



Minimalist shoes

For years you have been explaining to customers why *more* is better in a running shoe – more support, more cushioning, more stability. Now you have to explain to them why the brands are producing running shoes with *less*. While the shop floor is not the place to have a debate about the pros and cons of barefoot and minimalist running shoes vs regular running shoes, the following information should help you to field the questions your customers might ask.

What are minimalist running shoes?

Minimal running shoes do not attempt to control the natural motion of the foot and rather embrace the benefits and philosophy of barefoot running – they are therefore often referred to as *barefoot running shoes*.

Minimalist shoes offer minimal interference to the foot's natural shape and movement during running, by providing less cushioning and corrective support. They do not have high cushioned heels, stiff soles and arch support. However, this does not mean that they are without technology – some minimalist shoes look more technical and advanced than regular running shoes.

Specific characteristics of minimalist shoes are:

- The shoe should easily twist along its long axis and be able to bend at the midfoot. The entire shoe should be completely supple.
- The thickness of the cushioning in the rear- and forefoot should be about the same, and not too thick.
- There should be no arch support that prevents the natural movement of the arch of the foot. A stiff sole and arch support will prevent the natural flattening of the arch, preventing the muscles and ligaments of the foot from functioning as they were meant to.
- No built-up heel. If the heel is too large and stiff, the runner has to “over point” his toes, which might cause pain and damage to the foot.

Why the need for minimalist shoes?

- Humans have been running barefoot for mil-

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Words: Nelle du Toit. Compiled with the help of Prof Tim Noakes and Dr Ross Tucker of the Sport Science Institute of South Africa



lions of years – ever since we first started running upright to catch our food on the plains. Runners started running in flat-soled, non-cushioned shoes in the early 1900s, and as technology progressed, from around the 1970's, manufacturers started using EVA in the soles to provide more cushioning, explains Prof. Tim Noakes of the Sports Science Institute of South Africa (SSISA).

- The popular belief was that the added cushioning and support in shoes would help prevent the most common running injuries. Sport physicians, however, found that injuries continued, with more runners suffering from injuries in the lower leg. Studies suggest that at least 30% of runners get injured every year, and many of these injuries stem from problems that arise in the foot or lower leg. Whether this is related to running shoes, or the style of training, is inconclusive, says Noakes.
- This led to a belief in scientific circles that injury-free long-distance running can be promoted by running in shoes that do not re-

strict the natural movement of the foot, as this will enable the body to use its own shock absorption mechanisms. “There has always been a following of people believing in the benefits of minimalist/barefoot running. It has formed a type of *cult* to which naturalists and certain types of endurance runners are attracted to,” says Ross Tucker of SSISA.

- Earlier this year Prof Daniel Lieberman of Harvard University initiated a vigorous debate in the footwear industry when he published a study in British Science Journal Nature that suggested that humans have evolved into natural long-distance runners who might not need the heel-cushioning support that is so often seen in traditional running shoes. (See www.barefootrunning.fas.harvard.edu) Lieberman's Skeletal Lab team studied runners who grew up without shoes or wear thin rubber or leather sandals (Tarahumara ultra-runners, Kenyan runners etc.) and found that the barefoot runners land on their feet with a predominantly forefoot or midfoot strike, even when running downhill.

Benefits of minimal running shoes

- People who run barefoot, or with minimalist shoes, have a different foot-strike to people who run with cushioned soles. They land with a springy step on the middle, or forefoot, thereby reducing impact collision to much less than the heel-first foot-strike most running shoes comfortably support. Scientists believe that this can reduce the risk of lower leg injuries.
- Barefoot/minimalist runners point their toes more at landing, reducing impact by decreasing mass on the foot when landing. On the other hand, the thick heels of running shoes make people lengthen their strides, landing heel-first, and letting the shoe absorb the impact of the footfall. The Lieberman study found that impact forces for runners who forefoot strike are seven times lower than shod runners who heel strike. It suggests that there is anecdotal evidence that forefoot or midfoot striking can help avoid and/or mitigate repetitive stress injuries, especially stress fractures, plantar fasciitis, and runner's knee.
- “When you forefoot-flex, the angle of your ankle is less acute and you therefore absorb

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more of the impact,” says Tucker. “Your knees bend, so less impact is absorbed there, and you take shorter strides. Because you take shorter strides the steps are less jarring, and you achieve more bounce. This, in itself, is a completely different way to train.”

- Some scientists believe that running in minimalist shoes can help runners who suffer from previous running injuries, “Minimalist running can be therapeutic as some runners who have an injury and gradually introduce themselves to minimalist running allow their feet to foot-strike naturally. So, theoretically, one can perhaps remedy a non-chronic injury with barefoot/minimalist running,” remarks Professor Noakes.
- It strengthens the muscles in the foot, especially in the arch. Running minimally promotes a stronger foot that pronates less and is less liable to develop a collapsed arch.
- Studies show that you use up to 4% less energy when running with minimalist shoes, because you use the natural springs in your foot and calf muscles more to store and release energy. As less energy is used, oxygen consumption drops – which can be a

major benefit during an ultra-marathon. Alternatively, shoes with thicker inserts increase oxygen consumption as the materials used for cushioning in shoes absorb energy.

