

## Patellofemoral Dislocation Rehabilitation Program - Accelerated

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The Patellofemoral Dislocation Rehabilitation Program is an evidence-based and soft tissue healing dependent program allowing patients to progress to vocational and sports-related activities as quickly and safely as possible. Individual variations will occur depending on patient response to treatment. Avoid ROM with chondrosis or pain when performing exercises. Please contact us with any questions or concerns about this rehab protocol.

Phase I: 0-2 weeks	Acute phase
<b>Goals</b>	<ul style="list-style-type: none"> <li>• Minimize knee joint effusion</li> <li>• Gently increase ROM per tolerance</li> <li>• Encourage quadriceps function</li> <li>• Gradual progression of therapeutic exercises for strengthening, stretching, and balance</li> <li>• Normalization of gait pattern</li> </ul>
<b>ROM</b>	<ul style="list-style-type: none"> <li>• wk 0-1: 0 degrees</li> <li>• wk 1-2: Gradually increase as tolerated. Goal of full ROM by 4-6 wks.</li> </ul>
<b>WB</b>	<ul style="list-style-type: none"> <li>• WBAT w/ knee immobilizer. Switch to lateral patellar stabilizing brace when good quadriceps control.</li> </ul>
<b>Modalities</b>	<ul style="list-style-type: none"> <li>• Cryotherapy 15 minutes in duration 3x/day</li> <li>• IFC for pain/effusion if needed</li> <li>• NMES quadriceps if needed</li> </ul>
<b>Treatment Recommendations</b>  Guidelines for progression based on tolerance	<ul style="list-style-type: none"> <li>• Active warm-up through ROM as tolerated (ie Bike high seat for ROM, Nu Step)</li> <li>• Gentle stretching to increase ROM. Emphasis on full return of knee extension ASAP with gradual improvement for knee flexion ROM based on patient tolerance.     Low-load long duration stretching for extension with heat if needed (1<sup>st</sup> TERT= Total End Range Time)     Patellar mobilizations only if needed (ie: tight lateral retinaculum). Avoid lateral patellar glides     AROM / AAROM / PROM</li> <li>• Flexibility exercises for hamstring, gastoc-soleus, ITB, iliopsoas if indicated</li> <li>• Gentle strengthening exercises: Exercise in a pain-free manner. Respect patellofemoral joint reaction forces. Initiate functional CKC exercises with strengthening from terminal extension to mid-range flexion, respecting patellofemoral joint reaction forces which increase with higher knee flexion angles during CKC exercises. Initiate gentle sub-max OKC exercises from mid-range flexion to 0 (patella is well seated in the trochlear groove) and light isotonic OKC exercises 90 to 45 degrees, respecting patellofemoral joint reaction forces which increase into terminal extension angles. Incorporate total leg strengthening.     Biofeedback QS with adductor squeeze, SLR, CKC knee extension     Multi-angle isometrics quadriceps/hamstrings at 20 degree increments     Gentle short arc 0-30 quadriceps with biofeedback (if no chondrosis)     Light isotonic OKC exercises 90 to 45 degrees     CKC exercises of weight shifting, partial wall squats     Hip 4 way SLR, sidelying ER     Gastroc soleus strengthening</li> <li>• Balance/proprioception exercises double leg stance progressing to single leg</li> <li>• Core stability and upper body exercises if desired</li> <li>• IFC for pain/effusion, NMES for quadriceps activation and control as needed</li> <li>• Ice (in stretch for extension if needed) 2<sup>nd</sup> TERT</li> </ul>

<b>Phase II: 2-4 weeks</b>	<b>Minimal protective phase</b>
<b>Goals</b>	<ul style="list-style-type: none"> <li>• Minimize knee joint effusion</li> <li>• Return of full range of motion</li> <li>• Improve muscle strength and endurance</li> <li>• Progression of therapeutic exercises for strengthening, stretching, and balance</li> </ul>
<b>ROM</b>	<ul style="list-style-type: none"> <li>• Gradually progression to with goal of full ROM by wks 4-6</li> </ul>
<b>WB</b>	<ul style="list-style-type: none"> <li>• No limitations. Work on normalization of gait pattern if not already achieved.</li> <li>• Continue with patellar stabilizing brace for long distance ambulation</li> </ul>
<b>Modalities</b>	<ul style="list-style-type: none"> <li>• Cryotherapy 15 minutes in duration 1-2x/day</li> <li>• IFC for pain/effusion if needed</li> <li>• NMES quadriceps if needed</li> </ul>
<b>Treatment Recommendations</b>  Guidelines for progression based on tolerance	<ul style="list-style-type: none"> <li>• Active warm-up: Bike, Elliptical Runner, Nu Step, Treadmill walking</li> <li>• Stretching for full ROM            Low-load long duration stretching with heat if needed            (1<sup>st</sup> TERT= Total End Range Time)            Patellar mobilizations only if needed (ie: tight lateral retinaculum). Avoid lateral patellar glides            AROM / AAROM / PROM</li> <li>• Flexibility exercises for hamstring, gastoc-soleus, ITB, iliopsoas if indicated</li> <li>• Strengthening and endurance exercises: Exercise in a pain-free manner. Progress to full ROM exercises per tolerance. Respect patellofemoral joint reaction forces which increases with knee flexion angles during CKC exercises, increases with terminal extension angles with OKC exercises. Incorporate total leg strengthening. Avoid dynamic valgus during strengthening and functional activities (focus on hip abductor and external rotator strengthening).            Biofeedback QS with adductor squeeze, SLR, CKC knee extension            Quadriceps OKC isotonic short arc with progression to full ROM (if no chondrosis)            Hamstring isotonic            CKC exercises: Progress from mid ROM to full ROM – leg press, step-ups, partial lunges progress to full lunges, lateral step-overs, sidestep with T-band, partial squats progress to 90 degree squats            Hip 4 way SLR, sidelye ER            Gastroc soleus exercises            Total leg strengthening</li> <li>• Balance/proprioception</li> <li>• CV conditioning, Core stability</li> <li>• Ice (in stretch if needed) 2<sup>nd</sup> TERT</li> <li>• HEP for 3<sup>rd</sup> TERT if needed</li> </ul>

