

ValleyOrtho Rehabilitation Playbook Series

Physician: Dr. Noel Armstrong
Office Phone: 970-384-7140

Physician Assistant: Edlin Jara-Mollnar, Dawn Hershberger
Office Fax: 970-384-8133
Clinic Coordinator: Cindy Davis-Thompson

Surgical Procedure: Modified Brostrom Repair with Internal Brace

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.

****It is the responsibility of the therapist to read the operative report before providing care to the patient to improve treatment communication***.*

Therapeutic Activity Progression Disclaimer: Progression to the next phase should be strongly based on meeting clinical criteria (not solely based on the post-operative timeframes) and in collaboration with the referring surgeon. Exercise prescription should be clinically directed by pain and performance absent of detrimental movement patterns with respect to proper biomechanics of the spine, hip, knee and ankle.

Communication from Therapist to Surgical Team: When a treating therapist feels the need to reach out to Dr. Armstrong, or a member of his 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).
- After a fall/trauma, or near fall/trauma, resulting in a clinical change.

Preferred Contact Method: 1. Immediate Office Call. 2. If no response call the provider line 970-384-7147. If no response use Perfect Serve (PS) SBAR text message to "Admit/Consult" to ATC and MA. Use patient name & DOB in subject and in the body of the text.

For Incision Concerns: take and send Perfect Serve (PS) Picture to MD/PA/Clinic staff if:

- Incision draining after 7 days, redness outside the bandage margin and/or the patient is excessively worried about incision

Administrative Needs

- Rehabilitation Prescription needed or prescription change requests
 - Appointment needed with the physician office, or medication refill
- Preferred Contact Method:** 1. Create Athena Patient Case Request (include your clinic location) 2. Phone call to ATC / MA

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

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

Contact Method: Office or PS Phone call to MD &/or PA

Preferred Updates before checkup visits with MD/PA

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

- Info regarding adherence/participation in rehabilitation process.
- Progress and trending nature of the patient's rehab course.

Preferred Contact Method: 1. Use PS Chat (informal) Text to MD and/or PA. Use patient name & DOB in subject and body of text.

2. Complete a Progress note in Cedaron.



Phase 1: Protection, Edema Control & AROM (wks 1 & 2)

Patient Instructed Goals:

- Minimize pain/swelling with elevation rest and cold therapy
- Decrease movement inhibition around surgical foot. Initiate AROM program at ankle and toes
- Patient is proficient at initial HEP provided at time of surgery
- Sleep in boot, brace or splint until week 6

Precautions/Restrictions:

- WB/Gait:
 - NWB in splint with crutches for 1 week^{1,9}
 - Boot provided for TTWB at 1 wk f/u MD appointment¹
 - NWB to TTWB with crutches for 3 weeks¹
- Activity:
 - No formal Physical Therapy in this phase, delayed start to week 3¹
 - No IVR or EVR ROM
 - No impact or RROM

Phase 1 Therapeutic Activities:

- AROM:
 - AROM ankle DF and PF as tolerated¹
 - AROM toes as tolerated¹

Phase 2: ROM, Total LE Strengthening & Balance (wks 3 - 6)

Goals:

- Start formal outpatient PT at week 3
- Consistent swelling resolution despite activity increases
- Increase mobility of surgical ankle/foot/toes (No Inversion) without increasing swelling
- Protect healing tissue avoiding Inversion
- Transition normal gait pattern in boot

Precautions:

- WB/Gait:
 - Boot PWB to WBAT^{5,8}
- Ankle PROM:
 - Full PF, DF, EVR⁵. No IVR^{5,9}. No talocrural/subtalar mobilizations⁷
- Ankle AROM:
 - Full PF, DF, EVR. No IVR
- Ankle RROM:
 - No IVR
- Ankle Activity:
 - No impact

Phase 2 Therapeutic Activities:

- Gait:
 - Ensure proper weight shifting over involved extremity with appropriate assistance and WB in boot
 - Scar mobilizations on healed incisions to tolerance
- ROM:
 - OKC Hip, knee, ankle, foot, toe mobility
 - Stationary bike with boot^{8,9}
 - Joint mobilizations as tolerated excluding talocrural/subtalar⁷
- Strengthening:
 - Hip, knee, core strengthening/activities, intrinsic foot strengthening, submax ankle isometrics^{5,7,8,9}
 - Initiate manually resisted gentle ankle isometrics to tolerance
- Balance:
 - Proprioception within precautions^{5,9}

Criteria for Progression to Phase 3:

- Improving gait mechanics in boot without AD
- 75% ROM DF, PF, EVR of uninvolved ankle⁷



Phase 3: Total LE Strengthening & Balance (wks 7 - 11)

Goals:

- Transition normal gait pattern in brace and shoe
- Continue edema management as activity increases
- Begin WB exercises and controlled ankle strengthening

Precautions:

- WB/Gait:
 - WBAT in sturdy shoe with ankle brace, with single crutch for appropriate support until normal gait pattern¹
- Tissue Enlargement Not Uncommon
 - Foot may become more swollen or larger in this phase with increase in WB and activity. Manage slow progression of activity tolerance to target a gradual decrease in swelling towards the end of this phase
- Activity:
 - No impact

