

Prevalence of Balance Compromise in Commonly Treated Patient Populations: An Introduction to the Academy's State of the Science Conference on the Effects of Ankle-Foot Orthoses on Balance

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ABSTRACT

Balance compromise is frequently encountered among those patient populations commonly treated with ankle-foot orthoses. While this compromise can be measured and quantified using laboratory techniques and clinically accepted outcome measures, it also can be appreciated by considering such things as fall rates, associated injuries, balance confidence and activity limitation. The impact of these variables on the patient populations of stroke, acquired brain injury, incomplete spinal cord injury, multiple sclerosis, post-polio and peripheral neuropathy are briefly considered. An overview of the manuscripts included in the conference proceedings is presented. (*J Prosthet Orthot.* 2010;22:P1-P3.)

KEY INDEXING TERMS: ankle-foot orthosis, balance

The ultimate value of any discussions of the possible effects of ankle-foot orthoses (AFOs) on balance is predicated on a full appreciation of the balance compromise that exists within many of the patient populations commonly treated with this modality. Balance deficiencies can be observed in several ways. In addition to quantifiable laboratory parameters and clinical outcome measures, the more immediate effects of balance compromise are observed in stumble and fall rates, reports of reduced confidence and the fear of falling, activity restriction, and decreased societal participation. As the magnitude of these deficits is more fully appreciated, the importance of balance considerations in the provision of AFOs becomes clearer.

For example, during the acute inpatient phase of stroke recovery, 10% to 47% of stroke survivors will experience a fall.¹ Among community-dwelling patients with chronic stroke, 43% to 70% will have fallen in the first year with fall rates ranging from 1.4 to 5.0 falls per person per year.¹ The fear of falling is reported among 88% of these "fallers"² with nearly half of these subsequently restricting their activity.³

In a recent survey of individuals recovering from acquired brain injury, 54% reported having experienced at least one fall in the past 6 months including 25% who reported a fall-related injury.⁴ (In both cases, reports were corroborated by treating staff and therapists.) Reports of feeling unsteady during standing and walking were recorded at 42% and 33%, respectively.⁴ Even among community-dwelling subjects with traumatic brain injury, all of whom had unremarkable

neuromuscular examinations, survey data found relative compromise to balance-related physical performance, emotional well-being, and task-specific functional abilities relative to matched controls.⁵

Among a cohort of ambulatory patients with incomplete spinal cord injury, 75% reported having experienced at least one fall in the past year including 18% who experienced a fall-related fracture.⁶ Nearly half of the study participants reported that fall-related injuries restricted their ability to get out into the community and engage in productive activity.⁶ Similar fall and injury rates in this population have been corroborated by a later, unrelated prospective publication.⁷

Survey data suggest that among middle-aged and older adults with multiple sclerosis, over half have reported an injurious fall and 64% reported experiencing at least two falls per year.⁸ Sixty-four percent report a fear of falling, almost all of whom report an associated curtailment of activity.⁹

In a recent survey of patients with postpolio, 64% reported at least one fall in the past year, 61% reported experiencing a fall that required medical attention, and 35% had sustained at least one fall-related fracture.¹⁰ A second, unrelated survey found that 61% of respondents with postpolio reported a fear of falling with significant decreases in activity observed among fallers relative to activity rates observed among "nonfallers."¹¹

In a prospective analysis of older adults with peripheral neuropathy, 65% experienced at least one fall during the 1-year observation period and 30% sustained a fall-related injury.¹² In an unrelated survey of adults with diabetes mellitus, 35% reported at least one fall during the previous year with peripheral neuropathy present in 86% of these fallers. Reduced strength of ankle dorsiflexors and reduced gait velocity were strong predictors of these fallers.¹³

Given these collective observations, the importance of balance as a core consideration in the management of patients who will wear an AFO cannot be overstated. The

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