ORTHOPEDIC & SPORTS MEDICINE CENTER
The Strength of Experience

Post-operative Rehabilitation Protocol Medial Patellofemoral Ligament (MPFL) Reconstruction

PHASE I: PROTECTION PHASE (WEEKS 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 ≥ 90° KF
  - Independent ambulation WBAT with brace by 4 weeks, and appropriate assistive device on level surfaces and stairs
- PRECAUTIONS:
  - Avoid ambulation without brace for first 4 weeks
  - Avoid lateralization of patella
  - Avoid AA-AROM KE, especially with significant quad atrophy, and articular cartilage injury
  - Avoid symptom provocation: it leads to quadriceps shut down, joint effusion, active inflammation
  - Follow KF ROM as per surgeon's guidelines
- TREATMENT RECOMMENDATIONS:
  - Emphasize patient compliance to HEP and weight bearing precautions/ progression
    - 50% WB for first 2 weeks and WBAT starting at 2 weeks in brace with appropriate assistive device on level surfaces and stairs
    - Cryotherapy
    - Work on motion right away!
    - 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)

MINIMUM CRITERIA FOR ADVANCEMENT TO NEXT PHASE:

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

PHASE II: GAIT PHASE (WEEKS 7-10)

- 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
  - 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
  - Concomitant procedures: TTO, articular cartilage procedure
  - Lateralization of the patella
  - Pathological gait pattern (quadriceps avoidance; bent knee)
  - Arc of motion during exercise
- TREATMENT RECOMMENDATIONS:
  - HEP: advance as tolerated. Continue phase I exercises, as appropriate
  - Patient education: Activity modification, progression of gait training, cryotherapy
  - Patellar mobilization
  - 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 adequate quad control (SLR without a lag, ability to achieve terminal knee extension) and knee ROM] to ensure normal loading response; hydro–treadmill (adequate wound healing) or anti-gravity treadmill. 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
    - Quad sets, submaximal multi angle isometrics, Estim, biofeedback, 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 - evaluation-based: AROM KF with hip extension in standing
    - Advance proximal strength and core training: (i.e. hip extension with knee flexion, side planks, bridge)
    - 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

MINIMUM CRITERIA FOR ADVANCEMENT:

- *ROM 0° KE – > 115° KF*
- *Normal gait pattern*
- *Good patella mobility*
- *Postural stability, alignment and N-M control in single limb stance*
- *0/10 pain with ADLs and therapeutic exercise*
- *Independent HEP*

PHASE III: STRENGTHENING (WEEKS 11-18+)

- GOALS:
    - 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
    - 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:
    - Sign and symptom provocation: pain, and active inflammation/ effusion, quadriceps shutdown
    - Gait deviations
    - "Too much, too soon" progression
- TREATMENT RECOMMENDATIONS:
    - HEP, as instructed
    - Educate patient: Activity modification, individualized, and cryotherapy

- Quadriceps strengthening: progress as tolerated, monitor arc of motion, closed chain preferred
  - 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), 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
- Advance proximal strength through functional activities (bridging progression, hip extension with KF, clock, RDL, windmill, lawn mower) and core training (planks, side planks, Sahrmann progression)
- Balance progression with postural alignment and N-M control (static to dynamic, introduce different planes of motion, challenging surfaces)
- Address muscle imbalances – evaluation-based: (i.e. 2 joint hip flexor length)
- 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: Jump up to jump in place

CRITERIA FOR ADVANCEMENT:

- *No pain or swelling, normal ROM*
- *Normalize gait*
- *Ability to demonstrate alignment, control, stability in single limb stance during dynamic activities*
- *Core stability: Single leg bridge = 30 s, Sahrmann ≥ level 3*
- *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*

PHASE IV: ADVANCED STRENGTHENING AND FUNCTION (WEEKS 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
  - Inadequate strength, functional strength, ROM, flexibility, fitness when returning to sport
- TREATMENT RECOMMENDATIONS:
  - 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

CRITERIA FOR DISCHARGE/ RETURN TO SPORT:

- *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*
- *Hop Test > 85% limb symmetry*
- *Demonstrate quality of movement with required sports specific activities*