

Acute Nonoperative Hamstring Injury Rehabilitation Protocol

Initial Injury Management

Goals:

1. Restore Normal Gait
2. Reduce Pain
 - a. RICE Therapy + Modalities
3. PRP for Grade II tendon or muscle-tendon sprains
 - a. Can promote early healing

TABLE 5. Rehabilitation program for individuals in the progressive agility and trunk stabilization (PATs) group.

Phase 1
- Low- to moderate-intensity sidestepping, 3 × 1 min - Low- to moderate-intensity grapevine stepping (lateral stepping with the trail leg going over the lead leg and then under the lead leg), both directions, 3 × 1 min - Low- to moderate-intensity steps forward and backward over a tape line while moving sideways, 2 × 1 min - Single-leg stand progressing from eyes open to eyes closed, 4 × 20 sec - Prone abdominal body bridge (performed by using abdominal and hip muscles to hold the body in a face-down straight-plank position with the elbows and feet as the only point of contact), 4 × 20 sec - Supine extension bridge (performed by using abdominal and hip muscles to hold the body in a supine hook lying position with the head, upper back, arms, and feet as the points of contact), 4 × 20 sec - Side bridge, 4 × 20 sec on each side (Figure 3) - Ice in long sitting for 20 min
Phase 2*
- Moderate- to high-intensity sidestepping, 3 × 1 min - Moderate- to high-intensity grapevine stepping, 3 × 1 min - Moderate- to high-intensity steps forward and backward while moving sideways, 2 × 1 min - Single-leg stand windmill touches, 4 × 20 sec of repetitive alternate hand touches (Figure 4) - Push-up stabilization with trunk rotation (performed by starting at the top of a full push-up, then maintain this position with 1 hand while rotating the chest toward the side of the hand that is being lifted to point toward the ceiling, pause and return to the starting position), 2 × 15 reps on each side - Fast feet in place (performed by jogging in place with increasing velocity, picking the foot only a few inches off the ground), 4 × 20 sec - Proprioceptive neuromuscular facilitation trunk pull-downs with Thera-Band, 2 × 15 to the right and left - Symptom-free practice without high-speed maneuvers - Ice for 20 min if any symptoms of local fatigue or discomfort are present

Key: Low intensity, a velocity of movement that is less than or near that of normal walking; moderate intensity, a velocity of movement greater than normal walking but not as great as sport; high intensity, a velocity of movement similar to sport activity.

*Progression criteria: subjects progressed from exercises in phase 1 to exercises in phase 2 when they could walk with a normal gait pattern and do a high knee march in place without pain.

Return to Sport Phase

Rehabilitation Goals	• Good control and no pain with sport and work specific movements, including impact
Precautions	• No pain during the strength training • Post-activity soreness should resolve within 24 hours
Suggested Therapeutic Exercise	• Continue hamstring strengthening – progress toward higher velocity strengthening and reaction in lengthened positions, including eccentric strengthening with single leg forward leans with medicine ball, single leg dead lifts with dumbbells, single leg bridge curls on physioball, resisted running foot catches, and Nordic curls • Running and sprinting mechanics and drills • Hip and core strengthening • Impact control exercises beginning 2 feet to 2 feet, progressing from 1 foot to other and then 1 foot to same foot • Movement control exercise beginning with low velocity, single plane activities and progressing to higher velocity, multi-plane activities • Sport/work specific balance and proprioceptive drills • Stretching for patient specific muscle imbalances
Cardiovascular Exercise	• Replicate sport or work specific energy demands
Return to Sport/Work Criteria	• Dynamic neuromuscular control with multi-plane activities at high velocity without pain or swelling • Less than 10% deficit for side to side hamstring comparison on Biodex testing at 60° and 240° per second • Less than 10% deficit on functional testing profile

*UW Phase IV Rehab Protocol, Sherry + US Health Sports Medicine Physician Group

Maintenance/Injury Prevention

- 2-3x/week combined
 - Must be done with a solid Core Strengthening Program
 - Can be incorporated into FIFA 11+ protocol or strength and conditioning sessions
 - Timing of training must be coordinated into practice and team schedule to avoid risk of injury
1. Regular and graded exposure to sprinting
 1. Aim to hit max velocity 2 x a week w/ sprints over 30-50m to ensure max velocity attained
 2. Total sprint distance per session around 100-300m depending on tolerance
 2. Focus on proper running mechanics
 1. Avoid overstride
 2. Avoid Anterior Pelvic Tilt
 3. Strengthen Hamstrings in a variety of ways:
 - Eccentrics (most effective):
 - Nordics (1-3 sets of 8)

- Isometrically
 - Single Leg Hamstring bridge and Hold
- Concentric low velocity
 - Romanian deadlifts
- Concentric high velocity
 - Kettlebell Hip Thrusters
 - Bodyweight plyometrics
- Hip dominant movements (Romanian deadlifts)
- Knee dominant movements (Nordics, leg curls)

R. Judd Robins, M.D.
Orthopaedic Sports Medicine