



7858 Shrader Rd

Richmond, Virginia 23294

MPFL Reconstruction Rehabilitation

Medial Patellofemoral Ligament (MPFL) Reconstruction Guidelines

The following MPFL progression guidelines are based on healing constraints, functional progression specific to the patient. Phases and time frames are designed to give the clinician a general sense of progression. Acute versus chronic, and concomitant procedures (i.e. cartilage procedure, lateral release or tibial tubercle transfer) will alter the guideline. Please consult with the prescribing MD if any questions arise.



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POST-OPERATIVE PHASE I: Protection Phase (Week 0-6)

GOALS

- Independence in home therapeutic exercise (HEP) program
- Promote healing
- Control post-operative pain / swelling
- Prevent quadriceps inhibition: fair to good quadriceps contraction
- Straight leg raise (SLR) without lag, pain-free
- ROM: 0° KE to $\geq 90^\circ$ KF
- Independent ambulation WBAT with brace locked in extension

PRECAUTIONS

- Ambulation without brace
- Lateralization of patella
- AA-AROM KE, especially with significant quad atrophy, and articular cartilage injury
- Symptom provocation: quadriceps shut down, joint effusion, active inflammation



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TREATMENT RECOMMENDATIONS

- Emphasize patient compliance to HEP and weight bearing precautions/progression
- WBAT with brace locked in extension with appropriate assistive device on level surfaces and stairs
- Cryotherapy: home cold therapy unit
- Electrical stimulation for quadriceps re-education: quadriceps sets with towel roll under knee
- Sitting knee ROM exercise: AAROM KF, PROM KE
- Quad set with towel roll under knee
- Hip progressive resisted exercises: pain-free SLR with brace if lag is present
- Distal strengthening (PF)
- Flexibility exercises (hamstrings, gastrocnemius)

EMPHASIZE

- Ambulation with brace locked in extension
- Improving quadriceps contraction



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- Controlling pain/effusion
 - Compliance with home instructions

MINIMUM CRITERIA
FOR ADVANCEMENT
TO NEXT PHASE

- Fair to good quadriceps contraction
- Good patellar mobility in medial direction
- ROM: 0° knee extension to $\geq 90^\circ$ knee flexion
- 0/10 pain at rest
- Able to SLR pain-free without quadriceps lag



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POST-OPERATIVE PHASE II: Gait Phase (Weeks 7-12)

GOALS

- Independence in HEP, as instructed
- Control pain, inflammation, effusion
- Promote healing
- ROM 0° KE-110° KF (8 weeks), 120° (10 weeks) to full ROM
- Good patella mobility
- Good quad contraction
- Normalize gait with brace and assistive device, prn
- Postural stability, alignment and N-M control in single limb stance
- 0/10 pain with ADLs, therapeutic exercise: Recognize pain-free arc of motion

PRECAUTIONS

- Sign and symptom provocation: pain, inflammation, quadriceps shut down, joint effusion
- Lateralization of the patella



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TREATMENT RECOMMENDATIONS

- Pathological gait pattern (quadriceps avoidance; bent knee)
- Arc of motion during exercise
- HEP: advance as tolerated. Continue phase I exercises, as appropriate
- Patient education: Activity modification, progression of gait training, cryotherapy
- Patellar mobilization, MD directed
- ROM exercises:
- Sitting PROM to AAROM KE in a pain-free arc of motion (no cartilage injury) to AAROM KF
- KF: sitting progressing to stair ROM, supine wall ROM as tolerated (~125°KF in sitting, quad control)
- Gait training: heel toe gait pattern with brace open once adequate quad control
- Consider Hydro-treadmill (adequate wound healing) or anti-gravity treadmill.



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- Low grade elevation or retro-walking to encourage N-M control with KF during loading response
 - Quadriceps strengthening: progress pain-free arc of motion, close chain preferred
 - Continue with Estim, biofeedback, quad sets, submaximal multi angle isometrics, as needed
 - Leg press: monitor arc of motion (bilateral, eccentric)
 - Initiate forward step up (FSU) progression, 6" step with adequate strength
 - Bicycle: progressing from short crank to standard crank as ROM allows (115° KF in sitting), 80 RPMs
 - Flexibility exercises
 - Advance proximal strength and core training: (i.e. hip extension with knee flexion, side planks, bridge)
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- Hydrotherapy for gait, single limb alignment and stability, proximal strengthening
- Initiate balance and proprioceptive training: double limb support on progressively challenging surfaces to
- Single limb support on level surface only with demonstration of good alignment, stability, and N-M control

EMPHASIZE

- Symptom control with ADLs
- Minimizing knee effusion
- Normal gait pattern
- Postural stability, alignment, neuromuscular
- (N-M) control during stance

MINIMUM CRITERIA FOR ADVANCEMENT TO NEXT PHASE

- ROM 0° KE - 115° KF
- Normal gait pattern
- Good patella mobility
- Postural stability, alignment and N-M control in single limb stance



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- 0/10 pain with ADLs and therapeutic exercise
 - Independent HEP
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POST-OPERATIVE PHASE III: Strengthening (Week 13-18)

