

Keeping Your Feet in Shape: Orthotics May Be the Answer

A car performs poorly when its springs have metal fatigue or its shock absorbers are worn-out.

This results in an uncomfortable ride, tires that wear unevenly, and, eventually, structural damage involving the suspension, engine mounts and frame. A car's springs/ shocks don't repair themselves. The damage will continue unless the springs/ shocks are supplemented or replaced.

The arches of a person's feet are their springs/ shocks. They, too, need periodic inspection and maintenance.

Just as the balance and the ride of a loaded automobile depend upon its suspension, the standing body relies upon the strength and integrity of its foot arches for its balance and alignment.

Arches make it possible for feet to do what they are designed to do. As Dr. John Gillick explains below, a host of problems can result—including pain in and damage to the feet, shins, knees, hips and lower back—if their proper functioning is compromised. Gillick, MD and MPH, is a specialist in occupational medicine and Associate Clinical Professor of Medicine and Anesthesia at the University of California, San Diego.

The Critical Role Arches Play

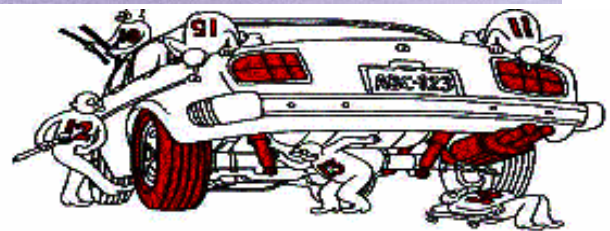


Normal foot arches are strong and springy. They hold the shape of the foot, balance the body and act as shock absorbers. The long arch raises and tilts the inside of the foot to ensure

proper body balance over the center of the foot, while the sideways arch stabilizes the front of the foot and prevents the toe bones from rubbing. (The arches of the foot resemble those of the hand when it is set in a relaxed position on a table top.)

Arch structure is genetic. Although arch-related problems are more common in people with low arches, they frequently develop in people with normal or high arches depending upon how they are used.

Movement muscles of the shins, thighs, hips and back normally only fine-tune balance. If arches sag or go flat, they must hold the body in balance over the feet as well as perform



their regular work. As a result, they become strained and prone to injury. (Try holding a book out at arm's length—after only 10 minutes of balancing work, the muscles hurt.)

Common types of arch-related problems include:

Foot Pain



Under the heel: "It's like an ice pick jamming up into my heel bone when I get up in the morning." The foot bones are held in their arched shape by a webbed strapping. When the strapping tears under the heel, pain and inflammation result (plantar fasciitis). Healing occurs

at night. Re-tearing comes with getting up or with extra hard usage. Repeated tearing and healing create heel spurs. Treatments include taping, anti-inflammatory medicines, exercises, steroid injections, heel cups and even surgery; but the surest remedy is full-time use of arch supports.

Under the base of the toes: "It feels like there is a rock in my shoe." When the foot loses its sideways arch, the skin under the middle toes rubs against the shoe, causing calluses. In addition, the middle toe bones may rub and bruise each other and the nerves between them (Morton's neuroma).

Tight shoes worsen this condition. The arch can be restored with a flexible sideways arch support put into the shoe.

Ankle sprains

When arches are low or flat, the ankle ligaments are stretched and become vulnerable to tearing (sprain). Meanwhile, the overactive shin muscles cause the foot to twist inward every time it leaves the ground. When a person is tired, tripping on in-turned toes is a common cause of ankle sprains.



Shin pain

The shin muscles normally fine-tune balance and add springiness to the feet. If arches are low, sagging or tired, the shin muscles become overloaded and tire much more quickly.

The shin muscles, which provide a spring-landing cushion effect for the feet, are strained to their limits by running on hard surfaces. Low arches magnify this strain. Over-strained shin muscles may tear from the bone, resulting in shin splints.

Knee pain

The outer side of the thigh and shin muscles tighten up to supplement low or fatigued arches and provide balance. These muscles connect with the outer side of the knee-cap, which slides in a groove at the end of the thigh bone.

Persistent tightening of the thigh and shin muscles causes the knee-cap to scrape against the side of the groove causing pain and injury (patello-femoral disease).



Hip pain

When hip muscles strain to balance the body over sagging arches, they cramp—causing pain in the buttock or hip and sometimes down the side of the leg. Applying knuckle pressure above the hip bone will “light up” shooting leg pains that result from hip muscle cramping.

