

## REHABILITATION GUIDELINES FOR ACL RECONSTRUCTION WITH MICROFRACTURE OR CARTIFORM/BIOCARTILAGE (TROCHLEA OR PATELLA)

PHASE I (0-3 WEEKS)

DATES:

Appointments	<ul style="list-style-type: none"> <li>• Begin physical therapy 2-5 days post op</li> <li>• Physical therapy 2-3x/week</li> <li>• MD visit at 2 weeks post op</li> </ul>
Rehabilitation Goals	<ul style="list-style-type: none"> <li>• By 1<sup>st</sup> post op visit at 2 weeks:             <ul style="list-style-type: none"> <li>- full extension symmetrical to contralateral knee</li> <li>- Flexion to 120°</li> <li>- 20° SLR without quad lag</li> </ul> </li> </ul>
Precautions	<p><b>Brace:</b></p> <ul style="list-style-type: none"> <li>• Brace locked in extension for ambulation x 6 weeks</li> <li>• May unlock brace at rest in sitting.</li> </ul> <p><b>WB:</b></p> <ul style="list-style-type: none"> <li>• WBAT 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>• Isometric quad set, then SLR</li> <li>• Hamstring isometrics</li> <li>• 4-way hip and ankle exercises</li> <li>• Initiate proprioceptive/balance exercises to include single leg stance, weight shifts forward, retro, lateral</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</li> </ul>

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(Phase I continued) Progression Criteria	<p><b>Brace:</b></p> <ul style="list-style-type: none"> <li>Continue brace x 6 weeks</li> </ul> <p><b>WB:</b></p> <ul style="list-style-type: none"> <li>DC crutches when quad control returns, full extension achieved, stable with low fall risk.</li> <li>May be weaned to 1 crutch with full extension but seem unsteady in gait.</li> </ul>
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### PHASE II (3-6 WEEKS)

DATES:

Appointments	<ul style="list-style-type: none"> <li>Continue physical therapy 2-3x/week</li> </ul>
Rehabilitation Goals	<ul style="list-style-type: none"> <li>Full ROM</li> <li>Advance strengthening</li> <li>Consider early neuromuscular retraining</li> </ul>
Precautions	<ul style="list-style-type: none"> <li>Continue to wear brace at all times except for sleeping, exercises</li> <li>DC brace at 6 weeks post-op if adequate quad control for gait on level surfaces</li> </ul>
Suggested Therapeutic Exercises	<ul style="list-style-type: none"> <li>AVOID OPEN CHAIN RESISTIVE ESPECIALLY WITH WEIGHTS</li> <li>Continue to progress exercises from phase I</li> </ul>
Cardiovascular Exercises	<ul style="list-style-type: none"> <li>Stationary bike; no resistance</li> </ul>
Progression Criteria	<ul style="list-style-type: none"> <li>Full ROM</li> <li>Minimal Effusion</li> <li>Functional control for ADL's 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 5x per week</li> </ul>
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<p>(Phase III continued)</p> <p>Rehabilitation Goals</p>	<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> <li>• Light running/hopping without pain or swelling (beginning at 12 weeks)</li> </ul>
<p>Precautions</p>	<ul style="list-style-type: none"> <li>• No downhill walking/running, downhill skiing, downhill biking</li> </ul>
<p>Suggested Therapeutic Exercises</p>	<ul style="list-style-type: none"> <li>• Closed chain exercises:             <ul style="list-style-type: none"> <li>- Bridge</li> <li>- mini squats/wall squats</li> <li>- step ups</li> <li>- hip extension</li> <li>- hip ABD/ADD</li> </ul> </li> <li>• heel raises</li> <li>• Progress neuromuscular proprioceptive/balance exercises including single leg balance progression- varying surfaces</li> <li>• Pool:             <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>- mini squats</li> <li>- lunges</li> <li>- bridge</li> <li>- calf raises</li> <li>- sport cord</li> <li>- wall squats</li> <li>- step up/down</li> </ul> </li> </ul>
<p>Cardiovascular Exercises</p>	<ul style="list-style-type: none"> <li>• Stationary bike with resistance as tolerated</li> <li>• Elliptical</li> <li>• Stairmaster</li> </ul>
<p>Progression Criteria</p>	<ul style="list-style-type: none"> <li>• Neuromuscular exercises without difficulty</li> </ul>

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### PHASE IV (3 TO 5 MONTHS)

DATES:

Appointments	<ul style="list-style-type: none"> <li>Continue physical therapy 1-2x per week</li> <li>HEP 5x per 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>Hop 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 (Ex: 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> <li>mini squats (0-60°)</li> <li>short arc quad (30-90°)</li> <li>hamstring curls with light weight/high repetition</li> </ul> </li> </ul>
Cardiovascular Exercises	<ul style="list-style-type: none"> <li>Begin endurance closed-chain exercises 3-4x/week:             <ul style="list-style-type: none"> <li>Stairmaster, stationary bike, elliptical, NordicTrack (short stride)</li> <li>Focus on increasing endurance.</li> </ul> </li> <li>Continue gait training, progress to running on treadmill or even ground (beginning at 12 weeks)</li> <li>Pool:             <ul style="list-style-type: none"> <li>may start freestyle swimming (avoid frog/breaststroke kick)</li> <li>progress to shallow water jogging</li> </ul> </li> </ul>
Progression Criteria	<ul style="list-style-type: none"> <li>Running, hopping/agility drills without knee pain or effusion</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> </ul>
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WITH MICROFRACTURE OR CARTIFORM/BIOCARTILAGE (TROCHLEA OR PATELLA)**

(Phase IV continued) Appointments	<ul style="list-style-type: none"> <li>Return to sport testing at 9 months, prior to MD visit</li> </ul>
Rehabilitation Goals	<ul style="list-style-type: none"> <li>Jogging on treadmill or even ground to running patterns at 75%</li> <li>Begin plyometric program: jump rope exercises</li> </ul>
Precautions	<ul style="list-style-type: none"> <li>Earliest return to sport: 9 months</li> </ul>
Suggested Therapeutic Exercises	<ul style="list-style-type: none"> <li>Agility drills:               <ul style="list-style-type: none"> <li>shuffling, hopping, running patterns (Ex: figure 8)</li> </ul> </li> <li>Sport specific drills in controlled environment:               <ul style="list-style-type: none"> <li>plyometric program</li> <li>fast straight running, backward running</li> <li>cutting, cross-overs, carioca</li> </ul> </li> </ul>
Cardiovascular Exercises	<ul style="list-style-type: none"> <li>Pool: may advance swimming (avoid frog/breaststroke kick)</li> </ul>
Progression Criteria (Return to Sport)	<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 of 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, PT, DPT 6/24/2016  
 MD name and date: Approved by MD 6/24/2016

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