GOALS	<ul style="list-style-type: none">▪ Independent HEP▪ Control pain, effusion and inflammation▪ 0/10 pain with ADLs, therapeutic exercise▪ ROM: WNLs, 130° (12 weeks)▪ Normalize gait on level surfaces and stairs▪ Address imbalances▪ Core stability: Single leg bridge = 30 s▪ Good single limb dynamic balance▪ Eccentric quadriceps and pelvic control with 6"/ 8" FSD▪ Initiate running program, plyometrics (bilateral)▪ Symmetry, quality, alignment during selected movement patterns: squat, jump in place
PRECAUTIONS	<ul style="list-style-type: none">▪ Sign and symptom provocation: pain, and active inflammation/ effusion, quadriceps shutdown▪ "Too much, too soon" progression▪ Maintain good quality of movement
TREATMENT RECOMMENDATIONS	<ul style="list-style-type: none">▪ HEP, as instructed▪ Educate patient: Activity modification, individualized, and cryotherapy▪ Quadriceps strengthening: progress as tolerated, monitor arc of motion, closed chain preferred



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- FSU progression: 6" step progressing to 8" step (dependent on patient height)
- Eccentric leg press progressing to:
 - Forward step down (FSD) progression: 6" step progressing to 8" step (dependent on patient height)
- Squat progression: chair squats, (use ball if necessary with buttocks moving under ball), to free squats
- ROM exercises:
 - (AA) ROM KE (monitor arc of motion) to AAROM KF in sitting to supine wall slides to stair stretch
- Gait training to emphasize heel-toe gait pattern with emphasis on loading response
- Proximal Functional Strengthening
 - Example: Bridging progression, hip extension with KF, clock, RDL, windmill, lawn mower



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- Core Training Progression
 - Balance progression with postural alignment and N-M control
 - Address muscle imbalances
 - Cross training: elliptical trainer initiated with good strength/ quality during 6" FSU, bicycle (80 RPMs),
 - swimming (crawl, back stroke)
 - Initiate running program (late phase): with eccentric quadriceps control during 8" FSD and MD clearance
 - 30 second interval initially
 - Initiate plyometric program with MD clearance and evidence of good eccentric quadriceps control
 - Vertical jumping progression
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- Normal gait
 - Identifying and addressing
 - muscle/ soft tissue imbalances
 - Neuromuscular control
 - Functional progression

EMPHASIZE



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MINIMUM CRITERIA FOR ADVANCEMENT TO NEXT PHASE

- Quality of movement
- ROM WNLs
- No pain or swelling
- Normalize gait
- Ability to demonstrate alignment, control, stability in single limb stance during dynamic activities
- Core stability: Single leg bridge = 30 s
- Able to ascend 6"/ 8" step with good control
- Able to descend 6"/ 8" step with good control, and alignment
- Symmetry, quality, alignment during selected movement patterns
- Independence in a home exercise program



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POST-OPERATIVE PHASE IV: Advanced Strengthening (Week 19-24)

GOALS

- Lack of pain, apprehension with sport specific movements
- Maximize strength and flexibility as to meet demands of individual's sport activity
- Ability to demonstrate strategy, symmetry, quality, control and alignment during selected movement patterns:
 - squat, jump (vertical and horizontal), single leg squat
- Isokinetic test: 180° / sec and 300° / sec
85% limb symmetry index (LSI)
- Cardiovascular fitness to meet demands of sport

PRECAUTIONS

- Pain with therapeutic exercise & functional activities



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TREATMENT RECOMMENDATIONS

- Inadequate strength, functional strength, ROM, flexibility, fitness when returning to sport
- Continue to advance LE strengthening, flexibility, dynamic single limb stability & agility programs
- Continue to address muscle imbalances – evaluation-based
- Advance core stability
- Cross training
- Advance plyometric program with MD clearance and evidence of good eccentric quadriceps control
- Vertical jumping progression: Jump down
- Horizontal jumping progression: Broad jump, single leg landings
- Progress running program
- Cutting, deceleration, change of direction with MD clearance and dynamic single limb stability

EMPHASIZE

- Quality of movement



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MINIMUM CRITERIA FOR ADVANCEMENT TO NEXT PHASE

- Functional progression
- Isokinetic test at 180°/ sec and 300°/ sec:
85% limb symmetry index (LSI)
- Demonstrate symmetry, quality,
alignment during selected movement
patterns
- Medical clearance by surgeon for return
to play progression
- Lack of apprehension with sport specific
movements
- Flexibility to meet demands of sport



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POST-OPERATIVE PHASE V: Return to Play (Weeks 25-30)

GOALS	<ul style="list-style-type: none">▪ Lack of pain, apprehension with sport specific movements▪ Maximize strength and flexibility as to meet demands of individual's sport activity▪ Ability to decelerate with good control, and alignment on single limb▪ Isokinetic test: 180° / sec and 300°/ sec 85% limb symmetry index (LSI)▪ Cardiovascular fitness to meet demands of sport▪ Hop Test > 85% limb symmetry
PRECAUTIONS	<ul style="list-style-type: none">▪ Pain with therapeutic exercise & functional activities▪ Inadequate strength, functional strength, ROM, flexibility, fitness when returning to sport
TREATMENT RECOMMENDATIONS	<ul style="list-style-type: none">▪ Continue to advance LE strengthening, flexibility, dynamic single limb stability, core stability & agility



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MINIMUM CRITERIA FOR ADVANCEMENT TO NEXT PHASE

- Advance plyometric program: with MD clearance
 - Horizontal jumping progression: Broad jump to Hop to opposite to Single leg hop
 - Advance cutting, deceleration training
 - Progress cardiovascular fitness to meet demands of sport
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- Isokinetic test: 180° / sec and 300°/ sec
85% limb symmetry index (LSI)
 - Ability to decelerate with good control, and alignment on single limb
 - Medical clearance by surgeon for return to play
 - Hop Test > 85% limb symmetry
 - Lack of apprehension with sport specific movements
 - Flexibility to meet demands of sport
 - Independence with gym program for maintenance and progression of therapeutic exercise program



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- Demonstrate quality of movement with required sports specific activities
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