When hip and thigh muscles are chronically strained, a band that connects from the side of the hip to below the knee is pulled tight. This ileo-tibial band may click or snap where it passes over the hip bone or knee bone.

Low back pain

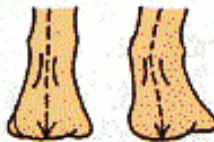
The low back muscles are the body's final mechanism for balance. Low back pain occurs when these muscles strain to balance a person with low arches. Low back, hip and leg pain caused by low



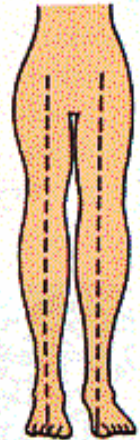
arches is often misinterpreted as a disc problem. When a two-minute stretch of the low back and hip muscles temporarily relieves the pain, low arches should be suspected as the cause.

Checking for Low Arches

Look at a person who is standing relaxed. From the front, picture a line coming down from the hip, past the middle of the ankle to the floor. If this line goes directly through the center width of the foot, the arch is normal. When the line falls inside toward the large toe, the arch is low.



From behind, if the ankle tendon is straight as a rod, the arch is normal; when it's curved, the arch is low.




Preventing and Treating Problems with Orthotics and Footwear

A properly functioning arch is key to balancing the body over the feet without muscle strain. Low or fatigued arches may be restored by full-time use of a foot orthotic. This arched insert should be worn whenever the sufferer is standing, walking, running or biking. Part-time wear will not allow the foot to recover.

Custom orthotics made from a mold or computer image of the foot (\$150 to \$400) are one option. However, if they are too thick, stiff, painful or don't offer adequate support, they should be remade or modified.

An alternative is a simple, flexible plastic foot orthotic as offered by Spenco (for work or play) or SuperFeet (for men's or women's dress shoes)—both available for less than \$30. Leather or foam inserts and gel pads are not adequate. Orthotics can be found to fit almost any shoe style. For some feet, a wedge (four to six degrees) under the inner side of the heel may also be needed to further shift the foot under the body.

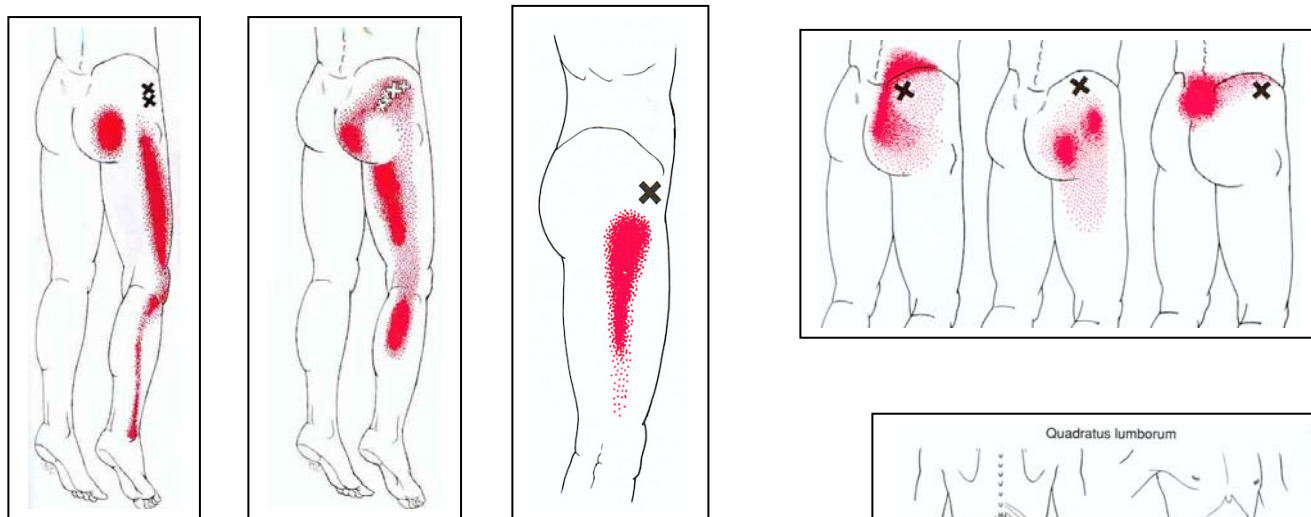
In addition to protecting feet from the ground, proper footwear should provide firm lateral support. Shoes must be wide enough to house the feet without rubbing. Rubbing causes skin thickening (calluses) and calcium deposits (bunions). Shoes should also be sized close enough to prevent bruising or blistering of the toes or heels. Shoes, including dress shoes and heels, need to be purchased with the orthotics already positioned in them.

