

## Patellofemoral Dysfunction Protocol

Weeks one to three	Weeks three to six
<b>Initial Evaluation</b>	<b>Evaluate</b>
<ul style="list-style-type: none"> <li>➤ Range of motion/flexibility (may see limitations due to pain, effusion, or muscle shortening)</li> <li>➤ Strength (may have weakness in glut med, glut max, hip LR, and quad/VMO)</li> <li>➤ Posture/patella alignment (inspect for femoral MR, tibial LR, STJ pronation, genu recurvatum, patella baja, alta, tilt, and rotation)</li> <li>➤ Pain/Joint effusion (painful structures may include retinaculum, quad tendon, patella tendon, fat pad, ITB insertion)</li> <li>➤ Address work and sport goals</li> </ul>	<ul style="list-style-type: none"> <li>➤ Range of Motion</li> <li>➤ Pain reduction and tolerance for initial treatment</li> <li>➤ Standing balance (look for MR, adduction, and contralateral hip drop)</li> <li>➤ Continue to correct faulty mechanics throughout treatment activities especially squatting, step-ups, and single leg stance.</li> </ul>
<b>Patient Education</b>	<b>Patient Education</b>
<ul style="list-style-type: none"> <li>➤ Support Physician prescribed meds</li> <li>➤ Teach the patient about contributing faulty movement patterns, and which muscle groups should be strengthened and stretched to improve mechanics</li> <li>➤ Discuss frequency and duration of treatment 2-3 times per week for 6 weeks</li> </ul>	<ul style="list-style-type: none"> <li>➤ Discuss proper posture and avoidance of hyperextension, medial femoral rotation and excessive closed chain dorsiflexion</li> <li>➤ Should consider the use of an orthotic if the patient has appropriate biomechanical need, minimal symptom reduction, and difficulty with exercise progression after first four to six weeks of therapy.</li> </ul>
<b>Therapeutic Exercise</b>	<b>Therapeutic Exercise</b>
<ul style="list-style-type: none"> <li>➤ Complete strengthening based on finding and progress depending on patient tolerance</li> <li>➤ The initial phase will typically include partial wall slide, assisted or mini squats SLR, Abdominal stability, glut and LR exercises</li> <li>➤ Quad, ITB and gastroc stretching as needed</li> </ul>	<ul style="list-style-type: none"> <li>➤ Progress to chair squats, side squats, step ups, lateral step ups, chops and lunges if patient is able to use proper mechanics and has no increase in symptoms</li> <li>➤ Single leg isotonic exercises</li> <li>➤ Quad, ITB and gastroc stretching as needed</li> </ul>
<b>Aquatics</b>	<b>Aquatics</b>
<ul style="list-style-type: none"> <li>➤ <b>Shallow Water:</b></li> <li>➤ Walking forward/backward/sideways with a focus on proper gait mechanics and good quad control</li> <li>➤ Closed chain LE exercises: Focus on hip adduction (avoid abduction unless MMT is -4/5 or less) and mid-range knee flexion(-20° to 80°) exercises, partial squats, heel raises, step-ups, modified lunges</li> <li>➤ <b>Deep Water:</b></li> <li>➤ Open chain with barbells: Cross country skiing, jumping jacks (slow ab/ fast ad) bicycling, flutter kick</li> <li>➤ Closed chain: squats on barbell/kickboard</li> </ul>	<ul style="list-style-type: none"> <li>➤ <b>Shallow water:</b></li> <li>➤ Walking with increased speed/resistance (cuffs/fins)</li> <li>➤ Closed chain LE: Increased squat depth, increase step up height (up to 8”), diagonal lunges</li> <li>➤ Balance: Eyes open/closed, tandem to SLS, braided walking</li> <li>➤ Plyometrics: On/off step may be added if tolerated</li> <li>➤ Sport/work specific simulated activities if tolerated</li> <li>➤ <b>Deep Water:</b></li> <li>➤ Open chain: Continue previous exercises with addition of cuffs/fins/speed as tolerated</li> <li>➤ Closed chain: Continue with previous exercises with the addition of multidirectional movement</li> </ul>
<b>Manual Techniques</b>	<b>Manual Techniques</b>
<ul style="list-style-type: none"> <li>➤ Patella mobilizations, taping, and bracing may be used to improve patella alignment</li> <li>➤ Manual stretching may be completed where needed</li> </ul>	<ul style="list-style-type: none"> <li>➤ Patella mobilizations, taping, and bracing may be used to improve patella alignment</li> <li>➤ Manual stretching may be completed where needed</li> </ul>
<b>Modalities</b>	<b>Modalities</b>
<ul style="list-style-type: none"> <li>➤ NMES is recommended for quad activity if deficit present</li> <li>➤ Any modalities may be used to address pain/effusion</li> </ul>	<ul style="list-style-type: none"> <li>➤ Modalities may be used as needed</li> </ul>
<b>Goals</b>	<b>Goals</b>
<ul style="list-style-type: none"> <li>➤ Control pain</li> <li>➤ No effusion</li> <li>➤ 0-120 degrees ROM</li> <li>➤ Independence with HEP</li> </ul>	<ul style="list-style-type: none"> <li>➤ No pain with ADL's</li> <li>➤ Normal ROM</li> <li>➤ Minimal limitations in patellar mobility</li> </ul>

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<b>Weeks six to discharge</b>
<b>Evaluate</b>
<ul style="list-style-type: none"> <li>➤ HEP compliance</li> <li>➤ Address any deficits that may limit return to work or sport goals</li> <li>➤ Patella mobility / crepitus</li> </ul>
<b>Therapeutic Exercise</b>
<ul style="list-style-type: none"> <li>➤ Progress to closed chain and single leg balance exercises on unstable surfaces</li> <li>➤ Return to any previous cardiovascular training that was halted due to pain</li> <li>➤ Begin agility and sport specific activity if applicable</li> <li>➤ Progress to plyometrics, running, and cutting activity if applicable</li> <li>➤ Encourage participation in the CFA</li> </ul>
<b>Aquatics</b>
<ul style="list-style-type: none"> <li>➤ Continue and progress exercises as indicated and necessary</li> </ul>
<b>Manual Techniques</b>
<ul style="list-style-type: none"> <li>➤ Any techniques as needed</li> </ul>
<b>Modalities</b>
<ul style="list-style-type: none"> <li>➤ Any as Indicated</li> </ul>
<b>Goals</b>
<ul style="list-style-type: none"> <li>➤ Normal strength</li> <li>➤ Discharge with full return to work or sport activity if applicable</li> <li>➤ Independence with proper mechanics and HEP</li> <li>➤ No limitations in patellar mobility</li> <li>➤ Central tracking of the patella in the trochlear groove</li> </ul>



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#### References:

- Alba-Martín P, Gallego-Izquierdo T, Plaza-Manzano G, Romero-Franco N, Núñez-Nagy S, Pecos-Martín D.(2015) Effectiveness of therapeutic physical exercise in the treatment of patellofemoral pain syndrome: a systematic review. *J Phys Ther Sci*, 27(7):2387-90.
- Anna Lucia Barker, Jason Talevski, Renata Teresa Morello, Caroline Anne Brand, Ann Elizabeth Rahmann, Donna Michelle Urquhart. (2014) Effectiveness of Aquatic Exercise for Musculoskeletal Conditions: A Meta-Analysis. *Archives of Physical Medicine and Rehabilitation*, Vol 95(7) 9,:1776-1786,