

# Revolution — what it means to runners

Completely rethinking orthotics may be part of the solution

In *The Lore of Running*, author Tim Noakes observes that perfect mechanical function is exceedingly rare. The handful who are blessed with this rare gene can run as far as they want in whatever shoes they want and remain injury free.

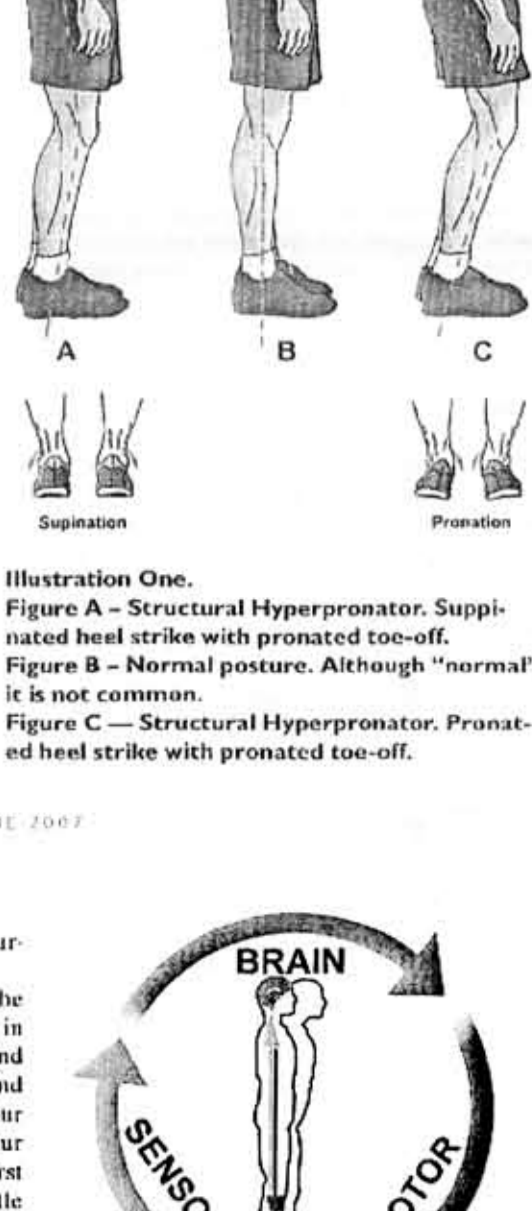
"The rest of us," Noakes says, "run despite varying grades of biomechanical disaster." Noakes' view mirrors the Conventional Running Wisdom™ (CRW) that if you are a runner, it is not a matter of "if," but "when" you injure.

You youngsters (below 30) may shrug off this notion, but if you are north of forty, you're probably a believer. You've likely had a variety of maladies that you've accepted as an inevitable consequence of running. You "mature" runners have probably also sought relief from running injuries with arch supports, motion control shoes and other means.

As a certified personal trainer and myofascial therapist, I have treated runners for shin splints, ball of foot pain, ankle, knee and hip pain and, of course, for back pain. My experience tells me Mr. Noakes is right — most of us do have musculoskeletal problems.

But I want to challenge the CRW. Running and a high tolerance for pain need not be inextricably linked.

Let's accept for now that running itself does not cause injuries. As Mr.



**Illustration One.**  
**Figure A — Structural Hyperpronator. Supinated heel strike with pronated toe-off.**  
**Figure B — Normal posture. Although "normal", it is not common.**  
**Figure C — Structural Hyperpronator. Pronated heel strike with pronated toe-off.**

Noakes implies, lack of good body mechanics causes injuries. But I do not believe that a genetic roll of the dice. Nor do I believe good body mechanics cannot be maintained or restored in a natural fashion.

That's where the revolution comes in. Good running technique does not equal good body mechanics. Without good mechanics, you cannot have good technique.

The revolution is in good posture! Understanding it, Restoring it, Maintaining it. And most importantly, dealing with the relationship between common running injuries and posture.

