



**Brian B. Gilmer, MD**  
US Ski Team Physician

**Karly M. Dawson PA-C**  
Teaching Associate

## REHABILITATION GUIDELINES FOR AUTOLOGOUS CULTURED CHONDROCYTES ON PORCINE COLLAGEN MEMBRANE (MACI IMPLANT) TIBIOFEMORAL LESIONS

### PHASE I (0-6 WEEKS POST-OP)

DATES:

Appointments	MD appointment at (10-14 days post-op) Begin physical therapy (3-5 days post-op)
Rehabilitation Goals	<ul style="list-style-type: none"><li>• Early ROM of knee</li><li>• Pain and Edema control</li><li>• Protect and promote cell adherence and proliferate growth to graft</li></ul>
Precautions	<ul style="list-style-type: none"><li>• <b>TTWB x 0-4 weeks, 25% WB progression each week to 50%PWB by 6 weeks (WB may change if bipolar lesions exist)</b></li><li>• <b>Brace locked in extension with gait, unlocked for ROM non-weight bearing, on at all times unless in CPM or in therapy.</b></li><li>• <b>ROM slow progression to full by 6 weeks (0-2 weeks 0-30°, 2-3 weeks 30-90°, 4-6 weeks 90-130°)</b></li><li>• <b>No open kinetic chain quad strength x 6 weeks</b></li></ul>
Suggested Therapeutic Exercises	<ul style="list-style-type: none"><li>• CPM day 1 post-op set 0-30 with slow progression of ROM as tolerated</li><li>• Ankle ROM</li><li>• Quad sets, Hamstring sets, Glut sets</li><li>• Passive/active heels slides</li><li>• 4-way hip (once quad activation allows)</li><li>• Clam-shells</li><li>• 4-6 weeks bilateral calf raises</li><li>• Gait training</li></ul>
Cardiovascular Exercises	<ul style="list-style-type: none"><li>• <b>Stationary Bike (no resistance)</b></li></ul>
Progression Criteria	<ul style="list-style-type: none"><li>• Pain free ROM to 130</li><li>• Able to do SLR without extension lag</li></ul>

## PHASE II (6-12 WEEKS POST-OP)

DATES:

Appointments	Continue physical therapy (2x week)
Rehabilitation Goals	<ul style="list-style-type: none"> <li>• Full pain free AROM</li> <li>• Normal gait pattern pain free</li> </ul>
Precautions	<ul style="list-style-type: none"> <li>• Progress to FWB weaning from crutches and brace</li> <li>• <b>No impact (running or jumping) x 12 weeks</b></li> <li>• <b>No cutting, pivot motions, or heavy impact x 6 months</b></li> </ul>
Suggested Therapeutic Exercises	<ul style="list-style-type: none"> <li>• Progress closed kinetic chain exercises from double leg to single leg</li> <li>• Balance progressing from double leg to single leg</li> <li>• Proprioception work</li> <li>• Squats, lunges, slowly initiate lateral motions (weight supported progressing to full body weight)</li> <li>• Step up/down</li> <li>• Normalize gait training without assistive devices</li> </ul>
Cardiovascular Exercises	<ul style="list-style-type: none"> <li>• Stationary Bike with progressive resistance</li> <li>• Walking on level ground</li> </ul>
Progression Criteria	<ul style="list-style-type: none"> <li>• Pain free normal gait pattern</li> <li>• Pain free ROM with weight bearing positions</li> </ul>

## PHASE III (3-6 MONTHS POST-OP)

DATES:

Appointments	Continue physical therapy (1-2x week progressing to prn)
Rehabilitation Goals	<ul style="list-style-type: none"> <li>• Return to pain free strenuous daily activity</li> <li>• Pain free stairs</li> <li>• Return to work</li> </ul>
Precautions	<ul style="list-style-type: none"> <li>• <b>No cutting, pivot motions, or heavy impact x 6 months</b></li> <li>• <b>No return to sport unless pass a return to sport test at 9 months</b></li> <li>• <b>No running outside on uneven surfaces x 9 months</b></li> </ul>
Suggested Therapeutic Exercises	<ul style="list-style-type: none"> <li>• Continue with Phase II strength progression</li> <li>• Agility drills</li> <li>• Single leg balance and strength progression</li> <li>• Balance and proprioception progression on uneven surfaces</li> </ul>
Cardiovascular Exercises	<ul style="list-style-type: none"> <li>• Bike outside</li> <li>• Walking</li> </ul>

	<ul style="list-style-type: none"> <li>• Running progression on controlled surfaces</li> </ul>
Progression Criteria	<ul style="list-style-type: none"> <li>• Pass a return to sport test prior to sport specific recreational activities at 9 months post-op</li> <li>• Able to walk pain free &gt; 3 miles on all terrain</li> </ul>

References: MACI Rehabilitation Manual, Jay Ebert, PHD, AEP ESSAM, Hollywood Functional Rehabilitation Clinic, School of Sport Science (Exercise and Health), University of Western Australia

### **MAMMOTH ORTHOPEDIC INSTITUTE**

85 Sierra Park Road ▪ Mammoth Lakes, CA 93546 ▪ 760.924.4084  
 162 South Main Street ▪ Bishop, CA 93514 ▪ 760.872.7766

### **SIERRA PARK PHYSICAL AND OCCUPATIONAL THERAPY**

85 Sierra Park Road ▪ Mammoth Lakes, CA 93546 ▪ 760.934.7302  
 162 South Main Street ▪ Bishop, CA 93514 ▪ 760.872.2942