



**Central Indiana Orthopedics**

INVESTED IN KEEPING YOU ACTIVE

**Brian E. Camilleri, DO**

2610 Enterprise Dr  
Anderson, IN 46013  
Phone: (765) 683-4400  
Fax: (765) 642-7903  
[www.ciocenter.com](http://www.ciocenter.com)

## **NON-OPERATIVE MCL TEAR REHABILITATION PROTOCOL**

The intent of this protocol is to provide the clinician with a guideline for a non-operative rehabilitation course of a patient with an isolated medial cruciate ligament injury. It is by no means intended to be a substitute for one's clinical decision making regarding the progression of a patient's course based on their physical exam/findings, individual progress, and/or the presence of complications. If a clinician requires assistance in the progression of the patient please consult with Dr Camilleri.

Please reference the exercise progression sheet for timelines and use the following precautions during your treatments. Thank you for progressing all patients appropriately and please fax all progress notes to Dr. Camilleri's office or hand deliver with the patient. Successful treatment requires a team approach and we value your care for the patient as well as your input. Please contact Dr. Camilleri at any time with your input on how to improve the therapy protocol.



## AQUATIC/LAND BASED CLINICAL PROTOCOL FOR GRADE I/II MCL INJURY

**FREQUENCY:** 2-3 times per week.

**DURATION:** 4-6 weeks based on Physical Therapy evaluation findings. Estimated length of treatment to discharge is 6-12 weeks. Continued formal treatment beyond meeting Self-Management Criteria will be allowed when:

- 1) Patient out of work or to hasten return to work full duty.
- 2) Athlete needs to return to organized athletic program.

**DOCUMENTATION:** Progress Note to physician at each follow-up appointment. Follow treatment calendar for daily requirements. Discharge Summary within two weeks of discharge.

### **INITIAL EVALUATION (WEEK ONE)**

#### **GOALS:**

1. Evaluation to assess gait pattern, active/passive range of motion, quadriceps recruitment, strength, joint instability, patellar mobility, and pain/inflammation.
  2. Active range of motion -10° to 70°.
  3. Independent with home exercise program and edema reduction techniques.
  4. Orient patient to pool program and give information packet.
- Initiate a formal course of rehabilitation 2-3 times per week until **SELF-MANAGEMENT CRITERIA** has been met. Frequency of weekly appointments will depend on patient's availability, working status, and choice/interest. When patient meets the following **SELF-MANAGEMENT CRITERIA** (estimated at 3-6 weeks):
- Symmetrical hip and ankle active range of motion.
  - Knee active range of motion 0-130°.
  - Good voluntary contraction of quadriceps complex particularly that of the vastus medialis oblique.
  - Minimal to no limitations in patellar mobility.
  - Normal gait pattern.
  - 4+/5 quadriceps and hamstring strength.
  - Trace to 1+ effusion.

then patient can be instructed in either home exercise program or program to be performed at a local health club with follow-up appointments every month until discharge criteria has been met.



## DISCHARGE CRITERIA

- No evidence of knee instability.
- Knee active/passive range of motion symmetrical to uninvolved knee.
- Patellar mobility symmetrical to uninvolved knee.
- No effusion.
- 5/5 strength of hip and ankle musculature.
- Return to work full duty.
- Met, or consistently progressing toward, established functional/objective outcomes.
- Failure to progress.
- Failure to comply.

Often times, return to sports activity is a goal after MCL injury. The patient can return to sports when the following criteria has been met:

- Full range of motion.
- No swelling.
- No evidence of instability.
- Complete walk/jog program, one legged hop for distance test, and timed hop test is 90% as compared to uninvolved knee.
- Use of functional knee brace with medial stabilizer if deemed necessary by physical therapist/physician.

## --TREATMENT GUIDELINES--

### GRADE I INJURY

#### WEEK 1 TO 2

GOAL: Meet SELF-MANAGEMENT CRITERIA.

BRACE: +/- bracing per physician discretion and according to laxity.

#### LAND COMPONENT:

- Modalities as indicated to control pain/inflammation.
- FES for muscle re-education of the quadriceps complex emphasizing the vastus medialis oblique if inhibition noted for multi-angle isometrics at 90°, 60°, and 30°.
- Manual patellar mobilization emphasizing medial glide and tilt.
- Patient performing home exercise program for isotonic/Theraband strengthening program to include abdominals, back extensors, squats, calf raises, multi-hip, hamstring curls, and ankle Theraband.
- Perform balance/proprioception activities.

#### WATER COMPONENT:

Shallow Water: (May add hydrofit cuffs at this phase to increase resistance)

- Walking forward/backward/sideways, clapping under, clapping behind, four-count walking kicks forward/backward, lunges forward/backward, straight leg walking forward/backward, squats, toe raises, step-ups forward and lateral.
- PRE's → Hip/Knee/Ankle exercises open chain all planes.
- Balance/Proprioception → Kickboard push/pull with added diagonals two-legged progressing to one-legged, one-legged balance with eyes open/eyes closed, tubing exercises in upper extremities two-legged progressing to one-legged multi-directional.



## **GRADE I INJURY**

### **WEEK 1 TO 2 (continued)**

#### **WATER COMPONENT:**

Deep Water:

Open Chain Exercises:

- Splits/Spreads, single/double knee to chest, corkscrews, bicycling, running supine ← → prone, sidelying running forward/backward, deep water running with/without tethers.

Closed Chain Exercises:

- Barbell/Kickboard squats two-legged progressing to one-legged with added 180's/ 360's, teeters, and standing barbell propulsion forward/backward.

### **WEEKS 3 TO DISCHARGE**

GOAL: Meet Discharge Criteria.

BRACE: +/- bracing per physician discretion according to laxity.

