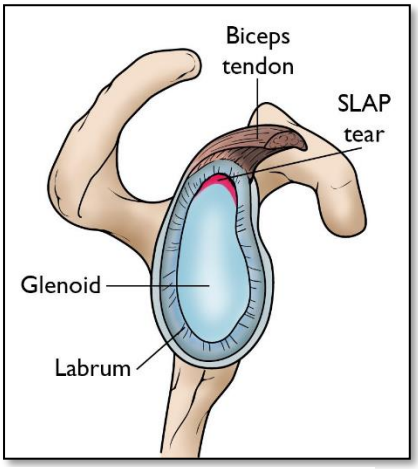
Superior Labrum Anterior to Posterior (SLAP) Repair

Post-Operative Rehabilitation Protocol

This rehabilitation protocol has been designed for patients undergoing a Superior Labrum Anterior to Posterior (SLAP) repair. This procedure is typically performed on overhead athletes or individuals with significant labral tears causing instability or pain. Commonly, the procedure includes reattaching the torn labrum to the socket of the shoulder, often with the use of sutures or anchors. It's essential to recognize that healing involves not only the labrum but also surrounding soft tissue structures, and this process must be respected throughout rehabilitation.

SLAP repair procedures may sometimes be accompanied by other interventions, such as biceps tenodesis or debridement of frayed tissues. **Communication with the surgeon and review of the operative note are critical to understand the specifics of the procedure and any necessary adjustments to the rehabilitation timeline.**



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Rehabilitation after a SLAP repair typically spans 6-9 months, with variations based on the sport's demands, the athlete's level of play, and their functional goals. Physical therapy should commence approximately 2 weeks post-operation, as advised by the surgeon. The supervised rehabilitation program should be supplemented with a home exercise regimen prescribed by the Physical Therapist. Return to overhead throwing or high-demand activities should be carefully guided and usually begins no earlier than 4-5 months post-op, with ongoing supervision to ensure safety and proper progression. Full return to sport is achieved when the patient has completed the rehabilitation protocol, a return-to-throwing program, and has received clearance from the surgeon.The primary goals of SLAP repair and its subsequent rehabilitation are to:

- Control pain and inflammation
- Allow for adequate tissue healing and maturation
- Restore normal range of motion and strength in the upper extremity
- Correct postural and mechanical deficits, ensuring consistent proper movement
- Achieve the patient's desired level of function and performance

Note: Adherence to the structured recovery program is crucial for a successful return to sport. Compliance with rehabilitation can significantly impact the success rate of returning to previous levels of activity, with favorable outcomes in most cases

There are not a lot of things that we can do to speed the process of healing, but there ARE things that we can do to slow it down.

- Refrain from heavy lifting or forceful movements involving the shoulder in the early stages
- Avoid activities that place undue stress on the repaired labrum, such as throwing or overhead lifting
- Don't push through pain

Typical Rehabilitation Timeline

Week	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26+
WOUND CARE																										
RANGE OF MOTION																										
STRENGTH																										
PLYOMETRICS																										
THROWING																										
HITTING																										

The dark bar indicates times of main focus for the corresponding category. A gradient bar indicates a continued focus of that activity.

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The following rehabilitation protocol is divided into five phases. Each phase is adaptable based on the individual and special circumstances. If any questions arise throughout the process, please the surgeon's staff or physical therapists for clarification.

