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Rehab Practice Guidelines for: Patellar Tendinopathy

Diagnostic Hallmarks[1]**:**

- 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 Diagnosis[1]**:**

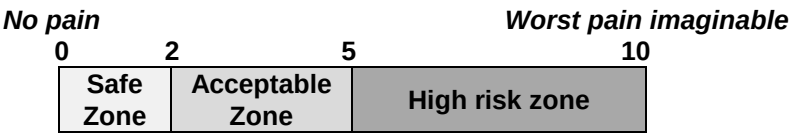
- Fat pad irritation
- Patellofemoral pain
- Joint pain
- Growth plate injuries in pediatric population

Assessment 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-P[4]

Use Pain Monitoring Model[5] **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

Phase	Initiate when:	Treatment Ideas	Dosage and Progression
Phase I: Acute	Pain with isotonic loading is >5/10	-Isometric exercises: 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%	-Isometrics: 5x45" holds[6,7] -Perform daily if pain returns to baseline

Phase II: Recovery	Pain with isotonic loading is <5/10	-Isotonic exercises Knee Extension Sit to Stands -Heavy Slow Resistance (HSR) training[8]: Leg Press Squat Hack Squat -Continue hip strengthening, noxious stim and NMES as indicated	-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
Phase III: Rebuilding	Tolerating decline squat of involved limb with <5/10 pain	-Progress Phase II exercises -Add: Split Squat Step-Downs (Lateral & Forward) Isokinetics (concentric/eccentric) -Decline Squat Program[9]	-Progress Phase II exercises to eccentric (2 up, 1 down) then unilateral -Progress 3x8 →3x15 -Decline Squat Program: 3x15, 1x/day
Phase IV: Return to Activity	Tolerating load with plyometric activities that replicate training demands	-Jump/Landing training -Acceleration -Deceleration -Cutting -Sport specific training	-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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This Clinical Guideline may need to be modified to meet the needs of a specific patient.
The model should not replace clinical judgment.

Decline Squat Test 1

Spanish Squat Lateral

Hack Squat

Decline Squat Test 2

Spanish Squat Anterior

Hack Squat