"Dr. Trevor" Stefanski, M.D.
Minimally Invasive Joint Specialist
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Innovating BIG RESULTS Through Small Incisions

Quadriceps Reconstruction with Mesh or Allograft Following Total Knee Arthroplasty (TKA)

Postoperative Physical Therapy Protocol

General Considerations

- This protocol addresses patients who have undergone TKA with quadriceps reconstruction using mesh or allograft tissue, often due to chronic extensor mechanism failure, tendon rupture, or poor tissue quality.
- The protocol is intentionally more conservative to protect the graft while balancing the need to prevent postoperative stiffness common in TKA patients.
- Progression is based on healing constraints of the reconstruction, not standard TKA timelines.

Phase I – Protective Phase (Weeks 0–4)

Goals:

- Protect reconstruction site
- Minimize inflammation and swelling
- Prevent stiffness while preserving full extension

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Fax: 513-985-2580

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- Begin neuromuscular activation (VMO emphasis)

Precautions / Restrictions:

- Weight Bearing: WBAT with brace locked in full extension (0–0°)
- Brace: Locked at 0–0° at all times during ambulation
- Range of Motion (ROM):
    - Weeks 0–2: No ROM
    - Weeks 2–4: Passive ROM only, 0–20°

Therapeutic Exercises:

- Ankle pumps
- Isometric quadriceps sets (with NMES or biofeedback)
- Hamstring and calf stretching (to maintain extension)
- Patellar mobilization (gentle medial glides)
- Leg raises in multiple planes (except hip flexion)
- Core and contralateral limb strengthening

Cardiovascular:

- Upper Body Ergometer
- Well-leg cycling

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Manual Therapy:

- Soft tissue mobilization to surrounding musculature only
- Effleurage for edema management
- Avoid contact with surgical portals or “no-touch zone” (2 inches around graft)

Phase II – Limited Motion Phase (Weeks 4–6)

Goals:

- Continue protection of reconstruction
- Gradually reintroduce ROM
- Maintain quadriceps and gluteal activation
- Improve mobility without stressing graft

Precautions / Restrictions:

- Brace: Continue locked in extension during ambulation
- ROM:
    - Advance passive ROM to 0–50° by end of Week 6
    - No active flexion until cleared

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Therapeutic Exercises:

- Seated assisted heel slides within range
- Quad sets with NMES
- Standing hip abduction/adduction (band resistance proximal to knee)
- Straight-leg bridging with brace on
- Standing calf raises
- Balance drills (double leg stance, no perturbation)

Manual Therapy:

- Soft tissue mobilization around patellofemoral joint and suprapatellar pouch
- Portal/scar mobilization if incisions fully healed

Phase III – Progressive Motion and Strength (Weeks 6–10)

Goals:

- Achieve 90° of flexion without stressing graft
- Begin active range of motion and closed-chain strength
- Normalize gait mechanics

Precautions / Restrictions:

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- Brace: May unlock brace gradually per MD approval
- ROM: Advance active-assisted ROM to 0–90°

Therapeutic Exercises:

- Wall slides (0–90° limit)
- Stationary bike (no resistance)
- Double leg bridges
- Mini step-ups
- Terminal knee extensions (short arc quads)
- Supported treadmill walking

Manual Therapy:

- Patellar glides
- Soft tissue mobilization to quads, IT band, lateral retinaculum

Phase IV – Reconditioning Phase (Weeks 10–16)

Goals:

- Restore full ROM
- Improve quad strength and symmetry

- Introduce unilateral loading and dynamic balance

Therapeutic Exercises:

- Full ROM cycling (add resistance)
- Leg press (0–60° arc)
- Mini squats, lateral step-ups
- Single-leg balance drills
- Begin pool-based gait and light resistance drills
- Elliptical if pain-free

Manual Therapy:

- Patellar taping if indicated for tracking
- Joint mobilization for stiffness

Phase V – Return to Function (Months 4–6)

Goals:

- Maximize strength, endurance, and proprioception
- Begin return to recreational and low-impact athletic activities
- Normalize gait and functional movements

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Therapeutic Exercises:

- Eccentric strengthening: leg press, decline squats
- Running progression (if criteria met)
- Agility ladder and dynamic balance drills
- Plyometric drills (box step-downs, low box jumps)

Criteria to Progress:

- Full ROM matching contralateral limb
- No extensor lag
- Quad strength ≥ 80% contralateral side
- Independent gait with proper mechanics

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