

Injuries can be reduced with proper fitting running shoes

By Maj. Gregory Weaver

Americans spent more than \$14 billion on footwear for athletic participation in 2003, according to the National Sporting Goods Association's Web site, but spending big bucks on a pair of running shoes does not guarantee optimum performance or injury prevention. Finding the right shoe for you is really a simple, three-step process.

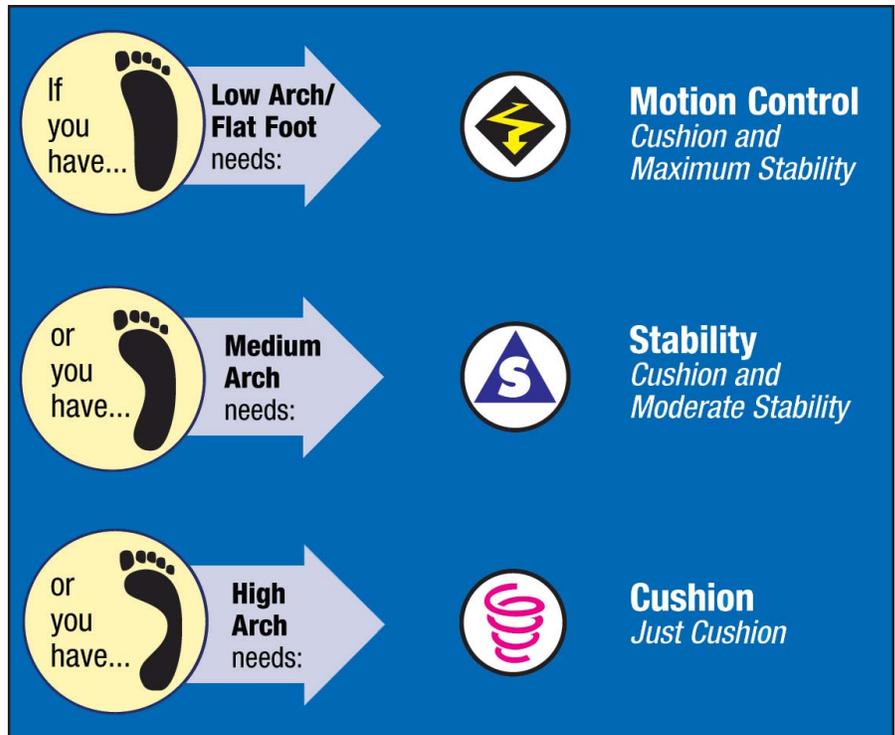
Here's what happens to your feet when you run: During normal running the outside of the heel strikes the ground first, then the outside of the foot contacts the ground, placing the foot in a supinated position. The foot then rolls inward and flattens out along the longitudinal arch in a pronated position. The foot should then supinate again by rolling through and over the ball of the foot, changing the foot from a mobile surface adapter to a rigid lever that propels your body forward.

Armed with an understanding of basic foot mechanics, you now know that selecting the right running shoes is critical for optimum running efficiency. The most common cause of a running injury is excessive pronation. Finding the right shoe, determined by your foot type, decreases the chance of you joining the ranks of the profile holders in any formation.

The first step in purchasing running shoes is to know what type of foot you have. Biomechanically, there are three types of feet: high-arch, no-arch or flat feet, and neutral or normal feet, which falls somewhere between the high-arch foot and the no-arch foot. High-arch feet are the least common, the most rigid and the most susceptible to stress and overuse injuries. Because a high-arch foot does not pronate enough, it is not an effective shock absorber. Consequently, with impact forces as great as three and half times body weight per stride, injury soon follows.

The flat foot, with little to no arch, is on the other end of the spectrum. This foot type, also known as a floppy foot, overpronates and rolls in excessively. The normal foot, with some degree of arch, is a foot that adheres to the description of normal foot mechanics. The normal foot is efficient and does not require any special considerations relative to purchasing running shoes.

You can determine your foot type by a simple test called "the wet test." To perform the wet test, wet your foot and step on a dry surface, such as a paper towel, and then examine the footprint left behind. Then compare your footprint to the standardized templates and determine which of the three



Graphic courtesy of Roadrunner Sports

The above graphic shows the relationship of the arch of the foot to the desired type of running shoe a person needs to ensure proper pronation. To find out what type of arch you have conduct the wet test by wetting your foot and then standing on a piece of paper. The type of foot arch you have will look similar to one of the three types depicted above.

outlines most closely matches your foot. Knowing your foot type roughly correlates with the amount of stability required for your shoes. This is an estimate and a handy starting point, but if you have a history of lower extremity injuries or have concerns with this process, seek medical assistance from professionals such as physical therapists, podiatrists or orthopedists to assess your foot type and running shoe requirements.

