



**Lahey Hospital  
& Medical Center**

**Rehabilitation Protocol:  
Reverse Total Shoulder**

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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, moving the scapulo-humeral joint center of rotation medially and inferiorly which increases 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). Boudreau et al.<sup>1</sup> report that because the biomechanics of this prosthesis are markedly different, there is the inherent potential for instability due to its design, and precautions for the rTSA are unique and distinctly different than those for TSA.

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.

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<sup>1</sup> Boudreau S et al. Rehabilitation following reverse total shoulder arthroplasty. J Orthop Sports Phys Ther 2007 Dec; 37(12):734-43.

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

### *Goals*

- Patient and family independent with
  - joint protection
  - Passive range of motion with (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
- Keep incision clean and dry (**NO** soaking/wetting for 2 weeks)
- **NO** Whirlpool, Jacuzzi, ocean or lake wading for 4 weeks

### **Therapeutic Exercise**

- Begin PROM in supine
  - Scaption<sup>2</sup> to 90°
  - External Rotation (ER) in the scapula plane to 20°-30°
  - 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

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<sup>2</sup> Scaption = Forward elevation in scapula plane

## **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.

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 demonstrate the ability to isometrically activate 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 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 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

### **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><b>Phase 1 – Immediate Post-surgical</b> <b>Day 1-4</b></p>	<p>Joint Protection (day 1-6 weeks)</p> <ul style="list-style-type: none"> <li>- Patient and family independent with joint protection</li> <li>PROM</li> <li>- Assisting with putting on and taking off sling</li> <li>- Assisting with Home Exercise Program (HEP)</li> <li>- Promote healing of soft tissue/maintain integrity of joint replacement</li> <li>- Enhance PROM of the shoulder</li> <li>- Restore AROM of elbow/wrist hand</li> <li>- Independence in activities of daily living (ADL's) with modification</li> <li>- Independent with transfers and ambulation as pre-admission state</li> </ul>	<p>Begin PROM in supine</p> <ul style="list-style-type: none"> <li>- Forward elevation in the scapula plane to 90°</li> <li>- External Rotation (ER) in the scapula plane to 20°-30°</li> <li>- No internal Rotation (IR) ROM</li> <li>- Pendulum exercise with-in 24-48 hours</li> <li>- Active assistive ROM of the cervical spine, elbow, wrist and hand</li> <li>- Pain free scapula isometric retraction</li> <li>- Insure that patient is independent in bed mobility, transfers and ambulation</li> <li>- Instruct patient and family in proper positioning, protection and written Home Exercise Program(HEP)</li> <li>- Frequent cryotherapy application 4-5 times a day for about 20 minutes</li> </ul>	<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><b>NO</b> Active Range of Motion (AROM)</p> <p><b>NO</b> lifting of objects with operated arm</p> <p>Keep incision clean and dry (<b>NO</b> soaking/wetting for 2 weeks)</p> <p><b>NO</b> Whirlpool, Jacuzzi ocean or lake wading for 4 weeks</p>

Post –op Phase/Goals	Range of Motion	Therapeutic Exercise	Precautions
<b>Day 5-21</b>	Protective Phase	<ul style="list-style-type: none"> <li>- Continue all exercises as above</li> <li>- Begin sub maximal deltoid isometrics in the scapula plane (Avoid shoulder extension)</li> <li>- Continue frequent Cryotherapy 4-5 times day for about twenty minutes</li> </ul> <p><b>NO</b> strengthening or resistance until 6 weeks</p>	
<b>3-6 Weeks</b>		<p>Progress exercise listed above</p> <p>Progress PROM:</p> <ul style="list-style-type: none"> <li>- Flexion in the scaption plane to 120°</li> <li>- ER in scapula plane to tolerance, respecting soft tissue constraints.</li> </ul> <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"> <li>- Encourage normal arm swing and use of arm of light ADL's (feeding, writing)</li> </ul>
<b>Criteria to progress</b>	<p>Patient tolerates PROM and isometrics and AROM</p> <ul style="list-style-type: none"> <li>- Patient demonstrated the ability to isometrically activate all components of the deltoid and periscapular muscles</li> </ul>		

Post –op Phase/Goals	Range of Motion	Therapeutic Exercise	Precautions
<p><b>Phase II</b>  <b>Week 6-8</b>  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</p> <ul style="list-style-type: none"> <li>- At 6 weeks post op start PROM to tolerance (not to exceed 50° in the scapula plane)</li> <li>- Begin shoulder A/AAROM as appropriate</li> <li>- 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</li> <li>- Begin gentle glenohumeral IR and ER submax pain free isometrics</li> <li>- Initiate gentle scapulothoracic rhythmic stabilization. Begin gentle periscapular and deltoid sub-max pain free isotonic exercise (8 weeks)</li> <li>- Gentle glenohumeral and scapulothoracic joint mobilization (grade I-II) as indicated</li> </ul>	<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><b>NO</b> supporting of body weight be involved upper extremity</p>
<p><b>Week 9-12</b></p>		<p>Continue with above exercises and functional activity progression</p> <ul style="list-style-type: none"> <li>- Begin light weight forward elevation (1-3 lbs)</li> <li>- Progress IR/ER isotonic strengthening (1-3 lbs) in side lying and /or light resistive bands.</li> </ul>	

<b>Criteria to progress</b>	Patient tolerates PROM and isometrics and AROM - Patient demonstrated the ability to isometrically activate all components of the deltoid and periscapular muscles		
<b>Post –op Phase/Goals</b>	<b>Range of Motion</b>	<b>Therapeutic Exercise</b>	<b>Precautions</b>
<b>Phase II</b> <b>Week 6-8</b> 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  <b>NO</b> supporting of body weight be involved upper extremity

<b>Post –op Phase/Goals</b>	<b>Range of Motion</b>	<b>Therapeutic Exercise</b>	<b>Precautions</b>
<b>Week 9-12</b>		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.	
<b>Criteria to progress</b>	Patient demonstrates the ability to isotonically activate all components of the deltoid and periscapular musculature is gaining strength		
<b>Phase III Moderate strengthening Week 12+</b>	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	<b>NO</b> Lifting of objects heavier than 6 lbs with the operative side  <b>NO</b> sudden lifting or pushing activities
<b>Phase IV Continued HEP Typically 4+ months</b>	Goals: - Patient is on a HEP performed 3-4 week focusing on strength and function		
<b>Criteria for discharge</b>	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.		