5th International Symposium on Gait and Balance in MS: Fall Detection and Prevention

A summary statement linking research and clinical contributions

On September 25th and 26th, 2015 close to 100 clinicians, researchers, engineers and others from around the world gathered in Portland, Oregon for the 5th International Symposium on Gait and Balance in MS. This year's meeting focused specifically on falls in people with MS – how often people with MS fall, why they fall, how to detect falls, and how to prevent them. Although much is still not known, the presenters all agreed, we've come a long way in a short time.

Falls are well known to be a significant problem for older adults. Thirty percent of older adults (over 65) fall each year. People with MS fall more. The first research paper on falls in people with MS, published in 2002, found that 27 (54%) out of 50 people with MS reported falling at least once in the previous 6 months. Since then, researchers in the US, England, Ireland, Sweden and Australia studying falls in people with MS, consistently found that 50-70% fell in a 2 to 6 month period, that about 30% of this group fell multiple times, and that most have been injured by a fall. About 2 to 3 times as many people with MS fall and are injured by falls compared to healthy people of the same age. Clearly, falls are a significant problem for people with MS.

Because people with MS fall frequently, investigating why and how these falls happen requires research as well as a better clinical understanding. Risk factors for falls are complex and include issues related to the person, the environment and the activity. Personal fall risk factors include poor balance and slow walking, reduced proprioception (the sensation of where your body parts are in space), as well as the use of assistive devices (canes and walkers) and neurologically active medications. People with MS mostly fall in or around their homes, and, unlike healthy adults who usually fall doing sports or other risky activities, people with MS generally fall doing basic activities such as walking in crowds, washing themselves or preparing meals. Although we know a lot about the risk factors and the causes of falls in people with MS, this work is still in its adolescence. We still need to better understand the factors, particularly which modifiable factors are most important, how these factors interact and how they might be changed with intervention.

Reducing the rate and incidence of falls requires accurate detection. Most fall detection is based on self-reported recollection, which has shown to be fairly inaccurate. Another low-tech method for tracking falls is a fall diary, where the person writes down their falls each day. Diaries are more accurate than recall but are burdensome to fill out and collect. One high-tech advance is to use body-worn electronic sensors to detect falls. Unfortunately, because the devices available today developed their fall detection algorithms using simulated falls, they are not yet very accurate. Researchers are now designing and testing body-worn automatic fall detection devices that are being tested on real-life falls by people with MS. The goal is to produce easy to use, inexpensive, accurate automatic fall detection tools that can be used in the home and community.

Given the frequency and multifactorial nature of falls in people with MS, preventing them is important but challenging. Fall prevention for people with MS needs to address the person, their environment and their activities. This may be done with 1-on-1 with individualized physical or occupational therapy or group programs such as the National MS Society's 8-session *Free From Falls program*. Researchers from around the world, individually, and collaboratively through groups such as the International MS Fall Prevention Research Network are designing and carrying out studies to understand what works best. Although this area of research is still in its infancy, we look forward soon to having evidence-based interventions that help prevent falls in people with MS.