

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 (trans-osseous) 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 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.

<p>Pre-Op</p>	<p>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 behind the back vertebral level ROM (Trenerry et al, Clin Ortho Related Res, 2005).</p> <p>Pre-op exercises should be on increasing or maintaining overall ROM and muscle activation. Emphasis on improving behind the back horizontal adduction and IR.</p>
<p>Factors Influencing Post-op Rehabilitation</p>	<p>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).</p>
<p>General Program Outline</p>	
	<p>ROM: Emphasis on PROM initially. Wk 2: Add AAROM ER and safe AAROM shoulder elevation, no Pulleys. Wk 6: Add AROM elevation with emphasis on avoiding shoulder shrug. Goal of functional ROM 10-12 wks</p> <p>Muscle Activation: Important to prevent reflex disassociation, maintain muscle tone, and prevent muscle atrophy. Initiate with sub-max, pain-free isometrics and AROM with emphasis on quality movement as outlined in the protocol. Perform rhythmic stabilization to facilitate RTC function and co-contraction to decrease HH superior migration.</p> <p>Strengthening: No aggressive strengthening for 12 wks. Create a posterior dominant shoulder, emphasize ER and scapular retractors. Goal of 85-90% strength by 5-6 months. Patients should continue with strength training for at least 1 year post-op to maximize outcome.</p> <p style="text-align: right;">Updated 4/2020</p>

	Rotator Cuff Repair: Small/medium Excellent/Good Tissue Quality																																	
Phase I: 0-4 weeks	(Immediate post-op maximum protected motion phase)																																	
Goals	<ul style="list-style-type: none"> • Protect anatomic repair • Prevent negative effects of immobilization • Gently begin PROM/safe AAROM per tolerance except for IR and extension • Adequate pain control 																																	
Sling	<ul style="list-style-type: none"> • 24 hours/day for 4-6 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	<ul style="list-style-type: none"> • 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 See next page for specific treatments	<ul style="list-style-type: none"> • No AROM or resisted range of motion. • Initial emphasis on PROM per tolerance except for IR and ext. Start all motions in scapular plane. • Safe AAROM for shoulder elevation (see below). No pulleys 																																	
Modalities	<ul style="list-style-type: none"> • Ice 15 minutes 3-5x/day, more often as needed for pain control • IFC for pain management/inflammation control 																																	
PROM Primary treatment emphasis except for IR and extension	<ul style="list-style-type: none"> • Gradually progress based on tolerance except no IR and extension for 4 weeks. • Elevation: start in at least 30 deg of elevation for all motions. start in scapular plane, progress to abduction (limit to 80 deg) and flexion (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 2 progress to 60 deg, wk 3 progress to 80 deg. Strain on supraspinatus with ER: 30 deg scaption < 60 deg scaption < 0-15 deg (Hatakeyama et al, AJSM, 2001). • Goals: <table border="1" data-bbox="443 1173 1528 1549"> <thead> <tr> <th colspan="3">ROM Targets (in degrees)</th> </tr> <tr> <th></th> <th>0-2 wks</th> <th>2-4 wks</th> </tr> </thead> <tbody> <tr> <td>Flexion / scaption</td> <td>Per tolerance</td> <td>Per tolerance (at least 90)</td> </tr> <tr> <td>Abduction</td> <td>60</td> <td>90</td> </tr> <tr> <td>ER at 0 deg</td> <td>None</td> <td>None</td> </tr> <tr> <td>ER in scapular plane</td> <td>30</td> <td>45</td> </tr> <tr> <td>ER at 60 ABD</td> <td>30</td> <td>45</td> </tr> <tr> <td>ER at 90 ABD</td> <td>None</td> <td>30</td> </tr> <tr> <td>IR in scapular plane</td> <td>None</td> <td>None</td> </tr> <tr> <td>IR at 90 ABD</td> <td>None</td> <td>None</td> </tr> <tr> <td>Extension</td> <td>Neutral</td> <td>Neutral</td> </tr> </tbody> </table> 	ROM Targets (in degrees)				0-2 wks	2-4 wks	Flexion / scaption	Per tolerance	Per tolerance (at least 90)	Abduction	60	90	ER at 0 deg	None	None	ER in scapular plane	30	45	ER at 60 ABD	30	45	ER at 90 ABD	None	30	IR in scapular plane	None	None	IR at 90 ABD	None	None	Extension	Neutral	Neutral
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AAROM	<ul style="list-style-type: none"> • See PROM progression listed above • No pulleys until 4 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/protraction hands close and hands wide with washcloth or wand Forward bow Towel slide and/or ball roll table Codmans small and large, progress passive to active (Dockery et al, Orthopedics, 1998, Uhl et al, Phy Med Rehab 2010, Long JOSPT 2010) 																																	
AROM	<ul style="list-style-type: none"> • None 																																	

