The GLSM Rotator Cuff Repair Rehabilitation Program is an evidence-based and soft tissue healing dependent program which allows patients to progress to vocational and sports-related activities as quickly and safely as possible. This program is outlined for a double row suture bridge supraspinatus repair performed either mini-open (splitting of the deltoid muscle fibers) or arthroscopically. Individual variations will occur depending on surgical details and patient response to treatment. Double row fixation has been shown to better restore the normal rotator cuff footprint, maximize tendon-bone contact, and minimize gapping with early ROM (Kim et al, AJSM, 2006).

For a partial rotator cuff repair with Regeneten augmentation use a modified/accelerated program including: sling: 4 weeks. AROM: start at 4 weeks. Strengthening: start at 8 weeks

For a subscapularis repair: limit extension to neutral 6 wks, ER to neutral for 4 wks, at 4 wks ER >neutral to patient tolerance until 6 wks, gentle stretching for ER at wk 6, no isolated heavy resistance to IR for 12 wks.

For an open repair: limit extension and ER ROM to neutral for 6 wks, no active flexion for 6-8 wks, and no resistance to IR for 6-8 wks secondary to deltoid detachment and reattachment.

Contact us at 1-800-362-9567 ext. 58600 if you have questions.

| Pre-Op | Pre-op overall stiffness can be correlated to post-op stiffness. The best predictor of post-op stiffness at 6 wks is decreased pre-op IR vertebral level ROM (Trenerry et al, Clin Ortho Related Res, 2005).
Pre-op exercises should be on increasing or maintaining overall ROM and muscle activation. Emphasis on improving behind the back horizontal adduction and IR. |
|---|---|
| Factors Influencing Post-op Rehabilitation | Type of repair: Open, mini-open, arthroscopic
Size of tear: small-(<1cm) medium (2-4cm) large to massive (5+cm)
Location of tear and number of tendons involved
Amount of tendon retraction
Tissue degeneration/fatty infiltrate
Pre-op stiffness
Tissue quality: is affected by age, smoking, diabetes, chronicity of tear
Surgeon preference
Tissue healing: Soft tissue-to-bone healing is a slow and gradual process that requires at least 12 wks of healing to allow adequate pull-out strength of the repair (Ghodadra et al, JOSPT, 2009). |
Muscle Activation: Important to prevent reflex disassociation, maintain muscle tone, and prevent muscle atrophy. Initiate with sub-max pain-free isometrics and AROM as outlined in the protocol.
Strengthening: No aggressive strengthening for 12 wks. Goal of 75-80% strength by 5-6 months. Patients should continue with strength training at least 1 year post-op to maximize outcome. |

Updated: 4/2020
### Phase I: 0-6 weeks (Immediate post-op maximum protected motion phase)

#### Goals
- Protect anatomic repair
- Prevent negative effects of immobilization
- Gently begin PROM per tolerance except for IR
- Adequate pain control

#### Sling
- 24 hours/day for 6-8 weeks. D/C based on MD approval
- Remove sling for bathing/dressing and exercises as outlined by PT
- Try to keep arm relaxed in sling and avoid protective posture to decrease muscle tension in cervical region

#### Precautions
- Keep arm supported when in and out of sling.
- When laying supine, prop elbow on pillow to keep in line with the shoulder.
- No behind the back movements (avoid combined ext/add/IR). Try to keep elbow in line with shoulder.
- Avoid sudden movements or supporting body weight through the hand or elbow.
- No lifting or carrying of objects on injured side.
- Avoid pushing or pulling objects to minimize compression/shear to the shoulder

#### Recommendations
- No shld AROM or resisted motion
- Initial emphasis on PROM per tolerance except for IR and ext. Start all motion in scapular plane
- Safe AAROM for shld elevation (see below). No pulleys

#### Modalities
- Ice 15 minutes 3-5x/day, more often as needed for pain control
- IFC for pain management/inflammation control

