



THE CAUSES OF RUNNING INJURIES A PHYSICIAN'S PERSPECTIVE

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An **injury** occurs when the tissues of the body are **loaded beyond their resilience**. There is a spectrum of injury causation from trauma – a large force – to ‘overuse’ injuries caused by much smaller but repetitive forces. **Most running injuries fall into this latter category.**

Every running step results in a force being absorbed by the body. In health, with the correct technique, good conditioning and adequate rest between bouts of exercise, the body can cope with these repeated forces. Indeed, over a period of time, the body can improve its resilience and allow an increase in training. However if any part of a body is continually overloaded, injury will occur as inevitably as night follows day.

Traditional medical doctrine for running injuries was rest, possibly with non-steroidal anti-inflammatory medications,

and a cortisone injection. If these did not work then surgery would be considered. But for running injuries caused by repetitive overload and not major trauma, this approach is almost universally inappropriate, for it fails to address injury causation. Unfortunately even today this ‘traditional’ medical doctrine is believed by too many medical practitioners. The point is that running injuries have a cause and the cause is predominately tissue overload. The body may be thought of as a chain, and injury is most likely to occur at the weakest point of the chain. This encompasses all

the common running injuries including bone injuries (stress syndromes and stress fractures), muscle injury, tendinopathies (eg Achilles and patellar), bursitis and even entrapment neuropathies.

So if excessive force is at the root of running injuries what can we do to modify these forces and either treat, or ideally prevent, injuries? This requires an assessment of individuals’ ‘intrinsic’ and ‘extrinsic’ factors.

Intrinsic factors are unique to that person; they include age, sex, previous injuries, physical conditioning and crucially



their individual biomechanics (anatomy or shape). It is the biomechanics that allow efficient (or inefficient) distribution of forces through the body. If forces are evenly distributed through the body and not concentrated in any particular area then the body will withstand these forces much better.

Extrinsic factors are essentially what we do to our body; they include the amount and intensity of training, the surfaces on which we run and technique. It is the combination of an individual's intrinsic and extrinsic factors plus the amount of loading (running) that determines whether injury will or will not happen.

Unfortunately traditional medical thinking remains so ingrained that many running injuries are simply not assessed in terms of the causes and a thorough analysis of the intrinsic and extrinsic risk factors. An example of this is chronic exertional compartment syndrome which, remarkably, is still considered by many sports medicine practitioners as a condition requiring surgical treatment rather than rehabilitation despite surgical results often being disappointing. The principles of force, force dissipation intrinsic and extrinsic factors are ignored.

In chronic exertional compartment syndrome there is increasing pain in the lower leg, which increases progressively during running inevitably causing the athlete to stop running. Historically this was thought of as being caused by gradually increasing pressure within at least one of the four compartments within the lower leg. The theory of increasing compartment pressures has recently been challenged

(there is debate on what is actually causing the pain). However by applying the principles of rehabilitation, and of optimising collision forces within the lower leg, this condition can often be successfully treated without surgery. This will require an individualised approach for each patient. A programme will usually include running re-education to avoid excessive heel strike, a more forefoot or midfoot landing, improved flexibility and strengthening of the muscles of the lower leg (including avoidance of over striding and a general conditioning programme).

This brings us on to an area of great interest - 'Barefoot Running'. Although this has been promoted as a 'new' style of running, it is certainly not new and indeed should really be regarded as 'traditional' running. The 'new' style of running is essentially the style that has been imposed by the modern running shoe. Most modern running shoes have a large well-cushioned heel, which promotes a heel strike (rear foot) pattern of landing rather than mid or forefoot landing. A 'barefoot' technique, which does not have to be performed barefoot, promotes a shorter stride length, greater cadence and results in lowered collision forces with the ground. These features of barefoot running are identical to many of the features that are so helpful in managing chronic exertional compartment syndrome. A word of warning however, barefoot running is a skill that has to be learned, transition must be gradual and it is not suitable for everyone, particularly those with a tendency to Achilles tendinopathy.

In summary, running injuries have a cause, and this cause is invariably

repetitive force overload. A careful assessment of the factors causing force overload, namely the intrinsic and extrinsic factors, will inform the practitioner on the steps required to overcome or at least minimise the impact of the injury. This applies to all running injuries including chronic exertional compartment syndrome, which can often be treated successfully with rehabilitation. An understanding of the principles of barefoot running may aid the practitioner in the promotion of an efficient reduced impact running style.

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