Continue to avoid shoulder hyperextension, horizontal adduction beyond neutral, or IR behind the back
- In the presence of poor shoulder mechanics avoid repetitive shoulder AROM
- Restrict lifting of objects to no heavier than a coffee cup
- **NO** supporting of body weight by involved upper extremity

Therapeutic Exercise

Continue with PROM

- At 6 weeks post op start PROM/AAROM IR to tolerance (not to exceed 50° in the scapula plane)
- Begin shoulder A/AAROM as appropriate
- Forward flexion and elevation in scapula plane supine with progression to sitting/standing (beach chair)
- ER and IR in the scapula plane in supine with progression to sitting/standing
- Begin gentle glenohumeral IR and ER submaximal pain free isometrics
- Initiate gentle scapulothoracic rhythmic stabilization.
- Begin gentle periscapular and deltoid sub-max pain free isotonic exercise (8 weeks)
- Gentle glenohumeral and scapthoracic joint mobilization (grade I-II) as indicated

Week 9-12

Therapeutic Exercise

Continue with above exercises and functional activity progression

- Begin light weight forward elevation (1-3 lbs)
- Progress IR/ER isotonic strengthening (1-3 lbs) in side lying and /or light resistive bands.

Criteria to progress

Patient demonstrates the ability to isotonicly activate all components of the deltoid and periscapular musculature is gaining strength.

**◀ Phase III Moderate strengthening
Week 12+**

Goals

- Enhance functional use of the operative extremity and advance functional activities

Precautions

- **NO** Lifting of objects heavier than 6 lbs with the operative side
- **NO** sudden lifting or pushing activities

Therapeutic Exercise

Continue with previous program as indicated

- Progress to gentle resisted standing flexion/elevation

**◀ Phase IV Continued HEP
Typically 4+ months**

Goals

- Patient is on a HEP performed 3-4 week focusing on strength and function

Criteria for discharge from skilled therapy:

Patient is able to maintain pain free AROM (typically 80° -120° of elevation with functional ER of about 30°). Patient is able to perform light household and work activities.

Post –op Phase/Goals	Range of Motion	Therapeutic Exercise	Precautions
<p>Phase 1 – Immediate Post-surgical Day 1-4</p>	<p>Joint Protection (day 1-6 weeks)</p> <ul style="list-style-type: none"> - Patient and family independent with joint protection PROM - Assisting with putting on and taking off sling - Assisting with Home Exercise Program (HEP) - Promote healing of soft tissue/maintain integrity of joint replacement - Enhance PROM of the shoulder - Restore AROM of elbow/wrist hand - Independence in activities of daily living (ADL’s) with modification - Independent with transfers and ambulation as pre-admission state 	<p>Begin PROM in supine</p> <ul style="list-style-type: none"> - Scaption plane to 90° - External Rotation (ER) in the scapula plane to 20°-30° - No internal Rotation (IR) ROM <p>With the Lateral Surgical approach ER to neutral only</p> <ul style="list-style-type: none"> - Pendulum exercise with-in 24-48 hours - Active assistive ROM of the cervical spine, elbow, wrist and hand - Pain free scapula isometric retraction - Insure that patient is independent in bed mobility, transfers and ambulation - Instruct patient and family in proper positioning, protection and written Home Exercise Program(HEP) - Frequent cryotherapy application 4-5 times a day for about 20 minutes 	<p>Important to clarify surgical approach</p> <p>Sling is worn for 3-4 weeks. (May be extended to 6 weeks if rTSA is a revision surgery)</p> <p>While lying supine, the elbow should be supported by towel roll to avoid shoulder extension. Patient should be instructed “to always be able to visualize their elbow while lying supine.</p> <p>NO Active Range of Motion (AROM)</p> <p>NO lifting of objects with operated arm</p> <p>Keep incision clean and dry (NO soaking/wetting for 2 weeks)</p> <p>NO Whirlpool, Jacuzzi ocean or lake wading for 4 weeks</p>

Post –op Phase/Goals	Range of Motion	Therapeutic Exercise	Precautions
Day 5-21	Protective Phase	<ul style="list-style-type: none"> - Continue all exercises as above - Begin sub maximal deltoid isometrics in the scapula plane (Avoid shoulder extension) - Continue frequent Cryotherapy 4-5 times day for about twenty minutes <p>NO strengthening or resistance until 6 weeks</p>	
3-6 Weeks		<p>Progress exercise listed above</p> <p>Progress PROM:</p> <ul style="list-style-type: none"> - Flexion in the scaption plane to 120° - ER in scapula plane to tolerance, respecting soft tissue constraints. <p>With the Lateral Surgical approach initiate ER to tolerance at 4 – 6 weeks post op</p> <p>Gentle resisted exercise of the elbow, wrist and hand</p> <p>Continue cryotherapy</p>	<p>At 4 weeks when sling is discontinued</p> <ul style="list-style-type: none"> - Encourage normal arm swing and use of arm of light ADL’s (feeding, writing)
Criteria to progress	<p>Patient tolerates PROM and isometrics and AROM</p> <p>Patient demonstrates isometric contraction of all components of the deltoid and periscapular muscles</p>		

