

ValleyOrtho Rehabilitation Playbook Series

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Surgical Procedure: Shoulder Instability Repair: Labral repair, Capsular Plication, and/or Laterjet procedure

*The intent of this information is to inform the treating clinician on the evidence based considerations to be used as a guideline regarding the surgery noted above. This is not a substitute for appropriate clinical decision making but a supplement to that effect. If at any time a clinician feels uncertain about a given phase discrepancy or patient presentation they are strongly encouraged to discuss this with the referring physician and his/her team. If specific comorbidities create unattainable goals for phase progression, discuss this with the treating physician group before progressing to the next phase. **Always check the prescription for potential patient specific ROM variations.***

****It is the responsibility of the therapist to read the operative report before providing care to the patient to improve treatment communication as variations to treatment plan may occur because of surgical details and patient response to treatment****

Therapeutic Activity Progression Disclaimer: Phase progression should be strongly based on meeting clinical criteria (not solely based on the post-operative timeframes) and in collaboration with the referring surgeon. Patient progress is variable and should be individualized while ROM restrictions provide upper limits, not absolute goals. Exercise prescription should be clinically directed by pain and performance absent of detrimental compensation with respect to proper arthrokinematics at the glenohumeral joint (GHJ).

Communication Recommendations from Therapist to Surgical

Team: When a treating therapist feels the need to reach out to the physician, and his/her team, at any point for any reason they are strongly encouraged to do so. All concerns are not explicitly written and clinical judgement is paramount. Below is a handful of reasons and suggested methods of contact to promote communication:

Urgent Red Flag Communication: the patient is in clinic and an action is required as directed by referring staff office

- Uncontrollable and unremitting pain
- Signs of infection at incision or treated limb
- Severe palpation tenderness, swelling, tachycardia (UE or LE DVT)
- Labored breathing (PE)
- Drastic improvement or decline in ROM (failed repair)
- Excessive muscle guarding or motion phobia evident after the first 1-2 outpatient visits

• After a fall/trauma, or near fall/trauma, resulting in a clinical change

Preferred Contact Method: 1. Immediate call to MD or PA Cell.
2. Office phone call to request consult with MD/PA/MA/ATC until answer.

Administrative Needs

- Rehabilitation Prescription needed or prescription change requests.
- Appointment needed with the physician office, or medication refill.

Preferred Contact Method: Office phone call to MA/ATC.

Other Patient Concerns During Clinic Hours M-TH 9am-5pm F 9-3pm

- Abnormal pain, comorbidities, complications or compliance issues that may prevent attainment of established discharge criteria
- Adverse work or home practices negatively impacting recovery
- Patient expresses discontent or concerns with the current POC established by PT/OT and/or by MD/PA

Preferred Contact Method: Phone call to MD &/or PA

Preferred Updates before checkup visits with MD

During Clinic Hours M-TH 9am-5pm F 9-3pm

- Information regarding adherence/participation in rehabilitation process
- Comments on progress and trending nature of the patient's rehab course

Preferred Contact Method: Phone call MD and/or PA. Or Fax update.



Phase 1: Healing & PROM Recovery (weeks 2 to 6)

Goals: Rehabilitation to begin 7-10 days after surgery date^{2, 5, 6, 19, 20, 22}

- Protect repaired tissue while using controlled stress to promote proper collagen fiber proliferation across repair¹⁴
- Educate pain, swelling and sling/cryotherapy management

Precautions:

- Sling **for 3-4 weeks** during situations of ambulation and sleeping, out of sling for HEP/Rehab and static rest^{2, 3, 6-9, 12, 14-17, 21-23}
- Sling D/C based on MD approval based on progress with AA/PROM²⁴
- No forceful ROM: stretches stop at patient reported light stretch¹²
- No ROM behind body for 4 wks²⁰
- P/AAROM immediately OK¹²
- No AROM until wk 4^{15, 17, 19, 20} outside self-care face to groin range²⁴
- No RROM outside of submax isometrics until wk 8^{3, 8-10, 15, 16, 18, 20, 22, 23}
- No FWB CKC until wk 8^{2, 19} 50% WB OK at wk 6
- No RROM elbow flexion until wk 12 with Bicep Tenodesis or repair²
- No Rotational RROM in ABD 90/90 position until wk 12