The case for cushioned shoes

Many runners, however, run long distances with cushioned running shoes without suffering any injuries – but some runners suffer from repetitive stress injuries.

- This does not mean that all runners should contemplate discarding their cushioned shoes. “A western runner used to running with cushioned, supportive shoes, will not adapt easily to barefoot running and they would have to teach themselves all over again how to run barefoot,” explains Noakes.
- “It’s not necessarily the shoe that causes injuries, but the training,” says Tucker. “And the shoe is the mediator of that training.” You might not train as hard when running barefoot as you would train while wearing cushioned soles. “Because you are not training your body as hard when running barefoot, it could be less likely for you to pick up an injury.”
- Some shod runners have problems running

in minimalistic shoes. If the runner has been a heel striker, it will take some time and much work to train his body to forefoot or midfoot strike, especially because he’ll need to develop stronger feet and calf muscles.

- Runners may be at greater risk of developing Achilles tendonitis when they switch from heel striking to forefoot or midfoot striking. Heel striking is painful when running barefoot or in minimal shoes as the collision force is greater each time the foot hits the ground. Once natural foot structures are weakened by long-term footwear use, people have to rely on the external support of the footwear.
- People who have been heel strikers most of their life will have to do lots of work to switch to forefoot striking.
- Novice forefoot and midfoot strikers typically experience tired feet, and very stiff and sore calf muscles. In addition, the Achilles tendon often gets very stiff. This is normal and eventually goes away, but a person can make the transition more successfully if you only run about 400m-1.5km during the first week of minimal running and then increase the distance by no more than 10% per week.

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be effective for limiting ankle and midfoot motion and thus it helps when a patient has ankle arthritis.

Research

In order for manufacturers of toning shoes to claim any of the above benefits they had to conduct research studies. The reports on some of these can be found at www.toningshoestudies.com.

- Reebok had their Easytone shoes tested by the University of Delaware using Electromyography (EMG) technology. These tests were conducted over a period of several months and included a cross-section of women who were each monitored wearing regular foam based walking shoes, Easytones and walked barefoot (unshod). These tests showed an 11% increase in calf and hamstring muscle activation from regular shoes to Easytones and a slight increase from unshod feet to Easytones. Their butt muscles were activated an alarming 28% more with Easytones than compared to regular shoes.
- New Balance International has done various lab and field tests with their Rock and Tone toning shoes and have had only positive results and feedback. “We are confident that increased muscle activation occurs when wearing our toning footwear. Internal and external lab tests were performed to measure muscle activation and calorie burn. While individual results may vary, increases were noted in certain muscle groups as compared to traditional walking shoes,” reports NB International.
- Skechers say that the Shape-ups studies are consistent with the findings of other studies

of rocker-bottom shoes published in peer-reviewed clinical journals over a period of several years, and four clinical studies conducted on Shape-ups by experts. The most recent is the November 2009 study by sport physician Dr. Steven Gautreau, D.C., et al, involving 80 participants (including a control group) who were studied for eight weeks. The study found both Shape-ups wearers and the control group gained strength, but only Shape-ups wearers experienced significant weight loss and reduced body fat. Earlier research include a study by a leading Southern California hospital and university; a prior trial study by Dr. Gautreau; and a study by Juntendo University in Japan.

- The American Council on Exercise (ACE) recently announced that they had conducted the first independent research study, in which they found no difference in the muscle activation of the subjects wearing toning shoes. Toning shoe manufacturers, however, slammed this study because they used only 12 volunteers who walked on a treadmill for five minutes. Manufacturers also questioned the independence of the ACE as it sells fitness training courses and materials, which would be threatened by the growing popularity of toning shoes.

Advice to customers

As toning shoes changes the walking gait of the wearer, certain guidelines should be followed to ensure that the wearer learns to walk properly in these shoes:

- The customer should practice walking in a different manner. The shoes should force

the wearer to walk heel-to-toe and eventually make the wearer feel like they are walking in the sand on the beach. Some manufacturers have created online training video clips to show consumers who have bought the shoes how to walk correctly in the shoes. Emphasis is placed on the wearers’ posture to help stabilize them while wearing the shoes. The correct posture will feel as if their muscles are working harder.

- Some manufacturers warn to not wear the walking shoes while training at the gym or during any high-impact exercise – these shoes were made for walking or daily activities (walking the dog and taking a stroll or doing household chores). Some manufacturers are, however, launching toning shoes designed to be worn during gym training or for running.
- Manufacturers warn that people with balance problems or tight Achilles tendons should take a cautious approach. The American Podiatric Medical Association (APMA) warns that toning shoes can put an increased strain on these body parts. People with pre-existing balance or stability problems may want to avoid wearing toning footwear altogether.
- Certain manufacturers warn that you should not wear the shoes for longer than 10 minutes for the first time and incrementally increase wearing time – just as any other fitness activity would be gradually increased. After the initial 10-minute walk increase to 30 minutes on the first day. Fatigue in the calves, thighs, hamstrings and core will be felt after the 30-minute walk. Thereafter, gradually increase the amount of time spent walking in the shoes.