PHASE 1 (0-2 weeks)	**Acute Post-Op**
Important Considerations	• Protect surgical site including portals • Monitor wound healing and refer back to MD if the following occur in the patient ○ Excessive swelling of the shoulder or arm, abnormal/night pain, extreme hypersensitivity, numbness, feverse, severe limitations in ROM, redness of incision site, abnormal/excessive wound drainage
Rehabilitation Goals	• Promote healing of the shoulder • Control pain and inflammation • Initiate gentle passive motion • Patient education & independence with home exercise program
Precautions	• Any incisions should be kept clean, dry, and dressed (do not submerge incisions) • No lifting, twisting, pulling, or pushing with affected upper extremity, remember the bicep insertion into the superior labrum • Careful with PROM during this phase to mitigate patient guarding and increased pain
Frequency	• Supervised Physical Therapy 1-2x/week
Bracing/ROM	• Sling should be worn at all times except for bathing and during Physical Therapy (4-6 weeks total) ○ The cushion actually allows for better blood flow to the glenohumeral joint, please use • PROM/AAROM only! • **Flexion/scaption** – 0-60° by week 1; 0-75° by week 2; 0-90° by week 3 • **ER** (scapular plane) – 0-15° by week 1; 0-30° by week 2-3 • **IR** (scapular plane) – as tolerated • **Extension** – none
Therapeutic Activities	Range of Motion: *see restrictions above* • AAROM with pulleys (flexion/scaption) or cane • AAROM table slides (flexion/scaption) • Elbow and wrist flexion/extension, pronation/supination Strengthening: • Scapular stability: scapula squeeze, shoulder shrug, slow prone rows • Submaximal pain-free isometrics with arm at 0° - IR/ER/ext/abd (**NO ELBOW or SHOULDER FLEXION**) Education: • Good posture, the sling can hinder this • Donning/doffing sling and/or clothing • Wound care/signs of infection • Home exercise program
Manual Therapy	• PROM as indicated above with gentle/slow motions • Gentle STM to the upper trapezius, deltoid, bicep – caution with portal sites or other incisions
Modalities	• Ice or electrical stimulation (IFC/premod) as needed for pain modulation
Progression Criteria	• Pain is controlled w/ no sensation deficits or paresthesias • Incision is approximated and healing • Patient demonstrates understanding of home exercise program and precautions • Good posture (very important throughout)

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PHASE 2 (2-6 weeks)	Subacute Post-Op
Important Considerations	• Wounds and incisions should appear healthy/healing throughout, allow steri-strips to fall off when ready • **Be mindful when transitioning back to ADL's** (shaking hands, picking up bags, opening doors, etc.)
Rehabilitation Goals	• Initiate light muscle contraction of upper extremity – maintain caution with bicep loading • Maintain adequate strength in lower extremity and abdominal musculature
Precautions	• No lifting >5lbs with affected upper extremity • Avoid heavy sweating until incisions are closed
Frequency	• Supervised Physical Therapy 2x/week
Bracing/ROM	• Can consider weaning from sling weeks 4-6, larger repairs likely need longer • **Flexion/scaption** – 0-145° by week 6 • **ER** (scapular plane) – 0-50° by week 6 • **IR** (scapular plane) – full by week 6 • **Extension** – none
Therapeutic Activities	Range of Motion: • Continue Phase 1 activities within progressive ROM ranges Strengthening: • Continue Phase 1 activities, increase isometric time up to 10sec • May progressively add light resistance (<5lb) for wrist/forearm activities • **Week 3**: shoulder tubing/band exercises – rows, extensions, IR, ER (not too far), triceps ext • Prone rows, extensions, horiz abduction (emphasis on mid/low trapezius) – unresisted, start adding light weight at **week 4** • Light biceps curls (1-3lb) can begin **week 3-4** • Blood flow restriction (BFR) can be considered to supplement strength gains and mitigate atrophy Cardio: • Upper body ergometer (UBE) can begin weeks 4-6 once adequate ROM (flexion 90-100°) is achieved Proprioception: • Rhythmic stabilization in progressive fashion (supine, sidelying, standing) • PNF patterns – ensure available ROM • Ball on wall or DS2 board – ABC's, circles Core Stabilization: • Dead bugs, leg lifts, hollow holds, windshield wipers, flutter kicks, scissor kicks • Avoid excessive WB through affected UE (**no full CKC activities yet**) Lower Extremity: • Clamshells, bridges, lateral band walks, monster walks, leg press, squats (not barbell), calf raises, single leg balance, step ups – overall, emphasize single leg control
Manual Therapy	• Continue STM as needed for shoulder girdle musculature including trap, lat, rotator cuff, pec major • Joint mobilizations as needed: grade I-II (reduce pain), grade III-IV (regain mobility) • PROM within limits above
Modalities	• Ice as needed for pain modulation
Progression Criteria	• No pain or inflammation with ADLs • Meet ROM limits above

