POST-OPERATIVE PROTOCOL · MPFL RECONSTRUCTION · PAGE 1 OF 6

MEDIAL PATELLOFEMORAL LIGAMENT RECONSTRUCTION

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Progression through this protocol is **time and criterion based**, and depends on soft tissue healing, patient demographics and clinician evaluation. Advance only when the goals of the current phase have been met. **Concerns about limited range of motion should be communicated directly with the surgeon.**

ABOUT THE REPAIR

BACKGROUND

- The **medial patellofemoral ligament** runs along the inner side of the knee and helps hold the kneecap from sliding to the outside
- It is commonly injured when the kneecap dislocates
- An MPFL reconstruction rebuilds that ligament with a graft, restoring the restraint that keeps the kneecap tracking
- The graft is **most often an allograft** — donor tissue — though a graft taken from elsewhere in your own leg (an autograft) is sometimes used instead

CONTRIBUTING FACTORS

ASSESSMENT

- Patellar instability
- Altered mechanics with functional movement
- Bony morphology
- Quadriceps strength deficits

PRECAUTIONS

- **Weight bearing as tolerated with crutches** until there is no extensor lag with a straight leg raise
- Protected electrical stimulation program if warranted
- Patellar glides are **passive only**
- **Avoid isolated hamstring strengthening until 8 weeks** if an autograft was used
- **Superior and medial glide only until 6 weeks**
- **No lateral patellar glides**

PHASE I	PHASE I	PHASE II	PHASE II	PHASE III	PHASE IV
WEEKS 0–2	**WEEKS 2–4**	**WEEKS 4–6**	**WEEKS 6–10**	**WEEKS 10–12**	**WEEKS 12–16**
Protection, quad activation	Normalize gait, early strength	Progressive resistance	Dynamic control, early jumping	Plyometrics, walk-jog	Return to sport

CORRECTIVE INTERVENTIONS

- Manual therapy for patellar mobility and knee range of motion
- Neuromuscular re-training to improve lower extremity strength and normalize mechanics
- Neuromuscular electrical stimulation for quadriceps activation
- Sport-specific activity training
- Vasopneumatic device for edema control

MANUAL THERAPY

- Patellar mobilization — **passive superior and medial glide only until 6 weeks**
- Knee extension and flexion PROM
- Scar massage
- Soft tissue mobilization as appropriate

OUTCOME TESTING

- Isometric testing at **10 weeks**
- Isokinetic testing at **12 weeks**
- Functional testing — hop testing

PROUD MEDICAL TEAM FOR

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I PROTECTION · WEEKS 0–2

GOALS Full active quadriceps contraction with superior patellar glide · full passive knee extension · effusion 2+ or less · straight leg raise held 10 seconds without extensor lag

GAIT — WEEKS 0–2

- **Weight bearing as tolerated with crutches**
  - Confirm with the surgeon if weight-bearing status is not documented in the chart
- Gait training focused on equal weight distribution and normal mechanics
- Begin with two crutches, progress to one, then to no support once mechanics are normalized
- Evaluate for symmetrical joint loading in stance, heel strike with full knee extension at initial contact, and appropriate push-off at toe off

PAIN & EFFUSION — WEEKS 0–2

- Ice or cryotherapy, compression and elevation to reduce post-operative effusion

RANGE OF MOTION — WEEKS 0–2

- Begin passive, active-assisted and active ROM as tolerated
- Biking with half revolutions, progressing to full revolutions per precautions
- **No forced flexion beyond 90° with meniscal repairs**
- Patellar mobilization — emphasis on superior and inferior mobility, **no lateral mobilization**
- Heel slides
- IT band stretch and soft tissue mobilization
- Gastrocnemius and soleus stretching in a seated position

STRENGTHENING — WEEKS 0–2

- Quad sets and glute sets
- Straight leg raise in flexion and abduction — **avoid extensor lag**
- NMES to the quadriceps at 60–90°
- Multi-angle knee extensor isometrics from 60–90° for patients who cannot tolerate high-intensity NMES

