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## ANTERIOR INTERVAL RELEASE, MUA, DEBRIDEMENT POST-OPERATIVE PROTOCOL

Time Frame (Weeks)	Guidelines	Goals	
<b>PHASE I</b>	0 to 1	<p><b>CRUTCHES:</b> 50% partial weight bearing x 2-4 weeks</p> <p><b>EXERCISE PROGRESSION</b></p> <ul style="list-style-type: none"> <li>• Gait training</li> <li>• Extension - heel props or JAS progressive stretching unit</li> <li>• Flexion - off table or wall slides</li> <li>• Quadriceps setting using NMES (Kneehab)</li> <li>• Multi-plane straight leg raises</li> <li>• Bilateral calf raises</li> </ul> <p><b>CARDIOVASCULAR EXERCISE</b></p> <ul style="list-style-type: none"> <li>• Stationary biking</li> </ul> <p><b>RECOMMENDED LOADING</b></p> <ul style="list-style-type: none"> <li>• Short but frequent bouts of ROM, quad activation 3+x/day</li> </ul>	<ul style="list-style-type: none"> <li>• Reduce inflammation</li> <li>• Normalize patella mobility with manual mobilizations</li> <li>• Full extension both passive and active</li> <li>• Good quadriceps activation</li> <li>• No extension lag</li> <li>• 100°-120° of knee flexion, progressing to full as tolerated</li> </ul>
	2 to 4	<p><b>EXERCISE PROGRESSION</b></p> <ul style="list-style-type: none"> <li>• Continue with 0-1 week program</li> <li>• Extension – continue with heel props, prone hangs and/or JAS</li> <li>• Flexion – wall or heel slides</li> <li>• Ball bridge and/or isometric hamstring activation</li> </ul> <p><b>CARDIOVASCULAR EXERCISE</b></p> <ul style="list-style-type: none"> <li>• Stationary biking</li> <li>• Short walks using a crutch as needed</li> </ul> <p><b>RECOMMENDED LOADING</b></p> <ul style="list-style-type: none"> <li>• Short but frequent bouts of ROM, quad activation 3x/day</li> </ul>	<ul style="list-style-type: none"> <li>• Reduce inflammation</li> <li>• Transition off crutches</li> <li>• Full knee extension/hyperextension</li> <li>• No extension lag</li> <li>• 120°+ of knee flexion</li> </ul>
<b>PHASE II</b>	4 to 6	<p><b>EXERCISE PROGRESSION</b></p> <ul style="list-style-type: none"> <li>• Extension – heel props, prone hangs and/or JAS</li> <li>• Flexion – continue with end range heel slides</li> <li>• Bilateral squat progression – focus on proper alignment with <u>limited range initially</u></li> <li>• Multi-plane open and closed kinetic chain hip strengthening</li> <li>• Step-up progression – focus on proper alignment with <u>limited range initially</u></li> <li>• Hamstring activation with bridge on floor, ball or box</li> <li>• Progress to unilateral heel raise off the floor then off a step</li> <li>• Proprioception drills</li> </ul> <p><b>CARDIOVASCULAR EXERCISE</b></p> <ul style="list-style-type: none"> <li>• Stationary biking</li> <li>• Treadmill/outdoor walking, focus on proper gait mechanics</li> </ul> <p><b>RECOMMENDED LOADING</b></p> <ul style="list-style-type: none"> <li>• ROM: 2-3x/day</li> <li>• Strength: 1x/day open chain; 3x/week closed chain</li> <li>• Cardiovascular: 20 minutes/day with low intensity</li> </ul>	<ul style="list-style-type: none"> <li>• Progress off crutches</li> <li>• Full knee extension/hyperextension</li> <li>• Knee flexion to full as tolerated</li> <li>• Normalize gait mechanics</li> <li>• Normalize patellofemoral joint and scar mobility</li> </ul>

