

## Treating inflammation with PRICE - immediately after injury and for 3-5 days afterwards

Tissue injury usually involves damage to small blood vessels that results in bleeding at the site of injury. This bleeding leads to the five main signs of inflammation: heat, redness, swelling, pain and loss of function. The inflammatory reaction is necessary as it is part of the natural healing process. However the body tends to overreact to sudden traumatic injury and as a result more inflammatory fluid accumulates than is necessary for healing. This fluid contains a protein that turns into replacement 'scar' tissue. Too much scar tissue may prevent the structure returning to normal function with reduced flexibility and increased risk of re-injury. The advice below should be followed for 3-5 days depending on severity. It can be remembered by the acronym **PRICE**.

- **PROTECT** - Protect the injured tissue from undue stress that may disrupt the healing process and/or cause further injury. Make sure the mode of protection can accommodate swelling.
- **REST** - This reduces the energy requirements of the area, avoids any unnecessary increase in blood flow, ensures protection of the area and optimises healing. For example using slings, crutches or static rest (ie. sitting or lying down).
- **ICE** - The ice helps constrict the blood vessels thereby limiting bleeding and reducing the accumulation of unnecessary scar tissue. Crushed ice wrapped in a damp towel (to prevent ice burn) is best (ice cubes can be wrapped in the cloth and smashed against a wall to crush the cubes). Ice should be applied immediately after injury for 20 minutes every 3-4 hours or no more than 5-10 minutes at a time on bony areas.
- **COMPRESSION** - Simple off-the-shelf compression bandages such as Tubigrip™ and adjustable neoprene supports are adequate. It is important to ensure the bandages are not too tight to cause pins and needles or any loss of feeling around the joint.
- **ELEVATION** - Lowers the blood pressure and helps limit bleeding and encourage drainage of fluid through the lymphatic system.

When following **PRICE** it is also important to avoid **HARM**, hence the saying: 'Give **PRICE** and avoid **HARM**'.

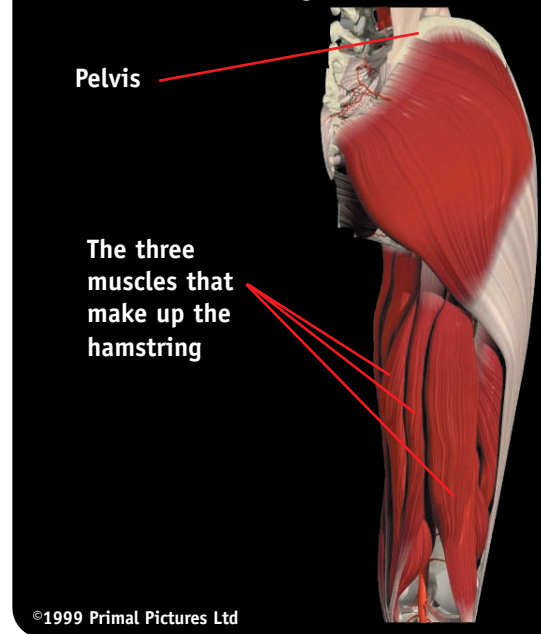
### AVOID

**H** - Heat (eg. hot bath, sauna)  
**A** - Alcohol  
**R** - Running  
**M** - Massage



these are counter-productive to **PRICE** treatment

Diagram showing the back of the thigh and the hamstring muscles



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### USEFUL RESOURCES

- SportEX Medicine magazine [www.sportex.net](http://www.sportex.net)
- The Organisation of Chartered Physiotherapists in Private Practice - [www.physiofirst.org.uk](http://www.physiofirst.org.uk)
- General Osteopathic Council [www.osteopathy.org.uk](http://www.osteopathy.org.uk)
- The Sports Massage Association [www.thesma.org](http://www.thesma.org)
- The Osteopathic Sports Care Association [www.osca.org.uk](http://www.osca.org.uk)

### YOUR INJURY

The hamstring muscle group is found in the back of the thigh and consists of three muscles. They are described as two-joint muscles because their contraction results in movement at both the hip and the knee. This makes them particularly vulnerable to injury. Muscle damage can take several forms ranging from minor to major damage.

- Grade 1 - minor tear of a few fibres
- Grade 2 - tearing of more fibres but muscle still intact
- Grade 3 - total rupture of muscle

Any injury to muscle will cause pain and inflammation and possibly limit future function if correct rehabilitation is not carried out.