	Rotator Cuff Repair: Small/medium Excellent/Good Tissue Quality
Phase I: 0-4 weeks	<ul style="list-style-type: none"> • (Immediate post-op maximum protected motion phase)
Treatment Interventions	<ul style="list-style-type: none"> • 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 2: progress to 60 deg scaption/abduction wk 3: progress to 80 deg scaption/abduction, wk 4: 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

ROM Targets Reference Chart (in degrees)						
Overall goal is Functional ROM at 10-12 weeks						
	0-2 wks	2-4 wks	4-6 wks	6-8 wks	8-10 wks	10-12 wks
Flexion / scaption	Per tolerance	Per tolerance (at least 90)	Per tolerance (at least 120)	Unlimited (140)	Unlimited (160)	Unlimited (170/180)
Abduction	60	90	90	120	150	170/180
ER at 0 deg	None	None	30	50	65	65+
ER in scapular plane	30	45	60	70	70	70+
ER at 60 ABD	30	45	60	70	70	70+
ER at 90 ABD	None	30	45	60	75	80/90
IR in scapular plane	None	None	30	50	60	60+
IR at 90 ABD	None	None	None	30	40	50+
Extension	Neutral	Neutral	30	45	60	60+

	Rotator Cuff Repair: Small/medium Excellent/Good Tissue Quality																				
Phase II: 4-6 weeks	(Intermediate moderate protection phase)																				
Goals	<ul style="list-style-type: none"> • Protect anatomic repair • Prevent negative effects of immobilization • Adequate pain control • Progress PROM/AAROM per guidelines • Progress to shoulder isometrics 																				
Sling	<ul style="list-style-type: none"> • D/C per MD approval, as needed for comfort 																				
Precautions	<ul style="list-style-type: none"> • No shoulder AROM for lifting. No lifting or carrying objects on injured side • Avoid prolonged unsupported arm positioning. • Avoid sudden movements 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	<ul style="list-style-type: none"> • 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 • Facilitate thoracic extension 																				
Modalities	<ul style="list-style-type: none"> • Ice 15 minutes 3-5x/day, more often as needed for pain control • IFC for pain management/inflammation control 																				
Aquatics if needed	<ul style="list-style-type: none"> • Emphasis on ROM with water at shld height 																				
PROM / AAROM	<ul style="list-style-type: none"> • Continue with PROM/AAROM with goal of full PROM by wk 10-12. Add gentle IR stretching in scapular plane and at 60 deg. Add in gentle shoulder extension. Progress ER at 0 deg. • Add in pulleys to improve shoulder elevation if needed • <u>Goals:</u> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="2" style="text-align: center;">ROM Targets (in degrees)</th> </tr> <tr> <th></th> <th style="text-align: center;">4-6 wks</th> </tr> </thead> <tbody> <tr> <td>Flexion / scaption</td> <td style="text-align: center;">Per tolerance (at least 120)</td> </tr> <tr> <td>Abduction</td> <td style="text-align: center;">90</td> </tr> <tr> <td>ER at 0 deg</td> <td style="text-align: center;">30</td> </tr> <tr> <td>ER in scapular plane</td> <td style="text-align: center;">60</td> </tr> <tr> <td>ER at 90 ABD</td> <td style="text-align: center;">45</td> </tr> <tr> <td>IR in scapular plane</td> <td style="text-align: center;">30</td> </tr> <tr> <td>IR at 90 ABD</td> <td style="text-align: center;">None</td> </tr> <tr> <td>Extension</td> <td style="text-align: center;">30</td> </tr> </tbody> </table>	ROM Targets (in degrees)			4-6 wks	Flexion / scaption	Per tolerance (at least 120)	Abduction	90	ER at 0 deg	30	ER in scapular plane	60	ER at 90 ABD	45	IR in scapular plane	30	IR at 90 ABD	None	Extension	30
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IR in scapular plane	30																				
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Extension	30																				
AROM	<ul style="list-style-type: none"> • Contraindicated for flexion, scaption, abduction. • IR / ER with arm in scapular plane through pain-free ROM with arm supported 																				
Treatment Interventions	<ul style="list-style-type: none"> • Warm up: Passive Pendulum or Hot pack or AAROM on Nustep • GH Mobilizations grade I/II for pain, III/IV to increase joint mobility as needed • Thoracic spine P-A mobilizations • Facilitate Thoracic extension: stretch in sitting with/without overpressure (ball / towel roll/ foam roller behind back) • Emphasis on GH PROM/AAROM range of motion per guidelines. Add in: IR stretching in scapular plane and at 60 deg. Extension ER at 0 deg • AROM: IR/ER with arm supported. Contra-indicated for elevation. • Safe AAROM: see previous. Add in pulleys. • Active scapular retraction, scapular depression in neutral position • Cryotherapy. IFC if indicated 																				

