
Recurrent Unremitting Patellar Tendonitis/ Tendonosis Rehabilitation Program

I. Phase I

Goals: Diminish pain and inflammation
Promote tendon healing
Improve quadriceps strength
Enhance flexibility
Control functional stresses

Treatment Regimen:

- Hot packs applied to knee
 - Ultrasound to patellar tendon
 - Transverse friction massage
 - Warm-up bicycle (10-12 min.)
 - Stretch (hamstrings quadriceps, gastroc)
 - Application of pain stimulation to each side of patella tendon or infra-patellar fat pad x 10 minutes
 - Electrical stimulation parameters
 - Waveform: Russian
 - Frequency: 2500 Hz pulse; width: 200 MS; Rate: 50/sec
 - 60 pulses per second (pps)
 - duty cycle 10 on/10 off; ramp of 1 second
 - pad placement- 1"x1" electrodes placed on each side of inflamed/painful tendon (After 3 minutes, palpate tendon, should be less painful and becoming numb, if not, move electrodes)
 - Quadriceps strengthening program (Level I)
 - E-stim to quadriceps*
 - Quad sets*
 - SLR flexion*
 - Hip adduction/abduction*
 - Vertical squats (tilt board)
 - Hip flexion/extension
 - Toe-calf raises
 - Bicycle (15-20 min.)
- *Monitor subjective pain level response (goal level 5-7)
- Pool program
 - Stretch (aggressive stretching)
 - Laser
 - Cryotherapy

II. Phase II

Emphasize eccentric training for quadriceps

Goals: Gradual increase stress to patellar tendon
Enhance quadriceps strength
Improve flexibility
Gradual increase functional activities

Treatment Regimen:

- Hot packs or warm whirlpool
- Ultrasound to patellar tendon
- Transverse message to patellar tendon
- Active warm-up bicycle (10-12 min.)
- Stretch (hamstrings, quadriceps, gastroc)
- Application of pain stimulation
- Strengthening program (Level II)
 - Leg press (90-0°) and (45-100°)-(emphasize eccentrics)
 - Hip add/abduction
 - Hip flex/extension
 - Wall squats (0-70°)
 - Lateral step-up (foam)-(emphasize eccentrics)
 - Front lunges- (emphasize back leg)
 - Knee extension (progress from eccentric to concentric)-(emphasize eccentrics)
 - Leg press (progress from concentric to eccentric)
 - Hamstring curls
 - Toe-calf raises
 - Bicycle/stairmaster
 - Control forces to knee
 - Enhance hip & ankle strength & stability
 - Core stability
- *Monitor subjective pain level response (goal 5-7)
- Aggressive stretching
- Laser
- Cryotherapy

III. Phase III

- Goals:** Gradually increase applied loads
Functional training
Enhance lower extremity strength
Improve flexibility

Treatment Regimen:

- Hot packs to knee
- Ultrasound to patellar tendon
- Transverse message
- Active warm-up
- Stretch
- Application of noxious electrical stimulation protocol
- Strengthening program (Level III)
 - Continue previous exercises
 - Continue eccentric progression
 - Leg press
 - Hip machine
 - Wall squats
 - Tilt board squats
 - Lateral step-ups
 - Front step-downs
 - Agility drills

- Lunges onto unstable surface
- Step-ups on unstable surface
- Single leg balance on unstable surface
- Plyometric program
 - Initiate two-legged jumps
 - Progress to one-legged jumps
- *Monitor pain level (goal level 5-7)
- Progress to running program
 - Backward running
 - Lateral movements
 - Forward running
- Laser Therapy
- Stretching

IV. Phase IV

- Goals:**
- Sports specific training
 - Continue stretching/flexibility program
 - Continue strengthening program

Treatment Regimen:

- Heat and ultrasound (if needed)
- Active warm-up
- Stretching
- Continue strengthening program
- Initiate sport specific drills and training
- Progress to practice situation
- Stretch
- Ice (if needed)

Pain (noxious) Stimulation Protocol

Clinical muscular electro-stimulator

- Specific parameters
 - Frequency: 2500 Hz pulse width: 200MS
 - Rate: 60 pulses per second (pps)
 - Ramp: 1 sec
 - Waveform: Russian
 - Duty cycle: 10 on/10 off
 - Time: 12 minutes

- **Electrode placement**

- 1" X 1" electrodes placed on each side of painful tendon or infrapatella fat pad

* after 3 minutes palpate tendon, if not becoming less painful or numb, move electrodes