

Pediatric and Adolescent Rehabilitation Protocol for Proximal Humeral Apophysitis (Little League Shoulder)

This protocol is intended to guide clinicians through non-operative management of proximal humeral apophysitis or “Little League Shoulder” (LLS). This protocol is time based (dependent on tissue healing) as well as criterion based. Specific intervention should be based on the needs of the individual and should consider exam findings and clinical decision making. The time limits for expected outcomes contained within this guideline may vary based on referring physician preference, degree of growth plate widening, additional impairments, and/or complications.

The interventions included within this protocol are not intended to be an all-inclusive list of exercises. Therapeutic interventions should be included and modified based on the progress of the patient, and under the discretion of the clinician.

Considerations for the rehabilitation of LLS

Important factors that influence the rehabilitation outcomes for LLS include the age of the patient, compliance with the rehabilitation program and patient/family education. Education needs to emphasize that repeated throwing, especially with poor mechanics or excessive force, strains the growth plate at the top of the humerus. Over time, inflammation and irritation to that growth plate results in pain and discomfort. Rest from overhead sporting activities is imperative for healing (up to 3 months or as indicated by orthopedic specialist). The athlete may still run and field (no throwing), pending level of symptoms. Upon return to pitching, the athlete must abide by recommended pitch counts and rest days to prevent recurrence of symptoms.

The early phase of recovery will be the most variable based on the symptoms of the individual. Everything in this phase should be guided by symptoms and remain pain free. It is imperative that core and lower extremity impairments are addressed throughout the rehab process. Finally, functional upper extremity testing in the pediatric population has not been researched, leaving a lack of normative data for this population for determining return to sport. Return-to-sport decision making should be individualized and based upon factors including level of demand on the upper extremity and frequency of participation, etc.

PHASE I: PROTECTION AND PAIN MANAGEMENT (0-2 WEEKS AFTER INJURY)

Rehabilitation Goals	<ul style="list-style-type: none"> • Protect the shoulder joint • Manage pain and inflammation • Begin range of motion (ROM) exercises • Begin periscapular strengthening
Interventions	<p><i>Pain Management</i></p> <ul style="list-style-type: none"> • Ice application for pain and swelling • Non-Steroidal anti-inflammatory drugs (NSAIDs) as prescribed <p><i>Range of Motion</i></p> <ul style="list-style-type: none"> • GH flexion table slide, Horizontal table slide, Table walk backs, Wall slides, • Pendulums, Cane ER, Book openers <p><i>Stretching</i></p> <ul style="list-style-type: none"> • Hip flexor stretch, Hamstring stretch <p><i>Strengthening</i></p>

	<ul style="list-style-type: none"> Periscapular: Scapular clocks, Prone row, Banded row, Supine serratus punches Wrist and elbow: Flexion, Extension, Supination, Pronation, Radial and ulnar deviation <p><i>Manual Therapy</i></p> <ul style="list-style-type: none"> Scapular mobilization and PNF PROM of the shoulder
Criteria to Progress	<ul style="list-style-type: none"> Reduced pain levels to < 2/10 Achieve full ROM of the shoulder Performed basic scapular stabilization exercises without pain

PHASE II: SUBACUTE PHASE (3-6 WEEKS AFTER INJURY)

Rehabilitation Goals	<ul style="list-style-type: none"> Begin progressive rotator cuff strengthening exercises Improve scapular and shoulder motor control
Additional Intervention <i>*Continue with Phase I interventions</i>	<p><i>Range of Motion and Flexibility</i></p> <ul style="list-style-type: none"> AROM: Side-lying shoulder ER, Side-lying shoulder abduction, Side-lying shoulder flexion Stretching: Sleeper stretch, Pec minor stretch in doorway, Cross body stretch, Hip flexor stretch, Hamstring stretch <p><i>Strengthening</i></p> <ul style="list-style-type: none"> Periscapular: Prone shoulder extension/abduction, W, Shoulder extension with band, Row with band, Push up plus on knees, Forward punch dumbbell or band Rotator cuff: Side-lying external rotation with weight, Prone abduction with thumb up, Standing external and internal rotation with band, Standing scaption Core and lower extremity: Plank progressions, Bridge progressions, Quadruped progressions, Chops, Single leg squats, Romanian dead lifts, Copenhagen progressions <p><i>Neuromuscular Control</i></p> <ul style="list-style-type: none"> Ball stabilization on wall, Quadruped alternating isometrics, Rhythmic stabilization 90 and 120 deg of flexion <p><i>Manual Therapy</i></p> <ul style="list-style-type: none"> Soft tissue mobilization to pec minor Joint mobilization as indicated Posterior shoulder stretching as indicated
Criteria to Progress	<ul style="list-style-type: none"> Full pain free ROM of the shoulder Performed all exercises demonstrating symmetric scapular mechanics Progressed to functional activities without pain

PHASE III: PROGRESSIVE STRENGTHENING (7-12 WEEKS AFTER INJURY)

Rehabilitation Goals	<ul style="list-style-type: none"> Improve shoulder strength and stability Enhance dynamic scapular control Perform all functional activities pain free
Additional Interventions <i>*Continue with Phase I-II Interventions as indicated</i>	<p><i>Strengthening</i></p> <ul style="list-style-type: none"> Dynamic Stability Exercises: 90/90 Internal and external rotation with band, Push-up progressions <p><i>Neuromuscular Control</i></p> <ul style="list-style-type: none"> Resistance band PNF D1 and D2 pattern, Plank sliders, Wall slides with resistance band Plyometric shoulder exercises: Prone abduction ball catch, Ball dribble in 90/90, Kneeling 90/90 trampoline toss, Medicine ball chest pass Throwing motion drills: Shadow throwing w/towel or tube, Figure 8s, Reverse throws
Criteria to Progress	<ul style="list-style-type: none"> Sustained pain-free, full AROM Full strength of Rotator cuff and parascapular muscles Performed all exercises demonstrating symmetric scapular mechanics Demonstrated stability and control of scapulothoracic joint during plyometric exercises

PHASE IV: RETURN TO PLAY AND MAINTENANCE (12+ WEEKS AFTER INJURY)

Rehabilitation Goals	<ul style="list-style-type: none"> • Full return to throwing and sports activities • Maintain shoulder strength and stability
Additional Interventions <i>*Continue with Phase II-III interventions as indicated</i>	<p><i>Strengthening</i></p> <ul style="list-style-type: none"> • Progression of dynamic strengthening: Body blade through throwing motion, OH kettlebell press, Turkish get-ups, Landmine shoulder press • MGB Youth Overhead Strengthening Program <p><i>Functional Training</i></p> <ul style="list-style-type: none"> • MGB Youth Throwing Progression • Biomechanical Assessment: Evaluate and correct any faulty throwing mechanics
Criteria to Progress	<ul style="list-style-type: none"> • Completed throwing progression pain free • QuickDASH < 10 • Pediatric Activity Scale for the Shoulder (PASS) > 90 • Upper Extremity Functional Assessment: Joint position sense < 5 degree margin of error ER/IR strength minimum 85% of the uninvolved arm ER/IR ratio > 64% Scapular dyskinesis test symmetrical
Contact	Please email MGHSportsPhysicalTherapy@partners.org with questions specific to this protocol

References:

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