



**Patellar Instability Nonoperative Rehab Protocol**

<u>Phase</u>	<u>Precautions</u>	<u>Treatment Recommendations</u>	<u>Emphasize</u>
<p><b>Phase 1: Protection Phase</b> <b>Weeks 0-3</b></p> <p><i>Criteria for Advancement:</i> -Fair to good quadriceps contraction -Good patellar mobility in medial direction -ROM: 0° knee extension to 90° knee flexion -0/10 pain at rest -Able to SLR pain-free without quadriceps lag</p>	<ul style="list-style-type: none"> <li>▪ Ambulation without brace or without crutches</li> <li>▪ Lateralization of patella</li> <li>▪ Symptom provocation: quadriceps shut down, joint effusion, active inflammation</li> </ul>	<ul style="list-style-type: none"> <li>▪ Emphasize patient compliance to HEP and ambulation</li> <li>▪ Ambulation: WBAT with assistive device to normalize gait pattern.</li> <li>▪ Brace: MD directed; until able to perform pain-free SLR without a lag</li> <li>▪ Cryotherapy: home cold therapy unit</li> <li>▪ Electrical stimulation for quadriceps re-education: quadriceps sets with towel roll under knee</li> <li>▪ Sitting knee ROM exercise: AAROM KF, PROM KE, stationary bike (short crank 90-115°KF)</li> <li>▪ Quadriceps strengthening: progress as tolerated in a pain-free arc of motion, close chain preferred               <ul style="list-style-type: none"> <li>o Estim, biofeedback</li> <li>o Quad set with towel roll under knee; submaximal multi angle isometrics, as needed</li> <li>o Leg press: initiate with improvement of quadriceps contraction monitor arc of motion (bilateral)</li> </ul> </li> <li>▪ Hip progressive resisted exercises: all planes, pain-free SLR with brace if lag is present</li> <li>▪ Distal strengthening (PF)</li> <li>▪ Flexibility exercises (hamstrings, gastrocnemius)</li> <li>▪ Initiate balance and proprioceptive training: double limb support for weight shifting with soft knee</li> <li>▪ Gait training</li> </ul>	<ul style="list-style-type: none"> <li>▪ Normalize gait with appropriate assistive device</li> <li>▪ Improving quadriceps contraction</li> <li>▪ Controlling pain/effusion</li> <li>▪ Compliance with home instructions: cold therapy, activity modification, quadriceps re-education with estim unit</li> <li>▪ Straight leg raise (SLR) without lag, pain-free</li> <li>▪ Independent ambulation WBAT w/ brace locked in full extension and appropriate assistive device on level surfaces and stairs</li> </ul>
<p><b>Phase 2: Gait Phase</b> <b>Weeks 4-6</b></p> <p><i>Criteria for Advancement:</i> -ROM 0°-125° -Normal gait pattern -Good patella mobility -Postural stability, alignment and N-M control in single limb stance -0/10 pain with ADLs and therapeutic exercise -Independent HEP</p>	<ul style="list-style-type: none"> <li>▪ Sign and symptom provocation: pain, inflammation, quadriceps shut down, joint effusion</li> <li>▪ Concomitant injuries</li> <li>▪ Lateralization of the patella</li> <li>▪ Pathological gait pattern (quadriceps avoidance; bent knee)</li> <li>▪ Arc of motion during exercise</li> </ul>	<ul style="list-style-type: none"> <li>▪ HEP: advance as tolerated. Continue phase I exercises, as appropriate</li> <li>▪ Patient education: Activity modification, progression of gait training, cryotherapy</li> <li>▪ Patellar mobilization, MD directed</li> <li>▪ ROM exercises:               <ul style="list-style-type: none"> <li>o Short sitting progressing to stair ROM, supine wall ROM as tolerated (-125°KF in sitting, quad control)</li> </ul> </li> <li>▪ Gait training: heel toe gait pattern with brace and assistive device, prn</li> <li>▪ Quadriceps strengthening: progress as tolerated in a pain-free arc of motion, close chain preferred               <ul style="list-style-type: none"> <li>o Continue with Estim, biofeedback, quad sets, submaximal multi angle isometrics, as needed</li> <li>o Leg press: monitor arc of motion (bilateral, eccentric)</li> <li>o Initiate forward step up (FSU) progression, 6" step with adequate strength</li> </ul> </li> <li>▪ Bicycle: progressing to standard crank as ROM allows (115° KF in sitting), 80 RPMs</li> <li>▪ Flexibility exercises - evaluation-based: AROM KF with hip extension in standing</li> <li>▪ Advance proximal strength and core training: (i.e. hip extension with knee flexion, side planks, bridge)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Symptom control with ADLs, therex</li> <li>▪ Minimizing knee effusion</li> <li>▪ Normal gait pattern</li> <li>▪ Postural stability, alignment, neuro-muscular (N-M) control during stance</li> <li>▪ Control pain, inflammation, effusion</li> <li>▪ Good patella mobility, quad contraction</li> <li>▪ Normalize gait w/ brace, assistive device prn</li> </ul>
<p><b>Phase 2: Gait Phase</b> <b>Weeks 4-6 (continued)</b></p>			