ROM Restrictions / Goals for end of phase:

- No ER in > 60° ABD^{2, 8, 12-14, 21}
- ER: to 20°-30° until wk 4^{2, 3, 6, 12-14, 20, 21, 23}, Then to 40° until wk 6^{3, 6, 17-19}
- IR: to 45° in RP until week 3^{2, 14, 17} then to 60° in 60° ABD until wk 6¹⁹
- Elevation: to 90° until wk 3^{2, 14, 12, 17, 18 22} Then to 115° wks 3-6¹²
- Extension: to 20° beginning from wks 4-6

Phase 1 Therapeutic Activities:

- Light pain free rhythmic stability and submax isometrics at wk 2^{1, 2, 5 6, 8, 13, 17, 18, 20, 22} Delay ER/IR isometrics until week 4²¹
- NMES as needed²¹ with AROM at wk 4
- Cervical, thoracic and scapular manual work and postural exercises
- AROM encouraged at elbow, wrist, hand, scapula, cervical and T-spine
- Tubigrip and/or glove compression to manage distal swelling as needed
- Scar management on healed incisions as tolerated

Criteria for Progression to Phase 2 Activities:

- Meets ROM goals & activity progressions ≠ undue discomfort

Progression Note:

- If actual ROM is less than target ROM, osteokinematic stretching should be applied for ROM gains to prevent adhesions.¹² Initiate GHJ mobilizations if gains are not made with osteokinematic stretching.
- If ROM meets phase goal without stretch sense avoid ROM exercises in that plane to prevent overstretching until Phase goal allows progression¹²

Phase 2: ROM & Early Strength (weeks 6 to 10)

Goals:

- Continue strong emphasis of P/AAROM and Manual therapy in this phase: Restore ≈ 75% of full PROM
- Gently restore RTC function with proper GHJ AROM arthrokinematics
- Minimal to no pain at rest, full return to light ADLs¹
- Recognition that tissue healing is generally incomplete until 12 wks.¹²

Precautions:

- No FWB CKC until wk 8^{2, 19}
- No RROM elbow flexion until wk 12 with Bicep Tenodesis or repair²
- No Rotational RROM in ABD 90/90 position until wk 12

ROM Restrictions / Goals for end of phase:

- ER: OK to 60° in RP⁶
- ER: OK in 90° ABD to 45° at wk 8^{2, 12-14, 19} Then progress ≈ 10°/wk^{2, 21}
- IR: slowly return to WNL, avoid behind back until wk 8²²
- Elevation: OK to 140° until week 8 then to full ROM as tolerated^{7, 8, 12, 13}
- Extension: Slow progressions as tolerated to full

Phase 2 Therapeutic Activities:

- Slow progressive RTC RROM OK at wk 8^{3, 8-10, 15, 16, 18, 20, 22, 23}
 - High reps 30-50/set recommended for RTC & scapula^{12, 18}
- A/AA/PROM IR and ADD behind the body as tolerated at wk 8²²
- Increase active scapula upward rotation focused activities⁴
- Begin 50% BW CKC activities progressing to FWB at wk 8^{2, 19}
- Begin gentle joint mobilization for normal arthrokinematics at AC & SC joints²³

Criteria for Progression to Phase 3 Activities:

- Patient tolerates therapeutic progressions without undue discomfort, compensation or guarding
- **ROM to Achieve without significantly exceeding: (Elevation=full) (ER in RP to 60°, ER in 60° ABD to 70° and ER in 90° ABD to 65°) (IR @ RP = full) (IR @ 90° ABD = 60°) (Ext = full)**

Progression Note:

- If actual ROM is less than target ROM, osteokinematic stretching should be applied for ROM gains to prevent adhesions.¹² Initiate GHJ mobilizations if gains are not made with osteokinematic stretching.
- If ROM meets phase goal without stretch avoid ROM exercises in that plane to prevent overstretching until Phase goal allows progression¹²



Phase 3: Final ROM & Intermediate strength (weeks 10 to 16)

Goals:

- Full restoration of AROM with arthrokinematic focus $\approx$ wk 12^{7,12,13}
- As ROM goals are met focus shifts to neuromuscular cuff and scapular control for centered GHJ activities¹²
- Improve neuromuscular control/coordination of T-spine, scapula, GHJ
- Return to all ADL's without discomfort