	Time Frame (Weeks)	Guidelines	Goals
<b>PHASE II (continued)</b>	6 to 8	<p><b>EXERCISE PROGRESSION</b></p> <ul style="list-style-type: none"> <li>Controlled movement series - warm-up</li> <li>Leg press, hamstrings curls (light resistance)</li> <li>Single leg RDL's</li> </ul> <p><b>CARDIOVASCULAR EXERCISE</b></p> <ul style="list-style-type: none"> <li>Slowly increase intensity/duration</li> <li>Stationary biking</li> <li>Treadmill/outdoor walking, focus on proper gait mechanics</li> <li>Arc trainer or elliptical</li> </ul> <p><b>RECOMMENDED LOADING</b></p> <ul style="list-style-type: none"> <li>ROM: 2x/day</li> <li>Strength: 3x/week on closed chain loading</li> <li>Cardiovascular: 20-30 minutes/day, low/moderate intensity</li> </ul>	<ul style="list-style-type: none"> <li>Reduce inflammation</li> <li>Full ROM</li> <li>Normal gait</li> </ul>
<b>PHASE III</b>	8 to 12	<p><b>EXERCISE PROGRESSION</b></p> <ul style="list-style-type: none"> <li>Movement prep; foam roller, controlled movement series</li> <li>Leg press and squat – gradually increase load</li> <li>Single leg squat/lunge progression (dips, retro, walk and split) *recognize and adjust for degenerative changes or inflammation in the patello-femoral joint</li> <li>Lateral band walk</li> </ul> <p><b>CORE PROGRAM</b></p> <ul style="list-style-type: none"> <li>Front &amp; side plank – full, may advance to alternating leg lift</li> <li>Bridge – marching or single leg</li> <li>Dead bug progression</li> <li>Quadruped alternating arm-leg</li> </ul> <p><b>CARDIOVASCULAR EXERCISE</b></p> <ul style="list-style-type: none"> <li>Stationary biking</li> <li>Treadmill/outdoor walking, focus on proper gait mechanics</li> <li>Arc trainer or elliptical</li> </ul> <p><b>SPORT SPECIFIC ACTIVITY PROGRESSION</b></p> <ul style="list-style-type: none"> <li>Outdoor biking – week 10</li> <li>Swimming free style – week 8-10</li> </ul> <p><b>RECOMMENDED LOADING</b></p> <ul style="list-style-type: none"> <li>ROM: 1-2x/day</li> <li>Strength: 3x/week on closed chain loading</li> <li>Cardiovascular: 20-45 minutes 5x/week with moderate intensity and intervals.</li> </ul>	<ul style="list-style-type: none"> <li>Control inflammation with increasing loads</li> <li>Full knee flexion and extension with terminal stretch</li> <li>Progressive strengthening</li> <li>Increase muscular endurance</li> </ul>
<b>PHASE IV</b>	12 wks to 4-6 months	<p><b>MOVEMENT PREP</b></p> <ul style="list-style-type: none"> <li>Foam roller</li> <li>Controlled movement series</li> </ul> <p><b>EXERCISE PROGRESSION</b></p> <ul style="list-style-type: none"> <li>Increasing loads from phase III</li> <li>Core program: Increase load as appropriate</li> </ul> <p><b>CARDIOVASCULAR EXERCISE</b></p> <ul style="list-style-type: none"> <li>Stationary biking</li> <li>Arc trainer or elliptical</li> <li>Swimming</li> </ul> <p><b>RUNNING PROGRESSION</b></p> <ul style="list-style-type: none"> <li>Ladder series – <b>WEEK 12</b></li> <li>Skipping – <b>WEEK 12</b></li> <li>Walk/jog interval – <b>WEEKS 6-8</b></li> <li>Linear acceleration/deceleration – <b>WEEKS 14-16</b></li> <li>Sprinting – <b>WEEK 16</b></li> <li>Change of direction and lateral agility – <b>WEEKS 16-20</b></li> </ul>	<ul style="list-style-type: none"> <li>Control inflammation with increasing loads</li> <li>Progressive strengthening</li> <li>Increase muscular strength, power and endurance</li> </ul>

	Time Frame (Weeks)	Guidelines	Goals
<b>PHASE IV (continued)</b>	12 weeks to 4-6 months	<p><b>JUMPING PROGRESSION</b></p> <ul style="list-style-type: none"> <li>• Low amplitude bilateral single response jumps</li> <li>• Bilateral multiple response jumps</li> <li>• Unilateral single response jumps</li> </ul> <p><b>SPORTS SPECIFIC ACTIVITY PROGRESSION</b></p> <ul style="list-style-type: none"> <li>• Interval golf program: <b>WEEK 12</b></li> <li>• Field/court progression toward full RTS <b>4-6 MONTHS</b></li> </ul> <p><b>SPORTS TEST AND FULL RETURN TO ACTIVITY</b></p> <ul style="list-style-type: none"> <li>• Follow-up examination with physician</li> <li>• Sports test for return to competition at <b><u>4-6 MONTHS</u></b></li> </ul> <p><b>RECOMMENDED LOADING</b></p> <ul style="list-style-type: none"> <li>• ROM: global stretching</li> <li>• Strength: 2-3x/week with increasing resistance</li> <li>• Cardiovascular: 20-45 minutes 5x/week. Alternate impact and non-impact days using sound recovery principles</li> </ul>	<ul style="list-style-type: none"> <li>• Control inflammation with increasing loads</li> <li>• Progressive strengthening</li> <li>• Increase muscular strength, power and endurance</li> </ul>