#### PROM
- Gradually progress based on tolerance except no IR or extension for 6 weeks
- **Elevation:** start in at least 30 deg of elevation for all motion. Start in scapular plane, progressing to abduction (limit of 90 deg) and flexion/scaption as tolerated.
  - Strain on supraspinatus: scaption < abduction < flexion, so start in scaption (Hatakeyama et al, AJSM, 2001)
  - ER / IR: no IR until 4 weeks
    - ER: start in scapular plane at least 30 deg (avoid 0 deg). wk 3: progress to 60 deg of abduction, wk 4: progress to 90 deg
    - Strain on supraspinatus with ER: 30 deg scaption < 60 deg < 0-15 deg (Hatakeyama et al, AJSM, 2001)

#### ROM Targets (in degrees)

<table>
<thead>
<tr>
<th></th>
<th>0-2 wks</th>
<th>2-4 wks</th>
<th>4-6 wks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Flexion / scaption</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Per tolerance</td>
<td>Per tolerance (at least 90)</td>
<td>Per tolerance (0-110)</td>
<td></td>
</tr>
<tr>
<td>Abduction</td>
<td>45</td>
<td>60</td>
<td>90</td>
</tr>
<tr>
<td>ER at 0 deg</td>
<td>None</td>
<td>None</td>
<td>30</td>
</tr>
<tr>
<td>ER in scapular plane</td>
<td>20</td>
<td>40</td>
<td>60</td>
</tr>
<tr>
<td>ER at 60 ABD</td>
<td>none</td>
<td>30</td>
<td>45</td>
</tr>
<tr>
<td>ER at 90 ABD</td>
<td>none</td>
<td>none</td>
<td>30</td>
</tr>
<tr>
<td>IR (GH) in scapular plane</td>
<td>none</td>
<td>none</td>
<td>20</td>
</tr>
<tr>
<td>IR at 90 ABD</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Extension</td>
<td>Neutral</td>
<td>Neutral</td>
<td>Neutral</td>
</tr>
</tbody>
</table>

#### AAROM
- See PROM progression listed above
- No pulleys until 6 weeks secondary to increased EMG activity. (Dockery et al, Orthopedics, 1998)
- Safe exercises to perform based on EMG < 20 MVC:
  - Supine assisted ROM with opposite arm or wand flexion and ER
  - Supine press-up/protration hands close and hands wide with washcloth or wand
  - Forward bow
  - Towel slide and/or ball roll table

#### AROM
- None
### Treatment Interventions

- Warm up: Passive Pendulum or Hot pack
- GH Mobilizations grade I/II for pain or muscle spasm
- Thoracic spine P-A mobilizations as needed.
- Emphasis on GH PROM/AAROM range of motion per guidelines. No IR or extension. Start shoulder elevation in at least 30 deg.
- ER positioning: start in scapular plane,
  - wk 3: progress to 60 deg scaption/abduction
  - wk 4: progress to 80 deg scaption/abduction,
  - wk 5: progress to arm by side
- No AROM
- AAROM safe exercises:
  - Supine assisted ROM with opposite arm or wand flexion, scaption, and ER Forward bow
  - Towel slide and/or ball roll table
  - Codman’s small and large, progress passive to active
  - Supine press-up/protraction hands close and hands wide with washcloth or wand
- Active scapular retraction, scapular depression in neutral position
- Postural education: Avoid forward head/rounded shld.
- Scapular PROM in sidelying (if needed). Manual resisted scapular isometrics
- AROM elbow, wrist, hand. Gripping activities without lifting
- Cryotherapy. IFC if indicated

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### ROM Targets Reference Chart (in degrees)