- Hydrotherapy for gait, single limb alignment and stability, proximal strengthening
- Balance and proprioceptive training: double limb support on progressively challenging surfaces to single limb support on level surface only with demonstration of good alignment, stability and N-M control

**Phase 3: Strengthening Weeks 7-16**

*Criteria for Advancement:*  
 -ROM WNLs  
 -No pain or swelling  
 -Normalize gait on level surfaces and stairs  
 -Ability to demonstrate alignment, control, stability in single limb stance during dynamic activities  
 -Core stability: Single leg bridge - 30 s, Sahrman \* level 3  
 -Symmetry, quality, alignment during selected movement patterns  
 -Isokinetic test at 180°/sec and 300°/sec: 85% limb symmetry index (LSI)

- Sign and symptom provocation: pain, and active inflammation/effusion, quadriceps shutdown
- Gait deviations
- "Too much, too soon" progression
- Disregarding quality of movement
- HEP, as instructed
- Educate patient: Activity modification, individualized, and cryotherapy
- Quadriceps strengthening: progress as tolerated, monitor arc of motion, closed chain preferred
  - o FSU progression: 6" step progressing to 8" step (dependent on patient height)
  - o Eccentric leg press progressing to:
    - o Forward step down (FSD) progression: 6" step progressing to 8" step (dependent on patient height)
    - o Squat progression: chair, ball if necessary with buttocks moving under ball, free squats to single leg
- ROM exercises: supine
- Gait training to emphasize heel-toe gait pattern with emphasis on loading response
- Advance proximal strength through functional activities (bridging progression, hip extension with KF, clock, RDL, windmill, lawn mower) and core training (planks, side planks, Sahrman progression)
- Balance progression with postural alignment and N-M control: (static to dynamic, introduce different planes of motion, challenging surfaces middle phase)
- Address muscle imbalances — evaluation-based: (i.e. 2 joint hip flexor length)
- Cross training: elliptical trainer initiated with good strength/ quality during 6' FSU, bicycle (80 RPMs), swimming (crawl, back stroke)
- Initiate running program (late phase): with eccentric quadriceps control during 8" FSD and MD clearance 30 second interval initially
- Initiate plyometric program with MD clearance and evidence of good eccentric quadriceps control Vertical jumping progression: Jump up to jump in place
- Identifying and addressing muscle/ soft tissue imbalances
- Neuromuscular control
- Functional progression
- Quality of movement
- Initiate running program, plyometrics (bilateral)
- Symmetry, quality, alignment during selected movement patterns: squat, jump in place, side to side

**Phase 4: Advanced Strengthening and Function Weeks 16-20+**

*Criteria for Advancement:*  
 -Demonstrate symmetry, quality, alignment during selected movement patterns

- Pain with therapeutic exercise & functional activities
- Inadequate strength, functional strength, ROM, flexibility, fitness when
- Continue to advance LE strengthening, flexibility, dynamic single limb stability & agility programs
- Continue to address muscle imbalances — evaluation-based
- Advance core stability
- Cross training
- Advance plyometric program with MD clearance and evidence of good eccentric quadriceps control
  - o Vertical jumping progression: Jump down
  - o Horizontal jumping progression. Broad jump, single leg landings
  - o Progress running program
- Quality of movement
- Functional progression
- Cardiovascular fitness to meet demands of sport
- Ability to demonstrate strategy, symmetry, quality, control and alignment during selected movement patterns: squat, jump

-Medical clearance by surgeon for return to play progression  
-Lack of apprehension with sport specific movements  
-Flexibility to meet demands of sport

returning to sport

o Cutting, deceleration, change of direction with MD clearance and dynamic single limb stability

(vertical and horizontal: broad jump, hop to opposite, single leg hop), single leg squat, Isokinetic test: 180° / sec and 300° / sec 85% limb symmetry index (LSI)

*Protocol adapted from Hospital for Special Surgery Rehabilitation patellar instability guidelines*

*I hereby certify these services as medically necessary for the patient's plan of care.*

\_\_\_\_\_  
*Physician's Signature*

Date \_\_\_\_\_

**FLOWERY BRANCH OFFICE**

4450 Falcon Parkway  
Flowery Branch, GA 30542

**TEL: (404)-544-1282**

**FAX: (404)-544-1278**

**EMAIL: [jlampo@emory.edu](mailto:jlampo@emory.edu)**