GOALS TO PROGRESS — WEEKS 0–2

1. Full active quadriceps contraction with superior patellar glide
2. Full passive knee extension
3. Effusion 2+ or less — can at least be swept out of the medial sulcus
4. Straight leg raise held 10 seconds without extensor lag
5. Tolerates full weight bearing without increased pain or 3+ effusion
6. Walks with an assistive device without obvious deviations on observation

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I PROTECTION · WEEKS 2–4

GOALS Effusion 2+ or less · full weight bearing without increased pain or effusion · walks on level surfaces without an assistive device · single-leg stance 30 seconds

GAIT — WEEKS 2–4

- **Weight bearing as tolerated**
- Gait training emphasizing avoidance of a flexed or stiff-knee gait, and normal push-off through the gastrocnemius–soleus complex to restore normal gait speed and cadence

RANGE OF MOTION — WEEKS 2–4

- Continue passive, active-assisted and active ROM as tolerated
- **Meniscal repairs: no forced flexion beyond 90°**
- Towel stretching, prone hangs and bag hangs to achieve and maintain knee extension symmetrical to the other limb
- Bike with **no resistance**
- Patellar mobilization with emphasis on superior and inferior glides
- Begin light quadriceps and hamstring stretching

STRENGTHENING — WEEKS 2–4

- Continue the weeks 0–2 program
- Quad set progression — prone quad sets, supine, terminal knee extension
- Straight leg raise in flexion, abduction, adduction and extension
- NMES at 60° of knee flexion
- Initiate **hamstring activation** — heel slides, hamstring sets, bridges
- Step-ups from a 2" starting height, progressed without increased pain and with good technique
- Begin trunk and lumbopelvic strengthening — bridging, planks, pelvic tilts, abdominal bracing
- Shuttle or leg press 90–0°
  - Bilateral to single-leg per tolerance and good mechanics
  - Increase resistance per tolerance
- Single-leg stance — eyes open to eyes closed, progressing to dynamic movement or an unstable surface
- Heel and toe raises
- Squat, correct form, in a modified range

II PROGRESSIVE RESISTANCE · WEEKS 4–6

GOALS Tolerates the therapeutic exercise program without increased pain or effusion (1+ or less) · full pain-free AROM equal to the other limb · normal patellofemoral mobility without apprehension · normal mechanics on reciprocal stairs

RANGE OF MOTION — WEEKS 4–6

- Continue passive, active-assisted and active ROM as tolerated
- **Concerns with limited ROM should be communicated directly with the surgeon**
- Continue patellar mobilization as needed
- Bike with light resistance
- Continue quadriceps and hamstring flexibility

STRENGTHENING — WEEKS 4–6

- Continue NMES
- Weighted multi-angle straight leg raises
- Resistance exercises for gluteal strengthening — resisted side stepping, backward walking, clamshells, reverse clamshells
- Progressive resistance quadriceps and hamstring exercises per tolerance, including partial-range lunges
- Progress weight-bearing and closed-chain strengthening — shuttle, aquatics, Total Gym
- Squat progressions on stable and unstable surfaces with good mechanics
- **No jogging and no single-leg plyometrics**

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VANDERBILT HEALTH

II DYNAMIC CONTROL · WEEKS 6–10

GOALS Effusion 1+ or less · tolerates the exercise program without increased pain or effusion · maintains full pain-free AROM · normal patellofemoral mobility · normal mechanics with closed-chain exercise and early jumping

STRENGTHENING & DYNAMIC CONTROL

WEEKS 6–10

- Progress weight-bearing strengthening for the quadriceps and hamstrings — lunges, shuttle, steamboats, side stepping, leg press, squats, single-leg Romanian deadlifts
- Step-ups and step-downs (heel touch), progressing step height as tolerated
- Begin sub-maximal leg extensions, **90–45° only**
- Begin bilateral shuttle jumping at **50% body weight**, emphasizing symmetry in landing and take-off

ENDURANCE & LANDING

WEEKS 6–10

- Low-impact endurance work — treadmill walking, stepper, elliptical
- Progress single-leg balance activities
- Begin full-weight landing mechanics once mechanics on the shuttle are good, with visual cueing
  - Double to single-leg loading response
  - Double-leg jumping in place
- **Week 8:** initiate isolated hamstring strengthening per tolerance

