

## Minimalism: Put Your Shoes to the Test

By Karin Edwards, Certified Advanced Rolfer™

Have you noticed that advice about shoes is sometimes contradictory? Podiatrists and shoe stores often push highly supportive shoes, and yet most of us remember the joy of going barefoot as a child. Is there a middle ground?

This article will explain the principles of “minimalist” footwear and give you seven hands-on tests you can do for yourself and teach your clients, as well as a guide to shopping for minimalist shoes. An asterisk in the text indicates that there is a short video of the test available on my website (see Additional Resources at the end of the article).

### Shoe Tests

This section will give you tests to see if your shoes meet the criteria for minimalism and good foot biomechanics. Start by having a look at Figure 1, which shows examples of minimalist shoes compared to conventional shoes.



Figure 1: A - examples of minimalist shoes; B examples of stiff, over-supportive shoes. Photos by David Wagner.

### Test 1: Flexibility

*Take off your shoe, turn it sole-side up, grab it at the heel and in the middle of the shoe, and twist.\* Avoid ‘torsional rigidity’, a trend in shoes that locks down the mobility of the tarsal bones. Make sure it can twist at least a small amount, specifically at the tarsal area.*

Our feet need stability for standing and mobility for movement. Most footwear errs on the side of stability, largely immobilizing the foot. The joints between each of the tarsal bones, metatarsals, and phalanges (toe bones) have slight movements that allow the foot to adapt to the ground and create a responsive base of support for the rest of the body. Do your shoes have the flexibility to allow for natural foot motion?

## Test 2: Ground-feel

*While wearing your shoes, step on a rock the size of a marble. Can you clearly feel the rock through your shoe? If not, the sole of the shoe is either stiff or too pillowy.*

**Shock absorption:** Shoes that are stiff or overly cushioned interfere with proprioceptive sensing of the ground. When walking barefoot or in lightweight shoes, your gait naturally adjusts to avoid discomfort from heavy landing. Research shows that conventional sneakers and stiff-soled clogs cause harder foot-strikes, increasing joint shock and the risk for knee osteoarthritis (Shakoor and Block 2006). When your feet can feel the ground through your shoes, you will tend to land more softly. If your feet feel too sensitive, it's okay to add a thin flexible insole to your minimalist shoe.

**Muscle firing:** Sensory feedback from the feet is essential for the correct firing of motor nerves. The nervous system demands quite a bit of sensory data, but if that data is lacking, the muscles may fire late or weakly. For example, the tibialis posterior muscle does the job of lifting the arch of the foot, but it will tend to be lazy if the ground-feel is muted by overly padded or stiff shoes.

## Test 3: Neutral Heel

*This test involves a bit of research. For athletic shoes, look online for the 'heel-to-toe drop'. Five millimeters or less is acceptable. 'Zero-drop' is perfectly flat but may feel too extreme initially.*

Most footwear, even 'flat' dress shoes, has a half-inch heel. The heel prevents a full range of motion while walking or exercising, resulting in shortened calf muscles. Over time, this limits ankle freedom, contributes to tight hamstrings, and pulls into the lower back (and even up to the neck). The connective tissue of the Achilles tendon weakens and can be at risk for injury.

When making footwear suggestions to clients, keep in mind that switching to a neutral heel abruptly has its challenges. One of my clients, an ultramarathoner, regularly wore conventional athletic shoes with no apparent ill effect. But spending a single day barefoot at a water park triggered lasting plantar fasciitis. His shortened calves became overstretched by trying to move naturally. My treatment was to calm and free the tibial/plantar nerve and artery, to lengthen the calf muscles and fascia, and to have him *gradually* transition to footwear with a neutral heel.

## Test 4: Wide at the End of the Toes

*Remove the insole and stand on it, spacing out your toes a bit. Does your big toe or pinkie toe overlap the edge of the insole? If so, you need more space in your toe box.*

The toe box should be foot-shaped, which means the toe box needs to be wide at the *end* of the toes instead of tapering from the ball of the foot to the toes. Narrow toe boxes cause bunions, neuromas, distorted toes, weak arches, and many other problems. Athletic shoes are often wide at the ball of the foot but narrow at the tips of the toes. Tapered toe boxes are a sneaky contributor to over-pronation. If the big toe is pushed toward the other toes, the foot is more likely to over-pronate.

As an experiment, while standing, use your hand to pull your big toe away from your other toes. Then try to collapse your medial arch. Feel that there is a natural resistance that tells the arch where to stop? Then contrast it to the toe position in a tapered toe box, by pushing your big toe in toward your other toes. This time, can you collapse your medial arch much farther? You might even feel a twinge in your medial knee. When the big toe is in its natural position, it helps limit pronation. See my website for a short video of this demonstration, which I perform on clients to help them feel why their toes need so much toe box space. 📺 (See Additional Resources section at the end of the article for the website url.)