#### **LAND COMPONENT:**

- Continue with treatment as indicated in Week 1 to 2.
- Progress weights and strengthening program as indicated.
- Perform one-legged hop test for distance and for time.

#### **WATER COMPONENT:**

(Shallow and Deep Water):

- Continue with treatment as indicated by Week 1 to 2. Emphasis on increased resistance using either fins, cuffs, or tethers.
- Add sports specific exercises and plyometrics.

## **GRADE II INJURY**

### **WEEK ONE**

GOALS:

1. Active range of motion -10° to 70°.
2. Independent weight bearing as tolerated gait pattern with use of crutches and brace on if appropriate.
3. Independent with home exercise program and edema reduction techniques.

BRACE: Hinged long leg brace bent into varus. Range of motion limit -10° of extension. Brace per physician discretion.

CRUTCHES: Weight bearing as tolerated gait pattern.

PRECAUTIONS: Avoid valgus stress/adduction on lower extremity.



## **GRADE II INJURY (continued)**

### **WEEK ONE (continued)**

#### **LAND COMPONENT:**

- Modalities as indicated to decrease pain/inflammation.
- Patellar mobilization emphasizing superior glide and medial glide and tilt.
- Manual stretching of quadriceps, soleus, and hamstrings.
- Isometric sets for quadriceps and hamstrings.
- Instruct in home exercise program, edema reduction techniques, and weight bearing as tolerated gait pattern with use of crutches and brace on if appropriate.

#### **WATER COMPONENT:**

##### Shallow Water:

- Walking forward/backward/sideways emphasizing equal weight bearing and ambulating without flexed knee. (May use underwater FES/EMG for quadriceps complex emphasizing vastus medialis oblique if inhibition noted.)
- Perform clap under, clap behind, partial squats, toe raises, modified lunges, straight leg walk, all exercises forward/backward.
- Open chain PRE's for hip/knee/ankle avoiding valgus stress on knee. Perform gastrocnemius stretch.

##### Deep Water:

- Splits/Spreads (emphasis on abduction vs. adduction), corkscrews, single knee to chest, double knee to chest, and bicycling.

### **WEEK TWO**

#### **GOALS:**

1. Active range of motion 0-100°.
2. Good recruitment of vastus medialis oblique.
3. 1+ effusion.

**BRACE:** Continue with hinged long leg brace with range of motion limit -10° of extension as per physician discretion.

**CRUTCHES:** Can wean off crutches with brace on/off as per physician discretion.

#### **LAND COMPONENT:**

- Modalities as indicated to decrease pain/inflammation.
- Patellar mobilization emphasizing superior glide and medial glide and tilt.
- Continue with home exercise program as in Day 1 to 7.

#### **WATER COMPONENT:**

##### Shallow Water: (May add hydrofit cuffs at this phase to increase resistance)

- Continue as in Week 1 adding four-count walking kicks forward/backward.
- Initiate balance/proprioception activities with eyes open/eyes closed using kickboard and tubing with eyes open and progressing to eyes closed.

##### Deep Water:

- Continue as in Week 1 adding supine ← → prone exercises, standing on kickboard or barbell with





upper extremity propulsion forward/backward. Add squats on kickboard/barbell.

## **GRADE II INJURY (continued)**

### **WEEK THREE**

#### **GOALS:**

1. Active range of motion 0-125°.
2. No effusion.
3. Normal gait pattern with brace on.

**BRACE:** Continue with hinged long leg brace with range of motion limit -10° of extension if appropriate.

#### **LAND COMPONENT:**

- Continue with treatment as indicated in Week Two.
- Continue with manual stretching, patellar mobilization, and functional electrical stimulation as indicated.
- Home exercise program to be performed for comprehensive isotonic/Theraband strengthening program to include abdominals, back extensors, partial squats, calf raises, hamstring curls, and multi-hip machine. Brace to be worn while performing multi-hip exercises. Theraband for ankle/foot musculature.

#### **WATER COMPONENT:**

##### **Shallow Water:**

- Continue with treatment as indicated in Weeks 1 to 2 adding increased resistance/ turbulence.

##### **Deep Water:**

- Continue with treatment as indicated in Weeks 1 to 2 adding 180°/360° squats on barbell/ kickboard, running in deep end with/without tethers, teeters on barbell with added 180°/360°, and perform sidelying running forward/backward.

### **WEEKS 4 TO 5**

#### **GOALS:**

1. Meet SELF-MANAGEMENT CRITERIA.
2. Progress to land by week six.

**BRACE:** Can discontinue brace if no medial laxity or pain with valgus stress testing as determined by physician.

#### **LAND COMPONENT:**

- Continue with manual stretching and patellar mobilization as indicated.
- Continue with comprehensive home strengthening program.
- Progress balance/proprioception activities.
- Continue to progress aerobic conditioning on land using the following: Stairmaster, cross country ski device, stationary bicycle, walking.

#### **WATER COMPONENT:**

##### **(Shallow and/or Deep Water):**

- Continue as previously outlined water treatment. Can begin sports specific exercises, plyometrics, or work simulated activities. May continue to add increased resistance with cuffs, fins, or tethers.



## **GRADE II INJURY (continued)**

### **WEEKS 6 TO DISCHARGE**

#### **GOAL:**

1. Meet DISCHARGE CRITERIA.
  2. Completely transitioned to land at this phase.
- 
- Continue with comprehensive isotonic strengthening program.
  - Continue with muscular and cardiovascular endurance program utilizing stairmaster, cross country ski device, stationary bicycle, walking, water walking, and walk/jog program.
  - Continue to progress functional rehabilitation program. Activities and exercises should be sports specific.
  - Perform one legged hop test for distance and for time. Involved leg must be 90% as compared to uninvolved leg.