Hamstring Strain

What is a hamstring strain?
The muscle group at the back of your thigh is commonly called the hamstrings. The hamstrings comprises of 3 muscles:

- biceps femoris
- semimembranosus
- semitendinosus

These muscles originate from the pelvis and insert into the top of the lower leg bones

(figure 1).
The hamstring muscles are responsible for bending the knee and straightening the hip during activity and are particularly active during running, jumping and kicking. During contraction of the hamstrings, tension is placed through the hamstring muscle. When this tension is excessive due to too much repetition or high force, one or more of the hamstring muscles can tear. This is known as a hamstring strain.
Tears to the hamstring muscle can range from a small partial tear whereby there is minimal pain and minimal loss of function, to a complete rupture which may require surgical reconstruction. Hamstring strains range from a grade 1 to a grade 3 tear and are classified as follows:

- Grade 1: a small number of fibres are torn resulting in some pain, but allowing full function.
- Grade 2: a significant number of fibres are torn with moderate loss of function.
- Grade 3: all muscle fibres are ruptured resulting in major loss of function.

The majority of hamstrings strains are grade 2 tears.

Causes of a hamstring strain
Hamstring strains commonly occur due to a sudden contraction of the hamstring muscle often when it is in a position of stretch. This sometimes occurs with rapid acceleration whilst running or when a footballer performs a long kick. Hamstring strains are commonly seen in running sports such as football, hockey and athletics (particularly sprinters, hurdlers, and long jumpers). Hamstring strains tend to occur more commonly in the older athlete and particularly following an inadequate warm-up.

Signs and symptoms of a hamstring strain
Patients with a hamstring strain usually feel a sudden sharp pain or pulling sensation in the back of the thigh during the provocative activity. In minor cases, the patient

may be able to continue the activity only to have an increase in symptoms upon cooling down. In more severe cases the patient may be unable to continue the activity and will often limp or be unable to walk off the playing field.
Patients with a strained hamstring usually experience an increase in pain during activities which place load on the hamstring muscle. These activities may include: walking (especially uphill), going up and down stairs, running, jumping, and kicking. It is also common for patients to experience pain or stiffness after these activities with rest, especially upon waking in the morning.
Patients with this condition may also experience swelling, muscle spasm, weakness, tenderness and bruising in the back of the thigh.

Diagnosis of a hamstring strain
A thorough subjective and objective examination from a physiotherapist is usually sufficient to diagnose a hamstring strain. Further investigations such as an MRI scan or Ultrasound may be required, in rare cases, to confirm diagnosis.

Treatment for a hamstring strain
Most patients with a strained hamstring heal well with appropriate physiotherapy. The success rate of treatment is largely dictated by patient compliance. One of the key components is that the patient rests sufficiently from any activity that increases their pain until they are symptom free. Activities placing large amounts of stress through the hamstrings should also be minimized, these include: running, kicking and jumping. By avoiding these activities, the body can begin the healing process in the absence of further tissue damage. Once the patient can perform these activities pain-free a gradual return to these activities is indicated provided there is no increase in symptoms.
Ignoring symptoms or adopting a 'no pain, no gain' attitude is likely to lead to the problem becoming chronic. Immediate, appropriate treatment in patients with a hamstring strain is essential to ensure a speedy recovery. Once the condition is chronic, healing slows significantly resulting in markedly increased recovery times and an increased likelihood of future recurrence.
Diligently following the R.I.C.E. Regime in the initial phase of injury (first 72 hours) will greatly assist in improving recovery time in patients with a hamstring strain. This involves rest from aggravating activities, regular icing, the use of a compression bandage, and keeping the affected leg elevated (provided it is pain free). Anti-inflammatory medication may also help to reduce inflammation, pain and swelling. The use of crutches when walking may be necessary to protect the hamstring muscle from further damage and to hasten the healing process.
A graduated flexibility and strengthening program guided by a physiotherapist is essential to recondition the hamstring muscle and reduce the likelihood of injury recurrence following a hamstring strain. Careful assessment by the physiotherapist to determine which factors have contributed to the development of the hamstring strain, with subsequent correction of these factors is essential to ensure an optimal outcome.
A graduated return to running program in the final stages of rehabilitation of a hamstring strain is required to recondition the muscle for running in a safe and effective manner. This should include the implementation of progressive acceleration and deceleration running drills.

Prognosis of a hamstring strain

With appropriate management, patients with minor hamstring strains can usually recover in one to three weeks. With larger tears, recovery may take four to six weeks or longer depending on the severity. In cases of a complete rupture of the hamstring muscle, surgery may be considered with intensive rehabilitation to follow. Return to sport or activity may then take 6 months or longer.

