



## Prevention of Running Injuries: What is the evidence?

Running injuries are quite common. In fact, studies have reported 60% to 90% of runners experience an injury which prevents them from running, over a specified period of time. When compared to cycling and swimming, this percentage is quite high.

A large amount of products and services are proffered on the concept that the product or service will prevent a running injury from occurring. Unfortunately most of what has been proffered is based on opinion, and very little is based on good evidence. The weakest level of evidence is opinion or testimonial. An example of this would be when the most opinionated member of your running group encourages you to use "Heal Fast Ointment" because it helped him/her and they think it's great. The most powerful level of evidence are multiple studies done by different investigators who have used prospective randomized clinical trials with a control group, this is called a meta-analysis. There is only one meta-analysis that has been published related to running injury. An example of a prospective randomized clinical trial would be to follow two groups of runners. The first group would keep the progression of weekly mileage below a 10% increase per week and the second group would progress their weekly mileage at greater than 10% increase per week, and then measure which group experiences a greater frequency of injuries. This study has not been done, yet.

Three randomized studies looked at modification of running duration, frequency and distance (or graduated training) and found that training modifications were effective in preventing injury. Clearly running distance is a strong factor associated with injury. There is a particularly high risk (3 fold risk) if the distance is greater than 40 miles per week.

Five randomized studies looked at stretching exercises and only one of the five found that stretching exercises were beneficial in preventing injury.

Six randomized studies examined use of braces or footwear modifications and found some evidence with mixed results. They found that shock absorbing insoles were not effective and they found that athletic shoes were more effective than military boots.

Two randomized studies examined running form or technique and identified mechanical parameters related to running injury.

Multiple retrospective studies, without a control group, have described factors which are considered to increase risks of individuals developing a running injury include: miles run/week; increase in mileage/week; days run/week; number of races; years of running experience; running form or technique; participation in other sports; body weight; recent illness or medication usage; history of previous injury; the individuals anatomical structural alignment; the running surface; warm up; psychological factors (competitive drive); degree of pronation; shoes and finally shoe inserts.

Factors in which studies have shown conflicting risk (that is increased susceptibility or NO increased susceptibility) are: age, gender, anthropometric characteristics, previous running experience, previous injury, supinated foot type, pronated foot type, training intensity and warm up/cool down.

Factors which have shown increased susceptibility include: history of previous injury, increased running mileage, running form or technique, recent illness and use of medication(s).

Abnormal skeletal alignment has been implicated in predicting injury. There are some studies which have shown a relationship between structural measures and injury; whereas other studies have shown no relationship between structural measures and injury. The relationship between skeletal alignment and injury can be complex and does not always apply to different runners in the same way. What might cause an injury in one runner can have no influence on another, making it very difficult for scientist to identify a causal relationship. For example, one study demonstrated that excessive pronation contributed to injury in some runners, but that it did not contribute to injury in other runners.

The lack of powerful evidence related to preventing running injuries leaves the individual with questions and challenges. The lack of good evidence results in unsubstantiated claims and at times, to quackery. These questions still remain, what is the evidence and is the level of evidence low or high. If the evidence is weak, is there at least some logic or face validity behind the opinion?

A majority of runners will incur an injury. An ounce of prevention is worth a pound of cure. Prevention requires an individualized approach and a plan, to prevent injury. The individual plan should be based on self assessment of previous experiences as well as your own strengths and

weaknesses. Keeping a log/journal documenting injury, training parameters and risk factors, can enhance self assessment and future development of a prevention plan. Consultation with a health care professional or coach should enhance your individual plan. Make sure to ask the consultant what evidence is available or what is the rationale supporting the principals of the plan.