I have been distressed to see that most running magazines refer to posture as a part of running technique, frequently stressing that you should not run with your head leaning forward. The truth is that if your head is leaning forward when you run, that is only a symptom of poor posture — not the source of poor posture in and of itself.

### Posture — a little background

Now, more doctors, trainers, chiropractors and naturopathic physicians are getting in on the posture revolution and acknowledging that (1) poor posture robs you of good body mechanics, (2) for most of you, the source of poor posture is a structural problem in your feet, and (3) for most people, it is possible to restore or maintain good posture naturally. Yes naturally, without

surgery or drugs, by solving the structural problem in your feet.

With perfect posture, you should be able to draw a straight line from just in front of your anklebone to your ears, and that line should bisect the knee, hips and shoulders (figure B). From the front, your feet should be stable with your heels, first and fifth metatarsals (big toe and little toe bones) on the ground. Your ankle should be relatively straight (not rolled out or significantly inward).

For runners, good posture gives you improved body mechanics so that your joints and ligaments are not unduly stressed. Your gait will be softer and more balanced when you run. Good posture positively impacts ease of standing, proper breathing, and promotes better digestion.

If your posture is moderately distorted (figure A in Illustration One) you probably hyperpronate, meaning your ankles roll in. You may consciously or unconsciously roll your feet back out because it makes your feet and body feel better. This makes you a supinating bracer.

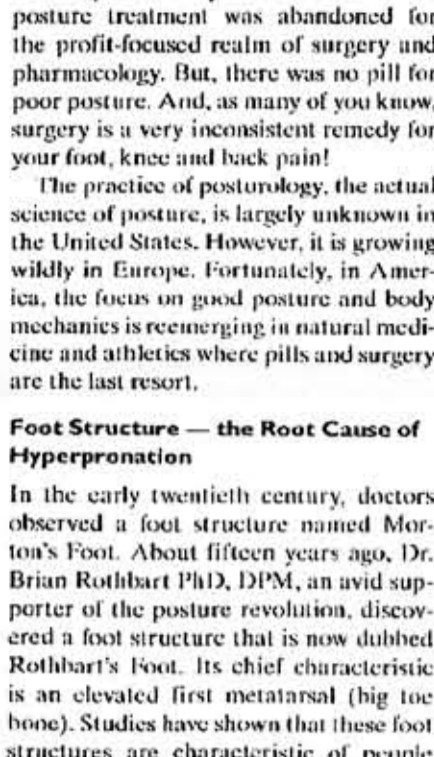
If you supinate in this way, you're using constant muscle tension to brace against hyperpronation. As a supinating bracer, with every step, your heel strikes the ground much harder than your body was designed to withstand because your feet no longer cushion the impact. The constant bracing makes your muscles tight — very tight.

If you're a bracer runner, you'll experience shin splints, sore calves and impact pain augmented by knee pain and tight IT bands as you age. Running store shoe specialists will recommend cushioned shoes as your best option.

If your posture is significantly distorted (figure C in Illustration One), chances are you freely release your feet to hyperpronate. You will feel most of your weight under the ball (second metatarsal) of your feet. You'll feel like your legs are internally rotated when you place your feet parallel. When you do a knee bend, your knees will naturally come together rather than extending over the top of your feet.

Called used feet, knee pain and tight IT bands are the running modes operandi of the "releasing hyperpronator." The running store shoe salesman will usually recommend that you buy motion control or anti-pronation shoes.

In both cases, your local podiatrist will attempt to sell you arch support orthotics.



**Illustration Two.**  
**Proprioception — Just as a pebble in your shoes can buckle your knee in an instant, purposefully placed shapes can control your muscles to your advantage.**

The good news is that whether you are a "preconditioned bracing supinator" or a "releasing hyperpronator," the posture revolution changes the paradigm in a way that will rock your running world!

### Rocking the running world

Seventy years ago good posture used to be central to medical practice. But, like so many other aspects of health care, posture treatment was abandoned for the profit-focused realm of surgery and pharmacology. But, there was no pill for poor posture. And, as many of you know, surgery is a very inconsistent remedy for your foot, knee and back pain!

