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Age related changes in balance reactions during standing and walking: Implications for fall prevention strategies

Postural control is the foundation of our ability to move independently and safely. Age-related deterioration in balance recovery responses is a major contributor to falls in older adults. Such deterioration results in an impaired ability to correct for postural disturbances experienced in everyday life, such as slips, trips, and pushes. A quick execution of a step is considered as the most important balance recovery response to prevent a fall. Studies demonstrated reduced voluntary stepping speed in older adults. Studies also showed reduced compensatory step length, decreased likelihood to take a "crossover" step, increased frequency of collisions between the legs, more steps to recover balance, and a failure to recover equilibrium in older adults. These postural "reflexes" were studied extensively in standing and less during walking. In the present talk age related changes in voluntary and compensatory stepping abilities during standing and during walking will be discussed. The ability of voluntary step execution test and compensatory step reactions tests to identify deteriorations in balance recovery abilities of older adults as well as the ability to improve these responses by specific physical interventions will be discussed. In addition, since the requirement to step rapidly when balance is lost and fall is initiated commonly occurs under circumstances where attention is focused not only on the postural demands but diverted to cognitive tasks such as reading a street sign or watching traffic. The interference effect of simultaneous performance of cognitive on postural tasks as a potential contributor to instability and falls in elderly individuals will be discussed as well.

Biography

Itshak Melzer received his BPT in physical therapy in 1985. In 2001 he obtained a Ph.D. in Health Sciences from the Ben-Gurion University Beer-Sheva, Israel, and from 2001 to 2003 he was Post-doctoral research fellow at the NeuroMuscular Research Center, Boston University, Boston, USA. Since 2003 he is the Director of the Schwartz Movement analysis & Rehabilitation Laboratory in the Physical Therapy Department, Recanati School for Community Health Professions, Faculty of Health Sciences at Ben-Gurion University of the Negev, Israel. His research interests include mechanisms of postural control and development of interventions to reduce falls in older adults.

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