Although these simple remedies usually prove effective in correcting arch-related problems, up to ten percent of sufferers may benefit from more careful evaluation and complex correction. Podiatrists and orthopedic surgeons specializing in ankles and feet are best equipped to diagnose and treat these conditions. 

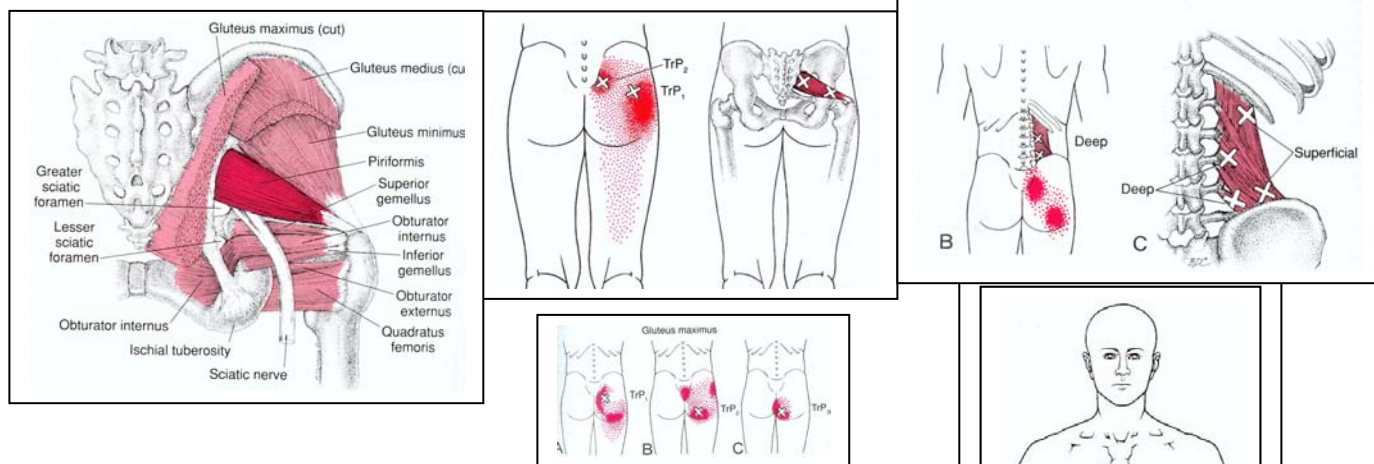
The previous article was written for *Small Business Success* magazine. It was abbreviated and edits were revised to keep it acceptable to this author as well as to the “creative staff”. This copy includes a change in the first paragraph and picture that more represent this author’s opinions.

The following pictures from Janet Travell’s book give a number of the myofascial presentations of foot induced myofascial pain.

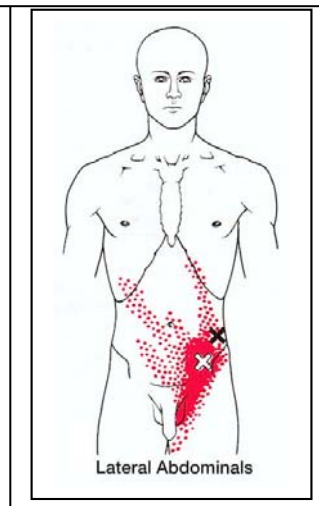
Hip pain and leg “pseudo-radiculopathies”: These are common complaints– in at least four of ten patients and in a third of the “low back pain” that I see and 90% of “idiopathic” hip pain.



Butt pain, pain down the back of the leg & night hip pain:
Piriformis strain and gluteal strain – often with back-pocket wallet, also with arch drop.



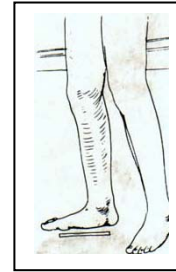
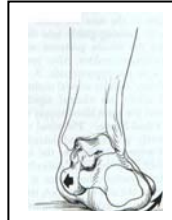
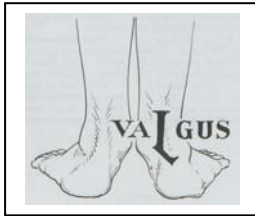
The abdominal findings – myofascial pelvic pain is a major player in IBS (irritable bowel syndrome), these symptoms, as well as the IBS clear/subside very commonly with the “full time usage of a properly sized arch support.”



