



Rehab Practice Guidelines for: **Patellar Tendinopathy**

Diagnostic Hallmarks¹

- Pain localized to inferior pole of patella
- Pain that increases with increased load on knee extensors, particularly during plyometric type activities involving the knee (e.g. jumping)

Differential Diagnosis¹

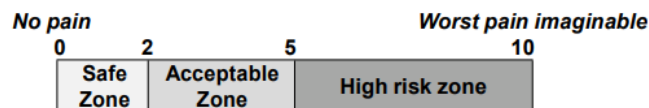
- Fat pad irritation
- Patellofemoral pain
- Joint pain
- Growth plate injuries in pediatric population

Assessments to include:

- Single leg decline squat test^{2,3}
 - Perform 2 single leg squats from 0-50° on decline board (angle 25°)
 - Rate pain 0-10
- Thorough kinetic chain assessment, including jumping, hopping and squatting mechanics
- Quadriceps strength testing
 - Using mechanical dynamometer at 60°, or angle of comfort if painful
 - Use Burst super imposition technique if appropriate; use clinical judgment and monitor pain
- Hip strength testing (with hand-held dynamometer)
- Outcome Measure: VISA-P⁴

Use Pain Monitoring Model⁵ for Progression:

- Visual Analog Scale (VAS) 0-10



- The pain is allowed to reach 5/10 on the VAS during exercises
- The pain after the whole exercise program is allowed to reach 5/10 on the VAS but should subside to baseline by the following morning
- Baseline pain is not allowed to increase from week to week



Patellar Tendinopathy Rehabilitation Protocol

Phase	Initiate when:	Treatment Ideas	Dosage and Progression:
<u>Phase I: Acute</u>	<ul style="list-style-type: none"> ▪ Pain with isotonic loading is >5/10 	<ul style="list-style-type: none"> ▪ Isometric exercises: <ul style="list-style-type: none"> ○ Knee Extension between 30-60° ○ Spanish Squats between 45-90° ○ Wall Sits between 45-90° ▪ Address hip strength deficits as indicated ▪ Noxious stim protocol[^] ▪ NMES* to the quadriceps if QI<80% 	<ul style="list-style-type: none"> ▪ Isometrics: 5x45" holds^{6,7} ▪ Perform daily if pain returns to baseline
<u>Phase II: Recovery</u>	<ul style="list-style-type: none"> ▪ Pain with isotonic loading is <5/10 	<ul style="list-style-type: none"> ▪ Isotonic exercises <ul style="list-style-type: none"> ○ Knee Extension ○ Sit to Stands ▪ Heavy Slow Resistance (HSR) training⁸: <ul style="list-style-type: none"> ○ Leg Press ○ Squat ○ Hack Squat ▪ Continue hip strengthening, noxious stim and NMES as indicated 	<ul style="list-style-type: none"> ▪ All exercises performed: bilaterally, every other day ▪ HSR: 3-4 sets, progress from 15 RM → 6RM, 90-0°, complete with 3 sec eccentric phase, 3 sec concentric phase ▪ Can continue Phase I exercises on off days
<u>Phase III: Rebuilding</u>	<ul style="list-style-type: none"> ▪ Tolerating decline squat of involved limb with <5/10 pain 	<ul style="list-style-type: none"> ▪ Progress Phase II exercises ▪ Add: <ul style="list-style-type: none"> ○ Split Squat ○ Step-Downs (Lateral & Forward) ○ Isokinetics (concentric/eccentric) ▪ Decline Squat Program⁹ 	<ul style="list-style-type: none"> ▪ Progress Phase II exercises to eccentric (2 up, 1 down) then unilateral ▪ Progress 3x8 → 3x15 ▪ Decline Squat Program: 3x15, 1x/day
<u>Phase IV: Return to Activity</u>	<ul style="list-style-type: none"> ▪ Tolerating load with plyometric activities that replicate training demands 	<ul style="list-style-type: none"> ▪ Jump/Landing training ▪ Acceleration ▪ Deceleration ▪ Cutting ▪ Sport specific training 	<ul style="list-style-type: none"> ▪ Progressively increase volume and then intensity ▪ Progress through training drills then full competition

MVIC: Maximum voluntary isometric contraction, NMES: Neuromuscular electric stimulation, QI: Quad Index, HSR: Heavy slow resistance

[^]**Noxious stim protocol:** Pulse width >150us, frequency >50 pps, 2 sec ramp, 12 sec on, 8 sec off, 10-15 min total, max tolerance (aim for 3x sensory threshold)

***NMES Guidelines:**

- Electrodes placed over proximal lateral quadriceps and distal medial quadriceps.
- Stimulation parameters: 400 us (2500Hz), 75 pps, 2 sec ramp, 12 sec on, 50 sec off, intensity to max tolerable [at least 50% MVIC, 10 contractions per session, continue until quadriceps strength MVIC is 80% of uninvolved.
- Stimulation performed **isometrically at 60°**, or angle of comfort if painful.



References

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