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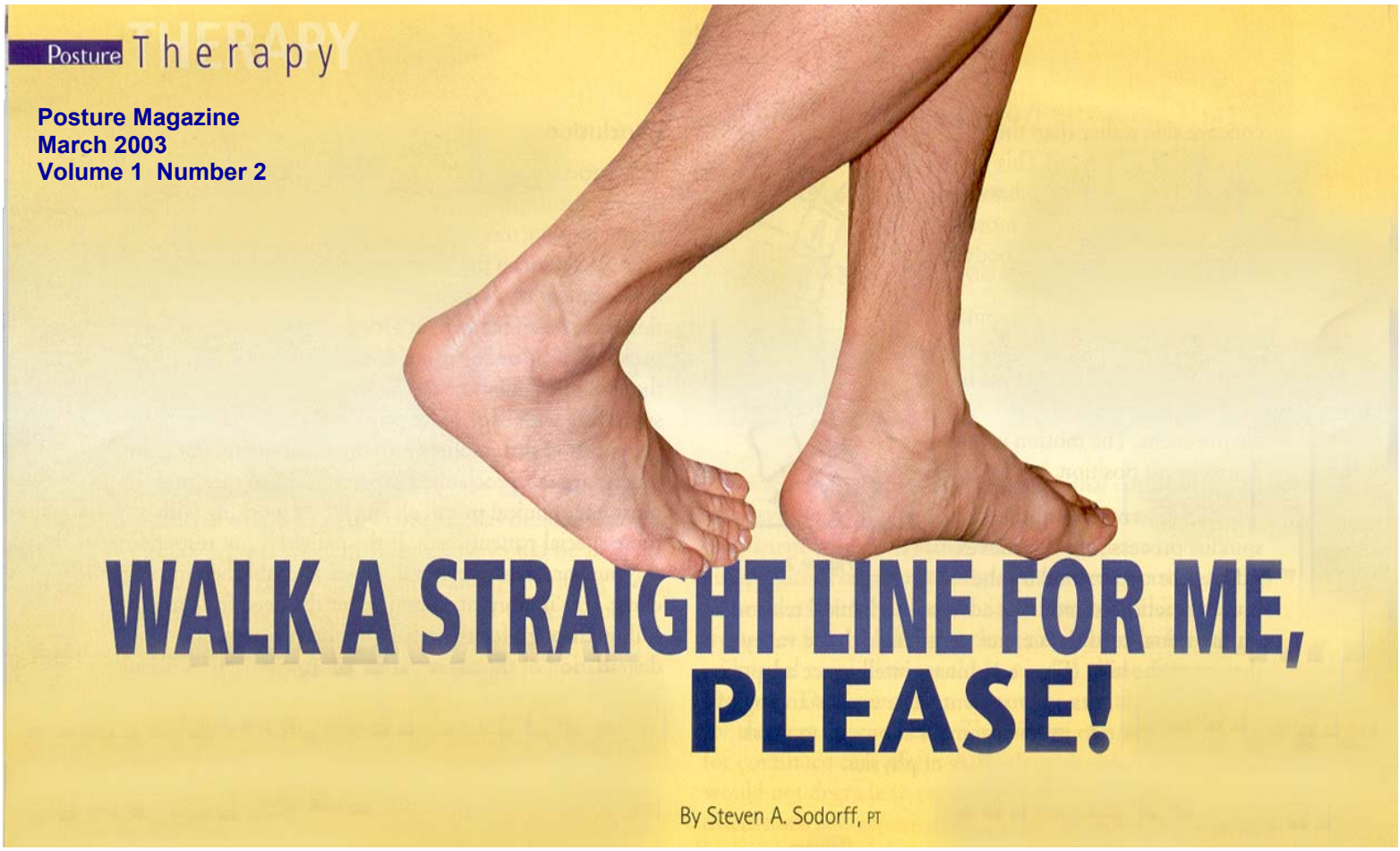

WALK A STRAIGHT LINE FOR ME, PLEASE!

By Steven A. Sodorff, PT

The next time you're evaluating a patient's posture, take a minute to ask your patient to walk a straight line for you. Determine if their problems stem from their primary base of support, evaluate the need for foot orthotics, and gait re-training!

When we hear the word posture, the image we automatically visualize involves the spine. "Sit up straight! "Put your shoulders back! But posture is a complex system that originates from the primary base of support, the foot and ankle.

Posture becomes dysfunctional

While there are many supportive mechanisms, including core strength, flexibility, paraspinal strength, and neuromuscular balance that influence posture, when the alignment, flexibility, or stability of the foot and ankle are compromised, the body's combined "postures become dysfunctional. The correct neuromuscular firing patterns are established when the lower extremity and trunk postures are within normal limits. With any change of the postural supporting structures, the firing patterns are altered. Only realignment, of the compromised structures, the foot and ankle in this case, will allow the firing patterns to return to normal.

