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Assessment of Slip Severity Among Different Age Groups

Reference 10446: Lockhart, T. E., Woldstad, J. C., and Smith, J. L., ***"Assessment of slip severity among different age groups,"*** *ASTM STP 1424,* Metrology of Pedestrian Locomotion and Slip Resistance. M. Marpet and M. A. Sapienza, Eds., American Society for Testing and Materials, West Conshohocken, PA, 2002.

Abstract: A laboratory study utilizing new techniques for assessing slip severity was conducted to investigate the process of inadvertent slips and falls among different age groups. Forty-two subjects from three age groups (young adults, middle-aged, and the elderly) walked on a rectangular track at a self-determined pace. Without the subjects' awareness, a slippery floor surface was placed on the track over a force-measuring platform. The results indicated that elderly adults' friction demand (RCOF) was not significantly different from the young and middle-aged adults. The older adults, however, fell more often than the other age groups. Fall recovery threshold (FRT) measures indicated that younger adults were able to recover from a slip (thus preventing a fall) with higher sliding speeds and longer slip distances than older adults. Additionally, older adults' adjusted friction utilization (AFU) on the slippery floor surface was not adjusted within the dynamic friction requirements, resulting in more falls. Based on the age-related differences observed, it appears that fall-related accidents among older adults are due more to factors influencing compensation of a slip rather than gait characteristics influencing slip initiation.

Keywords: Slips and falls; slip severity; fall recovery, gait biomechanics; aging; friction demand; slip distances; heel velocity; coefficient of friction

Introduction

Reducing slip and fall accidents has been a goal of many researchers since the 1920s. Four primary approaches have been traditionally used to understand slip and fall accidents: epidemiology, biomechanics, tribology and psychophysics. In spite of improvements in tribometric techniques to assess shoe/floor interactions, increased knowledge of the biomechanical responses to walking on slippery floor surfaces, and numerous studies exploring postural control, fall accidents continue to represent a

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