Precautions:

- No RROM elbow flexion until wk 12 with Bicep Tenodesis or repair²
- No Rotational RROM in 90° ABD position until wk 12

Phase 3 Therapeutic Activities:

- PROM with proper GHJ arthrokinematics and mobilizations with target intensity for mild to moderate tissue deformation as needed to return motion to normal
- Progressive RTC exercise and CKC activities as tolerated
- Increase duration and intensity with rhythmic stabilization activities
- Increase post capsule mobility with gentle horizontal adduction cross body stretching/sleeper stretch as tolerated at week 10^{12, 20} no forceful horizontal ADD stretching until wk 12 if necessary²²

Progression Note:

- If the patient is not attaining the above mentioned functional ROM at 12 weeks, more forceful short lever mobilizations and stretching with GHJ protection may be used with respect to pain tolerance

Low Demand D/C Criteria:

- Full and pain free elevation and return to all ADLs
- Total ER/IR arc of ROM in 90° ABD within 7° of uninjured²
- Pain free Hawkins Kennedy, relocation 90/90 test & SLAP testing²
- MMT with Hand Held Dynamometer² at 12 weeks:

(Laterjet Procedure: discuss with surgical team before initial testing)

- ☐ ER:IR and ER:ABD Ratios of 70%^{14, 21}
- ☐ Flex and ABD LSI >75%²¹

Additional Criteria for Progression to Phase 4: (see appendix A-D)

- Achieved Low demand D/C criteria above
- Front & side plank on hands for 60" with proper scapular form²
- Prone ball flips for 30" with proper form maintained without pain²
- 2# rhythmic IR bounces at wall x 10 without pain²
- 1# 20" ball toss/catch to rebounder with proper form maintained without pain²

Phase 4: Advanced Strength / Return to Sport (week 16 to D/C)

Goals:

- Maintain full non-painful AROM
- Progress overhead muscular endurance, strength and power
- Return to full duty work and recreational activity at PLOF
- Patient understands appropriate exercise progressions/regressions for long term success with HEP to prevent likelihood of re-injury

Precautions:

- No ROM restrictions
- Ensure gradual exercise and activity progression

Phase 4 Therapeutic Activities:

- Progress RROM above shoulder level focusing on stability
- Home program maintenance and progression education
- Return to work and recreation/sport specific exercise
 - ☐ Suggested sport specific progressions for overhead throwing, softball pitching, swimming, tennis and volleyball can be found in the Return to Shoulder Sports Playbook at vvorthocare.org

Criteria for High Demand D/C / Expected Outcomes:

- Pain free AROM $\geq 95\%$ uninjured extremity with normal mechanics
- Pain free isometric muscle strength $\geq 90\%$ uninjured extremity^{21, 25}
- Compliant with prescribed HEP and understanding of commitment to shoulder care
- External rotation endurance test (ERET) at $\geq 90\%$ LSI (see appendix E)²⁵
- Closed Kinetic Chain Upper Extremity Stability (CKCUES) test ≥ 21 touches (see appendix F)^{25, 26}
- Unilateral Seated Shotput (USS) test at $\geq 90\%$ LSI with 10% adjustment for hand dominance (see appendix G)²⁵

Physician Alert Recommended:

- If the patient hasn't made progress in ROM for 1.5 - 2 weeks and/or has persistent pain complaints beyond recovery expectations; Dr. Liotta requests more information to decide whether injections, surgical release or revision may need to be provided during the 12-16 week timeframe
 - If comorbidities create unattainable goals for discharge, discuss this with the treating physician group



Abbreviation List:

AAROM: Active assisted range of motion

ABD: Abduction

ADD: Adduction

ADL: Activity of daily Living

AROM: Active range of motion

BT: Biceps tenodesis

BW: Body Weight

CKC: Closed kinetic chain

D/C: Discharge

DVT: Deep vein thrombosis

ER: External rotation

EXT: Extension

FT: Feet

FWB: Full weight bearing

GHJ: Glenohumeral joint

HEP: Home exercise program

IR: Internal rotation

LE: Lower extremity

LSI: Limb Symmetry Index = *(Score of an involved divided by the score of the uninvolved x 100 for any given test for a % score)*