### WARM UP & WARM DOWN

When injured it is particularly important that you warm up with a fast walk (at a pain free pace) for 3-4 minutes before you start your exercises. This increases your circulation and helps prepare your muscles for the activity to come. When you have finished your exercises, it is also important to allow your heart rate to slow down gradually by ending the session with a gentle walk for 3-4 minutes.

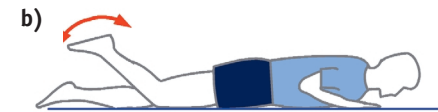
# Exercises for early hamstring strain rehabilitation

## Strengthening exercises

### Your rehabilitation programme

In order for you to fully rehabilitate your injury you need to gain strength and flexibility in the hamstring muscles. The following exercises have been chosen specifically to strengthen your hamstrings in a progressive, graduated manner. Initially the muscle is contracted against a resistance but the limb is held in a fixed position and so no actual movement takes place (isometric contraction). Your therapist will guide you on the number of repetitions for each exercise.

When this has been accomplished without pain, exercise can progress to dynamic muscle contraction (ie. where the limb actually moves) with a gradually increasing load (resistance) and speed. The final step in your rehabilitation will be to carry out some sport specific exercises for your hamstrings which mimic the stresses of your particular sport. Your therapist will advise you on these only when you can achieve the exercises described below satisfactorily.

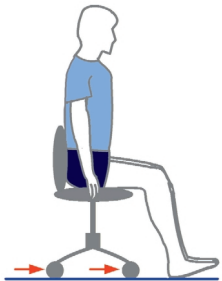


### 1 Hamstring flexion (static)

a) Lie face down and begin by trying to bring your heel to your bottom against resistance of your therapist (ie. your leg remains static) b) Progress by including movement and then c) build up to adding a Theraband and flexing your heel to your bottom - **build up to 20 repetitions and repeat 5 times**

### 2 Chair drags

Sit on a office chair (with wheels) pull yourself along digging in your heels as opposed to pushing off the floor - **build up to 10 repetitions traveling 10 metres each time**



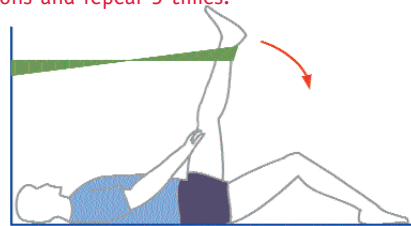
### 3 High step ups

Step up onto a high step (starting position hip at 90° on step) - **build up to 20 repetitions and repeat 5 times**



### 4 Hip curls

Lying on your back with your head towards a door (or point of attachment for a Theraband). Flex your hip as high as possible keeping your knee straight. Attach the band to your ankle and extend the leg to the floor and control the return movement - **build up to 20 repetitions and repeat 5 times.**



## Stretching exercises

### Regaining flexibility

During the first two weeks following injury you should not stretch the injured muscle as this is likely to pull apart the healing tissue. After 14 days the scar begins to shrink and then stretching exercises are required in order to maintain normal extensibility of the involved muscle.

### 1 Sitting hamstring stretch

Sit on a chair and extend your leg until you feel a gentle stretch in your hamstrings



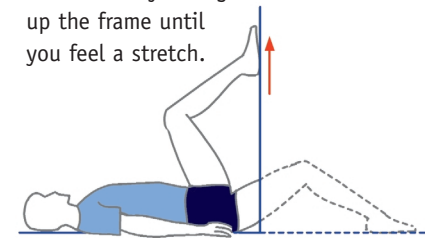
### 2 Hamstring stretch (lying down)

Lie on your back and extend your leg upwards until you feel a stretch, work towards straightening your knee



### 3 Supported hamstring stretch

Lie on your back through an open door, hips just in front of the door frame. Slide your leg up the frame until you feel a stretch.



### Guidance for stretching exercises

Hold all the stretches for 20 seconds each and repeat them five times on each leg. It is important to stretch the uninjured muscles so that both legs reach a similar point of flexibility.

### Progression speed

Your therapist will advise you on the speed you should progress on the strengthening and the stretching exercises. Progression is not just about being able to do the exercise but to do it correctly, with appropriate control. Remember poor practice leads to poor performance and potential strain on your injured muscles. If at any time you feel pain or discomfort stop the exercises and consult your therapist.

### PRACTITIONER CONTACT DETAILS