



Dynamic Chiropractic – September 1, 1992, Vol. 10, Issue 18

Running Injuries -- Starting Off on the Right Foot -- Part II

By Kathleen M. Naughton, DC, CCSP

In addition to a biomechanical evaluation and running injury history, the chiropractic physician must thoroughly investigate the runner's style and training habits. Optimal conditions would facilitate a video recording of the patient. In lieu of this, the patient should be observed running in usual shoes and on typical surfaces. The runner's daily mileage, frequency, and speed must be assessed. The neophyte that begins an aggressive training program is highly susceptible to overuse injuries. Running surfaces must also be assessed. Concrete sidewalks may provide safety, but also represent the hardest surfaces to run on. Asphalt is less hard and man-made tracks are generally preferable. The forces generated at heel strike are dissipated through the musculoskeletal system. Harder surfaces result in increased pounding and subsequent deleterious effects. Many runners do not have access to a track or treadmill and the irregular surfaces of cross-country running provide obvious hazards; therefore, most take to the roads. These surfaces are typically asphalt, and less hard than concrete, but are often crowned or banked like some indoor tracks. Banked surfaces result in overpronation and should be avoided. As this may be impractical, runners on banked surfaces should run on the same side of the road on their way out and on their return. This effectively alternates the foot subjected to the more banked surface.

Runners with tight achilles tendons, or those previously trained as sprinters frequently land on their forefoot, instead of their heel. This circumvents the normal force dissipation mechanisms and may result in metatarsalgia or stress fracture.

Proper footwear can be one of the most effective means to compensate for biomechanical faults and training errors. However, the advertising blitz by the running shoe industry combined with a myriad of high-tech innovation may prove confusing to the typical neophyte. The chiropractic physician can assist their patients by informing them of the shoe features appropriate to their needs.

Well-made running shoes are designed to provide cushioning, flexibility, and to control for biomechanical faults. Consequently, all major brands provide versions of shoes to meet the individual needs of any runner. Running shoes are composed of an upper, outsole, and midsole. The midsole is by far the most important feature as this area provides the shoes' cushioning and many of the biomechanical stabilizing features. Most midsoles are composed of ethylene vinyl acetate, polyurethane or similar substances. However, their durability is often inversely related to their cushioning. Gels and a variety of air cells are also employed for this effect. Cushioning is necessary for all runners; however, additional cushioning must be considered for the heavier or supinated runner who runs on hard surfaces.

Stabilization and motion control devices are important features to consider. While these features range from the Nike Footbridge, to the Saucony Torsion Rigidity Bar, one of the most important aspects of the running shoe is the heel counter. The heel counter should be firm and made of plastic. It is an essential factor in controlling rearfoot motion and resisting pronation. A firm counter also adds to the shoes' overall cushioning by laterally compressing the runner's own fat pad. This may increase the shock absorbency by as much as 50 percent. While rearfoot stability is an important feature to consider, forefoot flexibility is equally essential. The shoes' forefoot should flex easily with minimal force. This flexibility can significantly reduce the strain on the achilles tendon.

The basic construction of the running shoe can also compensate for biomechanical faults. The shoe is constructed by gluing the upper to a fiberboard or fabric (slip) or combination last. A board lasted shoe promotes stability, whereas a slip-lasted shoe promotes flexibility. A combination last offers rearfoot stability and forefoot flexibility. A shoe's shape may be straight, curved, or semi-curved. A straight last provides more medial support, whereas a curved last is favored by lighter runners or supinators that require less support. Shoe shapes can be determined by comparison and inspection and are fairly self-explanatory. Board, slip or combination lasting can only be determined by removing the shoes' innersole. A board-lasted shoe will demonstrate a cardboard surface. A slip-lasted shoe will show stitching up the middle, and a combination will have fiberboard in the rearfoot and slip-lasting in the forefoot.

Runners with overpronation should be advised to purchase board- lasted, straight shoes with a firm heel counter and motion control device. Supinated runners should be directed towards slip-lasted, curved shoes with extra cushioning.

There are other minor shoe features to consider. Variable lacing can prevent extensor tenosynovitis and reflective strips are essential for night runners. Uppers may also be waterproof and breathable for the all-weather runner. Shoe weight is an issue for faster runners; therefore the uppers, midsoles and outsoles should be of lighter material. It must be remembered, however, that durability is often sacrificed for the lighter weight.

The runner can bring in shoes for evaluation and should be advised to invest in a new pair if the heel counter or the midsole has broken down. After approximately 500 miles, most of the cushioning (55-70 percent) effect has been lost. If the outsole is worn down to the midsole, the shoes should also be replaced. In an effort to save money, many runners have their shoes resoled; however, since the cushioning effect has been lost, the cost effectiveness of this practice should be reconsidered.

In addition to proper footwear, orthotics have traditionally been employed to compensate for runners' biomechanical faults. While orthotics can offer the runner a great deal of support, the methods of casting and the material used in this process are controversial and beyond the scope of this article.

It is apparent that typical modes of treatment of running injuries, designed to reduce pain and inflammation and increase range of motion, will prove only palliative if underlying biomechanical faults are not detected and addressed. Proper patient education which outlines appropriate compensatory strategies must supplement treatment to effectively manage this patient population.

Kathleen M. Naughton, D.C., CCSP

Fairview Heights, Illinois



Page printed from:

http://www.chiroweb.com/mpacms/dc/article.php?id=43447&no_paginate=true&p_friendly=true&no_b=true