MA: Medical assistant

MD: Medical doctor

Mobs: Mobilizations

NWB: Non weight bearing

PA: Physician assistant

PE: Pulmonary embolism

PLOF: Prior Level of Function

PROM: Passive range of motion

ROM: Range of motion

RP: Resting position

RROM: Resisted range of motion

RTC: Rotator Cuff

UE: Upper extremity

WB: Weight bearing

Wks: Weeks

#: Pounds

≈: Approximately

≠: Without

“: Seconds

Factors to Consider to Minimize Instability Recurrence:

- Glenoid bone loss without fracture, large Hill-Sachs lesion, stretched GHL, ≤ 3 anchors labral repair, General patient ligamentous hyperlaxity ($ER > 90$ at 0 abd)³ $\geq 5/9$ Beighton score.
- DM, PVD, connective tissue disorders may necessitate slowing rehabilitation process due to delayed healing process.¹²
- > 35 yo increased failure rate with SLAP II repair¹⁵
- Generally more suture anchors = slower rehab process for protection purposes²

ROM & Activity Quick Guide

Wk	ROM Restrictions	Activity Progressions
2-4	• <u>ER</u>: 30°. No ER in $> 60^\circ$ ABD • <u>Elevation</u>: 90° • <u>IR</u>: 45° in RP • No ROM behind the body	• PROM • AAROM • Light rhythmic stability • Sub-max Isometric ($\neq$ rotations until week 4)
4-6	• <u>ER</u>: 40° RP. No ER in $> 60^\circ$ ABD • <u>Elevation</u>: 115° • <u>IR</u>: 60° in 60° ABD • <u>EXT</u>: 20°	• Begin ER/IR Isometrics • Begin AROM • NMES OK with AROM
6-8	• <u>ER</u>: 55° RP, to 45° in 90° ABD • <u>Elevation</u>: 140° • <u>IR</u>: full in RP, to 45° in 90° ABD • <u>EXT</u>: full as tolerated	• Begin CKC at 50% BW • AC / SC / GHJ mobilizations
8-10	• <u>ER</u>: 70° in $< 90^\circ$ ABD, to 65° in 90° ABD • <u>Elevation</u>: WNL as tolerated • <u>IR</u>: full in RP, to 60° in 90° ABD	• Slow progressive RTC RROM ($\neq$ ER/IR in 90° ABD until wk 12) • FWB CKC activities OK • Begin IR behind the body work
10-12	AS TOLERATED	• Increase post capsule work
12+	AS TOLERATED	• RROM elbow flexion with BT • Rotational RROM in 90° ABD
16+	AS TOLERATED	• Return to sport progressions



Appendix A: Front & Side Plank Positions



Maintain plank on hands for 60" with proper scapular form² in each position.

Appendix B: Prone Ball Flips



Laying prone on a table, maintain proper scapular form² and repetitively drop and catch ball for 30 seconds.



Appendix C: Rhythmic IR Bounces at Wall



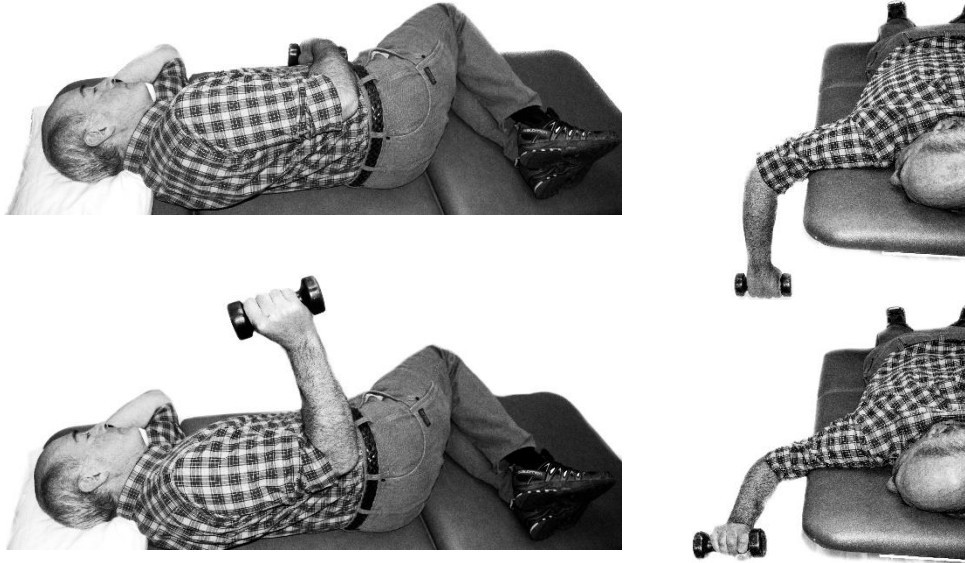
Maintain proper scapular form² while repetitively bouncing 2# ball into wall for 10 repetitions.