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PHASE 3 (6-12 weeks)	**Intermediate: Integrated strength**
Important Considerations	• Deficits in balance and kinetic chain strength are correlated with increased injury risk during pitching or throwing. It is vital to include glute and core stabilization along with shoulder and elbow strengthening in this phase to better prepare the athlete for a safe return to sport.
Rehabilitation Goals	• Maximize strength and endurance with proper mechanics and movement quality • Maximize proprioception and arthrokinematics • Progress power and strength of lower extremity/core musculature
Precautions	• Begin graded valgus stress to affected upper extremity • Begin gradual/controlled weight bearing through upper extremity ○ **Full body weight bearing through affected upper extremity is not recommended until 8-10 weeks post-op - >12 weeks if large repair**
Frequency	• Supervised Physical Therapy 2x/week
Bracing/ROM	• Discharge from sling, progress to full ROM as tolerated (conservative stretching, don't force)

Therapeutic Activities	Range of Motion:
	• Continue PHASE 1-2 range of motion exercises
	• Maintain adequate ranges in lower extremity musculature
	Strengthening:
	• Continue PHASE 1-2 activities as appropriate
	  ○ *Do not neglect the basic "boring" exercises for overly-complex, fad-based activities*
	  ○ A progressive approach should be taken to resistance training, ensure **quality of movement** prior to adding load
	• Utilize dynamic neuromuscular stabilization exercises to prime patient for sports-specific movement
	• Progress periscapular exercise with emphasis on rotator cuff, serratus anterior, mid/low trapezius muscles (**continually emphasize good scapula posture**)
	  ○ Full can, prone/standing IYTs, sidelying ER/flexion, banded ER/IR, prone ER, scapular punches, serratus walks, D2 flexion/extension
	  ○ Wall angels – ensure full ROM first
	  ○ Eccentric activities (sidelying decels, banded 90/90 ER, scaption plane decels, etc.)
	  ▪ Start very light and focus on control early
	• Progress core stabilization exercises (be mindful of weight-bearing, hold until 8-10 wks)
	  ○ Dead bugs, V-ups, stir-the-pots, planks, side planks, plank plus, etc.
	• Progress lower extremity strengthening with single leg balance
	  ○ Single leg tap downs, single leg squats, single leg RDLs, single leg lawnmowers, single leg bridge, bird dogs
	• BFR can be utilized to maximize strength return with lower loads (ensure exercise quality; **maximum total tourniquet time of 20min per session**)
	Cardio:
	• Same as PHASE 2, progressing intensity levels and interval training when appropriate
	• Progressive intensity on UBE
	• May begin jogging at 6 weeks post-op; sprinting at 12 weeks post-op
	  ○ Minimize risk of falling!

Manual Therapy	• PROM likely needed throughout to achieve and maintain full shoulder ROM, be gentle with ER/extension early – work soft tissue in the lats/subscap/posterior cuff as appropriate • Initiate manual resistance PNF patterns
Modalities	• Ice, dry needling as needed
Progression Criteria	• Minimal to no scapular dyskinesis, full pain-free AROM/PROM, good postural awareness

