## Rehabilitation

Always seek the advice of a sports medicine professional before returning to sport. The best preventative measures involve a consistent program of both stretching and strengthening exercises. Increased flexibility combined with appropriate strength will contribute greatly to the ability of the hamstring muscles to resist strains and injury.

Poor rehabilitation can make the hamstrings more prone to re-injury. Hamstring injuries can recur and can become long-term injuries if rehabilitation is inadequate or the progression of rehabilitation is too fast.

As a general rule, grade one hamstring strains should be rested from sporting activity for about 3 weeks and grade two injuries for a minimum of 4 to 8 weeks. In the case of a complete rupture (grade three strain), the muscle may have to be repaired surgically and the rehabilitation to follow will take about 3 months. Timeframes for rehabilitation and return to sport vary depending on the nature and severity of the strain.

## Return to Sport

Premature return to sport and inadequate rehabilitation will increase the risk of re-injury. Full stretch and strength should be achieved in addition to the ability to perform full speed training. Assessment of sport-related activities, such as twisting, jumping and changing direction suddenly should also be evaluated.

A thorough, general warm-up should be followed by stretching and a sport-specific warm-up and should form part of all pre-training and pre-competition activities. Continued stretching during the season will help maintain flexibility.

As a general rule, any activity that elicits pain at or near the injured site may be causing further injury and will only hamper the recovery process.

All these rehab activities must be carried out before the athlete is able to return to full activity with minimal risk of recurrence.

## References


Brukner P, Khan K. Clinical Sports Medicine Revised Second Edition. McGraw Hill Australia Pty Ltd 2002

Zuluaga M et al. Sports Physiotherapy Applied Science and Practice. Pearson Professional (Australia) Pty Ltd 1995

Kolt GS, Snyder-Mackler L. Physical Therapies in Sport and Exercise. Elsevier Science Limited 2003

Arnheim DD. Modern Principles of Athletic Training. Times Mirror/Mosby College Printing 1989


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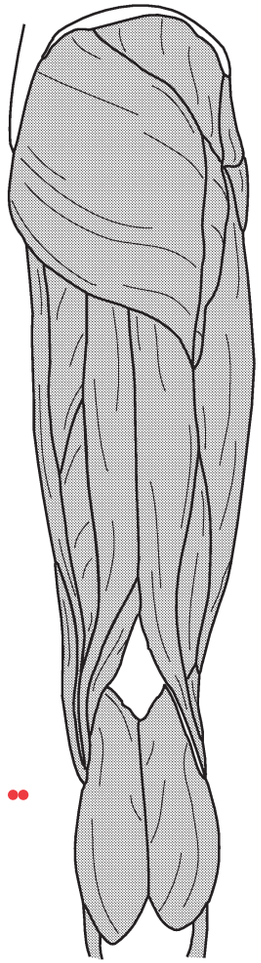
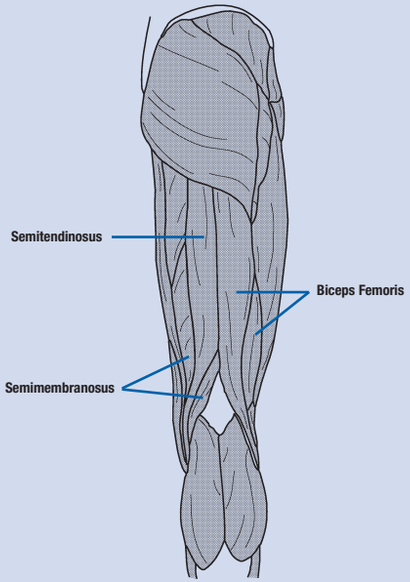
# Hamstring Strain



# Introduction

One of the most common injuries in sport is the hamstring strain. The hamstring muscles are very susceptible to tears and strains. Hamstring strains are most common among sports that require a high degree of speed, power and agility such as soccer, basketball, tennis and football.




## Functional Anatomy

The hamstring group of muscles, located on the back of the upper leg, are a group of three separate muscles: Biceps Femoris, Semimembranosus and Semitendinosus. The top of these muscles are attached to the lower part of the pelvis, and the bottom of the hamstring muscles are attached to the tibia and fibula (shin bones) just below the knee joint. The action of the hamstring muscles is to flex (bend) the knee and extend (straighten) the hip.

## Causes of Injury

Hamstring strains are classified as first, second or third grade/degree strains depending on their severity. A hamstring strain may occur in one or more of the three muscles in the group.

The major cause of hamstring injuries originates from an imbalance between the quadriceps muscle (located at the front of the thigh) and the hamstring muscles. The quadriceps are a very large, strong group of muscles which help to extend (straighten) the leg. These muscles may forcibly over stretch the hamstrings, placing excessive tension on the hamstring muscles. Other major predisposing factors include inadequate warm-up, poor flexibility and fatigue.

## Signs & Symptoms

A grade one strain might consist of small micro tears in the muscle. A grade two strain would be a partial tear in the muscle and grade three is a severe or complete rupture of the muscle.
A sudden, sharp pain in the back of the thigh is often associated with a hamstring strain. Depending on the severity of the strain, the associated sensation will differ.

Signs of a grade one hamstring strain may not be present until after the activity is over. There may be a sensation of cramp or tightness and a slight feeling of pain when the muscle is stretched or contracted. A feeling of pain may be reported with sitting or while walking uphill or ascending stairs. Depending on the severity again, weight bearing activities may or may not be possible, walking properly may be possible and there will probably be little swelling.

Pain associated with a grade two hamstring strain is more immediate and more severe than the pain of a grade one strain. A grade two strain is confirmed by pain on stretch and contraction of the muscle, and is usually sore to touch. Limping is likely during walking and occasional sudden twinges of pain during activity may occur. Bending the knee against resistance will cause pain and there may be some difficulty in fully straightening the knee.

A grade three hamstring strain is a serious injury. There is an immediate burning or stabbing pain and walking is not possible without pain. The muscle is completely torn and there may be a large lump (of muscle tissue) above a depression where the tear is.

After a few days with grade two and three injuries, a large bruise may appear below the injury site caused by bleeding within the tissues.

## Initial Treatment

The immediate treatment of any soft tissue injury consists of the RICER protocol - rest, ice, compression, elevation and referral. The RICER protocol should be followed for 48 - 72 hours. The aim is to reduce the bleeding and damage in the muscle. The muscle should be rested in an elevated position with an ice pack applied for 20 minutes every two hours (never apply ice directly to the skin). A compression bandage should be applied to limit bleeding and swelling in the injured area.

The No HARM protocol should also be applied - no heat, no alcohol, no running or activity, and no massage. All these will lead to increased swelling and bleeding in the injured area.

## Diagnosis, Treatment & Evaluation

An accurate diagnosis by a sports medicine professional is essential for proper rehabilitation of hamstring injuries. Treatment varies according to severity of the hamstring strain. Patients with minor (grade one) strains may progress quickly to stretching and strengthening exercises, while those with a severe (grade three, complete rupture) may require surgery.