

PHYSICAL THERAPY PROTOCOL

Proximal Hamstring Repair Rehabilitation

Endoscopic or Open Repair at the Ischial Tuberosity — Acute & Chronic Injuries

FOR THE PHYSICAL THERAPIST

Overview and Goals

This protocol governs rehabilitation following proximal hamstring repair at the ischial tuberosity, for both acute traumatic avulsion injuries and chronic tendinopathy that has progressed to a partial- or full-thickness tear. The protocol is driven by tendon-to-bone healing biology, which is the same regardless of surgical approach — rehabilitation is identical for endoscopic and open repairs.^{13,14,15} Endoscopic repair involves less soft-tissue dissection, but published outcomes for retear, function, and patient satisfaction are comparable between techniques.^{13,14}

The patient population is more heterogeneous than for most other hip procedures. Acute traumatic avulsions are typically younger, active patients (water skiers, skiers, runners) with sudden-onset injuries and good tissue quality. Chronic tendinopathy patients are typically older, with insidious-onset symptoms and degenerative tissue. Recovery trajectories differ accordingly, and a single fixed timeline does not serve both populations well — the protocol provides a standard framework with explicit modifications for tear chronicity and severity.

Two principles guide rehabilitation. First, protect the tendon-to-bone construct in the early phases through restricted weight-bearing, controlled knee extension via a hinged brace, and avoidance of the combined hip flexion + knee extension position that maximally tensions the hamstring across both joints. Second, introduce loading in stages — passive ROM precedes gravity-assisted active motion, which precedes resisted contraction, which precedes eccentric loading. The Askling L-Protocol (Phase 3) provides the canonical framework for the eccentric progression and has been validated in over 200 patients with only one re-rupture.³

Progression between phases is criterion-based. Time ranges represent typical windows, not gates. Continued progression beyond formal PT discharge is expected and appropriate.

Rehabilitation Phases

PHASE	WEIGHT BEARING	BRACE	ROM GOALS	EXERCISES	CRITERIA TO ADVANCE
PHASE 1 Weeks 0–6 <i>Tendon protection & protected motion</i>	• Toe-touch weight bearing (TTWB), ~20 lbs, with two crutches for the full 6 weeks.^{4,5}	• Hinged knee brace with extension block set intraoperatively by Dr. Roth based on repair-tension assessment. • The exact angle is specified in the operative report — typically ~30°, tighter (more flexion required) for higher-tension repairs. • In the brace at all times during Phase 1 except for prescribed	• Avoid the combined position of hip flexion + knee extension — maximally tensions the hamstring across both joints. Passive SLR: • Limited to ≤ 30–40° initially, progressing ~10° per week as tolerated.^{3,4} Knee flexion: • Passive and gravity-assisted ROM permissible	Pain & effusion control: • Cryotherapy, scar massage once incisions healed Sitting: • Use a cushion to offload the ischial tuberosity; avoid prolonged sitting on hard surfaces. A coccyx cushion or shifting weight to the contralateral side reduces direct pressure on the repair.³ Positioning: • Prone lying encouraged to prevent hip flexion contracture and offload the ischium.³ Strengthening (isometrics only — submaximal): • Quad sets, gluteal sets (submaximal) • Ankle pumps, plantarflexion / dorsiflexion	• Pain controlled at rest and with prescribed exercises • Pain-free passive ROM within phase limits • Tolerates progression to weight-bearing transition • Quad and gluteal isometric activation symmetric on palpation • Minimum 6 weeks elapsed