Phase 3 Therapeutic Activities:

- ROM:
 - Start inversion P/AROM^{1,9}, increasing by 5 degrees each wk¹
 - LE chain mobility and flexibility⁵
- Strengthening & Activity:
 - 4 way ankle theraband⁵
 - Hip, knee, core, ankle, foot intrinsic strengthening as tolerated within precautions^{5,6,8}
 - DL to SL CKC LE exercises^{8,9}
 - Stationary bike to elliptical to treadmill⁸
- Balance:
 - Proprioception training progressions with variable surfaces and perturbations as tolerated^{5,6,8}

Criteria for Progression to Phase 4:

- Patient able to ambulate with normalized gait in shoe and brace⁶
- 95% ROM of uninvolved ankle⁶
- 25 single leg heel raises^{5,6}
- SLS 90% of uninvolved limb on firm surface⁶

Phase 4: Single Leg Strength & Plyometrics (wks 12+)

Goals:

- Increasing strength to support desired activity
- Optimize biomechanics at the hip, knee and ankle
- Address remaining barriers to RTS
- Establish patient specific HEP relative to resources and goals
- Post activity soreness resolves within 24 hours

Precautions:

- Brace on for plyometrics, sports, and high impact x 1 year¹

Phase 4 Therapeutic Activities:

- Begin sport specific drills/patterns at 50% effort
- Single leg plyometric progressions
- Single leg strengthening progressions⁵
- Ladder drills and progressive agility at 50-75% effort as tolerated
- High level balance training
- Slow progressions of cutting/pivot & decelerating intensity as tolerated
- Continue total lower extremity strengthening based on remaining deficits

Criteria for Return to Sport:⁶

- Physician Clearance
- 90% LSI Functional Hop Testing⁵
- 90% LSI Y-Balance Test
- 90% strength with handheld dynamometer DF, PF, IVR, EVR
- Foot Lift Test < 5 errors

Return to Sport Test Descriptions:

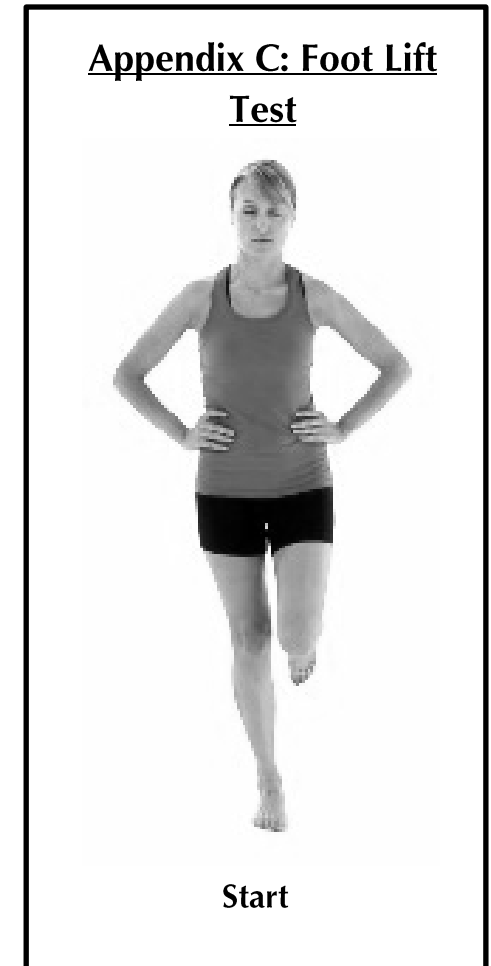
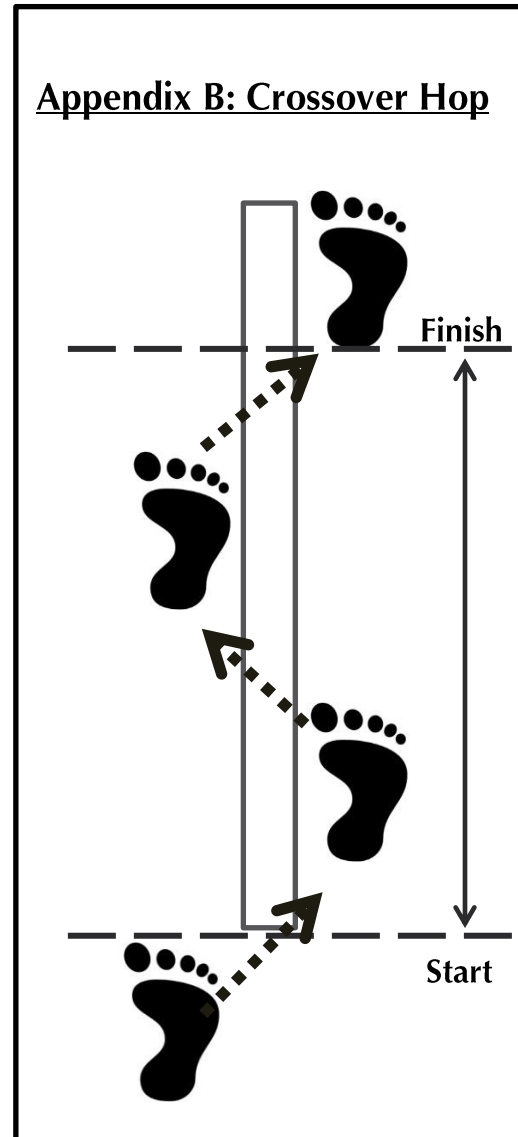
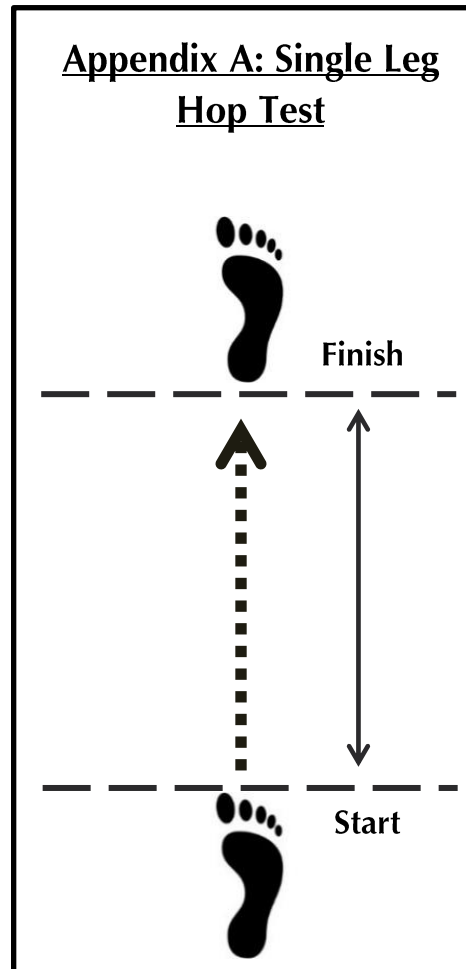
LSI Functional Hop Testing⁵