Don't neglect the pinkie toe when selecting a toe box. If the pinkie toe is compressed inward, it disrupts the lateral arch. Dr. Rolf put a lot of value on the lateral arch: "In all pictures of Hermes, or Mercury, the wings are on the outside of the feet. And what they're saying was if you want transportation, you must walk as though you had wings on the outside of your feet." The lateral arch is the foundation for the medial arch, and toe spacing is intimately related to these arches.



Figure 2: A view inside the toe box. Photo by Lems Shoes ([www.lemsshoes.com](http://www.lemsshoes.com)), used with permission.

Toes will expand to fill the space if allowed enough room, so try sizing up from the size you normally wear. If you have a wide-toed shoe but you need even more space, try removing the insole liner. Avoid sandal straps that cross the toes and compress either the big toe or the fifth toe.

### **Test 5: Avoid Loose Slip-ons**

*Grab your sandals and put them on. Shake your foot. Is the sandal secure, or does it feel like it could come off?*

While it makes sense that tight shoes can deform toes, loose shoes can have a similar impact. If shoes are loose enough that the toes need to grip them in order to stay on, it can result in a habitual curling or lifting of the toes that contributes to hammertoe, claw toe, and generally

squished-together toes. For shoes that tend to be loose, such as flip-flops, Crocs™, or Birkenstock® shoes, select a version with a heel strap or ankle strap.

### **Test 6: Avoid Toe Spring**

*Put the shoe on a flat surface and look at it from the side. Does the toe curve upward about 15°? That's 'toe spring'.*

Athletic shoe companies started engineering toe spring into their shoes two decades ago. Their idea was to aid the rocker motion of the foot in running and to look appealing in store display windows. However, this change was completely unnecessary, as our legs naturally perform this motion without a change to shoe shape. Toe spring holds the toes in a lifted position, which limits the ability of the flexors and extensors of the toes to work properly, and contributes to deformed toes. Dress shoes also sometimes have toe spring.



Figure 3: Two examples of toe spring.

Stretching the top of the foot and toes after exercise can help restore correct alignment. If the shoe is flexible, a modest toe spring can be removed by bending the shoe in the other direction for a half hour.

### **Test 7: Minimal Arch Support**

*Stand in your shoes. Can you feel the shoe arch pressing up into your foot? That's too much arch support. Do a slow knee bend. Does your foot lengthen and your arch spread and lower slightly, or does your shoe prevent that motion?*

The medial arch is meant to be supported by the bone structure, ligaments, and muscles. A stiff arch support, and especially an orthotic, undermine both the pronation and supination of the foot. In the weight-bearing phase of a stride, the peroneal muscles will attempt to pronate the foot. If there is an arch support interfering with this function, it can result in peroneal tendonitis and even strain in the lower IT band. The arch muscles (tibialis posterior, flexor hallucis, and flexor digitorum longus) are further weakened by wearing shoes with too much arch support.

Many clients are concerned that their 'flat feet' require arch support. Low arches and 'over-pronation' have been incorrectly pathologized. In fact, many people have arches that are low but 'functional', meaning that the arch is going through a range of motion that is performing some shock absorption. To build natural arch function and safely transition from using artificial arch

support, focus on toe-spreading (Test 4) and correct firing of the arch muscles by improving proprioception (Test 2).

## Shopping Guide

If your shoes fail the tests, it may be time to go shopping. Keep these principles in mind as you shop, and you will find many minimalist shoes for \$80-\$140. Excellent brands include Lems, Vivo Barefoot, Softstar Shoes, and Altra (choose only the Altra models with the thinnest sole). Merrell® Barefoot and New Balance Minimus are specific lines that are minimalist, though I do not recommend other shoes by those manufacturers.

The most important characteristic is the wide toe box, so don't compromise on that. If you find yourself needing even more toe room, here are some quick strategies. Ideally, choose a larger size. If that isn't an option, remove the insole and try the shoe without it. Re-lace the shoe, skipping the first pair of eyelets, which will give you some more room at the toes. You can also do a web search for "alternative lacing patterns" for methods that change how your shoe fits. A technique I have used successfully is to stretch the leather in specific places by soaking it in rubbing alcohol and using a tool such as the blunt end of a pen.