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Phase III: 6-12 wks	(Minimal protection phase with emphasis on normalizing ROM)																																								
Goals	<ul style="list-style-type: none"> • Preserve the integrity of the surgical repair • Implement AROM for shoulder elevation avoiding shoulder shrug • Restore normal ROM • Decrease pain and inflammation • Initiate sub-max and pain-free muscle activation exercises • Improve dynamic humeral head control with RTC activation / co-contractions 																																								
Precautions	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • Treatment emphasis on restoring PROM / AAROM / AROM / Joint Mobilizations • Add AROM exercises avoiding compensatory shoulder shrug. Encourage normal movement patterns • Add sub-max pain-free shoulder isometrics (GH, RTC) • Add low load long duration stretching • Add sub-max rhythmic stabilizations to encourage co-contraction • Continue with thoracic extension exercises • Progress with Personalized Blood Flow Restriction exercises if needed. • Consider aquatics if needed 																																								
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PROM / AAROM / AROM	<ul style="list-style-type: none"> • Goal is functional ROM in all planes with normal movement patterns by 10-12 wks • Progress to IR stretch in 90 deg abduction at wk 6 • Add in gentle IR stretch behind the back vertebral level at wk 8 <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th colspan="4" style="text-align: center;">ROM Targets (in degrees)</th> </tr> <tr> <th></th> <th>6-8 wks</th> <th>8-10 wks</th> <th>10-12 wks</th> </tr> </thead> <tbody> <tr> <td>Flexion / scaption</td> <td>Unlimited (140)</td> <td>Unlimited (160)</td> <td>Unlimited (170/180)</td> </tr> <tr> <td>Abduction</td> <td>120</td> <td>150</td> <td>170/180</td> </tr> <tr> <td>ER at 0 deg</td> <td>50</td> <td>65</td> <td>65+</td> </tr> <tr> <td>ER in scapular plane</td> <td>70</td> <td>70</td> <td>70+</td> </tr> <tr> <td>ER at 90 ABD</td> <td>60</td> <td>75</td> <td>80/90</td> </tr> <tr> <td>IR (GH) in scapular plane</td> <td>50</td> <td>60</td> <td>60</td> </tr> <tr> <td>IR (GH) at 90 ABD</td> <td>30</td> <td>40</td> <td>50</td> </tr> <tr> <td>Extension</td> <td>45</td> <td>60</td> <td>60</td> </tr> </tbody> </table>	ROM Targets (in degrees)					6-8 wks	8-10 wks	10-12 wks	Flexion / scaption	Unlimited (140)	Unlimited (160)	Unlimited (170/180)	Abduction	120	150	170/180	ER at 0 deg	50	65	65+	ER in scapular plane	70	70	70+	ER at 90 ABD	60	75	80/90	IR (GH) in scapular plane	50	60	60	IR (GH) at 90 ABD	30	40	50	Extension	45	60	60
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IR (GH) in scapular plane	50	60	60																																						
IR (GH) at 90 ABD	30	40	50																																						
Extension	45	60	60																																						
Muscle Activation Strengthening	<ul style="list-style-type: none"> • 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 isotonic in the next phase, the patient must be able to elevate arm without shoulder or scapular hiking. If unable, will need to continue rotator cuff activation and dynamic rhythmic stabilization GH joint exercises. • Add in arm supported bicep / triceps isotonic strengthening wk 6, progress to unsupported at wk 8 																																								