<table>
<thead>
<tr>
<th>Overall goal is Functional ROM at 10-12 weeks</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-2 wks</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Flexion / scaption</th>
<th>Per tolerance</th>
<th>Per tolerance (at least 90)</th>
<th>Per tolerance (at least 120)</th>
<th>Unlimited (140)</th>
<th>Unlimited (160)</th>
<th>Unlimited (170/180)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abduction</td>
<td>45</td>
<td>60</td>
<td>90</td>
<td>120</td>
<td>150</td>
<td>170/180</td>
</tr>
<tr>
<td>ER at 0 deg</td>
<td>None</td>
<td>None</td>
<td>30</td>
<td>50</td>
<td>65</td>
<td>65+</td>
</tr>
<tr>
<td>ER in scapular plane</td>
<td>20</td>
<td>40</td>
<td>60</td>
<td>70</td>
<td>70</td>
<td>70+</td>
</tr>
<tr>
<td>ER at 60 ABD</td>
<td>None</td>
<td>30</td>
<td>45</td>
<td>60</td>
<td>70</td>
<td>70+</td>
</tr>
<tr>
<td>ER at 90 ABD</td>
<td>None</td>
<td>None</td>
<td>30</td>
<td>50</td>
<td>70</td>
<td>80/90</td>
</tr>
<tr>
<td>IR in scapular plane</td>
<td>None</td>
<td>None</td>
<td>20</td>
<td>40</td>
<td>60</td>
<td>60+</td>
</tr>
<tr>
<td>IR at 90 ABD</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>30</td>
<td>40</td>
<td>50+</td>
</tr>
</tbody>
</table>

| Extension          | Neutral       | Neutral                     | Neutral                     | 45              | 60              | 60+                 |
## Rotator Cuff Repair  Large/Massive  Compromised Tissue Quality

### Phase II: 6-8 weeks  
(Intermediate moderate protection phase)

#### Goals
- Protect anatomic repair
- Adequate pain control
- Progress PROM/AAROM per guidelines
- Progress to shoulder isometrics

#### Sling
- D/C per MD approval

#### Precautions
- No shoulder AROM for lifting. No lifting or carrying objects on injured side.
- Avoid prolonged unsupported arm positioning.
- Avoid sudden movement or supporting body weight through the hand or elbow.
- Avoid pushing or pulling objects to minimize compression/shear to the shoulder
- No resisted movement.

#### Recommendations
- Patient can perform ADL’s below shoulder height
- Treatment emphasis on restoring PROM /AAROM based on guidelines provided
- Gentle movement into extension, gentle movement into IR, but no combined ext/add/IR
- Add low load long duration stretching if needed
- Facilitate thoracic extension

#### Modalities
- Ice 15 minutes 3-5x/day, more often as needed for pain control
- IFC for pain management/inflammation control

#### Aquatics if needed
- Emphasis on ROM with water at shld height

#### PROM / AAROM
- Continue with PROM with goal of full PROM by wk 12. Progress to gentle PROM IR at 90/90 at wk 7. Add gentle PROM ext at wk 7.
- Add AAROM for shld elevation with goal of full AAROM by wk12-14.

<table>
<thead>
<tr>
<th>ROM Targets (in degrees)</th>
<th>6-8 wks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flexion / scaption</td>
<td>Per tolerance (140)</td>
</tr>
<tr>
<td>Abduction</td>
<td>120</td>
</tr>
<tr>
<td>ER at 0 deg</td>
<td>50</td>
</tr>
<tr>
<td>ER in scapular plane</td>
<td>60</td>
</tr>
<tr>
<td>ER at 60 ABD</td>
<td>60</td>
</tr>
<tr>
<td>ER at 90 ABD</td>
<td>50</td>
</tr>
<tr>
<td>IR (GH) in scapular plane</td>
<td>40</td>
</tr>
<tr>
<td>IR at 90 ABD</td>
<td>30</td>
</tr>
<tr>
<td>Extension</td>
<td>45</td>
</tr>
</tbody>
</table>

