

PATELLOFEMORAL DISLOCATION REHABILITATION PROGRAM - DELAYED

Phase I: 0-2 weeks	Acute phase
Goals	<ul style="list-style-type: none"> Minimize knee joint effusion Gently increase ROM per guidelines Encourage quadriceps function Gradual progression of therapeutic exercises for strengthening and stretching
ROM	<ul style="list-style-type: none"> wk 0-1: 0 degrees wk 1-2: 0-30 degrees
WB	<ul style="list-style-type: none"> WBAT w/ brace locked at 0 deg for ambulation.
Modalities	<ul style="list-style-type: none"> Cryotherapy 15 minutes in duration 3x/day IFC for pain/effusion if needed NMES quadriceps if needed
Treatment Recommendations Guidelines for progression based on tolerance	<ul style="list-style-type: none"> Active warm-up through ROM (Bike with limited motion, Nustep) Gentle stretching to attain full extension and 30 degrees of flexion if needed. Emphasis on full return of knee extension ASAP <ul style="list-style-type: none"> Low-load long duration stretching for extension with heat if needed (1st TERT= Total End Range Time) Patellar mobilizations only if needed (ie: tight lateral retinaculum). Avoid lateral patellar glides Limited AROM / AAROM / PROM if needed Flexibility exercises for hamstring, gastoc-soleus, ITB, iliopsoas if indicated Gentle strengthening exercises: Exercise in a pain-free manner. Respect patellofemoral joint reaction forces and soft tissue healing. <ul style="list-style-type: none"> Biofeedback QS with adductor squeeze, SLR Multi-angle isometrics quadriceps/hamstrings at 20 degree increments Gentle short arc 0-30 quadriceps with biofeedback (if no chondrosis) CKC exercises of weight shifting Hip 4 way SLR, sidelying ER Gastroc soleus strengthening Balance/proprioception exercises double leg stance Core stability and upper body exercises if desired IFC for pain/effusion, NMES for quadriceps activation and control as needed Ice (in stretch for extension if needed) 2nd TERT HEP for 3rd TERT
Phase II: 2-4 weeks	Moderate protective phase
Goals	<ul style="list-style-type: none"> Minimize knee joint effusion Gently increase ROM per guidelines Encourage quadriceps function Gradual progression of therapeutic exercises for strengthening, stretching, and balance Normalization of gait pattern
ROM	<ul style="list-style-type: none"> wks 2-3: 0-60 degrees wks 3-4: 0-90 degrees
WB	<ul style="list-style-type: none"> WBAT with brace unlocked for ambulation if has good quadriceps activation and control. Utilize crutches as needed until patient demonstrates normal heel-to-toe pattern

Phase II: 2-4 weeks	Moderate protective phase
Modalities	<ul style="list-style-type: none"> • Cryotherapy 15 minutes in duration 1-2x/day • IFC for pain/effusion if needed • NMES quadriceps if needed
Treatment Recommendations Guidelines for progression based on tolerance	<ul style="list-style-type: none"> • Active warm-up: Bike, Nu Step, Treadmill walking • Gentle stretching for full extension as flexion per guidelines Low-load long duration stretching with heat if needed (1st TERT= Total End Range Time) Patellar mobilizations only if needed (ie: tight lateral retinaculum). Avoid lateral patellar glides AROM / AAROM / PROM • Flexibility exercises for hamstring, gastoc-soleus, ITB, iliopsoas if indicated • Strengthening exercises: Exercise in a pain-free manner. Progress to ROM exercises per guidelines. 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. 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 isotonics short arc with progression to full ROM (if no chondrosis) Hamstring isotonics 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 • Balance/proprioception • CV conditioning, Core stability • Ice (in stretch if needed) 2nd TERT • HEP for 3rd TERT if needed
Phase III: 4-6weeks	Minimal protective phase
Goals	<ul style="list-style-type: none"> • Return of full range of motion • Improve muscle strength and endurance • Progression of therapeutic exercises for strengthening, stretching, and balance
ROM	<ul style="list-style-type: none"> • Wks 4-5: 0-120 degrees • Wks 5+: Progress as tolerated with goal of full ROM by wks 6-8
Brace	<ul style="list-style-type: none"> • Switch to lateral patellar stabilizing brace at wk 5.
Modalities	<ul style="list-style-type: none"> • Cryotherapy 15 minutes in duration 1-2x/day • IFC for pain/effusion if needed • NMES quadriceps if needed
Treatment Recommendations Guidelines for progression based on tolerance	<ul style="list-style-type: none"> • Active warm-up: Bike, Elliptical Runner, Nu Step, Treadmill walking • Stretching for full ROM Low-load long duration stretching with heat if needed (1st TERT= Total End Range Time) Patellar mobilizations only if needed (ie: tight lateral retinaculum). Avoid lateral patellar glides AROM / AAROM / PROM

Phase III: 4-6 wks	Minimal Protective Phase
Treatment Recommendations Continued	<ul style="list-style-type: none"> • Flexibility exercises for hamstring, gastoc-soleus, ITB, iliopsoas if indicated • 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). <ul style="list-style-type: none"> Biofeedback QS SLR, CKC knee extension Quadriceps OKC isotonics short arc with progression to full ROM (if no chondrosis) Hamstring isotonics 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 • Dynamic balance activities • CV conditioning, Core stability • Ice (in stretch if needed) 2nd TERT • HEP for 3rd TERT if needed
Phase IV: 6+ weeks	Return to activity phase
Goals	<ul style="list-style-type: none"> • Progress muscle strength, endurance, and balance activities • Progress to higher level activities depending on functional demands and MD approval • Return back to vocational, recreational, and sport activities
Brace	• Patellar stabilizing brace only for sport / strenuous work activities until wk 12
Modalities	• Cryotherapy 15 minutes 1x/day or after strenuous activity
Treatment Recommendations	<ul style="list-style-type: none"> • Active warm-up: Bike, Elliptical Runner, Nu Step, Treadmill walking • Continue with stretching and flexibility exercises as needed • 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"> Total leg strengthening Hip strengthening Heel raises Hamstring full ROM isotonics Quadriceps isotonics in ROM without chondrosis Isokinetic quadriceps/hamstrings in ROM without chondrosis CKC exercises: Leg press, multiple direction lunges and step-ups, squats, sidestepping progress to sideshuffle with T-band Gastroc soleus exercise Stairmaster, Euroglide • Dynamic balance exercises • Impact activities when attains 75% strength on CKC testing: running program, agility drills, plyometrics • Sports-specific activities • CV conditioning and core stability • Ice

Phase IV: 6+ weeks	Return to activity phase
Testing at 8 weeks	<ul style="list-style-type: none"> • Linea CKC testing • Biodex knee flex/ext 0-90 if indicated • Functional testing when appropriate
Return to sport/work guidelines	<ul style="list-style-type: none"> • 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 • Anticipated return to full activity between 10-24 weeks
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- 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 th 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