

Quadriceps Tendon Repair

Physical Therapy Protocol · Extensor Mechanism Repair, 6-8+ Month Timeline

Modeled on the Ohio State University Wexner Medical Center Quadriceps Tendon/Patellar Tendon Repair Clinical Practice Guideline and the Mass General Brigham patella/quad tendon repair rehabilitation protocol.



AT A GLANCE

TIMELINE	6-8+ months; flexion is deliberately staged and strengthening is delayed to protect the repair
WEIGHT BEARING	Hinged knee brace locked in extension for ambulation x 6 weeks; WBAT vs NWB per surgeon - always confirm against the operative note
KEY MILESTONES	PROM to ~90° by weeks 5-6 (advance ~20° every 4-5 days from week 2-3) · full flexion by ~12 weeks · brace discharged ~6-8 weeks with SLR and no lag
RETURN TO ACTIVITY	Jogging ~4-6 months with quad LSI ≥80%; sport 6-8+ months with quad index ≥90% and hop testing ≥85-90%

KEY PRECAUTIONS

- Brace locked in extension for all ambulation and sleeping until surgeon clears unlocking; extensor mechanism must not be loaded through flexion early.
- No active knee extension and no isolated OKC isotonic quadriceps strengthening x 8 weeks.
- No terminal/end-range quadriceps stretching x 8 weeks; progress flexion PROM no faster than ~10° per week before 12 weeks and avoid aggressive overpressure.
- No weight bearing with knee flexion >90° until after 8 weeks; no maximal voluntary quad contraction until ~week 16.

PHASED REHABILITATION

PHASE 1 — MAXIMUM PROTECTION		Weeks 0-2
GOALS	- Protect the repair; control pain and edema - Full passive extension to 0°; fair-to-good quadriceps activation (sub-maximal quad sets)	
INTERVENTIONS	- Hinged brace locked in extension worn at all times; weight bearing status per surgeon (WBAT with brace locked vs NWB x 6 weeks) - Passive extension work: heel props, supine passive extension to 0° - Prone PROM knee flexion within surgeon-set limit (commonly 30-60°; no passive flexion beyond 60° in this phase) - Sub-maximal quad sets, gluteal sets, hamstring sets, ankle pumps, calf raises (seated) - Gentle patellar mobilization; modalities and elevation for pain/edema	
CRITERIA TO ADVANCE	- Knee extension to 0° by 2 weeks post-op - Pain and edema controlled - Compliant with brace and weight bearing precautions	

PHASE 2 — STAGED FLEXION RECOVERY		Weeks 2-6
GOALS	- Staged flexion: ~60° max by week 2-3, advancing ~20° every 4-5 days to 90° by weeks 5-6 - SLR without extensor lag; progress toward full weight bearing in locked brace	
INTERVENTIONS	- PROM/AAROM flexion (heel slides) within weekly limits; light overpressure only - Brace remains locked in extension for standing, walking, and sleeping (night brace until week 6 unless directed otherwise) 4-way SLR with brace locked in extension; progressive sub-maximal quad sets - Seated hamstring curls without resistance within ROM limits - Superior/inferior patellar mobilizations; scar mobility work after incision healing - Hip abduction/adduction, glute bridges, core stabilization with abdominal brace	
CRITERIA TO ADVANCE	- Passive flexion to 90° by weeks 5-6; full passive extension - SLR without extensor lag - Full weight bearing in locked brace without pain	