Reveals internal rotational stress to the hip

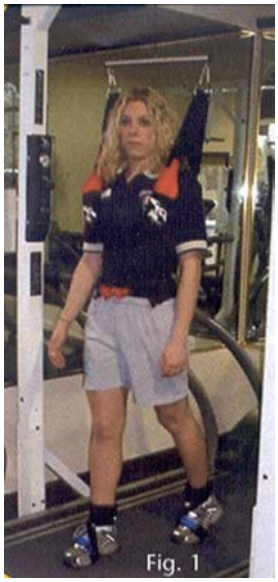
Fig. 1

Biomechanical imbalances of the foot and ankle can be divided into two groups; those caused by pronation and those caused by supination. Pronation is the most common biomechanical failure associated with the foot/ankle complex. The pathology that is associated with a pronated condition is extensive. In fact, it can contribute to many conditions in the kinetic chain, including Achilles tendonitis, plantar fasciitis, posterior tibialis tendonitis, shin splints, heel spurs, bunions, Morton's neuralgia, back pain at all levels, and headaches, all of which are related to postural alignment. A postural assessment of the pronated foot would reveal internal rotational stress to the hip, pelvis, and lower extremities, which would then continue up the kinetic chain. Specifically, the internal rotation produces anterior transfer of the pelvis and cervical spine, which typically results in lumbar lordosis and thoracic kyphosis, respectively.

Trunk forced into forward lean position

In many cases with moderate to severe pronation, the kinetic chain effect results in an "extensor collapse", where the trunk posture is forced into a forward lean position putting extensive stress on the paraspinal ~extensors. Additionally, pelvic asymmetries often occur with pronated lower extremities, resulting in sacroiliac dysfunction or axial rotation if the pronation is unilateral. Pronation of the forefoot during ambulation is usually accompanied by external rotation of the foot. Supination or cavus foot is less common, but as in the case of pronation, it can have a profound postural effect producing similar symptoms such as heel spurs, stress fractures, and lateral column pain. Subtalar inversion often accompanies a supinated foot, while subtalar eversion is generally associated with a pronated foot.

Orthotics effective for stabilization

While orthotics have proven to be very effective in the stabilization of pronation or supination, there has also been significant clinical success in correcting such problems utilizing neuromuscular retraining. This type of treatment has been very successful because it involves the body correcting itself through retraining and strengthening of the muscles. In several cases, reorienting the gait pattern via realignment of the foot and ankle reduces the need for orthotics, and at the least, should reduce the amount of correction required.

Involves multi-plane activities performed in an un-weighted environment


Pronation Fig. 2

An effective and active treatment in the correction of a foot/ankle misalignment and resetting of the neuro-muscular firing patterns involves multi-plane activities performed in an un-weighted environment (Fig. 1) utilizing specific external support. A forefoot strap (in this instance it is the Pneu-Gait™) can be used to correct pronation by supporting the forefoot at the first ray, while at the same time elevating the longitudinal arch. This is accomplished by anchoring the strap to an ankle cuff (Fig. 2). Conversely, while correcting for supination, the forefoot strap provides support at the distal lateral column, again anchoring on the ankle cuff (Fig. 3). Eversion of the rear-foot, that often accompanies pronation, is corrected by bringing the subtalar joint into a neutral position utilizing external straps that support from the medial to the lateral aspect of the ankle and are anchored to ankle cuff (Fig. 4) Inversion of the rear-foot would then be reduced placing the straps from the lateral to the medial aspect of the ankle (Fig. 5).


Supination Fig.3

Balance of core strength and flexibility

Stable posture is dependent on a balance of core strength and flexibility. Consequently, when correcting for an ankle/foot alignment problem, developing gluteal strength in lateral and retro patterns will ultimately facilitate correction of the externally rotated hip and support the neutral alignment of the ankle. For example, a fetrnlle patient of mine who is a retail salesperson was exhibiting pronated tendencies, without an excessive amount of pain. She spends approximately 8 hours/day on her feet. She was treated 3 times/week for four weeks utilizing forward, lateral, and retro gait patterns on the treadmill, unweighted at 40% of her body weight. The Pneu-Gait™ forefoot strap was utilized to place the foot into a neutral position during ambulation. She was then advanced weekly by re-weighting 10% of her body weight each week as she tolerated. The un-weighting, in combination with the external foot support, allowed the correction to be accelerated by removing the compressive ground forces (Fig. 1). Once the course of treatment was completed clinically, she was reevaluated to determine the necessity of orthotics. She has maintained a stable longitudinal arch, and the subtalar joint has remained neutralized, and therefore, orthotics were deemed unnecessary at this time.

Inversion Fig. 4

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Eversion Fig. 5

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