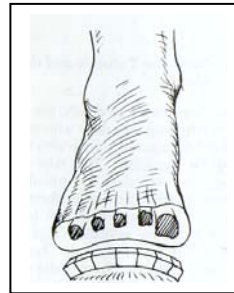
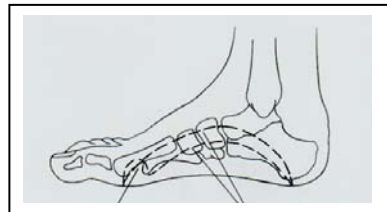
My Experience and Opinions concerning Arch support orthoses:

Do any shoe inserts work?

Absolutely not! Inserts that are just padding against the hard, cement floor, an absorbent heel cup or a low long arch riser offer some marginal benefit use; but they rarely do the necessary job of assisting the arch to regain and function in its position of best function. That needs a properly sized, semi-flexible arch-support orthoses that keeps and restores the standing (weighted) arch to its resting height and shape.



A proper arch-support orthoses needs to support both the long (longitudinal) and the transverse (metatarsal) arches up to resting height. It needs a little flexibility and must fit up to the top height of the arch height of the un-weighted arch (foot off of the ground). That particularly means that a cavus (high arch) needs a higher support longitudinal arch.



A proper arch support should:

1. Support both the long and the transverse arches to their normal height:
 - a. The longitudinal (long) arch that is fitted as high into the medial side of the foot as the resting arch is high. It should also be mildly elevated also on the lateral side of the foot so as to cradle the foot. A cavus foot (high arch) needs extra height. A one-cm. drop in arch is a big drop -- from a regular arch height or from a cavus height. Too low, doesn't do the job. Too high, causes discomfort.
 - b. The transverse (sideways) or metatarsal arch must appropriately support the natural resting "cross-arch area" under the front of the instep.
2. Construction should be inexpensive (mass-produced), simple, durable, cleanable, water-proof, interchangeable (fit in nearly any footwear), and take-up as little room as possible in the shoe.
3. Sizes:
 - a. Male (wide, from size 5 to 16) both in normal height and high (cavus) arch height.
 - b. Female (narrow, from sizes 4 through 14) also both in normal arch height and high (cavus) arch height – should be Velcro attachable to raised-heel or open-back shoes.
 - c. Cushioned padding to the arch supports should be optionally
3. Cost should be nominal - \$20-30 wholesale; and, retail under \$100 if possible. Available to anyone.
4. Should be worn whenever standing – home, work or play, 24 / 7.

What Orthotics do I suggest (January 2004)?

I have bought, tried and experimented with no fewer than twenty brands and types – at length, and have evaluated over 3500 people for foot related problems in the past six years. Most have some benefit – different ones will be quite satisfactory for many individuals.

My opinion now – and for the last year -- could change in a month. No loyalties.

Custom orthotics – from a foot cast? Usually no. My experience is that few (<1 of 10) of these “custom-made” (\$200-\$500) fit well. Most are not interchangeable into multiple shoes. Most are not durable.

Good foot stores (in San Diego) (\$140-200) have some pretty good products. A bit pricey when you get the two or three pairs recommended. Usually better than the custom-made, but not as good as the Flexify. (Retail stores)

Phase 4... on TV and in magazines (+/- \$20). These work for some people, have limited size choices and are really difficult to break in. (www.DrLeonard.com)

Spenco plastic orthotics: (retail stores, \$25+) Not the pads. These are okay for an arch that needs a only little help – badly need boiling and molding with higher long arch and a 1 cm. transverse arch bent in before working well. (Big Five, Sports Chalet...)

Super feet: (retail \$30+) Several types. They fit a normal height arch. Unfortunately there is no transverse arch and it can't be molded in. (Sports Chalet...)

Flexify: (Retail \$50+, several types). These meet most the criterion named above. They are the ones that I recommend for most of the people I see. They are the most versatile and meet all the needs for about 95%+ of folks> My usual source: (www.feetrelief.com) 1-888-671-8027, run by a personable and knowledgeable gentleman.. Also available in Tijuana, Mexico - *at Zapateria Leon* on Calle 2, downtown. Dr. Carlson, DC also carries some (on Washington St. in Hillcrest area of San Diego 619-297-1167) Another web site is: www.hitechsupports.com .

Dr Scholl, etc. in pharmacies. (ProFoot, Advantage, Dynastep) Some will help, particularly the person with a natural low unweighted arch height. Most are marginal. Most of what I find in the drug stores and the pads in the running stores are poor to mediocre. There are a lot for sale. The gel pads and magnets do little for mechanical assistance and may feel good. There is marginal value to them.

