

# All You Need To Know To Avoid Hamstring Injuries And What To Do If You Do Get One

By Sam Downer BSc HPC MCSP

## Introduction

The hamstrings are a group of 3 muscles (Biceps Femoris, Semitendinosus and Semimembranosus) found on the back of your thigh that attach to the back of your pelvis and into the top of the tibia and fibula bones. They are commonly injured muscles in all athletes but particularly footballers, runners, dancers and hockey. The function of the hamstrings is primarily to flex the knee and contribute to hip extension. They also provide a key role in stabilizing the knee joint, and help to control the forward movement of the tibia when the free leg is swinging during walking and running to prevent the knee snapping into hyper extension.



There are three grades of hamstring tear. Grade 1 is classified when only a few fibres are torn, Grade two tears are seen with a 50% tearing of muscle fibres and finally a grade 3 tear is a complete rupture to the muscle.

## Why Do The Hamstrings Get Injured?

Well, as previously mentioned the hamstrings run from the ischial tuberosity to below the knee, thus making them two joint muscles. This means that they require the right amount of flexibility as well as strength in order to work functionally and efficiently. If this balance is out of sync then there is the potential for an injury to occur.

The most common occurrence of hamstring strain is in the first 10-20 meters of a sprint race. This may be attributed to inadequate warm up, but more pertinent perhaps is to remember that we are dealing with a two joint muscle. When you are in the forward lean position the hamstrings have to work to raise the trunk as you move into a standing position, whilst at the same time thrusting the leg forwards to gain ground with a flexed knee, therefore being put under immense strain at both ends of the muscle. So it is not surprising that this amount of strain is sufficient to cause a tear.



Injuries when running are not confined to the starting blocks however. During normal sprinting, it is the eccentric control of the hamstrings as the free leg swings forward that hamstring injuries are usually instigated. As the leg swings through with a straight knee the hamstrings are stretched at the lower end, and when you sprint you have a tendency to increase your trunk flexion to gain more momentum and this causes a further stretch at the top end of the hamstrings. When you combine all of this with an increased stride length that comes with quicker running it is easy to see just how much stress is placed on them. When you aren't regularly stretching your hamstrings after running, you expose yourself to developing short and tight hamstrings. This could potentially lead to a muscle tear.

Other ways of tearing a hamstring include a one off movement, which usually involves ballistic limb movement into hip flexion as seen in kicking movements in football and ballet for example. These muscle injuries usually affect the upper portion of the hamstrings, whereas the injuries sustained when running usually impacts upon the musculo-tendon junction of the biceps femoris muscle.

Factors, with some evidence supporting them, that may be considered as risk factors for developing a hamstring tear include:

- Low hamstring : Quadriceps strength ratio
- Muscles that fatigue quickly
- Existing hamstring tightness
- Insufficient warm up
- A previous injury or returning to play before an injury has healed properly. In fact studies have shown you are between 12-31% more likely to suffer a hamstring tear if you have had one previously.

### What Are The Symptoms Of A Hamstring Tear?

The table below summarises the symptoms that you should look out for if you suspect you may have injured your hamstring:

Clinical Feature	Sign of Hamstring Strain
Onset of symptoms	Usually the problem happens suddenly
Pain level	Moderate to severe
Ability to walk	Unable to run, difficulty walking (particularly uphill)
Response to stretch	Reduced range of stretch, evoking a pain response
Response to strength	Weakness and pain produced on movements involving knee flexion
Local signs	Bleeding, swelling, bruising or redness
Tenderness	Tenderness to points in the hamstring muscles that may include the top attachment or lower into the muscle bellies

### What Should You Do If You Think You Have A Hamstring Tear?

The first thing you need to do is to stop exercising. It is important that you get the injury assessed quickly in order to determine what degree of damage has been sustained to the muscle. It is also important to stop exercising in order to prevent further damage.

You can then apply Ice to the painful area for 10-15 times regularly throughout the day in order to control the amount of bleeding that occurs. Applying a compression bandage to the area may also help.

Should you take Non-Steroidal Anti-inflammatory Drugs (NSAIDs)? Some advocate taking anti-inflammatory drugs, although the timing of this is debated. However there have been studies demonstrating no difference between taking NSAIDs and standard analgesics on the affect of muscle strains. Therefore simple analgesics can be as effective without carrying the same side effects that NSAIDs do. However, the best thing to do is to consult your GP prior to taking any medication.

### **Will Physiotherapy Help?**

Yes physiotherapy will help. Initially to limit damage to the muscles which is important to minimize scar tissue formation, that in turn reduces the chances of re-injury, but then to assist you in the correct rehabilitation of the muscle. The sort of physiotherapy treatments that you can expect to have include:

#### Early Management:

### **RICE**

If you are seen within 48 hours of sustaining the injury, Ice may be used as part of the treatment session.

