

Quadriceps/Patellar Tendon Repair

POSTOPERATIVE REHABILITATION PROTOCOL

Evidence basis: This protocol is primarily aligned with the AAOS-published 2024 review in JAAOS Global Research & Reviews, which notes that early range-of-motion protocols appear safe and effective and that return to sport is commonly expected around 6-8 months. It is supplemented by 2025-2026 orthopaedic literature describing protected early motion, brace use, progressive loading, and criteria-based return to running/sport. Please ask Dr. Tingstad any questions you have.

This outline is best suited to an uncomplicated, acute primary repair. Chronic tears, revision repairs, reconstructions, tenuous tissue, major augmentation, or concomitant procedures may require a slower progression.

SURGEON-SPECIFIC ORDERS – Dr Tingstad often modifies this protocol to meet patient specific factors.

Procedure / repair type		Surgery date	
ROM exception		WB exception	

CORE PRINCIPLES

- Protect the repair from excessive tensile load while avoiding unnecessary stiffness and quadriceps inhibition.
- Brace is locked in full extension for ambulation during the first 6 weeks unless the surgeon directs otherwise.
- Progress flexion gradually, targeting approximately 90 degrees by 6-8 weeks for a routine acute repair.
- Advance by both time and criteria: minimal effusion, full passive extension, no worsening extensor lag, acceptable gait, and surgeon/therapist assessment of repair protection.
- Avoid forced flexion, resisted open-chain knee extension, running, jumping, and deep loaded knee flexion early in healing.

AT-A-GLANCE TIMELINE

Phase	Weight Bearing / Brace	ROM	Primary Focus
0-2 weeks	WBAT* with brace locked in extension	0-30 degrees	Protect repair; edema control; quad activation
2-4 weeks	WBAT*; brace locked for gait	0-45 degrees	Progress controlled flexion; maintain full extension
4-6 weeks	WBAT*; brace locked for gait	0-90 degrees	Normalize protected gait; improve quadriceps control
6-8 weeks	Unlock brace for gait as control permits, crutches 8-12 weeks.	Progress as tolerated	Restore gait; initiate controlled closed-chain strength
8-12 weeks	Wean brace when no lag / good control	Toward full ROM	Strength, balance, stair control, cycling
12-16 weeks	Full WB	Full ROM	Progress strengthening; avoid high-impact loading
16-24 weeks	Full WB	Full ROM	Consider light running when criteria met
6-8 months	Full WB	Full ROM	Return to sport after functional testing and surgeon clearance

*WBAT = weight bearing as tolerated. A more restrictive order is appropriate when dictated by tissue quality, repair tension, augmentation/reconstruction, surgeon preference, or concomitant procedures.

PHASE I - PROTECTION / ACTIVATION (0-2 WEEKS)

Goals	Restrictions / Protection
Protect repair and incision; control pain and effusion.	

• Achieve and maintain full passive knee extension. • Begin safe quadriceps recruitment without stressing the repair.	• Hinged knee brace locked in full extension for standing and ambulation. • WBAT with crutches unless surgeon specifies partial or non-weight bearing. • ROM: 0-30 degrees, passive or active-assisted flexion; passive extension to 0 degrees. • No forced flexion. Avoid active unsupported knee extension.
Recommended Rehabilitation • Ankle pumps and DVT-prevention mobility. • Heel prop for extension; patellar mobility as appropriate after wound check. • Quadriceps sets; NMES may be used for poor activation. • Straight-leg raise only with brace locked in extension and only if no extensor lag / surgeon permits. • Hip abduction/adduction and core exercises with knee protected.	Criteria to Progress • Incision healing appropriately; pain/effusion controlled. • Full passive extension. • Able to perform quadriceps set without increasing symptoms.

PHASE II - PROTECTED MOTION (2-6 WEEKS)

Goals • Progress flexion without compromising repair. • Maintain full extension and improve quadriceps control. • Progress protected gait and functional mobility.	Restrictions / Protection • Brace remains locked in extension for ambulation through week 6. • ROM progression: 0-45 degrees by week 4; 0-90 degrees by week 6. • Continue WBAT with crutches; wean assistive devices only after week 6 unless directed otherwise. • No resisted knee extension and no loaded flexion beyond the prescribed ROM.
Recommended Rehabilitation • Heel slides / active-assisted flexion within limits. • Quadriceps sets and NMES as needed. • SLR in locked brace if no lag. • Hip/core strengthening; gentle calf strengthening with brace locked. • Gait training with brace locked in extension.	Criteria to Progress • ROM approximately 0-90 degrees without excessive pain or swelling. • No wound concerns. • Improving quadriceps control; no increase in extensor lag.

PHASE III - GAIT RESTORATION / EARLY STRENGTH (6-12 WEEKS)

Goals • Restore near-full to full ROM. • Normalize gait and discontinue brace when quadriceps control is adequate. • Begin progressive closed-chain strengthening.	Restrictions / Protection • At week 6, unlock brace for gait gradually (for example 0-50 degrees initially) if patient demonstrates adequate control. • Advance ROM as tolerated; avoid forceful stretching into flexion. • Brace may be discontinued around 8 weeks when there is no clinically significant extensor lag and gait is controlled. • Avoid heavy resisted open-chain knee extension; avoid deep squats.
Recommended Rehabilitation • Stationary bicycle when ROM permits, initially low resistance. • Mini-squats / sit-to-stand in shallow ranges (generally 0-45 to 60 degrees). • Leg press in protected range, low load. • Step-ups progressing by height and control. • Balance / proprioception; hip and trunk strengthening. • Progress calf raises and gait endurance.	Criteria to Progress • Full extension; flexion progressing toward functional full ROM. • Minimal effusion. • Independent gait without limp. • No meaningful extensor lag; good control with sit-to-stand and low step-up.