Birkenstocks, Earth shoes and the like are all better than the alternatives, but rarely fully support even the average arch.

Tennis shoe arches are better than none and are useful for the first few weeks or month. They are usually too soft and have no metatarsal support. I suggest wearing arch supports that fit in all footwear.

Just an insert- will not work. Just any orthotic- will not necessarily work or last work. The principles of fitting are simple and mechanical. Compliance is needed 24 / 7 when standing. If the supports don't feel comfortable within a week or two, they don't fit. If only one foot doesn't feel good – the feet are different and may *require* different sizes – bottom line, double the cost.

These comments are general. They in no way represent any professional recommendations for treatment. There is no treating relationship between this author and the reader, nor is any intended. This is for education purposes. Medical care should be directed by a knowledgeable health care professional.

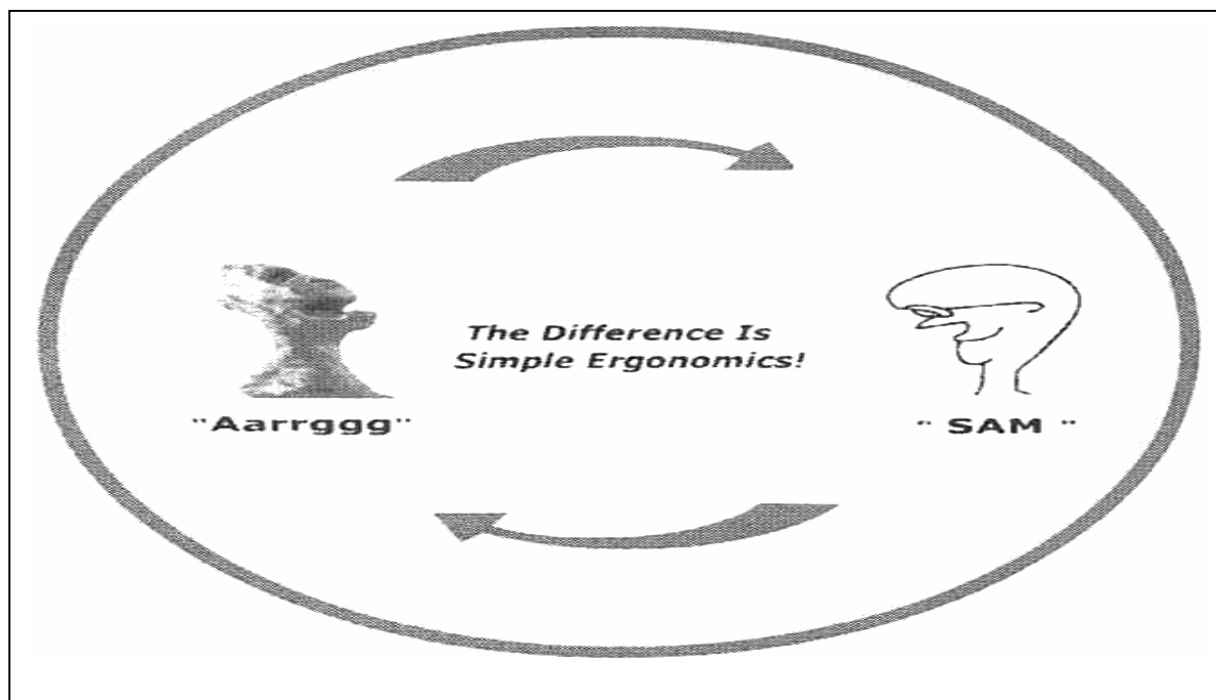
This author neither endorses nor has any relationship with any product or pharmacologic agent mentioned. Any comments are his current thoughts, based upon his current knowledge and opinions. These are always quite subject to revision or change.

Behavioral modifications toward sensible and non-injurious activities of daily living should be dictated by what makes sense and is sensible.

--jsgillick

Illustrations from:

Simons, Travell & Simons: Myofascial Pain and Dysfunction: The Trigger Point Manual;
 Vol. I- Upper Half of Body; Second Edition – Williams&Wilkins: 1999
 Travell & Simons: Myofascial Pain and Dysfunction: The Trigger Point Manual;
 Vol. II- Lower Extremities, First Edition – Williams&Wilkins: 1992
 Hoppenfeld: Physical Examination for the Spine & Extremities;
 –Appleton-Century-Crofts:1976
 Magee: Orthopedic Physical Assessment, Third Edition; –WB Saunders: 1987



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