The practice of postureology, the actual science of posture, is largely unknown in the United States. However, it is growing wildly in Europe. Fortunately, in America, the focus on good posture and body mechanics is reemerging in natural medicine and athletics where pills and surgery are the last resort.

### Foot Structure — the Root Cause of Hyperpronation

In the early twentieth century, doctors observed a foot structure named Morton's Foot. About fifteen years ago, Dr. Brian Rothbart PhD, DPM, an avid supporter of the posture revolution, discovered a foot structure that is now dubbed Rothbart's Foot. Its chief characteristic is an elevated first metatarsal (big toe bone). Studies have shown that these foot structures are characteristic of people who hyperpronate. These foot structures are becoming very prevalent — over 80% of the population has varying degrees of Rothbart's Foot Structure.

With Rothbart's Foot or Morton's Foot, the first metatarsal can remain elevated through as much as 88% of the forward weight bearing gait cycle. While the first metatarsal is supposed to give you most of the push off when you walk or run, if it is elevated, even slightly, that push off is delayed and you end up relying on your second metatarsal for forward motion.

Your foot is designed to be an all terrain motion-enhancing flexible tripod, with your heel as one corner (which provides your landing gear) and your first and fifth metatarsals as the other two corners that give you your forward thrust and balance.

If your first metatarsal doesn't do its complete job, you are literally walking or running on an ice skate. Your foot is forced to balance on a line between your heel and your second metatarsal head and it can roll in or roll out — hyperpronate or supinate.

If you have ever been on ice skates or watched a first time ice skater, you know how the body responds. Muscles throughout your body tense up and remain tense as long as your body tells you that you need the tension in order to maintain your balance.

Some people manage to partly straighten up their skates (bracer/supinators) while others seem to be skating on the inside leather forever (releaser/hyperpronators).

### Hyperpronation and Posture

The lack of support by your first metatarsal causes your ankles to tilt in and your legs to internally rotate. This tilts your hips forward and causes your upper body to lean forward. Your shoulders and head drift forward and down. Remember what I mentioned earlier about the runner's head leaning forward? It's just one symptom of poor posture — not the whole enchilada!

Your center of gravity shifts forward. Your walking and running start to resemble a sequence of forward falls and recoveries rather than an effortless, smooth stride.

My opinion is that the running shoe industry has not yet dealt with the root cause of hyperpronation — the elevated first metatarsal.

### Proprioception

Over the last decade proprioceptive training for improved balance and core strength has gained popularity and made its way into athletic training, physical

therapy and rehabilitation.

Proprioception is a motion dynamic and one of our body's great miracles — feedback from thousands of sensors on our skin, in our muscles, joints and ligaments processed by the brain and returned to the body as signals controlling our muscles. See Illustration Two.

If you are standing on a moving bus, even with your eyes closed, your feet, muscles and joints sense the changes in motion as the bus turns, slows, speeds up. Your feet and body actually become sensors. The signals processed by your brain instantly increase or decrease muscle tension so you can maintain your balance.

So, proprioception is all good — right? Not so, Steve Prefontaine! Trash in — trash out. Just like a computer, if your brain receives improper signals from your feet, the signals sent back to control your gait and posture may be incorrect.

Normally when the first metatarsal senses pressure from the ground, the muscles are instructed to respond by pushing back. When the first metatarsal remains elevated through most of the contact gait cycle, that muscle activation is delayed causing the arch to collapse

and the ankle to roll in. See Illustration Three.