Contributing factors to the development of a hamstring strain
There are several factors which can predispose patients to developing a strained hamstring. These need to be assessed and corrected with direction from a physiotherapist. Some of these factors include:

- poor hamstring flexibility
- hamstring weakness
- inadequate conditioning of the hamstring muscles
- muscle weakness (particularly the gluteals)
- muscle tightness (particularly the quadriceps and hip flexor muscles)
- inappropriate training or technique
- poor biomechanics
- poor posture
- decreased fitness
- fatigue
- inadequate warm up
- joint stiffness (particularly the lower back, hip and knee)
- poor core stability
- inadequate rehabilitation following a previous hamstring strain
- neural tightness
- muscle imbalances

Physiotherapy for a hamstring strain
Physiotherapy for patients with a hamstring strain is vital to hasten the healing process and ensure an optimal outcome. Treatment may comprise:

- soft tissue massage
- electrotherapy (e.g. ultrasound)
- stretches
- muscle energy techniques
- joint mobilization
- ice or heat treatment
- education
- biomechanical correction
- the use of crutches
- dry needling
- progressive exercises to improve strength, flexibility, core stability and balance
- activity modification advice
- technique correction
- anti-inflammatory advice
- devising and monitoring a return to sport or activity plan

Other intervention for a hamstring strain
Despite appropriate physiotherapy management, some patients with a hamstring strain do not improve adequately. When this occurs, the treating physiotherapist or doctor

can advise on the best course of management. This may include investigations such as an ultrasound, CT scan or MRI, or referral to appropriate medical authorities who can advise on any intervention that may be appropriate to improve the condition. In very rare cases, of complete hamstring rupture, surgical intervention may be considered.

Exercises for a hamstring strain
The following exercises are commonly prescribed to patients with this condition. You should discuss the suitability of these exercises with your physiotherapist prior to beginning them. Generally, they should be performed 3 times daily and only provided they do not cause or increase symptoms.

Hamstring Stretch
Place your foot on a step or chair. Keep your knee and back straight, lean forward at your hips until you feel a stretch in the back of your thigh / knee (figure 2). Hold for 15 seconds and repeat 4 times at a mild to moderate stretch pain free.

Figure 2 – Hamstring Stretch (left leg)

Hamstring Curls vs. Resistance Band
Begin this hamstring strengthening exercise lying on your stomach with a resistance band tied around your ankle as shown (figure 3). Slowly bend your knee tightening the back of your thigh (hamstrings). Perform 10 - 20 repetitions provided the exercise is pain free.

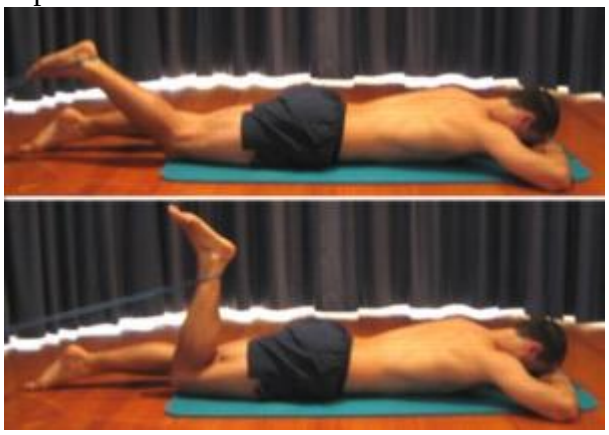

Figure 3 – Hamstring Curls vs. Resistance Band (right leg)

Hip Extension vs. Resistance Band
Begin this hamstring strengthening exercise standing at a bench or chair for balance and a resistance band around your ankle as demonstrated (figure 4). Keeping your back and knee straight, slowly take your leg backwards tightening the back of your thigh (hamstrings). Then slowly return to the starting position. Perform 10 - 20 repetitions as far as possible provided it is pain-free.

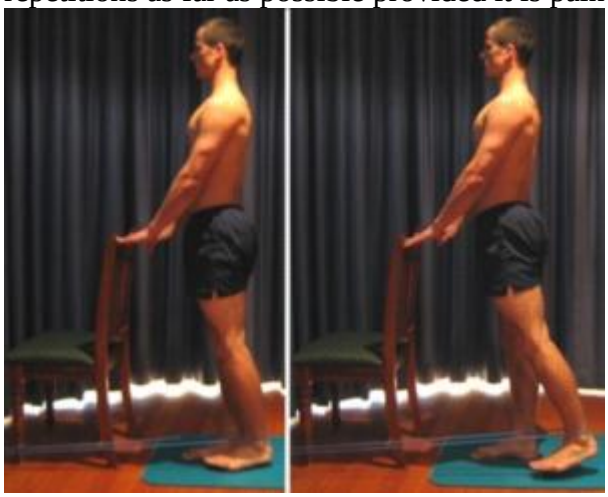

Figure 4 – Hip Extension vs. Resistance Band (left leg)

If you would like help with healing your hamstring injury contact me on +442222866328200 or email info@lindaburke.co.uk