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## REHABILITATION GUIDELINES FOR ACL RECONSTRUCTION WITH MICROFRACTURE OR CARTIFORM/BIOCARTILAGE (FEMORAL CONDYLE OR TIBIAL PLATEAU)

### PHASE I (0-3 WEEKS)

DATES:

Appointments	Begin physical therapy 2-3x/week, beginning 2-5 days post-op
Rehabilitation Goals	<ul style="list-style-type: none"> <li>• Full extension symmetrical to contralateral knee by the first post-op visit at 2 weeks</li> <li>• Flexion to 120°</li> <li>• 20° SLR without quad lag</li> </ul>
Precautions	<p><b>Brace:</b></p> <ul style="list-style-type: none"> <li>• x 6 weeks, unlocked, full ROM allowed</li> </ul> <p><b>WB:</b></p> <ul style="list-style-type: none"> <li>• NWB x 6 weeks with crutches</li> </ul>
Suggested Therapeutic Exercises	<ul style="list-style-type: none"> <li>• Prolonged extension: prone hang, supine with roll under ankle</li> <li>• Heel slides, wall slides</li> <li>• Isometric quad set, then SLR</li> <li>• Hamstring isometrics</li> <li>• 4-way hip and ankle exercises including calf pumps</li> <li>• Patellar mobilizations (especially cranially)</li> <li>• Ice 5x/day, 20min each time; especially after exercises</li> </ul>
Cardiovascular Exercises	<ul style="list-style-type: none"> <li>• Stationary bike no resistance, use non-operative leg for pedaling</li> </ul>
Progression Criteria	<ul style="list-style-type: none"> <li>• Knee flexion to 120 degrees</li> <li>• 20 degree SLR without lag</li> </ul>

### PHASE II (3-6 WEEKS)

DATES:

Appointments	<ul style="list-style-type: none"> <li>• Continue physical therapy 2-3x/week</li> </ul>
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(Phase II continued) Rehabilitation Goals	<ul style="list-style-type: none"> <li>• Full ROM</li> <li>• Advanced strengthening</li> <li>• Consider early neuromuscular retraining</li> <li>• Off of crutches and knee brace</li> </ul>
Precautions	<p><b>Brace:</b></p> <ul style="list-style-type: none"> <li>• Wear brace except for sleeping, exercises</li> </ul> <p><b>WB:</b></p> <ul style="list-style-type: none"> <li>• Continue NWB with crutches x 6 weeks post op</li> </ul>
Suggested Therapeutic Exercises	<ul style="list-style-type: none"> <li>• AVOID OPEN CHAIN RESISTIVE ESPECIALLY WITH WEIGHTS</li> <li>• Continue exercises from phase I</li> </ul>
Cardiovascular Exercises	<ul style="list-style-type: none"> <li>• Stationary bike no resistance, use non-operative leg for pedaling</li> </ul>
Progression Criteria	<ul style="list-style-type: none"> <li>• DC brace at 6 weeks post-op</li> <li>• DC crutches at 6 weeks if adequate quad control for gait on level surfaces</li> <li>• Full knee ROM</li> <li>• Minimal effusion</li> <li>• Functional control for ADLs achieved</li> </ul>

**PHASE III (6 WEEKS – 3 MONTHS)**

**DATES:**

Appointments	<ul style="list-style-type: none"> <li>• Continue physical therapy 1-2x/week</li> <li>• HEP 5 x/week</li> </ul>
Rehabilitation Goals	<ul style="list-style-type: none"> <li>• Progress to closed chain exercises</li> <li>• Maintain full ROM</li> <li>• Progress neuromuscular retraining program</li> <li>• Core integration</li> </ul>
Precautions	<ul style="list-style-type: none"> <li>• No downhill walking/running, downhill skiing, downhill biking</li> </ul>
Suggested Therapeutic Exercises	<ul style="list-style-type: none"> <li>• Closed chain exercises:             <ul style="list-style-type: none"> <li>- mini squat/wall squats</li> </ul> </li> </ul>

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(Phase III continued) Suggested Therapeutic Exercises	<ul style="list-style-type: none"> <li>- lunges</li> <li>- bridges</li> <li>- step ups/downs</li> <li>- calf raises</li> <li>• Initiate proprioceptive/balance exercises:                         <ul style="list-style-type: none"> <li>- single leg stance</li> <li>- weight shifts forward, retro, lateral and progress to varying surfaces</li> <li>- wobble board</li> </ul> </li> <li>• If pool available begin:                         <ul style="list-style-type: none"> <li>- 4 way hip</li> <li>- lateral movement</li> <li>- deep water jogging in place (no freestyle or frog/breaststroke kick)</li> </ul> </li> <li>• Strengthening:                         <ul style="list-style-type: none"> <li>- sport cord</li> </ul> </li> </ul>
Cardiovascular Exercises	<ul style="list-style-type: none"> <li>• Stationary bike, or road bike outdoors on flat roads only</li> </ul>
Progression Criteria	<ul style="list-style-type: none"> <li>• Neuromuscular exercises without difficulty</li> </ul>

