Erick Marigi MD
ORTHOPAEDIC SURGERY & SPORTS MEDICINE

Mayo Clinic in Florida
4500 San Pablo Rd S, Jacksonville, FL, 32224
Ph: 904-953-2496 | Fax: 904-953-2005

Knee Medial Collateral Ligament (MCL) Injury Non-Operative Treatment Guidelines

Outline

Overview:

- The following guidelines are for the non-operative management of the medial collateral ligament (MCL) injuries of the knee utilizing a combination of resources and adapted from the HSS rehabilitation group.
- The recovery curve is divided into four phases based on the patient presentation and grade of the sprain as dictated by the referring provider (Grade 1 – 3).
- Progression is both criteria based and patient specific. Progression should also be in alignment with patient goals.

Grades of MCL Sprains / Injuries:

- Grade 1
  - The MCL sustains a minimal number of torn fibers with localized tenderness and no laxity. These sprains typically present with full or near full range of motion (ROM) with little or no swelling or accompanying quadriceps inhibition.
  - Athletes with grade 1 sprains usually progress quickly and return to contact sports in 2 – 4 weeks with physician clearance.
- Grade 2
  - The MCL sustains a greater degree of ligamentous disruption with slight to moderate laxity that will require an element of protection (weight bearing precautions).
  - Grade 2 sprains in athletes typically result in a 4 - 6 weeks of rehabilitation and return to contact sports wearing a brace if the sport allows.
- Grade 3
  - The MCL sustains a complete tear of the ligament with disruption of fibers and demonstrable laxity.
  - Grade 3 sprains tears typically will require operative intervention. However, in low activity level patients or those willing to modify their lifestyle, non-operative treatment in the form of functional bracing and subsequent strengthening may play a role.
  - If non operative treatment is selected, a 6 - 8 week course of rehabilitation is typically required.

This protocol is not meant to be prescriptive but a recommendation to guide the rehabilitation process. Each patient's progress may vary based on specifics of their injury and procedure.

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Phase 1 – Weeks 0 - 2

Precautions:

- Avoid exercises and activities that increase pain and/or swelling
- Avoid end range stretching if empty end feel is present
- Weight bearing (WB) precautions as prescribed by physician (grades 2 and 3)

Assessment:

- NRS, LEFS, Lower extremity (LE) active range of motion (AROM) and passive range of motion (PROM)
- Quality of quadriceps contraction: good, fair, poor | Straight leg raise (SLR) in supine: with or without lag
- Gait: with / without assistive device | Prior / current level of function

Treatment Recommendations:

- Patient education – Understanding valgus stress on the knee
  - Activity modifications to decrease or eliminate pain and swelling
  - Understanding the importance of compliance with the home exercise program (HEP)
  - Management of pain and effusion - Protect, rest, ice, compression, elevation (PRICE)
- Manual therapy – Joint mobilizations (Patella mobilization), Soft tissue massage (Myofascial release)
- ROM / Flexibility – AAROM and AROM exercises (if braced may open unless not permitted by physician)
  - Stretching, Foam rolling, Stationary bike, Aquatic therapy if available
- Neuromuscular electric stimulation (NMES) quadriceps
  - Grade 1 – Standing terminal knee extension (TKE) | Delay for grades 2 and 3 until > 50% WB
- Strengthening
  - Progressive resistance exercises (PRE) – Consider blood flow restriction to low demand exercises
    - Quadriceps, Quadriceps sets, SLR (Lock brace at 0˚ if there is a quadriceps lag), Hamstrings Hip abductors, Grade 1: Hip adductors when no pain (delay for grades 2 and 3)
  - LE stabilizers proximal / distal to the knee – Advance WB exercise as prescribed
  - Upper Extremity (UE) and core strengthening without limit as long as there is no injury to the knee
- Functional training
  - Gait – Follow physician's prescribed brace and WB restrictions, typically:
    - Grade 1: WBAT | Grade 2-3: protected WB as per physician's instructions
    - Progressively wean off assistive device based on recommendation and gait normalization
  - Stairs – Non-reciprocal pattern

Criteria for Advancement:

- Minimal to no swelling present | Able to perform a SLR without an extensor lag
- Improved knee ROM – Full knee extension to 110° knee flexion

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Phase 2 – Weeks 3 - 6

Precautions:

- Avoid premature return to activity | Avoid stretching / overloading the injured ligament

Assessment:

- NRS, LEFS, Lower extremity (LE) active range of motion (AROM) and passive range of motion (PROM)
- Quality of quadriceps contraction: good, fair, poor | Straight leg raise (SLR) in supine: with or without lag
- Gait: with / without assistive device | Bilateral Squat | Single Leg Balance | Step up

Treatment Recommendations:

- Patient education – Progressive activity modification (0 / 10 with all ADL's)
    - Movement strategies (importance of hip strategy versus knee strategy)
    - Edema management: Protect, rest, ice, compression, elevation (PRICE), Modalities as Needed
- Manual therapy
    - Joint mobilizations (Patella All planes, Tibiofemoral Anterior / Posterior)
    - Soft tissue massage as needed (Myofascial release)
- ROM / Flexibility – Achieve full and painless AROM, Stretching, Foam rolling
- Strengthening
    - Progressive resistance exercises (PRE) – Consider blood flow restriction to low demand exercises
        - Quadriceps, Medial Hamstrings, Hip abductors, Hip adductors
            - Grade 3: Hold isolated adductor strengthening until weeks 4 – 6
    - LE stabilizers proximal / distal to the knee – Advance WB exercise as prescribed
    - Emphasize closed kinetic chain exercises < 90° flexion
        - TKE, Static lunges, Leg press: double leg → eccentric → single leg
    - Open kinetic chain quadriceps strengthening isometrics at 60° progressing to limited arc isotonics
    - Upper Extremity (UE) and core strengthening without limit as long as there is no injury to the knee
- Balance and proprioception, while observing WB precautions if any → Progress to single leg balance
- Functional training – Gait – Retrograde Treadmill, Squat emphasizing hip strategy
    - Forward step ups (FSU) progress from 6 – 8" and Forward step downs (FSD) progress from 4 – 6"
- Cardiovascular – Stationary bicycle

Criteria for Advancement:

- Successful reduction of Pain and edema as activity increases
- Full knee ROM and 5/5 strength quadriceps and hamstrings
- Able to perform symmetrical squat with proper alignment and control
- Able to perform pain-free FSU 8" and FSD 6" with proper alignment and control
- Able to perform single leg balance without compensation
- Demonstrates frontal plane knee stability during functional tasks such as FSU and FSD

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Phase 3 – Weeks 7 - 10

Precautions:

- Avoid premature return to activity, compensatory movement strategies, and premature MCL overloading

Assessment:

- NRS, LEFS, NPRS, LE flexibility and strength
- Squat (Bilateral → Unilateral) | Single leg balance
- Effects of muscle fatigue on movement patterns, quality or pain
- Ongoing efficacy of external support (brace, taping)
- Functional step up and step down

Treatment Recommendations:

- Patient education – Functional Progression and Importance of Adequate rest / recovery
- Manual therapy – Soft tissue massage to musculature as needed
- Flexibility – Stretching and Foam rolling as needed
- Strengthening and Functional Training
    - Progression of isotonic exercises – Double leg → Single leg exercises and Body weight → Resistance
    - Full kinetic chain exercises | Aquatic therapy if available (sport specific, higher level of resistance)
- Isokinetic exercise if available (high to moderate velocities)
- Balance and proprioception – Dynamic proprioceptive exercises and perturbation training
- Forward Step Downs (FSD) 8" – Single / Double leg squat
    - Jumping (Bilateral vertical → Forward → Lateral)
    - Hopping (Single alternating → Single unilateral | Vertical → forward → lateral)
- Running program – Progress distance and speed
- Cardiovascular conditioning – Elliptical | Stationary bike (Progressively increase resistance)

Criteria for Discharge or Advancement to Phase 4 (If Returning to Sport):

- Demonstrate FSD 8" with proper form and control
- Demonstrate unilateral squat with proper alignment and control
- Proper utilization of full kinetic chain during exercise
- Complete running program without limitations if applicable

Emphasize:

- Importance of adherence to HEP
- Pain-free exercise
- Quality of functional activities
- Proper knee alignment with functional strengthening – Avoid dynamic valgus

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Phase 4 – Return to Play

Precautions:

- Avoid premature return to play and dynamic valgus alignment during sport specific training

Considerations:

- Sport, Position, Need for Functional Athletic Brace

Assessment:

- LEFS, NPRS, Functional movement screen (Quality of movement, e.g., symmetry, pain)
- Special tests, e.g., Swain test, valgus laxity test
- Physical performance tests
    - Star excursion test
    - Hop tests, e.g.: Single hop for distance, Crossover hop, Triple hop for distance, 6-meter timed hop
    - Isokinetic testing if available

Treatment Recommendations:

- Running – Progress to shuttle runs, sprinting (Distances required by sport)
- Plyometrics – Progress resistance and endurance, sport specific
- Agility – Ladder, hurdles, cutting drills
- Sport specific drills

Criteria for Discharge:

- Isokinetic testing if available: ≥ 90% strength of contralateral limb (average peak torque, total work)
- Demonstrate quality movement on functional movement screen
- > 90% of contralateral limb on hop tests
- > 90% of contralateral limb on star excursion test
- No symptoms with sprinting
- No symptoms with sport-specific multidirectional movements and plyometrics
- Achieved established performance levels for their sport and position

Emphasize:

- Sport specific drills without valgus
- Importance of recognizing fatigue

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