#### AROM
- Contraindicated for flexion, scaption, abduction.
- IR / ER with arm in scapular plane through pain-free ROM

#### Treatment Interventions
- Warm up: Passive Pendulum or Hot pack or AAROM on Nustep
- Low-load long duration end-range stretch at wk 7 (if necessary) using wand and hot pack in supine for ER (Davies, Ellenbecker. Biomechanics, 1999).
- GH Mobilizations grade I/II for pain, III/IV to increase joint mobility
- Thoracic spine P-A mobilizations
- Facilitate Thoracic extension: stretch in sitting with/without overpressure (ball / towel roll/ foam roller behind back)
- PROM with end range stretching as outlined above
- AAROM as outlined above: Pulleys, wand exercises, ball rolling on table
- Aquatics
- Postural education: Avoid forward head/rounded shoulders
- Active scapular protraction, retraction to neutral, scapular depression
- Scapular manual RROM in sidelying
- AROM elbow, wrist, hand
- Cryotherapy. IFC if indicated
Rotator Cuff Repair  Large/Massive  Compromised Tissue Quality

Phase III: 8-12 wks
(Minimal protection phase with emphasis on normalizing ROM)

Goals
- Preserve the integrity of the surgical repair
- Implement AROM for shoulder elevation avoiding shoulder shrug
- Restore normal ROM with normal movement patterns
- Decrease pain and inflammation
- Initiate sub-max and pain-free muscle activation exercises

Precautions
- Patient can perform ADL’s up to shoulder height.
- Limit overhead activities.
- Avoid making sudden movements and lifting heavy objects.
- No aggressive strengthening activities.
- Avoid pushing or pulling heavy objects.

Recommendations
- Treatment emphasis on restoring PROM / AAROM / AROM
- Add AROM exercises avoiding compensatory shoulder shrug. Encourage normal movement patterns
- Add sub-max pain-free shoulder isometrics (GH, RTC)
- Add sub-max rhythmic stabilizations to encourage co-contraction
- Continue with thoracic extension exercises
- Continue with aquatics up to wk 10-12

Modalities
- Ice 15 minutes 1-3x/day, more often as needed for pain control
- IFC for pain management/inflammation control

Aquatics
- Continue until wk 10-12. Work on increasing ROM with emphasis on normal movement patterns.

PROM / AAROM / AROM
- Goal is functional ROM in all planes with normal movement patterns by 12-16 wks
- Add gentle AAROM ext wk 8.
- Add in gentle IR stretch behind the back vertebral level at wk 10

<table>
<thead>
<tr>
<th>ROM Targets (in degrees)</th>
<th>8-10 wks</th>
<th>10-12 wks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flexion / scaption</td>
<td>Unlimited (160)</td>
<td>Unlimited (0-170/180)</td>
</tr>
<tr>
<td>Abduction</td>
<td>150</td>
<td>170/180</td>
</tr>
<tr>
<td>ER in scapular plane</td>
<td>70</td>
<td>70+</td>
</tr>
<tr>
<td>ER at 60 ABD</td>
<td>70</td>
<td>70+</td>
</tr>
<tr>
<td>ER at 90 ABD</td>
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</tr>
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<td>IR (GH) in scapular plane</td>
<td>60</td>
<td>60+</td>
</tr>
<tr>
<td>IR (GH) at 90 ABD</td>
<td>40</td>
<td>50+</td>
</tr>
<tr>
<td>Extension</td>
<td>60</td>
<td>60+</td>
</tr>
</tbody>
</table>

