



A Powerful Treatment for a Running Injury

Often the aim of treatment of a running injury is to decrease the symptoms with medication and palliative therapeutic intervention. A brief internet search for treatment of running injuries will reveal a plethora of options. These include heat/cold modalities, electrotherapeutic modalities, ultrasound modalities, stretching and strengthening exercises, exercise equipment, massage, yoga, palliates, food supplements, magnets, medications, certain shoes, shoe inserts, active stretching and many more. However, if improper mechanics are one of the causes of the running injury, once the patient returns to running, the problem is likely to reoccur.

While athletes and health care professionals use a variety of strategies to address abnormal mechanics that can include strengthening and stretching exercises as well as equipment changes (shoes, orthotics, braces and tape), it needs to be recognized that this is just the first step. Such interventions may be necessary, but this is seldom sufficient. The next step is to figure out how to utilize improved mechanics, improved alignment and muscle balance (strength and flexibility) when running. The final step is to run with better form/technique/style.

A runner's form, technique and style can have a powerful influence on the development of an injury and/or the treatment of an injury. This belief has good face validity, but a scientist needs to ask what is the evidence supporting this belief. In fact some coaches have historically believed that running form/technique/style is relatively automatic and unchangeable. Therefore we must ask if there is any evidence that running technique/form/style contributes to injuries. Is there any evidence that, if an individual can change their running technique/form/style that the changes will alleviate a running injury?

Recent evidence from several research centers has shown that specific injuries are related to specific gait mechanics (Novacheck TF 1988, Williams TM 2006). Irene Davis has shown that individuals with stress fractures in their lower leg tend to land harder when each foot hits the ground (Davis, I 2006). If these faulty gait mechanics can be identified and feedback provided to the person, perhaps the individual can consciously modify the way they walk/run thereby alleviating the injury.

Researchers at the University of Delaware provided injured runners with real time visual feedback of shock and impact forces in the lower leg with accelerometers, and the runners were able to decrease the shock and impact by 25% to 50%, by consciously changing their gait pattern, during one treatment session (Crowell H 2005). Follow up

studies demonstrated lower extremity loading was reduced with real time visual feedback of shock and impact forces and that these changes were maintained at one month follow up (Davis, I 2007). An accelerometer device which measures shock was connected to a TV monitor displayed in real time illustrated how hard the individual was striking the ground. The runners were instructed to change how hard they struck the ground, and the immediate feedback helped the runner determine if his/her strategy was correct.

A similar study was conducted with runners suffering chronic knee pain. They were given visual feedback of the alignment and movement of their hips, knees and lower legs. Individuals with knee pain frequently the thigh rotates inward, the knees knock and feet pronate (McClay I 1999 – Davis I 2007). Again TV monitors provided feedback to the injured runners regarding whether their thighs were rotating inward, their knees were knocking or their feet were pronating. They were encouraged to consciously not let their thighs rotate inward, their knees to knock or their feet to pronate. By keeping their knees apart, not letting them collapse inward, they soon were able to eliminate the knee pain. They eliminated their excessive pronation without changing shoes without using shoe inserts or orthotics. The runners in this study were followed up one month later and it was found that they had retained the lessons on the improvements that they had learned.

The only intervention in these preliminary studies was gait re-training and relative rest from running. No stretching or strengthening exercises and no orthotics or other modalities were used. Changing how an individual ran, alleviated the injury and allowed the runners to return to running.