### **Exercise Therapy**

It is important to be seen by a physiotherapist within the first 48 hours in order to commence a low level strengthening and flexibility programme that is appropriate to your needs. Finding out what exercises you can do and in what movement range is important. Your physiotherapist will help to formulate a series of exercises for you to do at home to begin strengthening the muscle. This will vary widely depending on the type and severity of the tear. Early and appropriate muscle activation results in a process called 'angiogenesis' which is the production of new blood vessels. By stimulating this process it encourages muscle-derived stem cells to the injured region.

#### Subacute Management:

### **Stretching**

The role of stretching to the hamstrings following an injury is to maintain the flexibility and prevent tightness of the scar tissue.

### **Soft Tissue Therapy**

Soft tissue therapy may include ischemic pressure to the hamstrings and the gluteal muscles which sometimes present with abnormalities associated with hamstring injuries. Myofascial release and deeper massage techniques can also be used.

### **Neural mobilizing**

The sciatic nerve runs through the hamstrings and may become compressed due to bleeding accumulating around the nerve. If this happens it may cause nerve irritation and pain. Neural mobilizations can be used to help free the nerve and prevent it becoming irritated.

### **Exercise Therapy**

At this stage further strengthening exercises can be implemented to develop the strengthening of the muscle. At this stage, pain should have settled and as a result muscles should be able to work in a larger range therefore allowing for a wider variety of exercises to be undertaken.

### **End Stage Management**

#### **Exercise and Return To Sport Programmes**

The last stage of therapy is to complete high end sport specific exercises as well as return to sport in a graded way. Your physiotherapist will work with you to help write a programme that allows you to gently return to your sport in a way that will minimize your risk of re-injuring the muscles. This is a crucial part of the rehab process and one that athletes should comply with. Frequently athletes will return to their 'normal' sports programme too soon and end up breaking down and adding an extra few weeks onto their recovery. This is why it is important to discuss with your physiotherapist what is an appropriate level of exercise.

#### **How Do You Prevent Hamstring Tears?**

Although there are no guarantees to prevent injury, there are certain measures you can take to try and reduce your chances of sustaining an injury.

- 1) Build good endurance. Studies into professional football have shown that most hamstring strains appear to happen at the end of each half. This suggests that fatigue plays a part in injuries occurring. In order to help prevent an injury to fatigue it is important to work on muscular endurance as well as muscular strength. This involves performing high number of repetitions of exercises against low level resistance.
- 2) Maintain good strength of the hamstrings. One way to do this is to include some eccentric strength training into your exercise programmes. Eccentric strengthening involves the muscle tensioning whilst it is lengthening, and so it replicates the function of the muscles when running. This better prepares them for participation in sport.
- 3) Include some balance and proprioception training. There are studies that show including balance training as part of your general training regimes can help not only to prevent hamstring injuries in the first place, but can be particularly effective in preventing recurrence of a hamstring injury.
- 4) Utilise soft tissue therapy. Soft tissue therapy can help to maintain flexibility and prevent tightness. Particularly during a long hard season it is common to develop tightness to muscles and as previously mentioned this can predispose you to injury.
- 5) Include a warm up. Although there are conflicting thoughts on the benefits of warm ups there are some studies to suggest that warming up prior to competing or engaging in sport will help to reduce the chances of sustaining an injury.

### **How Long Will I Be Out For?**

The length of the recovery time is dependant on a number of factors. The main factor is the severity of the tear, obviously the worse the tear the longer the recovery period. Early indicators of how long the problem may take to heal to a degree that allows return to play is how quickly pain free jogging begins. It is suggested that if you are able to jog pain free within two days of injuring the leg then the recovery period may be less than 2 weeks. Anything that takes between 3 and 5 days is likely to take significantly longer than 2 weeks.

The site of the injury also has an impact. The higher up the muscle (closer to the attachment at the ischial tuberosity) the tear is, the slower the recovery. A hamstring strain that is caused through a kicking movement is also likely to take longer to recover than one sustained through quick running. Early and correct management will help reduce the recovery period but it may take anywhere between 2-5 weeks to recover sufficiently enough to allow return to play.

### **Conclusion**

In conclusion, hamstrings are two joint muscles that are put under immense stress during sporting participation. They can be quite debilitating and prevent you from continuing in sport in the short term. They require expert input to make sure they are treated correctly to avoid bad management and an increased likelihood of the problem reoccurring. The important thing to remember is to make sure you act quickly and get yourself seen by a physiotherapist who can examine you and get you started on your rehabilitation programme. Remember, the recovery process starts the moment you suffer an injury, the sooner you act the better the chances of a quicker recovery.