- Single leg hop test for distance (Appendix A): Arms are allowed to move freely. Must "stick" the landing. 2 practice hops, best of 2 test hops. Distance is measured from toe at start line to the landed heel.
- Cross-over hop for distance (Appendix B): Arms are allowed to move freely. 3 forward hops crossing over center line. 2 practice hops, average of 2 test hops. Distance is measured from toe at start to the landed heel.



Foot Lift Test⁶ (Appendix C)

- SLS on firm surface, hands on hips, uninvolved leg slightly flexed at hip and knee, with eyes closed, for 30 seconds.
- “Remain as motionless as possible, if you move out of position please return to original position as quickly as possible.”
- 1 error = any part of the foot that loses contact with the ground, uninvolved limb touches the floor (1 error added for every second it is out of position)
- Give 1 practice trial, take the average of 3 trials.



Abbreviation List:

AAROM: Active assisted range of motion
ABD: Abduction
AD: Assistive device
ADL: Activity of daily Living
AROM: Active range of motion
PE: Pulmonary embolism
BW: Body Weight
CKC: Closed kinetic chain
DVT: Deep vein thrombosis
MD: Medical doctor
NWB: Non weight bearing
OKC: Open kinetic chain
PA: Physician assistant
PROM: Passive range of motion
ROM: Range of motion
RROM: Resisted range of motion
RTS: Return to sport/activity
UE: Upper extremity

ER: External rotation
EXT: Extension
FWB: Full weight bearing
GHJ: Gleno-humeral joint
HEP: Home exercise program
HS: Hamstring
IR: Internal rotation
WBAT: Weight bearing as tolerated
LE: Lower extremity
LSI: Limb Symmetry Index

WB: Weight bearing
#: Absent/Without
#: Pounds
≈: Approximately
≤: Less than or equal to
≥: Greater than or equal to

Modified Brostrom Repair References:

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3. D’Hooghe, P., Vijverman, T., Van Dijk, C. N., Calder, J., & Kerkhoffs, G. (2023). Return to sport after Broström procedure with internal brace in elite athletes. *Orthopaedic Journal of Sports Medicine*, 11(1), 1–8. <https://doi.org/10.1177/23259671221145314>
4. Harris, J. D., Walton, D. M., MacDermid, J. C., & Seitz, A. L. (2019). Clinical practice guidelines for ankle ligament repair rehabilitation. *Journal of Sports Physical Therapy*, 49(6), 401–410. <https://doi.org/10.2519/jospt.2019.8821>
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6. Ohio State University Wexner Medical Center. (n.d.). *Broström procedure clinical practice guideline*. <https://hrs.osu.edu/-/media/files/wexnermedical/patient-care/healthcare-services/sports-medicine/education/medical-professionals/knee-ankle-and-foot/brostrom-cpg-2019.pdf>
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10. Wright, R. W., Spindler, K. P., Amendola, A., Andrish, J. T., & Kaeding, C. C. (2024). Modified Broström repair versus internal brace augmentation: A prospective randomized trial. *Journal of Orthopaedic Research*, 42(3), 512–519. <https://doi.org/10.1002/jor.25205>

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