

MENISCAL ROOT REPAIR REHABILITATION PROTOCOL

General Precautions:

- This protocol is intended for an isolated meniscal root repair. Restrictions for concomitant procedures, including ligament reconstruction, osteotomy, cartilage restoration, or other repairs, supersede this protocol.
- Protect the repair from axial loading, loaded knee flexion beyond 90°, deep squatting, pivoting, twisting, impact activity, and kneeling during early healing.
- Monitor pain, joint effusion, range of motion, quadriceps activation, gait quality, and mechanical symptoms at each visit.
- Notify the surgeon for increasing effusion, persistent or worsening joint-line pain, locking/catching, instability, fever, wound concerns, calf pain/swelling, or other concern for complication.

Phase I: Protection and Early Motion — Weeks 0–6

Goals

- Protect the meniscal root repair.
- Control pain and effusion.
- Achieve full passive knee extension.
- Restore quadriceps activation.
- Gradually restore non-weight-bearing knee flexion to 90°.

Brace

- Hinged knee brace locked in full extension for ambulation.
- Brace may be unlocked from 0–90° for prescribed exercises and range-of-motion work.
- Wear brace during sleep for the first 2 weeks; thereafter per surgeon instruction.

Weight Bearing

- Strict non-weight bearing with crutches for 6 weeks.

Range of Motion

- Passive/active-assisted ROM 0–90° only.
- Emphasize full extension; avoid hyperextension unless symmetric to contralateral knee.

- No loaded flexion beyond 90°.

Therapeutic Exercise

- Ankle pumps and calf mobility.
- Patellar mobilization as tolerated.
- Quad sets, straight-leg raises in brace locked in extension once no extensor lag.
- NMES for quadriceps activation as indicated.
- Hip abduction, adduction, and extension strengthening with the knee protected.
- Core and contralateral lower-extremity strengthening.
- Gentle stationary bike with high seat and no resistance may begin when 90° flexion is achieved, provided the knee remains unloaded and there is no increase in pain or effusion.

Avoid

- Weight bearing through the operative limb.
- Squats, leg press, lunges, step-ups, pivoting, or twisting.
- Active resisted hamstring work unless specifically cleared.
- Open-chain resisted knee extension through painful ranges.
- Knee flexion beyond 90°.

Criteria to Progress

- Full passive knee extension.
- Knee flexion to 90° without increased pain or effusion.
- Minimal effusion.
- Straight-leg raise without extensor lag.
- Adherence to non-weight-bearing restrictions.

Phase II: Progressive Weight Bearing and Motion — Weeks 6–12

Goals

- Progress to full weight bearing with normalized gait.
- Restore full, pain-free ROM.
- Improve quadriceps control and lower-extremity strength.
- Maintain minimal to no effusion.

Brace and Weight Bearing

- Begin progressive weight bearing at week 6.
- Progress from partial weight bearing to weight bearing as tolerated over 1–2 weeks, using crutches until gait is non-antalgic with good quadriceps control.

- Discontinue brace when adequate quadriceps control and normalized gait are demonstrated, typically between weeks 6–8.

Range of Motion

- Progress to full ROM as tolerated after week 6.
- Continue to avoid loaded flexion greater than 90° until at least 4 months postoperatively.

Therapeutic Exercise

- Stationary bike: progress duration and resistance as tolerated.
- Closed-chain strengthening in protected ranges: mini-squats 0–45°, weight shifts, terminal knee extension, and controlled leg press 0–60°.
- Step-ups beginning with low step height; progress based on alignment and symptom response.
- Bridge progression and hip/core strengthening.
- Balance and proprioceptive training: double-leg progressing to single-leg activities.
- Gait retraining, emphasizing full terminal extension and avoidance of limp.
- Pool walking may begin after incisions are fully healed.

Avoid

- Deep squats, loaded knee flexion beyond 90°, running, jumping, cutting, pivoting, or agility drills.
- High-load hamstring curls if they provoke posterior knee or joint-line symptoms.
- Progression through pain or recurrent effusion.

Criteria to Progress

- Full, pain-free ROM.
- No or trace effusion.
- Normal gait without assistive device.
- Good single-leg balance and frontal-plane knee control.
- Quadriceps strength improving toward at least 70% of the contralateral limb.

Phase III: Strengthening and Functional Control — Weeks 12–16

Goals

- Restore lower-extremity strength, endurance, and neuromuscular control.
- Develop controlled single-leg function.
- Prepare for progressive impact activity after appropriate healing interval.

Therapeutic Exercise

- Progress closed-chain strengthening: squats and leg press to 70–90° as tolerated.
- Step-up, step-down, split-squat, and lunge progression within pain-free, controlled ranges.
- Hamstring, calf, hip, and core strengthening.
- Single-leg balance, dynamic stability, and perturbation training.
- Elliptical, stair climber, and progressive cycling.
- Low-impact cardiovascular conditioning.

Restrictions

- No running, jumping, cutting, pivoting, or impact activities until cleared.
- Avoid deep loaded flexion, twisting, and pivoting through at least 4 months postoperatively.

Criteria to Begin Running Progression

- At least 4 months postoperatively and surgeon clearance.
- Full ROM with no pain or effusion.
- Normal gait and controlled single-leg squat/step-down.
- Quadriceps and hamstring strength at least 80% of contralateral limb.
- Ability to perform functional closed-chain activities without pain, swelling, or valgus collapse.

Phase IV: Return to Running and Higher-Level Function — Months 4–6

Goals

- Restore strength, power, endurance, and movement quality.
- Progress from straight-line running to sport- or work-specific activity.

Therapeutic Exercise

- Graduated walk-jog/running progression, beginning with straight-line running on level surfaces.
- Progressive plyometric training after successful running progression.
- Agility, deceleration, lateral movement, and controlled change-of-direction drills.
- Sport- or work-specific drills with progressive intensity.
- Continue progressive lower-extremity strengthening and neuromuscular training.

Criteria to Progress

- No pain, mechanical symptoms, or effusion with running or functional training.
- Quadriceps and hamstring strength at least 85–90% of contralateral limb.
- Symmetric functional testing with appropriate landing and single-leg control.

- Clearance by surgeon for pivoting and higher-demand activity.

Phase V: Return to Sport/Unrestricted Activity — Months 6–9

Goals

- Safe return to unrestricted recreational, occupational, or athletic activity.
- Maintain strength, movement quality, and joint-symptom control.

Return-to-Activity Criteria

- Surgeon clearance.
- Full, pain-free ROM with no effusion.
- No joint-line tenderness, locking, catching, or instability.
- Quadriceps and hamstring strength at least 90% of contralateral limb.
- Functional hop, balance, and movement testing at least 90% of contralateral limb when applicable.
- Demonstrated safe mechanics with squatting, landing, deceleration, cutting, pivoting, and sport- or work-specific tasks.
- Independent home strengthening and injury-prevention program.

Suggested Physical Therapy Frequency

- Weeks 0–6: 1–2 visits per week.
- Weeks 6–16: 1–2 visits per week, based on progress and functional deficits.
- Months 4–9: 1 visit every 1–2 weeks, with progressive independent strengthening and return-to-activity program.