ORTHOPEDICS & SPORTS MEDICINE
BAYCARE CLINIC

Dr. Chad Zehms

Medial Patellofemoral Ligament Reconstruction

Phase 1 – Maximum Protection Phase (0-6 weeks)

Goals for Phase 1

- Protect integrity of repair
- Minimize pain, inflammation, and swelling
- ROM 0-90°, emphasis on extension
- Encourage quadriceps function
- Prevent muscle atrophy
- Scar tissue mobility

Precautions

- No patellar mobility with lateral glides
- Avoid AAROM knee extension with significant quad atrophy or cartilage injury

Immobilization/Weight Bearing

- **0-2 weeks:** FFWB 20# with bilateral crutches
- **2-4 weeks:** Gradually progress full weight bearing with brace and crutches on even surfaces as pain and swelling allows

Brace

- Brace locked in extension with all weightbearing activities for 6 weeks
- Brace may be removed for hygiene and therapy
- Progression of opening brace is dependent controlled pain, appropriate quad strength, and controlled effusion

Range of Motion

- **0-6 weeks:** 0-90°, emphasis on extension
- PROM and AAROM flexion and extension
- 0-90° with no forced flexion

Manual Therapy

- Scar massage
- Gentle flexibility using deep tissue mobilization or "The Stick" – hamstring, quadriceps, gastroc-soleus, ITB
- PROM/AROM knee flexion per ROM guidelines listed above

Strengthening

- Stationary bike: Weeks 4-6 for ROM <90° of knee flexion
- Quadriceps strengthening (NMES for recruitment as appropriate)
- Quad sets, quadriceps isometrics
- Prone TKE
- Hip strengthening
- Gluteal sets, multi-plane open kinetic chain SLR, brace on if quad lag is present
- Hamstring activation; heel slides, hamstring sets, bridges
- Plantarflexion strengthening and ankle pumps
- Core strengthening
- Balance and proprioception as tolerated
- Upper body ergometer

Modalities

- Vaso pneumatic compression for edema management 2-3x/week
- Cryotherapy 3x/day for 20 minutes each with knee elevated above heart
- NMES for quadriceps function
- Home NMES unit with or without a garment to be issued for first 8 weeks following surgery, per MD and therapist discretion
- NMES to be used at home, 3x/day for 20 minutes each time

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Phase 2 – Moderate Protection Phase (6-10 weeks)

Goals for Phase 2

- Minimize pain, inflammation, and swelling
- Full knee ROM
- Pain-free arc of motion
- Good patellar mobility
- Good quad contraction
- Normalize gait with heel-toe pattern
- Discharge knee brace
- Restore normal, pain-free activities of daily living

Precautions

- Consider other procedures that may further limit progression
- Prevent quadriceps avoidance, promote full knee extension during gait

Immobilization/Weight Bearing

- Weight bearing as tolerated

Range of Motion

- Gradually progress with range of motion as tolerated

Brace

- Weaning from brace is dependent controlled pain, appropriate quad strength, and controlled effusion

Manual Therapy

- Gentle flexibility – hamstring, quad, gastroc-soleus, ITB

Strengthening

- Stationary bike for ROM
- Progress seat height and resistance as tolerated
- Progress quadriceps strengthening
- Mini squats, leg press, side planks
- 4-way hip strengthening, hip extension with knee flexion
- Step-ups, bridging, calf raises

Aquatics/Normalize Gait

- Initiate aquatic therapy program
- Underwater treadmill
- Anti-gravity treadmill for gait training
- Low grade elevation and retro walking

Neuromuscular Control

- Proprioception training, and core strengthening
- Double limb support on progressively challenging surfaces
- Progress to single limb support when able to perform with good alignment, stability and control

Modalities

- Vaso pneumatic compression for edema management 2x/week
- Cryotherapy 2x/day for 20 minutes each with knee elevated above heart
- NMES for quadriceps function if quad lag present with SLR

Phase 3 – Advanced Strengthening and Plyometrics (10-18+ weeks)

Goals for Phase 3

- Pain-free ADL's and pre-operative activity level
- Full knee ROM
- Normal gait on unlevel surfaces
- Uncompensated stair negotiation
- Good single limb dynamic balance
- Initiate running and plyometrics (bilateral)
- Achieve optimal patellar tracking during squatting and jumping in place

Precautions

- Avoid symptom provocation
- Correct gait deviations, ROM limitations or impaired patellar tracking

Immobilization/Weight Bearing

- Full without restriction

Range of Motion

- Maintain full ROM

Manual Therapy

- As needed to maintain pain-free motion and flexibility

Strengthening

- Stationary bike or elliptical for warm-up
- Bilateral gym strengthening with progression to unilateral as able; static to dynamic
- Leg press, step ups, side-stepping, calf raises
- Single leg squat
- Multidirectional lunges
- Core strengthening

Aquatics/Normalize Gait

- Swimming and advanced gait
- Promote cross training
- Initiate running progression - late phase
- Initiate bilateral plyometric program at 12 weeks if demonstrating <20% side to side strength deficit, single leg balance >30 seconds, able to complete a 12" lateral step down with good form, no pain or swelling, and evidence of good eccentric quadriceps control
- Submaximal body-weight exercise - pool, GTS, plyo-press, AlterG

Neuromuscular Control

- Advanced proprioception from double to single limb activities on unstable surfaces, different planes of motion and with dual tasking
- Address muscle imbalances

Modalities

- Cryotherapy after activity

Testing to advance to Phase 4 of protocol

- **Functional strength testing** to be scheduled before 12 week follow-up with MD. Appointment must be scheduled with Aurora BayCare Sports Physical Therapy at the 1110 Kepler location. Please contact physician office if unable to make this arrangement for alternative testing.
- Y-Balance testing within 4 cm for anterior reach and within 6 cm for posterior lateral and posterior medial reaches
- Isometric quadriceps testing (<25% difference)
- Single leg squat without display of knee valgus

Phase 4 – Advanced Function and Return to Sport (19-24 weeks)

Goals for Phase 4

- Pain free
- Lack of apprehension with sport specific movements
- Meet individualized sport specific demands including cardiovascular fitness
- Demonstrate optimal patellar tracking with lower extremity alignment during jumping and single leg squats
- 90% limb symmetry index with strength, hop, and agility testing

Precautions

- Pain with therapeutic exercise or pre-operative daily activities
- Inadequate strength, ROM, flexibility and overall fitness with return to sport

Manual Therapy

- Restore flexibility – hamstring, quad, gastroc-soleus, ITB
- As needed to maintain pain-free motion and flexibility

Strengthening

- Continue cross training, stationary bike or elliptical
- Continue to advance lower extremity strengthening

Neuromuscular Control

- Advanced plyometric program with 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 speed/direction with evidence of dynamic single limb stability
- Continue to address muscle imbalances in multiplane, sport-specific tasks on variable surfaces with progression of dual tasking

Modalities

- Cryotherapy after activity

Return to Function Testing: Aurora BayCare return to function for the lower extremity protocol to be used.

- Isometric and isokinetic test >90% limb symmetry index
- Demonstrate symmetry, quality, and alignment during selected movement patterns
- Medical clearance by surgeon
- Lack of apprehension
- Hop test >90% limb symmetry
- Demonstrate quality of movement with required sports specific activities

This protocol was reviewed and updated by Chad Zehms, MD and Katelyn Peterson, PT, DPT on November 10, 2025.