Appendix D: Rebounder Ball Toss

Maintain proper scapular form² and repetitively throw and catch 1# ball for 20 seconds.



Appendix E: External Rotation Endurance Test²⁵



- **Set up:** Calculate 5% of the patient's body weight to use as the free weight resistance
- **Test:** Count the # of repetitions the patient can perform before failure to move through the available ROM in:
 - 0 degrees Abducted position in a side lying position
 - 90 degrees of ABD in a prone position
- **Score:** Involved shoulder repetitions ÷ uninvolved shoulder repetitions x 100 = LSI
 - Score LSI for both prone and side lying positions

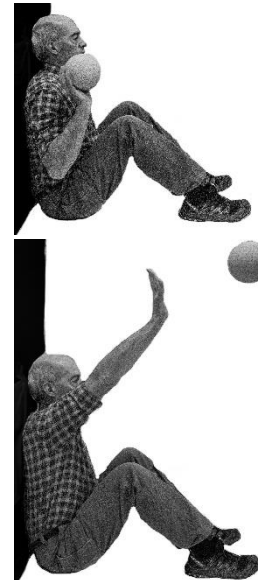


Appendix F: CKCUES Test²⁶

- **Set up:** Hands placed on 2 tape marks spaced 36 inches apart
- **Start position:** Push up; Males on feet Females on knees
- Practice 2 alternating hand taps
- **Test:** Patient instructed to alternately lift one hand off and touch the top of the other hand on the tape mark. Repeat as quickly as possible for 15 seconds
- **Score:** Perform 3 rounds. Take the average of the 3 rounds



Appendix G: Unilateral Seated Shotput Test²⁵



- **Set up:** Patient seated with back flat against wall, knees at 90°, with a 6 pound medicine ball
- **Test:** shotput ball as far as possible while maintaining start position, rest 30 seconds between attempts
- **Score:** Mark the landing spot of 3 trials from one UE with tape, take the average of the 3 attempts
 - Make appropriate 10% ↑ or ↓ for hand dominance when determining 90% LSI

