Update

Walking Patterns Used to Reduce Forefoot Plantar Pressures in People With Diabetic Neuropathies

In the United States, 56% to 83% of amputations occur in people with diabetes, and the most common causal factors are peripheral sensory neuropathy and neuropathic ulceration.[1,2] Fifteen percent of individuals with diabetes will likely develop foot ulcers in their lifetime, and approximately 15% to 20% of these ulcers will result in lower-extremity amputation.[3] In the presence of peripheral neuropathies, according to one research report,[4] 72% of the amputations of limbs in people with diabetes occur because minor trauma leads to ulceration and wound healing failure. Fortunately, research suggests that reductions in diabetes-related amputations can occur when a multispeciality approach to diabetes and treatment of the diabetic foot is utilized.[5–8] Several authors,[3,4,6] therefore, contend that treatment and prevention of ulcers should be the central focus of programs intended to reduce the number of lower-extremity amputations.

In people with peripheral sensory neuropathy, the ability to respond to potentially injurious stimuli is diminished or lost. There is also atrophy of the intrinsic muscles of the foot because of motor neuropathy. This muscle atrophy causes instability of the metatarsophalangeal joints and anterior migration and displacement of the fat pad that is normally located directly under the metatarsal heads.[9,10] Anterior displacement of the fat pad makes the forefoot more vulnerable to injury from accumulated trauma during walking.[9] Brand[10] has emphasized the role of decreased sensation and excessive, repetitive mechanical pressure as principal factors leading to plantar ulceration. High plantar pressures may lead to the breakdown of tissue and the formation of ulcers. These lesions often are followed by infection, gangrene, and amputation.[11]

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