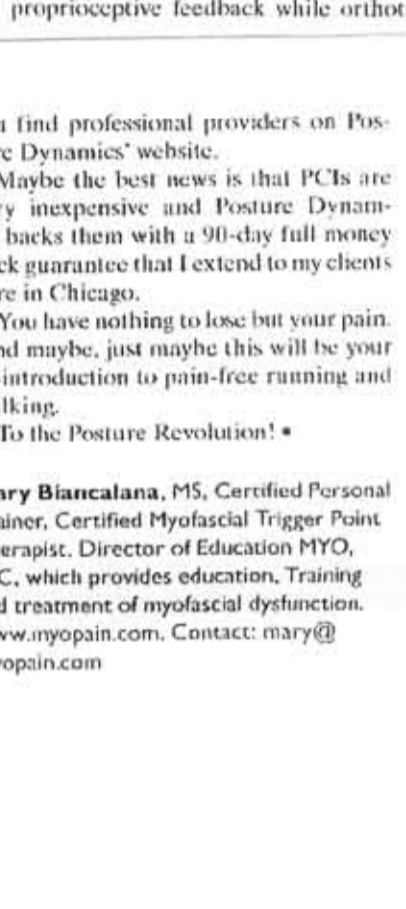
After identifying this dynamic with the first metatarsal, Dr. Rothbart developed technology that restores correct feedback from the feet to the brain and a beneficial proprioceptive response.

Building the ground up under the first metatarsal and big toe restores proper proprioception. In my practice, I used to fabricate pads for the first metatarsal from felt and moleskin. It was a tedious job, and frankly, the results didn't look all that professional. Durability was a big problem too.

### The posture control insole

Right in your Pacific Northwest back yard, a method for dealing with this posture problem has been successfully developed. It is called the Posture Control Insole (PCI) and it was developed based on the work of Dr. Rothbart. It has been brought to market by Posture Dynamics of Olympia, Washington.

The PCI, based on an assessment of your foot type, provides a specific tactile feedback to the forefoot that corrects your gait mechanics through the full gait



**Illustration Three.**  
**Elevation of the first metatarsal causes the foot to roll in. (Darker shade indicates higher pressure)**

cycle including your heel strike. An improved straight push off also improves the next heel strike.

I am often asked what differentiates PCIs and orthotics. PCIs allow the feet to move unrestricted while restoring proper proprioceptive feedback while orthotics



**Illustration Four.**  
**PCIs don't look like much, even compared to a standard insole, and they don't cost much either. The working part, the wedge underneath the first metatarsal, is kept in place by a thin (2 mm) full insole. The top of the insole is covered with cloth.**

are based on arch support which restrict or limit motion of the feet.

There may be some role for orthotics, especially in an injury situation: I felt that prescribing arch supports should be more conservative. The arch is, after all,

supported by muscles. If you restrict it so it cannot move, what happens to the muscles? Like any muscle not used, they atrophy and weaken. What sense does that make for a motion-intensive activity like running?

You'll love buying running shoes again, because motion control or anti-pronation shoes are not recommended with PCIs. Like those few with perfect body mechanics, you'll be able to run in most any pair of shoes. The insoles are so thin you can slip them underneath the sock liner. See Illustration Four.

Most runners prefer the most conservative, 3.5 mm pair (amount of proprioceptive feedback) in their running shoes, but if you pronate significantly you may need to wear 6.0 mm in your regular shoes.

I have fit hundreds of my patients in PCIs and the response has been overwhelmingly positive. Most of my patients are in extreme pain, so the PCI is part of my treatment program. However, on their website — www.mortonsfoot.com you'll find a page showing you how to assess your feet and your shoe wear pattern so you can match the insoles to your need.

For my patients with pancake flat feet, I normally prescribe a very conservative arch support, which can be added to the PCI. I also use arch support temporarily to help my patients heal from Plantar Fasciitis. I just tack them on with three drops of adhesive so they can be easily removed once they have outlived their purpose. Just like a cast, when the injured tissues have healed, they don't need the arch support any longer.

If you have longstanding problems for which you may also need therapy, you

can find professional providers on Posture Dynamics' website.

Maybe the best news is that PCIs are very inexpensive and Posture Dynamics backs them with a 90-day full money back guarantee that I extend to my clients here in Chicago.

You have nothing to lose but your pain. And maybe, just maybe this will be your re-introduction to pain-free running and walking.

To the Posture Revolution! \*

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