

Hamstring rehabilitation

Strains of any of the thigh muscles, or their attachments to tendon or bone, are common amongst active sportspeople, because these muscles are subject to significant forces. The most common predisposing factors for injury are muscle imbalance, poor flexibility, over stretching, and violent muscle contraction against heavy resistance. Hamstring strains are often frustrating injuries that recur.

Mechanism of hamstring injury

Hamstring injuries usually occur during sprinting or high speed exercises, for instance, as a sprinter leaves the block, or the lead leg of a hurdler.

In these situations, the hamstring muscle group actively contracts to decelerate the tibia as it swings forward. Once the foot is on the ground and weight is taken, hamstring function alters to extend the hip, allowing the contra lateral leg to move forward. In either situation the hamstring muscle is at risk of strain. The short head of the biceps femoris is the most common hamstring muscle to be injured in this way.

Diagnosis

The patient history usually includes a sudden sharp pain in the hamstring region during exercise, with associated hamstring spasm.

Examination may reveal localised swelling and bruising or, occasionally, a palpable gap. Severity is assessed by estimating the degree of knee flexion the patient can achieve whilst prone – the more severe the injury, the less flexion is obtained.

Hamstring rehabilitation

Rehabilitation should commence as soon as possible – within 48 hours of injury – to minimize time lost. It is divided into acute, intermediate and late phases.

Acute phase. The usual advice of RICE applies (i.e. rest, ice, compression and

elevation). Appropriately sized tubi-grip is useful to decrease swelling. The patient may be referred for physiotherapy for pulsed ultrasound treatment, with or without electrical stimulation.

Cryostretching may be useful at this stage – the affected muscle is stretched statically and contracted isometrically, done alternately with a cold pack applied.

Two to four days following the injury the patient is advised to begin a stretching program within their pain-free range. As symptoms improve, the stretching program is increased.

Intermediate phase. A stationary bicycle or stepper is introduced, along with continuous ultrasound treatment and local application of heat. Hamstring stretching exercises are introduced, together with progressive resistant exercises.

Once the patient tolerates these, hydrotherapy may be introduced. Each session of therapy is concluded with a combination of cold pack and passive hamstring stretching.

Late phase. The treatment is designed to rehabilitate the fast twitch muscle fibres, as they are responsible for generating short bursts of strength and speed. During this phase, jogging and running, both forward and backward, is introduced. Uphill running is encouraged. The patient uses a slide board and lateral drill.

Table 1: Severity of strains

SEVERITY	SYMPTOMS	SIGNS
MILD	Local pain, mild pain on passive stretch and active contraction of the involved muscle; minor disability	Mild spasm, swelling, ecchymosis, local tenderness, minor loss of function and strength
MODERATE	Local pain; moderate pain on passive stretch and active contraction of the involved muscle; moderate disability	Moderate spasm, swelling, ecchymosis, local tenderness; impaired muscle function and strength
SEVERE	Severe pain; disability	Severe spasm; swelling, ecchymosis; haematoma; tenderness, loss of muscle function; palpable defect may be present



■ In the prone position the contralateral leg is used to assist hamstring elasticity. (Can be used in conjunction with cryotherapy).



■ The use of traction weight with cryotherapy post exercise. This assists in regaining hamstring length.



■ Using elastic tubing, hamstring curls are performed to various levels of fatigue as an assistance to the development of muscle endurance.



■ Single leg hamstring stretch. The opposite leg is kept flat.

The author gratefully acknowledges Kerri Tiemann RN for assistance in preparing this article.

By Dr Ian Skinner, Orthopaedic Surgeon,
Murdoch Medical Clinic. Tel 9311 4800



Table 2: Three phases of hamstring rehabilitation

INITIAL PHASE
R.I.C.E and Tubi-Grip for effusion
Modalities include: pulsed ultrasound; electrical stimulation; and ice post-exercise
Cryostretching and cryokinetics with the following exercises: hamstring setting; co-contractions; heel slides (seated and supine); active hamstring curls; active hip extensions; and single-leg hamstring stretches to tolerance
Aquatic therapy
Active range of motion as tolerated
INTERMEDIATE PHASE
Stationary bike, Stairmaster
Modalities include: continuous ultrasound and moist heat
Hamstring Stretching: single leg hamstring stretches; straddle groin and hamstring stretches; and supine assisted hamstring stretches
Progressive-resistance exercises: hamstring curls; hip extension; hip adduction and abduction; and straight leg raises
Proprioceptive exercises including neuromuscular facilitation patterns
Prophylactic cryotherapy
Increased pool program
LATE PHASE
High-speed isokinetic exercises (seated and supine)
Eccentric hamstring curls
Functional drills: jogging or running (forward and backward and uphill); slide board; and lateral Drills
High speed tubing exercises in hip flexion, extension, abduction, and adduction and in knee flexion
Protective wrapping

Following completion of rehabilitation the patient is reminded to perform adequate stretching exercises and warm up exercises prior to embarking on sporting activity.