

Rehabilitation of Hamstring Strains

I. PHASE I: ACUTE PHASE

Goals: Diminish pain and inflammation
Gradually improve flexibility and ROM
Promote collagen synthesis & organization
Retard muscular atrophy and strength loss
Enhance healing of muscular strain

Immediately following injury:

- Cryotherapy, compression wrap
- Laser therapy to involved area
- Soft tissue massage
- ROM exercises:
 - Seated active and passive knee extension
 - Gradually decrease hip flexion angle
 - Initiate static hamstring stretch (gentle and gradual as tolerated)
- Stretch hip flexors, quadriceps, calf and hip adductors
- Strengthening exercises:
 - Quad sets
 - Straight leg raises (3 directions)
 - Active knee extensions
 - Toe calf raises
 - Isometric hamstring contractions (perform at knee flexion 45°)
 - Bicycle when able
 - Core stabilization program
 - Hip ER/IR strengthening
 - Hip extension, abduction & adduction strengthening
- Stretch and ROM exercises: perform post-exercises regimen
- Modalities for pain

II. PHASE II: SUBACUTE PHASE

Goals: Improve static & dynamic flexibility and ROM
Enhance collagen organization & collagen strength
Enhance muscular strength (hip, core, hamstrings) endurance
Promote healing of injured structures
Control any inflammation and pain

Criteria to progress to Phase II:

- Hamstring flexibility within 10 degrees to contralateral side
- Minimal tenderness on palpation
- Hamstring strength 4/5 or >

- Superficial heat to injured hamstring or contrast heat/cold
- Ultrasound over injured area
- Laser therapy
- Soft tissue mobilization and massage
- Active warm-up bicycle
- Dynamic/ballistic stretches
- Stretch lower extremity musculature – manual & self-stretches (stretch hamstrings seated and supine)

- Stretches static and initiate dynamic/ballistic stretching
- Initiate isotonic strengthening program
 - Leg press
 - Bridges bilateral & unilateral
 - Bridges on stability ball
 - Hamstring curls on stability (bilateral & unilateral)
 - Suspension band hamstring curls
 - Hip abd/add
 - Hip flex/ext
 - Knee extensions
 - Wall squats
 - Hamstring curls
 - Front lunges
 - Lateral lunges
 - Backward lunges
 - Lateral step-overs
 - Forward/backward step-overs
 - Toe-calf raises
- Core stabilization drills
- Stairmaster
- Initiate proprioception drills
- May initiate pool exercises and running in pool
- Stretch (static)
- Cryotherapy
- Use neoprene sleeve following workouts

III. **PHASE III: DYNAMIC PHASE**

Goals: Improve dynamic (ballistic) flexibility of hamstrings
Normalize static flexibility
Normalize muscular strength

Criteria to progress to Phase III:

- Hamstring flexibility equal to contralateral side
- No pain or tenderness on palpation
- Hamstring strength 5/5

- Active warm-up – bicycle or jog
- Stretch all major muscle groups lower extremity (stretch hamstrings seated and supine)
- Continue strengthening exercises listed above
- Initiate ballistic stretching maneuvers
- Emphasize plyometrics which promote dynamic flexibility
 - Plyometric leg press
 - Fast speed hamstring work with sport cord
 - Plyo front lunges
 - Scissor jumps
 - Scissor jumps onto box
 - Side to side box jumps (plyos)
 - Skip lunges
 - Fast speed lateral step-overs
 - Knee high running (forward) (ropes)

- Stretch after workout
- Cryotherapy
- Consider neoprene sleeve during drills

IV. PHASE IV: SPORTS SPECIFIC AND AGILITY DRILL PHASE

Goals: Normalize ballistic flexibility
Normalize muscular strength and agility
Gradual return to sport participation

Criteria to progress to Phase IV:

- Hamstring flexibility equal to contralateral side
 - No pain or tenderness on palpation
 - Hamstring strength which is normal
 - No pain with ballistic movements or running/sprinting
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- Active warm-up or jog
 - Stretch all lower extremity muscles
 - Continue strengthening program
 - Continue selected ballistic stretching drills
 - Initiate sport specific program
 - Side shuttles
 - Carciacos
 - Backward running
 - Forward running
 - Interval running
 - Progress to sprints
 - Running and cutting drills
 - Gradually increase intensity of running
 - Jog run→ sprint
 - Sprint training: start & stop program
 - Stretch following drills
 - Consider neoprene sleeve during drills
 - Gradually return to sport participation (criteria listed above)