	Rotator Cuff Repair: Small/medium Excellent/Good Tissue Quality
Phase III: 6-12 wks	Minimal protection phase with emphasis on normalizing ROM
Recommendations Is repeat from previous page	<ul style="list-style-type: none"> • 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 low load long duration stretching • Add sub-max rhythmic stabilizations to encourage co-contraction • Continue with thoracic extension exercises • Progress with Personalized Blood Flow Restriction exercises if needed. • Consider aquatics if needed
<p>Treatment Interventions</p> <p>To decrease Shoulder shrug:</p> <p>Work on: RTC function (posterior cuff) to decrease HH migration by deltoid</p> <p>Rhythmic stabilization for co-contraction</p> <p>? inferior capsule mobility</p> <p>4 key exercises to maximize mid/lower trapezius and inhibit upper trapezius* (Cool et al, AJSM, 2007)</p> <p>Sidelying ER Sidelying flexion* Prone hor abd w/ ER Prone extension</p> <p>*Emphasis on scapular setting during exercises</p> <p>Also: prone rowing for scapular control</p>	<ul style="list-style-type: none"> • Active warm-up: Codman's, UBE with no resistance (add light resistance at wk 8) • Low load long duration end-range stretch (if necessary) using wand and hot pack in supine for ER (Davies, Ellenbecker. Biomechanics, 1999) • GH Mobilizations • PROM / AAROM with end range stretch. TRX stretching, pulleys, wand, ball roll on wall Wk 8: add in gentle IR behind the back stretch, prone IR stretch • Therapeutic exercises: AROM: quality movements, can add in gentle manual resistance GH: All motions with emphasis on quality movement with no scapular substitution. Focus on endurance working up to 30 repetitions Elevation: scaption / flexion / progressing to abduction IR/ ER Sidelye flexion with scapular setting Sidelye ER with scapular setting • Scapulo-Thoracic: Protraction (supine progress to seated/standing), retraction (seated progress to prone), prone rows at side to neutral, rows at 45 deg, rows at 90 deg sidelye row prone horizontal abduction neutral rotation progression to with ER prone extension with ER, prone extension sidelye TS rotation wk 7: low load CKC (<BW): ie: weight shift on table • Muscle activation: GH isometrics: sub-max pain-free Supported Biceps / Triceps isotonic, wk 8: progress to unsupported biceps/triceps • Rhythmic stabilization sub-max (to facilitate muscle activation / co-contraction): wk 6: supine arm supported ER/IR at 45 deg progress to 90/90 low load CKC (<BW) for joint compression: ie: standing arm on table, wk 8-10: supine scaption 100 deg progress to 120 deg, gentle CKC (<BW) for jt compression: hand on wall 90 deg scaption wk 10: supine scaption 45 deg standing flexion 90 deg bilateral progress to unilateral • Personalized Blood Flow Restriction exercises if needed. • Encourage thoracic extension and rotation • Ice (in stretch if needed) 15 minutes • E Stim (IFC or NMES ER) if necessary

