

Orthotics Q&A: When Orthotics Can Treat Low Back Pain

- [Guest Clinical Editor: Nicholas Sol, DPM, CPed](#)

Have you seen your share of patients who have back pain as a result of compensating for gait-related problems? If so, you're not alone. Some patients may indeed get relief from lower back pain after getting custom orthotics. With this in mind, our expert panelists tackle this important subject.

Q: Podiatrists often report that many of their patients experience relief of low back pain after receiving custom orthotics. What is the relationship?

A: George Trachtenberg, DPM, believes the majority of lower back pain not caused by direct injury or congenital problems results from abnormal gait. If you see abnormal gait, particularly in the sagittal plane (the predominant plane of movement), Dr. Trachtenberg notes you may also see abnormal and early flexion of the knee, hip, back and cervical spine. This can lead to repetitive motion injuries, Dr. Trachtenberg says.

He says using appropriate orthotic devices will help eliminate these abnormal compensations and assist the aforementioned body parts in functioning more correctly. The low back is just one of those remote areas that can be affected by abnormal gait, notes Dr. Trachtenberg.

Nicholas Sol, DPM, also cites repetitive motion injuries. He notes the spine is an essential part of the kinetic chain, which coordinates and connects the phasic motion of the shoulder girdle and upper extremities with the phasic motion of the pelvic girdle and lower extremities.

"We all have different degrees of muscle strength. Yet, a man, woman and child can enjoy a prolonged walk together because walking is about efficiency and coordination, not muscle strength. When custom foot orthotics restore symmetric function of the lower extremities, both efficiency and coordinated phasic motion between the two girdles is enhanced," says Dr. Sol.

While diagnosing a short limb effectively and compensating for the short limb with a custom orthosis is "extremely helpful," Bruce Williams, DPM, says it only works in 50 percent or less of the patients.

"Understanding how important it is for the first metatarsal to engage the ground without jamming up is the most important thing to understand in relation to chronic back pain," notes Dr. Williams.

Dr. Williams says unimpeded sagittal plane progression is paramount to effectively treating low back pain and if your patients' feet and lower extremities do not function symmetrically or with similar accelerations, they will change gears from step to step "with disastrous outcomes."

Q: How do you use technology in your biomechanical practice to help treat these patients?

A: All three panelists use the F-Scan System (Tekscan).

"I feel that using an in-shoe pressure system is the only way to accurately treat complicated foot and ankle deformities with orthotics, as well as upper body postural problems with custom foot orthotics," notes Dr. Williams.

Dr. Williams says the F-Scan can give you a preliminary dynamic assessment, before any therapy has been instituted. He notes you can use the system to gauge the effectiveness of any adjustment you make to help improve the patient's function.

Dr. Trachtenberg supplements his use of the F-Scan with a conventional exam for his biomechanical patients.

"This technology gives me information that I was unable to get before that greatly assists in writing an orthotic prescription for the patient that will enhance normal movement," says Dr. Trachtenberg. "The emphasis now is on appropriate foot function rather than support."

By having the patient move toward a more normal gait, there is no need for the previous compensations the patient was making in his or her movements, according to Dr. Trachtenberg. He says this facilitates improved posture and will decrease or eliminate proximal symptoms as the source of the repetitive motion dysfunction.

Dr. Sol calls video gait analysis and in-shoe sensors "indispensable" and has used the F-Scan system for several years. Video gait analysis lets him do a frame-by-frame review with the patient. Regarding in-shoe sensors, Dr. Sol adds there is no substitute for being able to see a patient's shoes when he or she is walking and the technology lets him assess force from a "where, when and how much" standpoint.

"Using these technologies together permits me to stop time, assess movement and force and calculate a solution," comments Dr. Sol. "Technology has greatly improved my ability to correct pathomechanics that affect the kinetic chain. This is the fastest growing part of my practice."

Q: What are the three most frequent considerations when prescribing custom orthotics for patients with low back pain?

A: Dr. Williams emphasizes concentrating on the function of the first MPJ and first ray, saying the battle is half won if you can eliminate functional hallux limitus. You should also adjust properly for limb length difference and assess and treat ankle joint equinus. "All of these come into play regarding sagittal plane progression," notes Dr. Williams.

Dr. Trachtenberg advocates an interdisciplinary approach that includes chiropractic, physical therapy, massage therapy and sometimes acupuncture. If you address the etiology (abnormal gait) and then add the appropriate interdisciplinary care, "the results can be remarkable," he says. Dr. Trachtenberg also emphasizes that evaluating leg lengths is an important aspect when dealing with back pain.

In Dr. Sol's opinion, the most important consideration in prescribing custom orthotics for patients with low back pain is determining when the pathomechanic event happens. He says your solution will depend to a large extent on whether the event occurs before or after heel lift.

If the pathomechanic event occurs before heel lift, then you can find the solution in the rearfoot, forefoot or both, according to Dr. Sol. However, if the event occurs after heel lift, then the correction must be in the forefoot. "Most patients require correction of several pathomechanic events in each foot," explains Dr. Sol.

Q: What have you found to be most effective when prescribing custom orthotics specifically for patients who have low back pain?

A: For Dr. Sol, one of the most effective strategies is assisting with limb lift. In the average adult, each lower extremity accounts for 15 percent of total body weight. Each leg weighs approximately 18 pounds in an average 120-pound patient. Since we walk at 90 to 120 steps a minute, Dr. Sol says that represents a cumulative lifting load of 810 to 1,080 pounds per side in each walking minute.

"Compensating for failed limb lift mechanics causes many gait-related repetitive injuries to the low back," says Dr. Sol.

Dr. Williams favors an in-shoe pressure system to provide symmetric function in both feet and lower extremities. He adds that this effectively eliminates most of the upper body compensations which perpetuate chronic low back pain. "Eliminate the limp and the patients look, feel and function much better," he says.

Educating patients is important to Dr. Trachtenberg. "They must be committed to wearing their orthoses full time, wearing them in appropriately constructed shoes and getting involved with an interdisciplinary model of treatment if it applies to their situation," he says.