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PHASE	WEIGHT BEARING	BRACE	ROM GOALS	EXERCISES	CRITERIA TO ADVANCE
		exercises and hygiene. Do not advance the extension block beyond the surgeon's setting during this phase.	within the brace settings; respect the surgeon-set extension block.	Early ROM (within brace limits): - Prone knee flexion (gravity-assisted, 0–90°) beginning weeks 1–2³ - Gentle prone hip extension (no resistance) - Passive SLR within phase limits Stationary bike: - May begin at 3–4 weeks — no resistance, low seat to limit hip flexion.³ Avoid: - Combined hip flexion + knee extension position - Active hamstring stretching - Resisted knee flexion - Sitting on hard surfaces without a cushion - Active hip flexion / SLR beyond phase ROM limits	
PHASE 2 Weeks 6–12 <i>Early strengthening & ROM advancement</i>	Progress to full weight bearing without assistive device by weeks 6–8.¹	Wear brace by weeks 6–8, gradually advancing the extension block to neutral.⁵	- Progressive SLR stretching toward full range by 10–12 weeks.³ - Active-assisted hip flexion with knee extended, progressing gradually.	Strengthening progression: - Active prone knee flexion against gravity, progressing to light resistance^{3,4} - Double-leg bridges → single-leg bridges³ - Standing hip extension with elastic band³ - Lumbo-pelvic stabilization: planks, side planks, dead bug, bird dog^{7,8} - Quadriceps strengthening - Gluteal strengthening Aquatic therapy: - Pool walking once incisions fully healed — offloads the repair while supporting gait and strength.³ Cardio: - Stationary bike with progressive resistance Continue to avoid: - Aggressive hamstring stretching - Eccentric hamstring loading - Combined deep hip flexion + full knee extension	- Normalized gait without assistive device - Brace fully discontinued - Full or near-full active ROM in all planes by 10–12 weeks - Active prone knee flexion against gravity tolerated without pain - Single-leg bridge tolerated without pain or compensation
PHASE 3 Weeks 12–16 <i>Eccentric loading & Askling L-Protocol</i>	Full weight bearing.	None.	Full active ROM in all planes.	- Introduce the Askling L-Protocol — well-validated for hamstring rehabilitation across >200 published patients with one re-rupture. The three exercises progress eccentric loading from primarily passive to fully active:^{3,9,10} Extender: - Supine, hip flexed, slow controlled knee extension. Primarily passive stretch with minimal hamstring engagement — start here. Diver: - Single-leg stance with controlled forward lean (the “dive” position). Challenges hamstrings and gluteus maximus to stabilize the pelvis.	- Pain-free Askling L-Protocol exercises (Extender, Diver, Glider) - Modified Nordic hamstring curls tolerated without pain - Knee flexor strength symmetry approaching 70% - Tolerates walking program at full pace without pain

PHASE	WEIGHT BEARING	BRACE	ROM GOALS	EXERCISES	CRITERIA TO ADVANCE
				Glider: - Assisted split stance with controlled lengthening of the operative leg. Active eccentric hamstring loading — progress to here last. Additional exercises: - Modified / assisted Nordic hamstring curls⁹ - Leg press, light Romanian deadlifts³ - Single-leg balance and proprioceptive training³ - Walking program with progressive distance and pace Cardio: - Stationary bike at progressive resistance, elliptical trainer	
PHASE 4 Months 4–9+ <i>Advanced strengthening & return to sport</i>	Full weight bearing.	None.	Full pain-free ROM.	Full eccentric strengthening program: - Full Nordic hamstring curls⁹ - Romanian deadlifts at progressive load - Single-leg deadlifts - Continued Askling L-Protocol at advanced volume Return to running progression: - Walk-jog → continuous jogging → interval running → sprinting Sport-specific: - Agility, cutting, plyometric drills - For sports requiring sprinting: pain-free sprinting must be achieved before clearance to competition.⁸ Home program: - Establish home maintenance program for ongoing strength and ROM gains beyond formal PT	<i>See Return-to-Sport Criteria section below.</i> Athletes meeting all RTS criteria may clear at ~6 months; recreational return typically at ~6–9 months.^{11,12}

Procedure-Specific Considerations

Brace Setting Is Surgeon-Determined and Specified in the Operative Report

The hinged knee brace extension block is set intraoperatively by Dr. Roth based on direct assessment of repair tension. The exact angle is recorded in the operative report and may differ from the typical 30° default — repairs under higher tension warrant a tighter block (more knee flexion required, less extension permitted). Refer to the operative report for the specific angle and use it as the upper limit of permitted extension during Phase 1. Do not advance the extension block on your own judgment during Phase 1; if uncertain, contact Dr. Roth's office.

Sitting on the Ischium Compresses the Repair

The repair site is at the ischial tuberosity — the bony prominence that bears weight when sitting. Direct sitting pressure compresses the repair and can compromise healing. Patients should use a cushion (gel, foam, or coccyx-style) when sitting, shift weight to the contralateral side, or stand frequently throughout the day. Prone-lying is encouraged when feasible to offload the ischium and prevent hip flexion contracture.³ This is a uniquely important counseling point for hamstring patients and worth reinforcing repeatedly in early visits.

