

Proximal Hamstring Re-attachment Rehabilitation Guideline

This rehabilitation program is designed to return the individual to their activities as quickly and safely as possible. It is designed for rehabilitation following proximal hamstring re-attachment surgery. Modifications to this guideline may be necessary dependent on physician specific instruction, location of repair, concomitant injuries or procedures performed. This evidence-based proximal hamstring re-attachment is criterion-based; time frames and visits in each phase will vary depending on many factors- including patient demographics, goals, and individual progress. This guideline is designed to progress the individual through rehabilitation to full sport/ activity participation. The therapist may modify the program appropriately depending on the individual's goals for activity following proximal hamstring re-attachment.

This guideline is intended to provide the treating clinician a frame of reference for rehabilitation. It is not intended to substitute clinical judgment regarding the patient's post-operative care based on exam/treatment findings, individual progress, and/or the presence of concomitant procedures or post-operative complications. If the clinician should have questions regarding post-operative progression, they should contact the referring physician.

General Guidelines/Precautions:

- Axillary crutches with Toe touch weight bearing for 4-6 weeks
- Avoid unsafe surfaces or environments
- Avoid hip flexion coupled with knee extension
- ROM restrictive hip/knee braces maybe be used based on physician preference
- Utilize appropriate clinical judgment with progressions (timing of progressions may differ slightly based on location/technique of repair and surgeon's preference)
- Expected return to sport at 6 months with:
 - Normal gait and running mechanics
 - >80% hamstring and quad strength vs. non-injured extremity with isokinetic testing
 - No symptoms with sport specific dynamic activities

Proximal Hamstring Re-attachment Rehabilitation Guideline (28 weeks)

| PHASE | SUGGESTED INTERVENTIONS | GOALS/MILESTONES FOR PROGRESSION |
|--|--|---|
| <p>Phase I <i>Patient Education Phase</i></p> | <p>Discuss:</p> <ul style="list-style-type: none"> Anatomy, existing pathology, post-op rehab schedule, bracing, and expected progressions <p>Immediate Post-Operative instructions:</p> <ul style="list-style-type: none"> Gait training/ assisted device/ brace fitting Avoid coupled hip flexion with knee extension Toe touch weight bearing w/axillary crutches for up to 6 weeks Teach patient how to safely transfer with brace on: (supine to sit, sit to stand) | <p>Goals of Phase:</p> <ul style="list-style-type: none"> Prevention of post-operative complications |
| <p>Phase II <i>Maximum Protection Phase</i></p> <p>0-4 Weeks</p> <p>2-5 Expected Visits</p> | <p>Weight Bearing:</p> <ul style="list-style-type: none"> Utilize Axillary Crutches Toe Touch Weight bearing <p>Brace:</p> <ul style="list-style-type: none"> Wear brace at all times unless otherwise directed by surgeon <p>Precautions:</p> <ul style="list-style-type: none"> No Hamstring stretching/long sitting position Avoid coupled hip flexion with knee extension <p>Suggested Treatments:</p> <ul style="list-style-type: none"> ROM: <ul style="list-style-type: none"> hip, knee, ankle PROM to patient tolerance (hip 0-90°) Manual Therapy: <ul style="list-style-type: none"> Soft tissue & patellar mobilization, Modalities as indicated: <ul style="list-style-type: none"> Edema controlling treatments, NMES <p>Exercise Examples:</p> <ul style="list-style-type: none"> Quad sets (sidelying), ankle ABC's, Core stabilization, passive knee ROM, glute squeezes, passive calf stretching with no hip flexion | <p>Goals of Phase:</p> <ul style="list-style-type: none"> Provide environment of proper healing of repair site Restore ROM within restricted ranges Prevent muscle inhibition <p>Criteria to Advance to Next Phase:</p> <ul style="list-style-type: none"> Resolution of post-operative swelling/ecchymosis Pain well controlled |
| <p>Phase III <i>Protection Phase</i></p> <p>4-6 Weeks</p> <p>6-10 Expected Visits</p> | <p>Weight Bearing:</p> <ul style="list-style-type: none"> Begin weight bearing progression (50%) per patient tolerance Begin to wean from axillary crutches at 5-6 weeks <p>Brace:</p> <ul style="list-style-type: none"> Continue to wear brace at all times up to 6 weeks unless otherwise directed by surgeon to discontinue <p>Precautions:</p> <ul style="list-style-type: none"> No Hamstring stretching/long sitting position Avoid coupled hip flexion with knee extension <p>Suggested Treatments:</p> <ul style="list-style-type: none"> ROM: <ul style="list-style-type: none"> Progress PROM, begin gentle AROM of hip and knee Manual Therapy: <ul style="list-style-type: none"> Soft tissue, patellar, scar mobilizations Modalities as indicated: <ul style="list-style-type: none"> NMES if showing quad inhibition <p>Exercise Examples: <i>(Continue with phase II exercises)</i></p> <ul style="list-style-type: none"> Gentle LE AROM exercises (no hamstring contraction), sidelying hip abd/add, hip abduction isometrics, clamshells, <p>Other Activities:</p> <ul style="list-style-type: none"> Initiate aquatic exercises if available (fwd/retro ambulation, LE AROM avoiding terminal stretching, partial WB mini-squats) | <p>Goals of Phase:</p> <ul style="list-style-type: none"> Improve ADL's (stand, stairs, walking, etc.) Improve ROM Progress weight bearing <p>Criteria to Advance to Next Phase:</p> <ul style="list-style-type: none"> Full weight bearing pain free Level ground ambulation with minimal faults by week 6 |