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PHASE 4 (12-16 weeks)	Advanced: Plyometrics, Pre-Throwing
Important Considerations	• SLAP repairs are inherently challenging with regard to return to previous level of sport, pay close attention to ER/extension ROM • The throwers readiness inventory (TRI) is a comprehensive battery of tests to help in determination of return to throw timelines. This battery includes assessment of shoulder range of motion, shoulder strength, core strength, single leg squat form, scapulohumeral rhythm, psychological readiness, and adherence to the rehabilitation process • Strength testing and administration of TRI should be assessed ~**16 weeks** • Scores should be recorded and communicated with other members of the interdisciplinary care team to aid in the decision for commencement of the return to throw program
Rehabilitation Goals	• Maximize power, strength, and endurance of upper extremity, core, and lower extremities • Completion of plyometric training program • Develop readiness for return to throw
Precautions	• One-handed plyometrics should only be introduced after pain free completion of two-handed plyometrics
Frequency	• Supervised Physical Therapy 2x/week
Therapeutic Activities	Range of Motion: • Ensure normalized elbow and shoulder mobility in all planes (especially ER/IR) Strengthening: • Continue PHASE 1-3 activities as appropriate and as time allows • Two handed plyometrics (weeks 12-16): med ball chest pass, overhead throw, scoop toss, overhead dribble, rotational shot-put throw, slams (progressive loads) ○ Incorporate more dynamic, full-body movements after ~2 weeks of isolated plyometrics: squat to throw, single leg RDL to throw, split lunge slams • One handed plyometrics (weeks 16-20): wall dribble, kneeling decelerations, reverse throws, ball drops, dynamic body blade movements • Advance closed-chain (CKC) activities to maximize proprioception and control • Planks, side planks, plank to push-up, plank plus, reactive drills, slide board, swiss ball pikes, etc.
Manual Therapy	• Soft-tissue massage, joint mobilizations, active release, other manual techniques as warranted for mobility and recovery
Modalities	• As needed

Progression Criteria	• Completion of throwers readiness inventory (TRI) with acceptable measures in all categories (**16+ weeks**):
	  ○ ER:IR strength ratio > 67% (or ER at 0° approaching 20-25% of body weight)
	  ○ Side plank > 45 sec bilaterally
	  ○ Good single leg squat form
	  ○ No pain with any exercises or ADLs

❖ Throwing programs and other resources can be found at www.readytothrow.com

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PHASE 5 (16+ weeks)	Return to Sport Preparation

Important Considerations	• Adherence to the structured interval to throwing program is crucial for safe and effective return to sport – this process should not be rushed
	• After competition of a traditional return to throwing program, the athlete will perform position specific return to throwing or mound program
	• Before discharge and return to sport, your athlete should have a good understanding of warm up and cool down exercises to be performed on throwing days
	• Understand that the initial phases of throwing (first 1-2 months) are to <u>condition</u> the healing structures of the shoulder
	  ○ **Velocity/location are not important at this time – prioritize mechanics and consistency!**
	  ○ All throws should be intentional, ensure meaningful mechanics at all times

Rehabilitation Goals	• Return to position/sport-specific activities • Gradual/progressive return to competitive throwing and/or hitting
Precautions	• **Hitting and throwing should not commence at the same time** • Communicate with your athlete to assess preference and implement programs accordingly
Frequency	• Supervised Physical Therapy 2x/week

Therapeutic Activities	• Continue PHASE 1-4 activities as appropriate and as time allows
	• Interval throwing program and/or hitting program
	  ○ Observe mechanics or refer to specialist who may be able to address fault
	• It is vital to maintain rotator cuff/scapular strength through this phase
	  ○ Easy to forget/neglect the "basics", but ensure that the simple things are maintained 2-3x/week
	• Monitor ROM changes about the elbow/shoulder as tightness may develop
	<u>Education</u>:
	• Observe soreness rules and progression through interval programs
	  ○ Significant muscle soreness >24 hours warrants an extended day of rest to recuperate
	  ○ Do not skip throwing days – discuss how to adjust program as necessary
	• Warm up and cool down exercises prior to and after throwing performance
	  ○ Important to establish a repeatable routine
	• Risk reduction for future elbow and shoulder injury
	• Strength and conditioning programming for in-season vs off season

Manual Therapy	• Soft-tissue massage, joint mobilizations, active release, other manual techniques as warranted for mobility and recovery • Be mindful if ulnar nerve transposition was performed
Modalities	• As needed
Progression Criteria	• Pain-free completion of interval throwing/hitting programs • Good and repeatable mechanics • Clearance for return to sport by MD

- ❖ Full clearance only to be provided by operating surgeon
- ❖ Maintain open communication with all stakeholders involved in rehabilitation team (AT, PT, MD, coaches, S&C, parents)

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