Muscle Activation Strengthening
- No aggressive strengthening activities
- Add in sub-max pain-free shld isometrics for muscle activation. Muscle activation is important to minimize rotator cuff inhibition, maintain muscle tone, and minimize muscle atrophy (Ghodadra et al, JOSPT, 2009).
- Strengthening will be with the weight of the arm focusing on quality movement and endurance (ie: initially 2-3 sets of 10 progressing to 2-3 sets of 30 reps of full flexion, scaption, abduction, ER. 1x/day, 5 -7 days per week per tolerance).
- When progressing to shld isotonics in the next phase, the patient must be able to elevate arm without shoulder or scapular hiking. If unable, will need to continue with dynamic rhythmic stabilization GH joint exercises.
- Add in arm supported bicep / triceps isotonic strengthening wk 8, progress to unsupported at wk 10
<table>
<thead>
<tr>
<th>Phase III: 8-12 wks</th>
<th>(Minimal protection phase with emphasis on normalizing ROM)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Treatment Interventions</strong></td>
<td></td>
</tr>
<tr>
<td>• Active warm-up: Codman’s, UBE with no resistance (add light resistance at wk 9)</td>
<td></td>
</tr>
<tr>
<td>• Low load long duration end-range stretch (if necessary) using wand and hot pack in supine for ER. Utilize for other movements as necessary.</td>
<td></td>
</tr>
<tr>
<td>• GH Mobilizations</td>
<td></td>
</tr>
<tr>
<td>• PROM with end range stretch</td>
<td></td>
</tr>
<tr>
<td>• Therapeutic exercises:</td>
<td></td>
</tr>
<tr>
<td>AAROM: Pulleys, wand. Add in extension past neutral wk 7, Add in gentle IR behind the back stretch wk 10</td>
<td></td>
</tr>
<tr>
<td>AROM: GH: All motions with emphasis on quality movement. Focus on endurance working up to 30 repetitions</td>
<td></td>
</tr>
<tr>
<td>Scapula: (light resistance of &lt;5 lbs with emphasis on endurance) protraction, retraction (seated progress to prone), rows to neutral, depression</td>
<td></td>
</tr>
<tr>
<td>*** 4 keys exercises to maximize mid/lower trapezius and inhibit upper trapezius (Cools et al, AJSM, 2007)</td>
<td></td>
</tr>
<tr>
<td>sidelye ER</td>
<td></td>
</tr>
<tr>
<td>sidelye flexion</td>
<td></td>
</tr>
<tr>
<td>prone horizontal abduction with ER</td>
<td></td>
</tr>
<tr>
<td>prone extension</td>
<td></td>
</tr>
<tr>
<td>Muscle activation: <strong>Sub-max pain-free</strong> GH isometrics</td>
<td></td>
</tr>
<tr>
<td>Supported Biceps / Triceps isotonics, progress to unsupported wk 10</td>
<td></td>
</tr>
<tr>
<td>Rhythmic stabilization <strong>sub-max</strong> (to facilitate muscle activation / co-contraction):</td>
<td></td>
</tr>
<tr>
<td>Wk 8: supine arm supported ER/IR</td>
<td></td>
</tr>
<tr>
<td>wk 10-12: supine flexion 90 deg, low load CKC (&lt;BW) ie: ball on table with patient standing</td>
<td></td>
</tr>
<tr>
<td>• Encourage thoracic extension</td>
<td></td>
</tr>
<tr>
<td>• Ice (in stretch if needed) 15 minutes</td>
<td></td>
</tr>
<tr>
<td>• E Stim (IFC or NMES) if necessary</td>
<td></td>
</tr>
</tbody>
</table>
### Phase IV: 12+ wks

**Regain Functional ROM / Strengthening and Conditioning Phase**

#### Goals
- Establish and maintain functional ROM, mobility, and stability
- Progress muscular strength, power, and endurance
- Initiate higher level activates depending on functional demands and MD approval

#### Precautions
- Patient must be able to elevate arm without shoulder or scapular hiking. If unable, need to continue with dynamic rhythmic stabilization GH exercises.
- Patients should continue to perform strengthening exercises for up to 1 year post-op to maximize outcome.