PHASE IV - PROGRESSIVE STRENGTH / FUNCTION (12-16 WEEKS)

Goals - Develop quadriceps and lower-extremity strength/endurance. - Improve single-leg control and tolerance of functional loading.	Restrictions / Protection - Continue to avoid abrupt high-load eccentric quadriceps work. - Keep closed-chain loading relatively shallow and progressive; avoid deep loaded flexion until later healing. - Introduce open-chain knee extension cautiously and progressively if surgeon permits, beginning with low load and symptom monitoring.
Recommended Rehabilitation - Progress leg press, squat pattern, split squat, step-up/down, hamstring and hip strengthening. - Single-leg balance and controlled single-leg squat to a shallow depth. - Bike, elliptical, pool running as tolerated. - Progress resistance only if there is no reactive effusion, pain, or loss of extension.	Criteria to Progress - Full ROM or near symmetric ROM. - No pain with ADLs and stairs. - No reactive effusion after strengthening. - Good single-leg alignment and eccentric control.

PHASE V - RUNNING / POWER DEVELOPMENT (16-24 WEEKS)

Goals Restore higher-level strength, tendon load tolerance, and running mechanics.	Restrictions / Protection - Light running may begin in this window when clinical criteria are met; the 2025 Arthroscopy Techniques protocol uses quadriceps deficit <30% as a threshold. - No running if there is extensor lag, persistent effusion, pain with loading, or poor single-leg mechanics. - Progress plyometrics from bilateral low amplitude to unilateral only after a successful running progression.
Recommended Rehabilitation - Walk-jog progression on level surface. - Progressive squat/leg press depth and load. - Controlled deceleration drills. - Low-level bilateral hopping, then multidirectional progression. - Sport-specific conditioning without contact initially.	Criteria to Progress - Full ROM, no extensor lag, minimal/no effusion. - Pain-free brisk walking and stairs. - Quadriceps strength deficit <30% compared with contralateral side (preferably measured objectively). - Acceptable single-leg squat/step-down mechanics.

PHASE VI - RETURN TO SPORT / HEAVY ACTIVITY (6-8+ MONTHS)

Goals Return safely to unrestricted sport, jumping, cutting, heavy occupational demand, or recreational activity.	Restrictions / Protection - Return is criteria-based, not time alone. - Delay return when tissue quality was poor, repair was revision/reconstruction, symptoms persist, or objective deficits remain.
Recommended Rehabilitation - Progress full-depth closed-chain strengthening as tolerated. - Advanced plyometrics, acceleration/deceleration, cutting, and sport-specific drills. - Gradual practice exposure before unrestricted competition.	Criteria to Progress - No pain or effusion with sport-specific loading. - Full ROM and no extensor lag. - Quadriceps strength ideally $\geq 90\%$ limb symmetry; stronger thresholds may be appropriate for competitive pivoting/jumping athletes. - Hop/functional testing $\geq 90\%$ limb symmetry when appropriate, with acceptable movement quality. - Surgeon and rehabilitation team clearance.

WHEN TO SLOW OR MODIFY THE PROTOCOL

- Chronic rupture, revision repair, reconstruction, poor tendon quality, large gap, allograft/autograft reconstruction, or concern for repair tension.

For acute primary patellar tendon repair - surgeon-specific modifications supersede this guideline

- Concomitant fracture, ligament reconstruction, cartilage procedure, or other operation with more restrictive weight-bearing or ROM precautions.
- Worsening extensor lag, sudden loss of active extension, new palpable defect, or a traumatic flexion event.
- Increasing effusion, wound drainage/erythema, fever, calf pain/swelling, or other concern for infection or venous thromboembolism.
- Persistent pain or swelling after progression: reduce load and reassess before advancing.

SELECTED EVIDENCE / REFERENCES

1. Brinkman JC, Reeson E, Chhabra A. Acute Patellar Tendon Ruptures: An Update on Management. JAAOS Global Research & Reviews. 2024;8(4):e24.00060. doi:10.5435/JAAOSGlobal-D-24-00060. Published by Wolters Kluwer Health on behalf of the American Academy of Orthopaedic Surgeons.
2. Dave U, Rubin J, Chang N, et al. Patellar tendon repair restores extensor mechanism function with a low complication rate: a systematic review. Journal of Orthopaedics. 2025;66:146-153. doi:10.1016/j.jor.2025.01.011.
3. Daniel AV, Rechter GR, Reed LA, Williams WA, Carbone AD, Kannan AS. Patellar Tendon Repair With Bioinductive Implant Augmentation. Arthroscopy Techniques. 2025;14(7):103639. doi:10.1016/j.eats.2025.103639.
4. Aman ZS, Lorentz SG, Tisherman RT, Wittstein JR. Retensionable All-Suture Anchor Extensor Mechanism Repair. Video Journal of Sports Medicine. 2026;6(3). doi:10.1177/26350254261416542.
5. Burnham JM, Drazick AT, Knighton S. Complex Patellar Tendon Repair with Suture Anchors and Suture Tape Augmentation. AAOS Orthopaedic Video Theater. Published February 16, 2026.

Clinical note: The published literature remains heterogeneous regarding exact postoperative restrictions. This protocol intentionally uses a moderate, tissue-protective progression for routine acute primary repair. We often modify ROM, weight-bearing, brace, active-extension, and return-to-sport timing based on intraoperative stability, repair construct, tissue quality, patient factors, and concomitant procedures.