References

1. Amako, M. et al. Recovery of Shoulder Rotational Muscle Strength After Arthroscopic Bankart Repair. *The Orthopaedic Journal of Sports Medicine*. 2017.
2. Ellenbecker, T. et al. Sport Therapy for the Shoulder: Evaluation, Rehabilitation, and Return to Sport. *Human Kinetics*. 2017.
3. Boileau, P. et al. Risk Factors for Recurrence of Shoulder Instability After Arthroscopic Bankart Repair. *Journal of Bone and Joint Surgery*. 2006; 88(8): 1755-1763.
4. Best, M. et al. Multidirectional Instability of the Shoulder: Treatment Options and Considerations. *Sports Med Arthrosc Rev*. 2018; 26: 113-119.
5. Boesmueller, S. et al. Progression of Function and Pain Relief as Indicators for Returning to Sports After Arthroscopic Isolated Type II SLAP Repair – A Prospective Study. *BMC Musculoskeletal Disorders*. 2017 18: 257.
6. Cordasco, F. et al. Understanding Multidirectional Instability of the Shoulder. *Journal of Athletic Training*. 2000; 35(3): 278-285.
7. DeFroda, S. et al. Physical Therapy Protocols for Arthroscopic Bankart Repair. *Sports Health*. May 2018; 10(3): 250-258.
8. Eren, I. et al. A Clinical Comparison of Home-Based and Hospital-Based Exercise Programs Following Arthroscopic Capsulolabral Repair for Anterior Shoulder Instability. *Journal of Sports Rehabilitation*. Human kinetics Inc 2019.
9. Kim, S. et al. Accelerated Rehabilitation After Arthroscopic Bankart Repair for Selected Cases: A Prospective Randomized Clinical Study. *Arthroscopy: The Journal of Arthroscopic and Related Surgery*. 2003; 19(7): 722-731.
10. Gibson, J. et al. Accelerated rehabilitation after arthroscopic bankart repair in professional footballers. *Shoulder and Elbow*. 2016; 8(4): 279-286.
11. Gilliam, B. et al. Return to play and outcomes in baseball players after superior labral anterior-posterior repairs. *The American Journal of Sports Medicine*. 2018; 46(1): 109-115.
12. Gaunt, B. et al. The American Society of Shoulder and Elbow Therapists' consensus rehabilitation guideline for arthroscopic anterior capsulolabral repair of the shoulder. *J Orthop Sports Phys Ther*. 2010 Mar; 40(3):155-68.
13. Hayes, K. et al. Shoulder Instability: Management and Rehabilitation. *J Orthop Sports Phys Ther*. 2002 Oct; 32(10): 497-509.
14. Ma, R. et al. Current Concepts in Rehabilitation for Traumatic Anterior Shoulder Instability. *Curr Rev Musculoskelet Med*. 2017; 10: 499-506.
15. Nashikkar Et al. Is Anatomical Healing Essential for Better Clinical Outcome in Type II SLAP Repair? Clinico-Radiological Outcome After Type II SLAP Repair. *Clinics in Orthopedic Surgery*. 2018; 10(3): 358-367.
16. Witney-Lagen et al. Arthroscopic Plication for Multidirectional Instability: 50 patients with a minimum of 2 years of follow-up. *Journal of Shoulder and Elbow Surgery*. 2017; 26: e29-e36.
17. Brigham and Women's Hospital Department of Rehabilitation Services. Arthroscopic Labral Repair (types II,IV and complex tears) protocol. 2016. <https://www.brighamandwomens.org/assets/BWH/patients-and-families/rehabilitation-services/pdfs/shoulder-slap-ii-and-iv-complex-arthroscopic-labral-repair-protocol.pdf>
18. Vanderbilt Sports Medicine Knee Center and Shoulder Center. Post op guidelines Repair of SLAP Lesion. <https://www.mc.vanderbilt.edu/documents/orthopaedics/files/SLAP%20Repair%20Guidelines.pdf>
19. Gunderson Health System SLAP Lesion Type II Repair Rehabilitation Program. <https://www.gundersenhealth.org/app/files/public/1488/Sports-Medicine-Protocol-SLAP-Lesion-Type-II-Repair.pdf>
20. University of Wisconsin Sports Medicine Rehabilitation Guidelines for SLAP Lesion Repair. UWsportsmedicine.org
21. Gunderson Health System Arthroscopic Bankart Repair Rehabilitation Program.

<https://www.gundersenhealth.org/app/files/public/1480/Sports-Medicine-Protocol-Bankart-Repair-Arthroscopic.pdf>

22. University of Wisconsin Sports Medicine Rehabilitation Guidelines for Arthroscopic Capsular Shift. UWsportsmedicine.org.

23. Brigham and Women's Hospital Department of Rehabilitation Services. Posterior and Anterior and Inferior Capsular Shift Protocol. 2010. <https://www.brighamandwomens.org/assets/bwh/patients-and-families/pdfs/shoulder---posterior-and-posterior-inferior-capsular-shift-protocol.pdf>.

24. Liotta, F. Expert Opinion and Consultation.

25. Junior, MD, Popchak A, Wilson K, Kane G, Lin A. Criteria based return to sport testing is associated with lower recurrence rates following arthroscopic Bankart repair. *Journal of Shoulder and Elbow Surgery*. 2021. Doi: <https://doi.org/10.1016/j.jse.2021.03.141>.

26. Tucci et al. Closed kinetic chain upper extremity stability test (CKCUES test): a reliability study in persons with and without shoulder impingement syndrome. *BMC Musculoskeletal Disorders*. 2014; 15:1.

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