#### Recommendations
- Facilitate regaining functional ROM
- Emphasize regaining strength and endurance with proper movement patterns
- Continue with proprioceptive / kinesthetic exercises
- Progress to independent strengthening at wk 20-24
- Assess posterior capsule for tightness

#### Modalities
- Ice 1x/ day and /or after strenuous activities

#### ROM
- No restrictions. Goal is functional ROM in all planes with normal movement patterns by 12-16 wks

<table>
<thead>
<tr>
<th>Goals to achieve /not exceed</th>
<th>12-16 wks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flexion / scaption</td>
<td>Unlimited (0-170/180)</td>
</tr>
<tr>
<td>Abduction</td>
<td>0-170/180 deg</td>
</tr>
<tr>
<td>ER in scapular plane</td>
<td>0-80/90 deg</td>
</tr>
<tr>
<td>IR (GH) in scapular plane</td>
<td>0-70 deg</td>
</tr>
<tr>
<td>ER at 90 ABD</td>
<td>0-80/90 deg</td>
</tr>
<tr>
<td>IR (GH) at 90 ABD</td>
<td>0-70 deg</td>
</tr>
<tr>
<td>Extension</td>
<td>0-60 deg</td>
</tr>
</tbody>
</table>

#### Strengthening
- Target scapulothoracic, rotator cuff, glenohumeral, and total arm strengthening and endurance
- Progress to unilateral scapulothoracic strengthening
- Strengthening initially with uni-planar movements progressing to multi-planar movements
- Wk 20: Isokinetic ER/IR power test at 90, 180 deg/sec
- Wk 20: Progress to overhead strengthening (if needed) if adequate strength scores: MMT 4/5, Isokinetic ER/IR of 75% at 90 and 180 deg/sec; ER/IR ratio of 2/3 Isometric strength test (5 sec hold) for shld flexion and scaption of 75% compared to opp extremity. (Measure with hand-held dynamometer. Perform 3 reps and calculate the average)

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<table>
<thead>
<tr>
<th>Treatment Interventions: (Examples of exercises but not an all-inclusive list)</th>
<th>Rotator Cuff Repair Large/Massive Compromised Tissue Quality</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Phase IV: 12+ wks</strong></td>
<td><strong>Regain Functional ROM / Strengthening and Conditioning Phase</strong></td>
</tr>
<tr>
<td><strong>Active warm-up: UBE, rower</strong></td>
<td><strong>Isokinetic IR/ER testing</strong></td>
</tr>
<tr>
<td><strong>Continue with ROM activities as necessary</strong></td>
<td><strong>Wk 20 (5 months), wk 28 (7 months) and 12 months at 30/30/30 position or 90/90 (if appropriate)</strong></td>
</tr>
<tr>
<td><strong>Scapulothoracic strengthening:</strong></td>
<td><strong>Return to work/sport</strong></td>
</tr>
<tr>
<td>chest press (+), rows in full ROM, press down, scaption</td>
<td><strong>Based on MD approval, full ROM, minimal pain at rest or with activity, isokinetic power at 90%, isometric hand-held dynamometer testing 90% and/or MMT 5/5, and functional testing at 90 % compared to uninvolved side</strong></td>
</tr>
<tr>
<td>prone horizontal abduction in neutral rotation, prone extension with ER, prone horizontal abduction with ER, prone full can, dynamic hug, serratus punch 120 deg, lat pull downs (wk 18)</td>
<td><strong>6-8 months: Return to interval throwing program per MD approval</strong></td>
</tr>
<tr>
<td><strong>Glenohumeral / rotator cuff strengthening:</strong></td>
<td><strong>Rotator Cuff Repair References</strong></td>
</tr>
<tr>
<td>flexion, scaption, prone horizontal adduction with ER, press down</td>
<td>Gundersen Lutheran Medical Center, Inc.</td>
</tr>
</tbody>
</table>
Accousti KJ, Flatow EL. Technical pearls on how to maximize healing of the rotator cuff. Instr Course Lect. 2007; 56:3-12


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