Post –op Phase/Goals	Range of Motion	Therapeutic Exercise	Precautions
<p>Phase II Week 6-8 Active ROM/strengthening phase</p>	<p>Goals: - Continue progression of PROM (full PROM is not expected) - Gradually restore AROM - Control pain and inflammation - Allow for continued soft tissue healing - Re-establish dynamic shoulder and scapula stability</p>	<p>Continue with PROM - At 6 weeks post op start PROM to tolerance (not to exceed 50° in the scapula plane)</p> <p>- Begin shoulder A/AAROM as appropriate</p> <p>- Forward flexion and elevation in scapula plane supine with progression to sitting/standing – ER and IR in the scapula plane in the supine with progression to sitting/standing</p> <p>- Begin gentle glenohumeral IR and ER submax pain free isometrics</p> <p>- Initiate gentle scapulothoracic rhythmic stabilization. Begin gentle periscapular and deltoid sub-max pain free isotonic exercise (8 weeks)</p> <p>- Gentle glenohumeral and scapthoracic joint mobilization (grade I-II) as indicated</p>	<p>Continue to avoid shoulder hyperextension, horizontal adduction beyond neutral, or IR behind the back</p> <p>In the presence of poor shoulder mechanics avoid repetitive shoulder AROM</p> <p>Restrict lifting of objects to no heavier than a coffee cup</p> <p>NO supporting of body weight be involved upper extremity</p>
<p>Week 9-12</p>		<p>Continue with above exercises and functional activity progression</p> <p>- Begin light weight forward elevation (1-3 lbs) - Progress IR/ER isotonic strengthening (1-3 lbs) in side lying and /or light resistive bands.</p>	

Criteria to progress	Patient tolerates PROM and isometrics and AROM - Patient demonstrated the ability to isometrically activate all components of the deltoid and periscapular muscles		
Post –op Phase/Goals	Range of Motion	Therapeutic Exercise	Precautions
Phase II Week 6-8 Active ROM/strengthening phase	Goals: - Continue progression of PROM (full PROM is not expected) - Gradually restore AROM - Control pain and inflammation - Allow for continued soft tissue healing - Re-establish dynamic shoulder and scapula stability	Continue with PROM - At 6 weeks post op start PROM to tolerance (not to exceed 50° in the scapula plane) - Begin shoulder A/AAROM as appropriate - Forward flexion and elevation in scapula plane supine with progression to sitting/standing – ER and IR in the scapula plane in the supine with progression to sitting/standing - Begin gentle glenohumeral IR and ER submax pain free isometrics - Initiate gentle scapulothoracic rhythmic stabilization. Begin gentle periscapular and deltoid sub-max pain free isotonic exercise (8 weeks) - Gentle glenohumeral and scapthoracic joint mobilization (grade I-II) as indicated	Continue to avoid shoulder hyperextension, horizontal adduction beyond neutral, or IR behind the back In the presence of poor shoulder mechanics avoid repetitive shoulder AROM Restrict lifting of objects to no heavier than a coffee cup NO supporting of body weight be involved upper extremity

Post –op Phase/Goals	Range of Motion	Therapeutic Exercise	Precautions
Week 9-12		Continue with above exercises and functional activity progression - Begin light weight forward elevation (1-3 lbs) - Progress IR/ER isotonic strengthening (1-3 lbs) in side lying and /or light resistive bands.	
Criteria to progress	Patient demonstrates the ability to isotonicly activate all components of the deltoid and periscapular musculature is gaining strength		
Phase III Moderate strengthening Week 12+	Goals: - Enhance functional use of the operative extremity and advance functional activities	Continue with previous program as indicated - Progress to gentle resisted standing flexion/elevation	NO Lifting of objects heavier than 6 lbs with the operative side NO sudden lifting or pushing activities
Phase IV Continued HEP Typically 4+ months	Goals: - Patient is on a HEP performed 3-4 week focusing on strength and function		
Criteria for discharge	Patient is able to maintain pain free AROM, typically 80°-120° of elevation with functional ER of about 30°. Patient able to complete light household and work activities.		