PHASE 3 — BRACE WEANING AND AROM RESTORATION		Weeks 6-12
GOALS	• Wean brace (unlocked 0-60° for gait, discharge ~week 8) with normalized gait • Restore full flexion (~120°+ by week 12); initiate closed-chain strengthening without reactive effusion	
INTERVENTIONS	• Unlock brace for ambulation once quad control demonstrated; discharge per physician (~week 8) • Progress A/PROM no faster than ~10° per week toward full flexion • Stationary bike with minimal resistance • Bilateral CKC strengthening: squat to chair, leg press, weight shifts to single-leg stance • Weeks 8-12: initiate isolated isotonic quad work (leg extensions) in protected range; may begin end-range quad stretching after week 8 • Lateral band walks, bridges, Romanian deadlift patterning, single-leg balance on varied surfaces	
CRITERIA TO ADVANCE	• Full AROM including flexion $\geq 120^\circ$ • Normalized gait without brace; single-leg stance 30 seconds with good quad control • 10 single-leg squats to 60° with good mechanics; no reactive effusion with resistance exercise	

PHASE 4 — STRENGTHENING AND RUNNING PROGRESSION		Months 3-6
GOALS	• Restore quadriceps strength toward symmetry (quad LSI $\geq 80\%$ to run) • Initiate partial-weight-bearing plyometrics and jogging progression	
INTERVENTIONS	• Quadriceps progressive resistance exercise through full arc; eccentric emphasis (step-downs from 2-inch block progressing height) • Partial body-weight shuttle plyometrics bilateral to unilateral; slideboard • Jogging progression once criteria met: full ROM, resolved swelling, quad LSI $\geq 80\%$, 20 single-leg squats with good mechanics, 10 single-leg hops with symmetric control • Y-balance and single-leg control training • Low-intensity agility (figure-8, side shuffle, grapevine) at 25-50% intensity	
CRITERIA TO ADVANCE	• Quad index $\geq 80\%$ on dynamometry with symmetric hop control to enter running • Full ROM, no effusion, no pain with ADLs and walking • Y-balance within 90% of contralateral limb	

PHASE 5 — RETURN TO SPORT		Months 6-8+
GOALS	• Sport-specific power, agility, and confidence • Meet objective return-to-sport criteria	
INTERVENTIONS	• Multidirectional agility and acceleration/deceleration drills progressing to full effort • Plyometric progression: hop downs bilateral to unilateral with increasing step height • Sport-specific training and graded practice re-entry • Maintenance quadriceps strengthening 2-3x/week	
CRITERIA TO ADVANCE	• Quad index $\geq 90\%$ (isokinetic preferred); full ROM and 5/5 LE strength • Functional hop testing $\geq 85-90\%$ vs uninvolved limb • Confidence $\geq 7/10$ (IKDC-based scale) and physician clearance	

GUIDING PRINCIPLES

This protocol follows criterion-based progression over rigid time-based advancement; phased rehabilitation balancing tissue healing with controlled stress application; objective milestones (ROM, strength LSI, functional testing) to guide phase transitions; individualization based on surgical findings, tissue quality, and patient factors; and ongoing surgeon–therapist communication throughout recovery.

REFERENCES

1. Ohio State University Wexner Medical Center Sports Medicine. Quadriceps Tendon/Patellar Tendon Repair Clinical Practice Guideline. <https://hrs.osu.edu/-/media/files/wexnermedical/patient-care/healthcare-services/sports-medicine/education/medical-professionals/knee-ankle-and-foot/quadric-epstendonpatellartendon.pdf>
2. Massachusetts General Hospital / Mass General Brigham Sports Physical Therapy. Rehabilitation Protocol for Patella/Quad Tendon Repairs. <https://www.massgeneral.org/assets/mgh/pdf/orthopaedics/sports-medicine/physical-therapy/rehabilitation-protocol-for-patella-quad-tendon.pdf>
3. Ilan DI, Tejwani N, Keschner M, Leibman M. Quadriceps Tendon Rupture. *J Am Acad Orthop Surg*. 2003;11(3):192-200.

For clinical use by licensed physical therapists treating patients of Robert Pettit, MD. This document is a rehabilitation guideline, not a substitute for clinical judgment. Progression must be individualized based on intraoperative findings, tissue quality, and patient response. Scan the QR code for the current version of this protocol.