**PHASE IV (3 TO 5 MONTHS)**

**DATES:**

Appointments	<ul style="list-style-type: none"> <li>• Continue physical therapy 1-2 x/week</li> <li>• HEP 5 x/week</li> </ul>
Rehabilitation Goals	<ul style="list-style-type: none"> <li>• Running patterns at 75% speed</li> <li>• Good jumping mechanics- NO DYNAMIC VALGUS</li> <li>• Hopping drills without difficulty</li> </ul>
Precautions	<ul style="list-style-type: none"> <li>• No downhill walking/running, downhill skiing, downhill biking until 4.5 months</li> </ul>
Suggested Therapeutic Exercises	<ul style="list-style-type: none"> <li>• Agility drills:                         <ul style="list-style-type: none"> <li>- Shuffling</li> <li>- Hopping</li> <li>- running patterns</li> <li>- figure 8</li> </ul> </li> <li>• Sport specific closed-chain exercises:                         <ul style="list-style-type: none"> <li>- leg press (0-60°)</li> <li>- step ups</li> </ul> </li> </ul>

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(Phase IV continued) Suggested Therapeutic Exercises	<ul style="list-style-type: none"> <li>- mini squats (0-60°)</li> <li>- short arc quad (30-90°)</li> <li>- hamstring curls with light weight/high repetition</li> <li>• Light running/hopping without pain or swelling (beginning 12 weeks)</li> </ul>
Cardiovascular Exercises	<ul style="list-style-type: none"> <li>• Begin endurance closed-chain exercises 3-4x/week: Stairmaster, stationary bike, elliptical, NordicTrack (short stride). Focus on increasing endurance.</li> <li>• Continue gait training: progress from fast walking to light jogging and running on treadmill or even ground (may begin running at 12 weeks)</li> <li>• Pool available: may start freestyle swimming (avoid frog/breaststroke kick), progress to shallow water jogging</li> </ul>
Progression Criteria	<ul style="list-style-type: none"> <li>• Running, hopping/agility drills without knee effusion or pain</li> </ul>

**PHASE IV (5 TO 8 MONTHS)**

**DATES:**

Appointments	<ul style="list-style-type: none"> <li>• Continue physical therapy 2 visits per month to review HEP</li> <li>• HEP 4-5x per week</li> <li>• Return to sport testing prior to 9 month MD visit</li> </ul>
Rehabilitation Goals	<ul style="list-style-type: none"> <li>• Slow progression from fast walking to slow jogging on even ground or treadmill, or hill work.</li> <li>• May begin plyometric program; jump rope exercises</li> <li>• Return to sport</li> </ul>
Precautions	<ul style="list-style-type: none"> <li>• No downhill walking/running, downhill skiing, downhill biking until 4.5 months</li> <li>• No cutting, jumping or pivoting</li> <li>• Earliest return to full sports = 9 months</li> </ul>
Suggested Therapeutic Exercises	<ul style="list-style-type: none"> <li>• Progress agility drills:             <ul style="list-style-type: none"> <li>- shuffling</li> <li>- hopping (double and single leg)</li> <li>- running patterns</li> </ul> </li> <li>• Sport specific plyometric program:             <ul style="list-style-type: none"> <li>- fast straight running</li> <li>- backward running</li> <li>- cutting, cross-overs, carioca, etc. in controlled environment</li> </ul> </li> </ul>

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(Phase V continued) Cardiovascular Exercises	<ul style="list-style-type: none"> <li>• Pool available: may advance swimming (avoid frog/breaststroke kick)</li> </ul>
Progression Criteria	<ul style="list-style-type: none"> <li>• Quadriceps and hamstring strength at least 90% of opposite leg</li> <li>• Single leg hop test and vertical jump at least 90% of opposite leg</li> <li>• Jog, full speed run, shuttle run, and figure 8 running without a limp</li> <li>• Full controlled acceleration and deceleration</li> <li>• Squat and rise from a full squat</li> <li>• No effusion or quadriceps atrophy</li> </ul>

References: Mammoth Orthopedic Institute

PT name and date: Andrea Dillon 6/24/2016

MD name and date: Approved by MD 6/24/2016

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