Proximal Hamstring Re-attachment Rehabilitation Guideline (28 weeks)

| PHASE | SUGGESTED INTERVENTIONS | GOALS/MILESTONES FOR PROGRESSION |
|---|---|--|
| <p>Phase IV <i>Motion and Muscle Activation Phase</i></p> <p>6-12 Weeks</p> <p>11-20 Expected Visits</p> | <p>Weight Bearing:</p> <ul style="list-style-type: none"> Progress to full weight bearing without use of assistive device <p>Brace:</p> <ul style="list-style-type: none"> Discontinue use of brace <p>Precautions:</p> <ul style="list-style-type: none"> No running or high impact activities <p>Suggested Treatments:</p> <ul style="list-style-type: none"> ROM: <ul style="list-style-type: none"> Gentle progressive static stretching, gradually working towards end range Strengthening: <ul style="list-style-type: none"> Begin with mid-range, avoid lengthened hamstring position initially (isometric, eccentric, concentric) Equipment use: stationary bike, elliptical, stair master, treadmill walking when gait mechanics are normal <p>Exercise Examples: <i>(Continue with phase III exercises)</i></p> <ul style="list-style-type: none"> 6-8weeks: submax hamstring various angle isometrics, heel raises, single leg balance/proprioceptive activities, hip ext/flex SLR, terminal knee extension, step ups, standing SLR's, supine heel slides 8-12weeks: fwd lunge, SL RDL's, KB swings, bridges, hamstring curls, step downs, leg press | <p>Goals of Phase:</p> <ul style="list-style-type: none"> Restore full ROM & pain free functional movements Normal gait mechanics Improve muscular strength and endurance SLR PROM >70 <p>Criteria to Advance to Next Phase:</p> <ul style="list-style-type: none"> Pain free ambulation Full hip, knee, and ankle ROM Restoration of full hip strength 5/5 with MMT |
| <p>Phase V <i>Advanced movement and Impact Phase</i></p> <p>12-16 Weeks</p> <p>21-30 Expected Visits</p> | <p>Precautions:</p> <ul style="list-style-type: none"> No pain during strength training Soreness should resolve within 24 hours <p>Suggested Treatments:</p> <ul style="list-style-type: none"> Progress FWB double to single leg plyometrics Progress strengthening & core stability, begin isokinetics, Nordic hamstring exercises <p>Exercise Examples: <i>(Continue with phase IV exercises)</i></p> <ul style="list-style-type: none"> Progressive height hop downs, lunge matrix, slide board, BOSU, etc. Other Activities: <ul style="list-style-type: none"> Aquatic or alter-G progressive jogging in partial weight bearing environment | <p>Goals of Phase:</p> <ul style="list-style-type: none"> Normal pain-free ADL's Improved hamstring/quad strength Improved single leg proprioception (85% or greater on anterior and posterior lateral reach of Y Balance test) <p>Criteria to Advance to Next Phase:</p> <ul style="list-style-type: none"> Met all previous phase goals No evidence of dynamic instability with hop downs Cleared by surgeon |
| <p>Phase VI <i>Return to Sport Phase</i></p> <p>16-28 Weeks</p> <p>30-36 Expected Visits</p> | <p>Specific Instructions:</p> <ul style="list-style-type: none"> Initiation of dry land jogging at 16 weeks progressing to improve/normalize form and shock absorption (as cleared by MD) Progression to higher level activities and sports specific activities as strength and control dictate (as cleared by MD) <p>Exercise Examples:</p> <ul style="list-style-type: none"> Initiate deceleration Initiate cutting activities Initiate agility (floor ladder and cone drills) and sport specific activities | <p>Suggested Criteria for Discharge:</p> <ul style="list-style-type: none"> <20% hamstring and quad deficit compared to contralateral side with isokinetic testing 45/50 on Biomechanical functional assessment tests (if performed) No pain or complaints of instability with functional progression of sport specific skills 2:3 hamstring to quadriceps ratio with isokinetic testing |

Proximal Hamstring Re-attachment Rehabilitation Guideline (28 weeks)

****NOTE:** Progression of functional activities should be performed only as pain and proper biomechanics allow. Emphasis should be on proper shock absorption and control of dynamic valgus stress at knee (hip medial rotation with knee valgus) with each task performed. Progression to single limb based tasks (deceleration, hopping, and cutting) should not be performed until double limb activities have been mastered. Activities requiring dynamic control of rotational stress at the knee (cutting, multiple plane lunges/jumps/hops) should not be performed until sagittal and frontal plane control has been mastered. Return to sport may occur at any time during this stage as cleared by physician and as progress and goal achievement occurs

REFERENCES:

1. Bourne, M. N., Williams, M. D., Opar, D. A., Kerr, G. K., & Shield, A. J. (2016, May 13). Impact of exercise selection on hamstring muscle activation. *British Journal of Sports Medicine*.
2. Chahal J, Bush-Joseph C.A., Chow A, et al. (2012) Clinical and magnetic resonance imaging outcomes after surgical repair of complete proximal hamstring ruptures: Does the tendon heal? *The American Journal of Sports Medicine*.
3. Ohio State University Sports Medicine. (2012) Proximal Hamstring Avulsion Repair Rehabilitation Guidelines
4. Tsaklis, P., Malliaropoulos, N., & Mendiguchia, J. (2015, June). Muscle and intensity based hamstring exercise classification in elite female track and field athletes: Implications for exercise selection during rehabilitation. *Open Access Journal of Sports Medicine*, 209-217. University of Wisconsin Sports Medicine. (2010) Rehab Guidelines Following Proximal Hamstring Primary Repair
5. Vander Made, A., Reurink, G., Gouttebauge, V., & Tol, J. (2014, November 10). Outcome After Surgical Repair of Proximal Hamstring Avulsions: A Systematic Review. *The American Journal of Sports Medicine*, 2841-2851.