The second step in the process is to match your foot type with the correct shoe. For Soldiers, running shoes are the tool, the sword of battle, the one piece of equipment that runners depend on to keep them comfortable and injury-free during physical fitness training, according to Roadrunner Sports. To go along with the three types of feet, there are three types of running shoes: motion control, stability and cushioned. The high-arched foot requires a cushioned, curved shoe with plenty of flexibility to encourage motion from a foot that is naturally very rigid. The flat foot needs a motion control, straight shoe with a firm midsole and control features that limit and reduce pronation. The normal or neutral foot performs well with a stability, semi-curved shoe with only moderate control features.

The third and final step when choosing running shoes is to ensure proper fit. "More than 43.1 million Americans – one in

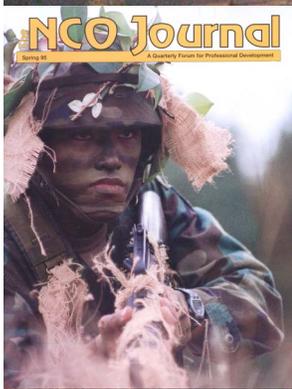
every six people – have trouble with their feet, mostly from improperly fitting shoes; this is a huge public risk that costs the U nited States \$3.4 billion a year,” according to the NSGA Web site. Some of the complications that many people encounter result from little-known facts. For example, most people have one foot that’s larger than the other. Also, your feet get larger as you grow older. Rarely does a salesperson in most mainstream retail stores know how to fit shoes; and rarely do we, as consumers, ask to have our feet measured. To further complicate proper fitting, “The draw to be like today’s sports hero and the running shoe industry being a \$5 billion gold mine, the average runner is often enticed by vibrant colors, funky styles and the latest trend when purchasing athletic footwear,” according to an article in *Orthopaedic Practice*. The biggest challenge remains for the consumers to purchase and wear shoes that fit the needs of their feet, not their fashion style.

There are three keys to the right fit with your running shoes. You should have approximately a thumb’s width of room between your longest toe and the tip of the shoe; you should be able to comfortably wiggle your toes in the shoe’s toe box. Second, the shoe should hold your foot securely around the arch or instep area and also at the heel with little or no slipping. Running shoes don’t need to be broken in; the way they fit the first time is the way they will always fit. The third key for proper fit is that the shoe should fit the shape of your foot and not force your foot to fit the shape of the shoe, according to the Roadrunner Sports Web

site. More tips on proper fit can be found on multiple Web sites such as: <http://www.aaos.org>, www.epodiatry.com, <http://www.roadrunnersports.com>, or consult FM 21-20, Appendix E pages E-1 and E-2.

When choosing running shoes, there are other factors to take into consideration, such as body weight. Men who weigh more than 180 pounds and women who weigh more than 150 pounds need shoes designed for heavier-than-average runners. Generally, these shoes are cushioned, heavy-duty shoes indicated as shoes for heavy runners. Another factor is shoe rotation. It is advisable to have two pairs of running shoes and rotate them after each workout, just like you did with your combat boots during basic training. You don’t have to buy two new pairs of shoes at the same time to rotate your shoes; you can do it with an older pair and a newer pair as well (for more information see <http://www.roadrunnersports.com>). Finally, listen to your body. If your ankles, knees, hips or lower back frequently ache after your run, then you may need to replace your shoes. The midsole, the most important part of a running shoe, eventually wears out, causing the shoe to lose its ability to absorb shock. At a minimum, plan to buy shoes every six months or every 400 miles and know that other conditions also affect the life expectancy of running shoes, such as humidity, moisture and the quality of construction. Invest in your health by buying high-quality running shoes that fit properly and match your foot type and body weight. Remember, your goal is to stay in the game and off the injury list.

Whether you are running in formation or on your own, having the right pair of running shoes that are designed for your arch is essential to preventing injuries and maximizing your fitness routine.



Editor's note: Maj. Gregory Weaver is the Health Promotions Officer for the U.S. Army Sergeants Major Academy, Fort Bliss, Texas. This article first ran in the Spring 1995 issue of the NCO Journal.