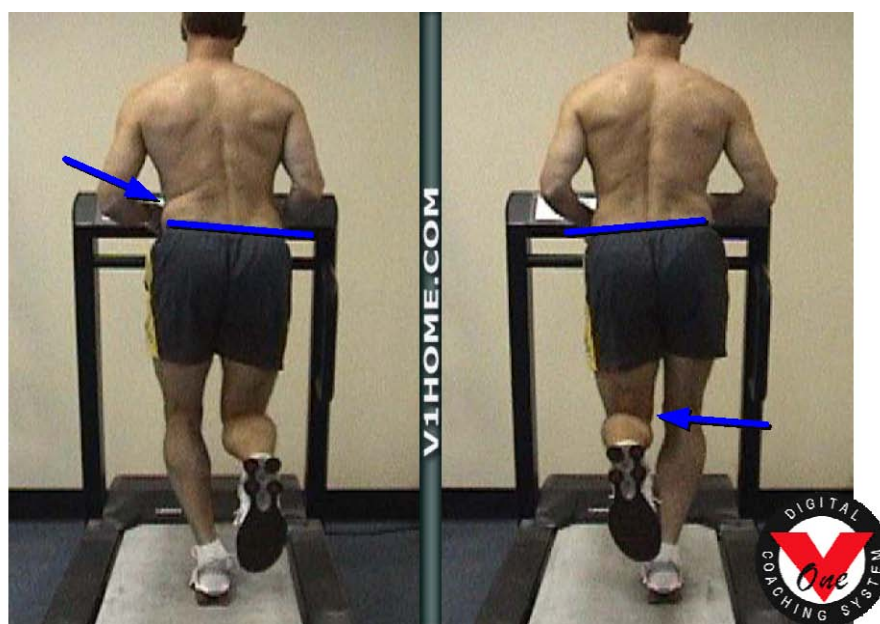
These preliminary investigations used a very specific protocol in terms of visual and auditory feedback, and also the frequency of training sessions. More investigation is needed to determine what type of feedback and what amount of feedback results in the most efficient learning of a more ideal gait pattern. Irene Davis, the lead investigator in these studies, has said most athletes do not have access to the kind of feedback equipment used in these studies, but that the same techniques can be used without the equipment. Individuals with knee pain can do well to run on treadmill facing a mirror, to get feedback about the alignment of the knees. There should be a space between the knees; the knees should not kiss each other when running. To determine if you hit the ground too hard, listen to footsteps and try to soften the foot strike. She also said that enlisting the help of a physical therapist, who is trained in gait analysis and gait re-training, is beneficial.

I have submitted a case series of 30 runners with shin pain to a peer reviewed journal. Sixty percent of those runners of the runners the only intervention was a brief period of relative rest, and gait re-training to learn to shorten their stride and avoid striking the ground with the heel first. Forty percent of the runners used shoe inserts, shoe

adjustments and exercise in addition to gait re-training. All 30 runners were able to return to symptom free running.

Unfortunately, there is a bit of disconnect between many health care professionals belief and understanding of running injuries and their evaluation and treatment of running injuries. I think most healthcare professionals would agree how a runner runs has a great deal to do with the development of a running injury. If a runner is running with poor form or technique, it is likely they will get injured. When evaluating an injured runner, most healthcare professionals do not observe the injured runner as they run. The standard examination includes measuring the flexibility (range of motion), strength, skeletal alignment and wear of the shoes, but does not include observing the runner as they run. If the healthcare professional does not look at how the injured runner runs, it is highly unlikely they will include gait re-training as part of the intervention.

By analyzing a runner's form/technique/style and abnormal mechanics, movements can be identified, and this can be a very powerful diagnostic tool and making it a very powerful intervention. This approach requires the injured runner to have an appreciation of what ideal or good running form should look like, and what his/her running form looks/sounds like. Even the most experienced coaches and sports medicine experts will agree that analyzing someone's gait is enhanced tremendously if slow motion video is available. Slow motion video enhances the clarity and accuracy of the analysis.



The picture above was obtained from a video recording. The photo on the left demonstrates abnormalities of the trunk leaning towards the left, a twisting of the spine, and excessive outward bowing of the left knee. The photo on the right

demonstrates a more normal alignment and movement. In this example, the traditional treatment might include strengthening exercises, a knee brace and medication. But after traditional treatment, the final step is to re-learn how to run with symmetry of movement by using gait re-training.

If you are injured and have a suspicion that faulty running technique may be contributing to the injury get someone to analyze your running form/technique/style. If are starting to run again after you have been injured, strive to run with symmetry and good form/style/technique.