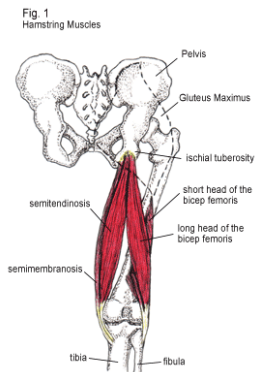


Leg Injuries



Hamstring Tears

The hamstrings are the muscles at the back of the thigh. There are three main muscles which make up this group (see Figure 1). They span from the lower pelvis to just below the knee.



Their main purpose is to move the thigh from front to back, and to bend the knee. They help us to take off and slow down quickly. They also assist in producing and controlling twisting motions at the knee. They help to stop us falling forward when we bend - an important function

when one is running & or moving suddenly. One of the main roles of the hamstrings in sport is to assist us in 'putting the brakes on'. When we sprint they slow down forward leg movement. When we stretch out, they resist the forward bend of the body. This braking movement is the action most likely to cause injury.



Hamstring tears (strains) are very common in all sports involving running, jumping, kicking, sudden

acceleration, and changes of direction. They represent around 15% of all AFL, and 12% of all soccer injuries. When running, the injury is most likely to occur as the hamstrings decelerate & then reverse the forward swing of the leg. The most common muscle injured in this situation is the outside one, the *biceps femoris*. As the leg strides out, this muscle undergoes the greatest stretch. Other areas of the hamstrings can be injured as well. (The high hamstring strain & hamstring 'tendinopathy' will be covered in another newsletter).



The hamstrings are vulnerable to injury in the following situations:

1. Sudden acceleration or running at full speed.
2. Overstretching while kicking or jumping.
3. Loss of control while moving quickly.
4. Doing the splits – sliding out on the playing surface.
5. Overbalancing forward.

Predisposing factors:

There are many potential contributing factors to hamstring injury:

1. Lack of flexibility, particularly in the hamstrings, hip flexors, quadriceps and spine.

2. Lack of strength, particularly in the gluteals, hamstrings, quadriceps and lower back
3. Muscle imbalance, especially between the hamstrings and quadriceps, or between the hamstrings and gluteals.
4. Fatigue. Injuries often occur late in the game or training. Tired muscles absorb energy less efficiently, and result in reduced coordination.
5. Lack of warm-up. Cold muscles will be vulnerable early in the game.
6. Back injury. The sciatic nerve passes deep through the hamstrings. The flexibility of this nerve can be affected by spinal and muscle disorders, and this makes the hamstrings and the nerve itself vulnerable to injury.
7. Past injury. Scar tissue can make the muscle more vulnerable, and affect strength & flexibility. Past injuries to the knee and other leg muscles are also a risk factor for hamstring strains.
8. Age. In AFL studies, it has been found that there is a significant increase in injury incidence between the ages of 21 & 24. In one study, 23 year old athletes were at twice the risk to younger players.
9. Poor core control of the lumbo-pelvic and trunk muscles.
10. Posture. Extremes of posture – resulting in pelvic forward or backward tilt, can affect hamstring tightness, tension and strength.
11. Race. Black athletes are at greater risk compared to white.



Recovery time: This will be affected by a few factors:

1. Location of the injury. Generally, high hamstring injuries will recover more slowly, and lateral (*biceps femoris*) muscle injuries will recover more slowly than medial hamstring strains (*semitendinosus* or *semimembranosus*).
2. Mechanism. The way the injury occurred, including the speed of the movement that

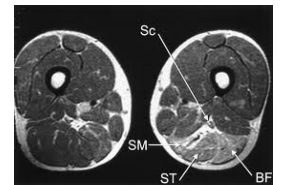
caused the tear, will affect recovery. Slow motion injuries are often the most problematic.

3. Core strength, and strength of other leg and hip muscles.
4. Past injuries. Apart from the fact that a re-injury will be treated more cautiously, recurrent injuries have been shown to heal more slowly.

The average time to return to sport in an AFL study was 4 weeks, with some injuries taking up to 8 weeks.

Assessment of the injury: To some extent, it is possible to predict recovery time depending on how restricted movements are in the first few days. Special tests are not usually necessary, however the main tests likely to be used in diagnosis are:

1. Ultrasound: This test is very unreliable for hamstring strains and has limited value in determining the extent of the injury.
2. Magnetic Resonance Imaging (MRI): this is a very accurate imaging technique, but is not usually required. It is generally reserved for very severe injuries, particularly where muscle or tendon ruptures (complete tears) are suspected.



Treatment:

For any soft-tissue injury, the early treatment is 'R.I.C.E': rest, ice compression and elevation. See http://www.cssphysio.com.au/pdfs/R_I_C_E_-_Procedure.pdf

It is common practice to take anti-inflammatory tablets after injuries such as hamstring strains. However research has shown that these medications interfere with certain metabolic processes natural to recovery. They have also been implicated in slower healing and greater chances of re-injuring the muscle. Concord Sport & Spine Physiotherapy does not recommend their use for acute muscle injuries.

Maintaining gentle movement, without producing pain, is recommended in the early stages. Stretching is commenced cautiously after the acute pain stage. However it is important to avoid overstretching healing tissues. Full stretching of other tight muscles, such as hip flexors and quadriceps, can be commenced after the first few days. It may also be beneficial to treat the spine if there is restriction of movement. Mobilisation, manipulation, stretching, and massage are some of the likely treatments. Core strength should be improved or maintained during this period. This is also the time to begin working on improving muscle balance.

Hamstring strengthening begins with pain-free gentle contractions. Other muscle groups can be strengthened while the hamstrings are gradually recovering. Cross training techniques that don't overload the hamstrings, but help to maintain fitness, include cycling & swimming. Massage can be commenced soon after the acute stage, but the injured area is avoided until adequate healing has taken place. This will be dependent on how severe the initial injury is.

For players who are serious about ensuring proper recovery and avoiding re-injury, rehabilitation will be structured and scientific. Prior to return to full training, it is necessary to work on 'specific strength' – ensuring the muscle is strong in the positions where sport will place it under the greatest loads. An interval programme should be prescribed. This involves a gradual increase in speed, duration and intensity of sport specific training. Normal flexibility, strength and speed needs to be recovered. Return to sport is possible after successful return to a few sessions of full training.

Re-injury:

Studies in soccer, the NFL & AFL, have shown that 12% to 35% of hamstring strains will recur. Most of these recurrences will be within the first 3 weeks of return to sport. There are many possible reasons for this. Subsequent rehab should obviously be conducted more cautiously.



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Please contact us if you would like a list of references for this topic.