Avoid the Combined Hip Flexion + Knee Extension Position

The hamstring crosses both the hip and knee. The combined position of hip flexion + knee extension — for example, sitting with the leg straight, or aggressive hamstring stretching — maximally tensions the proximal repair across both joints. This is the key position to avoid throughout Phase 1. Passive SLR is a controlled version of this stretch and should be limited to $\leq 30\text{--}40^\circ$ initially, progressing $\sim 10^\circ$ per week as tolerated.^{3,4}

Tear Chronicity Affects Protocol Pacing

Tear chronicity influences both repair quality and rehabilitation pacing:

- **Acute (≤ 2 weeks from injury):** Standard protocol timeline. Tissue is well-vascularized, retraction minimal, repair under low tension.
- **Subacute (2–12 weeks):** Standard protocol timeline. Mildly more conservative pacing if intraoperative findings suggest tissue compromise.
- **Chronic (> 12 weeks):** More conservative pacing throughout. Tissue quality is poorer, retraction is greater (often > 2 cm), and outcomes data show higher complication rates and lower PASS achievement regardless of technique. Phase progression should be slower; Phase 4 often extends to the longer end of the 6–9 month window.¹³

WHEN FORMAL PT ADDS THE MOST VALUE

The first 12 weeks are particularly valuable for protected ROM progression, brace weaning, gait restoration, and avoiding common pitfalls (premature hamstring stretching, sitting-related repair stress, combined hip-flexion / knee-extension positioning). The Askling L-Protocol benefits substantially from supervised instruction — especially the Glider, the most technique-dependent exercise.^{3,9} Formal supervised PT is most beneficial for:

- The first 12 weeks for protected ROM and brace management
- The Askling L-Protocol introduction (Phase 3)
- Athletes targeting return to sport-specific function and sprinting
- Patients with chronic tears or significant pre-operative weakness

Patients without complications often transition to a structured home program by months 4–6 with periodic check-ins.

NOTE ON THE AUJLA 2025 ACCELERATED REHAB RCT

A recent randomized controlled trial (Aujla et al., 2025) compared accelerated rehabilitation (immediate weight-bearing as tolerated, no brace) against the conservative protocol used here (TTWB and bracing $\times 6$ weeks) and found no significant difference in outcomes at 6 months across patient-reported measures, isokinetic strength, limb symmetry, re-injury, or complications.¹ Earlier retrospective data and the Askling protocol have similarly shown good outcomes without bracing.^{2,3}

This protocol uses the conservative approach because the accelerated approach is not better — only equivalent — and Dr. Roth has elected to maintain a more conservative early phase until further evidence emerges. Both approaches are evidence-supported.

Return-to-Sport Criteria

Return to sport after proximal hamstring repair is criterion-based. Mean time to return is approximately 5.8 months across published cohorts, with a pooled return-to-any-sport rate of 87% and return to preinjury level of 77%.¹¹ Professional athletes return at a mean of 6.2 months with 78% returning to preinjury competition level.¹² Athletes meeting all criteria below may clear at ~ 6 months; recreational return typically at $\sim 6\text{--}9$ months as criteria are reached. Chronic tears and tears with significant retraction may extend toward the longer end of this window.

Domain	Criterion
Pain & symptoms	No pain at rest, with sport-specific positions, or with impact loading; no pain with sitting or direct ischial pressure
Range of motion	Full pain-free hip and knee ROM; pain-free passive SLR to symmetric range
Knee flexor strength	LSI $\geq$ 80–90% on isokinetic dynamometer ¹
Hop test battery	LSI $\geq$ 90% on single, triple, and triple crossover hop tests ¹
Eccentric loading	Full Askling L-Protocol and Nordic hamstring curls completed without pain or compensation ^{9,10}
Sport-specific function	Running, agility, and sport-specific drills at progressive intensity without pain or compensation
Sprinting (if sport-specific)	For sports requiring sprinting: pain-free sprinting must be achieved before competition clearance ⁸
Time from surgery	Athletes meeting all criteria may clear at ~6 months; recreational return typically ~6–9 months ^{11,12}

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Glossary

FWB — Full weight-bearing.

HOS — Hip Outcome Score; a validated patient-reported outcome measure with ADL and Sports subscales.

LSI — Limb Symmetry Index; the operative limb's strength or performance as a percentage of the contralateral limb (operative ÷ contralateral × 100).

PASS — Patient-acceptable symptom state; the level of post-operative symptoms a patient considers acceptable.

RCT — Randomized controlled trial.

ROM — Range of motion.

RTS — Return to sport.

SLR — Straight leg raise; passive or active hip flexion with the knee extended. Tensions the hamstring across both joints.

TTWB — Toe-touch weight-bearing; the operative foot may rest on the floor for balance, but no body weight is loaded through it.



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