	Rotator Cuff Repair: Small/medium Excellent/Good Tissue Quality
Phase IV: 3-5 months	Strengthening and Conditioning Phase
Goals	<ul style="list-style-type: none"> Establish and maintain functional ROM, mobility, and stability Progress muscular strength, power, and endurance Initiate higher level activities depending on functional demands and MD approval Patient should continue to perform strengthening exercises for up to 1 year post-op to maximize outcome.
Precautions	<ul style="list-style-type: none"> Patient must be able to elevate arm without shoulder or scapular hiking. If unable, need to continue with dynamic rhythmic stabilization GH exercises.
Recommendations	<ul style="list-style-type: none"> Facilitate regaining functional ROM if not already attained Assess posterior capsule for tightness Treatment emphasis on regaining strength and endurance. Focus on proper movement patterns Create a “posterior dominant shoulder” – ie: focus on ER, scapular retractors Continue with proprioceptive / kinesthetic exercises Continue with personalized Blood Flow Restriction exercises if needed. Progress to independent strengthening at 4-5 months with periodic re-checks if meeting targets
Modalities	<ul style="list-style-type: none"> Ice 1x/ day and /or after strenuous activities
ROM	<ul style="list-style-type: none"> No restrictions. Goal is functional ROM in all planes with normal movement patterns by 10-12 wks
Strengthening	<ul style="list-style-type: none"> Target scapulothoracic, rotator cuff, glenohumeral, and total arm strengthening and endurance Strengthening initially with uni-planar movements progressing to multi-planar movements Wk 16: Progress to overhead strengthening (if needed)
Treatment Interventions: (Examples of exercises but not an all-inclusive list)	<ul style="list-style-type: none"> Active warm-up: UBE, rower Continue with ROM activities as necessary Scapulothoracic strengthening: <ul style="list-style-type: none"> chest press (+), rows in full ROM, press down, scaption (Moseley et al, AJSM, 1992) 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 16) Glenohumeral / rotator cuff strengthening: <ul style="list-style-type: none"> flexion, scaption, prone horizontal abduction with ER, press down (Townsend et al, AJSM, 1991) sidelying ER, isotonic IR/ER in scapular plane progress to 90/90 wk 16 if needed, isokinetic IR/ER in scapular plane progress to 90/90 wk 16 if needed Total arm strengthening: Triceps extensions, biceps curls PNF patterns Proprioceptive/Kinesthesia activities: rhythmic stabilizations, body blade CKC exercises: <ul style="list-style-type: none"> sub-max BW: quadruped (euroglide / cuff link), wall push-ups wk 16-18: Progress to full BW: partial prone walk-outs, full prone walk-outs Plyometrics: bilateral progress to unilateral Personalized blood flow restriction if indicated Cryotherapy, electrical stimulation, and biofeedback, and if necessary
Isokinetic IR/ER testing	<ul style="list-style-type: none"> Wk 16 (4 months if needed), wk 24 (6 months), and 12 months at 30/30/30 position or 90/90 (if appropriate)

	Rotator Cuff Repair: Small/medium Excellent/Good Tissue Quality
Phase V: 5-7 months	Advanced strengthening and Return back to Work/Sport Activities
Goals	<ul style="list-style-type: none"> • Progress muscular strength, power, and endurance • Initiate higher level activities depending on functional demands and MD approval • Patient should continue to perform strengthening exercises for up to 1 year post-op to maximize outcome
Treatment Interventions	<ul style="list-style-type: none"> • Continue with strengthening exercises, progressing with power and functional movement patterns • 5-6 months: return to interval throwing, golf, tennis, swimming program per MD/PT approval • Return to higher level work and sport activities based on: <ul style="list-style-type: none"> MD/PT approval, Full ROM, No pain at rest or with activity, Strength: Isokinetic strength and power at 90%, or isometric hand-held dynamometer testing 90% or MMT 5/5, Functional testing at 90 % compared to uninvolved Performance of sport specific activities.



Rotator Cuff Repair References

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