

# Chronic Low-Back Pain and Its Response to Custom-Made Foot Orthoses

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A new approach to treating chronic low-back pain with custom-made foot orthoses was investigated. The Quebec Back Pain Disability Scale was used to objectively assess the functional disability of 32 subjects at different times. Subjects in this prospective study experienced more than twice the improvement in alleviation of pain, and for twice as long, compared with subjects in a study using traditional back-pain treatment. The authors believe that the findings of this study may provide a new method by which patients with chronic low-back pain can be evaluated and treated. (*J Am Podiatr Med Assoc* 89(3): 109-117, 1999)

Chronic low-back pain is a medical problem throughout the world. Various studies have shown that this problem is characterized by partial remissions and frequent exacerbations of pain. Up to 70% of patients who develop disabling low-back pain will experience a repeat episode within 1 year of treatment.<sup>1,2</sup> Most care options address only acute flare-ups and are not useful for long-term management of pain. Surgical intervention has limited success, and is best performed for radiculopathic type leg pain and not for pain specifically involving the lower back.<sup>3,4</sup> The cost of treating low-back pain is in the tens of billions of dollars annually in the United States alone.<sup>5,7</sup>

Podiatric physicians have long known that the use of foot orthotic devices can help alleviate low-back pain. The evidence was primarily anecdotal. A 1990 study found that 77% of patients demonstrated 50% to 100% improvement over a 2-year follow-up period when custom-made foot orthoses were used to correct subtle aberrations in their gait style.<sup>8</sup> In 1993, in a two-part article, one of the authors of this article (H.J.D.) described the biomechanical relationship between gait style and lumbar stress.<sup>9,10</sup>

DiNapoli et al<sup>8</sup> and Dananberg<sup>9,10</sup> have postulated

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that functional hallux limitus is a major gait abnormality that causes lumbar stress. Essentially, functional hallux limitus is the blockage of a rotational type of motion at the first metatarsophalangeal joint at the time when the joint should be dorsiflexing in the single-support phase of gait. This occurs despite the fact that normal range of motion at this joint is available in the nonweightbearing state. With functional hallux limitus, the first metatarsal is not stabilized against the ground and, therefore, the foot and body cannot pass directly over it. Ankle equinus is another example of this type of motion restriction. These two conditions have been collectively referred to as sagittal plane blockage.<sup>9,10</sup> The purpose of this prospective study was to determine whether addressing sagittal plane blockage with custom-made foot orthoses and manipulation of affected joints could alleviate the chronic low-back pain that was experienced by the study participants.

## Materials and Methods

The 32 subjects in this study were referred to the Podiatry Centers of New Hampshire between the summer of 1996 and the fall of 1997 for gait evaluation and custom-made foot orthoses to treat chronic low-back pain. Each subject had been treated unsuccessfully with several standard low-back treatment modalities, including skilled spinal manipulation,