If the toe box is spacious but your toes need more help learning to spread out, you can wake them up by wearing 'toe socks', which have a separate pocket for each toe, like a glove instead of a mitten. This stimulation will increase sensory information coming from your toes and help you learn to use them. Some brands such as Injini® offer wicking fibers appropriate for sports. Many options are available from online companies such as Sock Dreams. A more daring style option is toe shoes, such as Vibram® Five Fingers. I suggest the leather type because they are more comfortable and more adaptable in fit than the synthetic options.

If you want a more significant corrective device to space your toes, Correct Toes® (\$65/pair) are the safest and most effective option. They are the only toe spreader that is safe to use in shoes and during exercise, which is exactly when it is most beneficial – to retrain the foot to move correctly. There are inexpensive 'bunion toe spacers' that only correct the big toe position; for some people those are adequate. In either case, they should be worn with shoes that are very wide at the end of the toes, with no tapering, and preferably sized up a half or full size from what you normally wear.

Metatarsal pads are a helpful addition to a minimalist shoe. They support the metatarsal arch, also called the transverse arch. Why support the metatarsal arch and not the medial arch? The medial arch is meant to rise and lower during walking, while the metatarsal arch is meant to be always lifted. In clients who have chronically lifted toes (that is, when their foot is relaxed, their toes are bent upward), the metatarsal arch is frequently dropped. Gently push up on the bottom of their metatarsal area to see if that straightens the toe alignment. If so, show this to the client so they can understand why this product would be beneficial.\* Metatarsal pads can help neuromas and many other foot ailments, especially when used with Correct Toes in a very-wide-toe shoe. I prefer Pedag® brand, \$10/pair, which have peel-off backings so they can adhere directly onto the liner or footbed of the shoe. Start with one pair of shoes to get used to them, then add them into the other shoes. Gradually transition into using them during sports. Many clients get ongoing benefit from using metatarsal pads. There is no need to wean off of them, and they will not make the foot dependent on them.

A couple of other considerations for helping clients improve their footwear:

- Look closely at shoes and socks. Perform 'fascial release' on the toe seam of tight socks, and teach clients to do it. Simply pinch and stretch.\*
- Encourage clients to cut, stretch, and otherwise modify their shoes to fit their feet and optimize their foot function. If a client has foot pain, examine shoes for a seam or a fabric pill that might be rubbing.

## **Natural Movement Using Minimal Footwear**

In minimal footwear, experiment with your stride by allowing your back foot to stay on the ground longer, rolling through to the tips of the toes, then swing your leg forward only to the point where it is just a little in front of your body. Contrast this to reaching the foot far in front of the body, striking the heel, and pulling the rest of the body forward.

This new stride will be shorter but with a faster cadence. Each step will feel lighter, minimizing both impact and effort. Keep the feet fairly close to your midline, over your center of gravity. This prevents side-to-side rocking, for reduced impact and improved balance. Don't tuck your tailbone, as that puts pressure on the lumbar discs and also makes it difficult for the gluteus maximus to fire.

For those who run, the transition to running in reduced heels and then neutral heels should occur over the course of months. During this time, careful warm-up and stretching will help prevent injury. Ankle circles – twenty in each direction – are a safe and effective warm-up for the foot, ankle, Achilles, and calf. Then follow with light bouncing and then one-legged bouncing for a minute on each side.\* Gradually, the Achilles tendon will respond and remodel to have more spring and resiliency.

Static (isometric) stretching should only be performed after exercise that fully warms the muscle tissue. I advocate for a more sensitive approach to stretching than is often taught. Stretch the calf by dropping the heel off the edge of a curb. Start slowly, feeling for the first place of resistance, pausing for ten to twenty seconds to let that resistance soften. Sink deeper and look for the next resistance. Once in the full stretch, hold the position for sixty seconds or more. This measured approach to stretching will prevent injury and support the calf in adjusting to shoes with a neutral sole.

*Author's Note: This article is indebted to the work of Dr. Ray McClanahan, DPM, [www.nwfootankle.com](http://www.nwfootankle.com), the inventor of Correct Toes.*

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## **Additional Resources**

Dicharry, J., 2012. *Anatomy for Runners*. Brattleboro, Vermont: Skyhorse Publishing. *A great resource for running biomechanics, anatomy, and exercises, written by a physical therapist.*

Shakoor, N. and J. Block 2006 Sep. "Walking Barefoot Decreases Loading on Lower Extremity Joints in Knee Osteoarthritis." *Arthritis & Rheumatism* 54(9):2923-2927.

Lieberman, D.E. et al. 2010 Jan 28. "Foot Strike Patterns and Collision Forces in Habitually Barefoot Versus Shod Runners." *Nature* 463(7280):531-535.

\*For short videos of these concepts, please visit my website [www.portlandrolfer.com/Feet](http://www.portlandrolfer.com/Feet).