III PLYOMETRICS & RUNNING · WEEKS 10–12

GOALS Effusion 1+ or less · tolerates the exercise program without increased pain or effusion · maintains full pain-free AROM · normal patellofemoral mobility · normal mechanics with all closed-chain exercise and early jumping

STRENGTHENING & FUNCTIONAL ACTIVITY

WEEKS 10–12

- Continue stretching and biking
- Full weight-bearing strengthening exercises
- Strength progression from stable to unstable surfaces
- Progress full-range open-chain knee extension as tolerated without pain
- Progress hamstring strengthening as tolerated — double-leg hamstring curls with a physioball, resisted leg curls
- Plyometric progression — squat jumps and broad jumps, initially at 50% effort for height and distance, progressing once correct technique is demonstrated
- Introduce single-leg jumping, rotational activity and jogging with increasing resistance

CRITERIA TO INITIATE JOGGING

- Full active knee extension
- Normal landing mechanics and single-leg squat pattern
- **Strength of the involved limb at least 80% of the uninvolved limb**
- Audible rhythmic strike pattern with no gross visual antalgic pattern

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VANDERBILT HEALTH

IV RETURN TO SPORT · WEEKS 12–16

GOALS Maintain ROM equal to the uninvolved limb · emphasize quadriceps, hamstring and trunk dynamic stability · emphasize power generation and absorption · progress to sport- and position-specific activity

STRENGTHENING — WEEKS 12–16

CONSIDER	EXAMPLES
Double-leg and single-leg activities and transitions	Weight lifting — squats, leg extension, leg curl, leg press, deadlifts
Vary planes of movement and change of direction	Lunges — forward, backward, rotational, side
Perturbations and altered support surface, indoor and outdoor	Rotational trunk exercises on static and dynamic surfaces
Challenge multiple muscle groups — lower extremity and core — simultaneously	Unilateral shuttle jumping with increasing resistance and mid-air rotations

RETURN TO SPORT ACTIVITIES

CONSIDER	EXAMPLES
Impact loading and an appropriate attenuation strategy; cue against "hard" landings	Single-leg hop downs from increasing height, up to a 12" box
Double-leg and single-leg activities and transitions	Single-leg hop-holds on a stable surface, progressing to an Airex pad
Vary planes of movement and change of direction	Double and single-leg hopping onto an unstable surface
Emphasize symmetry in weight bearing, joint loading and technique throughout	Tuck jumps, focusing on multi-joint flexion during landing and holding a stable position; 90–180° jumps

AGILITY — WEEKS 12–16

- Begin agility exercises at **50–75%**, using visual feedback to improve mechanics
- Side shuffling · hopping · carioca
- Figure 8s · zig-zags · back pedaling
- Resisted jogging with a sports cord in straight planes

SPORT-SPECIFIC WORK — WEEKS 12–16

- Emphasize sport- and position-specific activities
- Add the ball, racquet or stick
- Focus on activities that challenge muscle demand in intensity, frequency and duration

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VANDERBILT HEALTH

CRITERIA FOR DISCHARGE TO AN INDEPENDENT PROGRAM

1. Single-leg and triple cross-over hop test for distance **within 15%** of the uninvolved limb
2. Isokinetic peak torque for knee extension and flexion within **10%** of the uninvolved limb (60°/sec and 300°/sec)
3. Quadriceps to hamstring isokinetic strength ratio of **60%**
4. No signs of patellar instability with clinical testing
5. Completes sport-specific drills without compensatory movement, exacerbation of symptoms or reactive effusion

QUESTIONS ABOUT YOUR RECOVERY?

Call the office with any question about your protocol, your brace, or your incision. Bring this handout with you to every post-operative visit.

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Adapted from the Medial Patellofemoral Ligament Reconstruction Clinical Practice Guideline, Ohio State Sports Medicine, The Ohio State University Wexner Medical Center (Adam Ingle PT, DPT; Chelseana Davis PT, DPT; reviewed by John DeWitt PT, DPT, SCS, ATC; completed 4/8/15).

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