<b>Phase III 4+weeks</b>	<b>Return to activity phase</b>
<b>Goals</b>	<ul style="list-style-type: none"> <li>• Progress muscle strength, endurance, and balance activities</li> <li>• Progress to higher level activities depending on functional demands and MD approval</li> <li>• Return back to vocational, recreational, and sport activities</li> </ul>
<b>Brace</b>	• Patellar stabilizing brace only for sport / strenuous work activities until wk 12
<b>Modalities</b>	• Cryotherapy 15 minutes 1x/day or after strenuous activity
<b>Treatment Recommendations continued</b>	<ul style="list-style-type: none"> <li>• Active warm-up: Bike, Elliptical Runner, Nu Step, Treadmill walking</li> <li>• Continue with stretching and flexibility exercises as needed</li> <li>• Strengthening and endurance exercises: Advance as tolerated with emphasis on functional strengthening. Avoid dynamic valgus during strengthening and functional activities (focus on hip abductor and external rotator strengthening). <ul style="list-style-type: none"> <li>Total leg strengthening</li> <li>Hip strengthening</li> <li>Heel raises</li> <li>Hamstring full ROM isotonic</li> <li>Quadriceps isotonic in ROM without chondrosis</li> <li>Isokinetic quadriceps/hamstrings in ROM without chondrosis</li> <li>CKC exercises: Leg press, multiple direction lunges, squats, step-ups, sidestep with T-band</li> <li>Gastroc soleus exercise</li> <li>Stairmaster, Euroglide</li> </ul> </li> <li>• Dynamic balance exercises</li> <li>• Impact activities if 75% strength on CKC testing: running program, agility drills, plyometrics</li> <li>• Sports-specific activities</li> <li>• CV conditioning and core stability</li> </ul>
<b>Testing at 4-6 weeks</b>	<ul style="list-style-type: none"> <li>• Linea CKC testing</li> <li>• Biodex knee flex/ext 0-90 if indicated</li> <li>• Functional testing when appropriate</li> </ul>
<b>Return to sport/work guidelines</b>	<ul style="list-style-type: none"> <li>• Based on MD approval, minimal pain at rest or with activity, no knee joint effusion, full pain-free ROM, isokinetic strength and functional testing at 90% compared to uninvolved side, good performance on functional testing (90% compared to normative data or contralateral extremity) and adequate performance on sport-specific drills</li> <li>• Anticipated return to full activity between 8-24 weeks.</li> </ul>

- Redislocation rate ranges from 15-50% depending on activities and number of predisposing factors

- Predisposing factors for primary or recurrent dislocations:

Patella alta, lateral patellar displacement, trochlea dysplasia, increase Q angle (men > 10 +/- 5 deg, females > 15 +/- 5 deg), genu valgum, vastus medius hypoplasia, generalized ligamentous laxity, external tibial torsion, subtalar joint pronation or pes planus, increased femoral anteversion

- Beighton scale for generalized ligamentous laxity:

Instructions: Give patient a point for each of the following characteristics:

	Right	Left
Passive extension of 5 <sup>th</sup> MCP past 90 deg	_____	_____
Passive opposition of the thumb to forearm	_____	_____
Hyperextension of elbow past 10 deg	_____	_____
Hyperextension of knee past 10 deg	_____	_____
Trunk flexion with palms flat on the floor	_____	

Each limb is scored separately and a single point is given if positive, being able to touch hands for the floor counts as a single point. Highest possible score is 9.

Interpreting scores: Hypomobility = 0-3 Hypermobility = 4-6 Extreme hypermobility = 7-9