

Mellen Center Approaches: Falls and Fall Prevention in MS

Q: What is a fall?

A: A fall can be defined as an unplanned change in position resulting in the individual resting on the ground or a lower level.

A slow descent to the floor while being assisted by another person is considered a fall (sometimes called an “assisted fall”.) Falls are generally unexpected events, however risk factors for falling can be identified, and modifiable factors can be targeted by interventions to decrease the risk of occurrence of a fall.

Q: How frequently do falls occur in the MS population?

A: Even though numbers vary depending on the characteristics of the patients studied and approach for reporting falls, there is general agreement that falls occur in a large number of individuals affected by MS, underscoring the importance of this issue.

Published studies based on recall or prospective tracking show that a large number of individuals with MS (50% to 70%) experience at least one fall over a 6-month period, and 30 to 50% of those who fall experience recurrent falls.

Q: What causes falls in MS?

A: The causes of a fall event are most of the time multi-factorial, and can be categorized into intrinsic causes (related to the individual, including impairments related to MS) and extrinsic causes (related to the environment, e.g. area rugs).

Falls often occur while performing daily activities, particularly activities that involve walking and transferring. While uneven terrain, weather conditions, unfamiliar surroundings, and accessibility issues can result in falls outdoors, a large number of falls take place in the home. Falls occurring in the bathroom are more likely to result in injury due to the combination of limited space, need to transfer (toilet / bathtub), presence of water (slippery surfaces), and close proximity to hard surfaces.

The transition to wheelchair mobility is often associated with fewer falls. However, it is important to remember that non-ambulatory individuals do experience falls, particularly during transfers.

Q: What are the consequences of falling?

A: Falls are associated with negative consequences, including:

- Physical injury (e.g. soft tissue injury, fracture). The proportion of individuals with MS who sustain injurious falls is generally between 40 and 50%, although not all of these injuries require medical intervention. The risk of fracture from falling is increased in the presence of osteoporosis, which is a common consequence of decreased mobility. Falls in the bathroom are more frequently associated with injury.
- Fear of falling, which can lead to curtailment of activities and social isolation. In addition, fear of falling has been identified as an independent risk factor for future falls.

MS patients who fall may not be able to get off the floor on their own, which can lead to further injury, exposure, and psychological distress.

Q: What are common factors associated with falls in MS?

A: Many factors have been identified as associated with falls in individuals with MS, and are therefore considered risk factors, although causality is rarely established.

Past history of falling has been identified as one of the strongest predictor of future falls.

Other risk factors include:

- motor impairment (weakness, gait disturbance, imbalance, ataxia)
- sensory impairment (particularly loss of proprioception)
- bladder dysfunction (independent of mobility)
- cognitive impairment
- overall MS-related disability
- fear of falling (independent of past fall history)
- medication side effects (particularly neurotropic medications)
- fatigue and low physical activity
- male gender

The use of an assistive device for walking has also been associated with falling. This finding may reflect the increase in fall risk with more severe MS-related disability. Use of an inappropriate device (e.g. cane instead of walker), lack of consistency in using the device, and improper use of the device, are also possible explanations. Some patients do not use an assistive device to walk indoors, preferring to rely on walls and furniture for support. Walkers also may not be usable in small spaces, particularly bathrooms.

Vitamin D deficiency is common in people with MS. There is evidence suggesting that vitamin D supplementation reduces the risk of falls in older individuals by over 20%, although this has not been demonstrated in MS patients. When taken with calcium, vitamin D supplementation

appears to minimize loss of bone mineral density, which may help reduce the incidence of fractures due to falls.

Q: What can be done to screen for and monitor falls and fall risk?

A: Fall risk screening is identified as a quality measure in the care of MS patients of all ages by the American Academy of Neurology, although the choice of screening method is left to the discretion of the clinicians.

Screening for falls can be done in the clinic by asking patients if they have sustained any falls over a period of time. Asking a family member can be more accurate, particularly if the patient has cognitive deficits. We routinely ask patients if they had a fall in the past month during clinic visits. Other related information, such as the most common causes and circumstances associated with falls, any injury from falling requiring medical attention, and near falls, can also be helpful for decision making.

Diaries can be used to record falls prospectively for more in depth inquiry, or to assess the impact of a fall prevention intervention.

Other risk factors associated with falling, and risk factors for injury from falling (listed above) should also be taken into consideration in determining if a fall prevention intervention is needed.

Several tools are used to assess fall risk, although they have not always been fully validated in MS. It is also important to keep in mind that no individual test or questionnaire replaces clinical judgment.

The following tests can be administered in a clinical setting, usually by rehabilitation professionals:

- The Timed Up & Go (TUG) consists of asking the patient to stand up from a chair, walk 3 meters, walk back, and sit down. The time taken to complete the entire task is recorded. The TUG requires minimal equipment, space, and setup time, and is usually completed in less than 1 minute. A time of 13.5 seconds or greater on the TUG has been associated to increased fall risk in older adults.
- The Berg Balance Scale (BBS) measures performance on 14 tasks related to balance (higher scores indicate better performance, maximum score 56). Scores below 45 have been associated with a high risk of falls in elderly individuals. The BBS takes 20 to 30 minutes to complete.
- The Dynamic Gait Index (DGI) is a measure of dynamic balance, with ratings from 0 to 4 on 8 tasks related to walking, and takes usually 15 minutes to complete. Higher DGI scores are associated with increased fall risk in MS patients, but no cut-off score has been

determined. Use of the DGI is generally limited to patients who walk without an assistive device.

- The Physiological Profile Assessment (PPA) has been partially validated in MS as a fall risk screening tool, and includes tests of lower limb strength, lower limb proprioception, balance during quiet standing, vision, and reaction time. The short (screening) version takes 10-15 minutes to administer.

Q: What can be done to reduce the risk of falls?

A: Since fall risk is multifactorial, fall prevention interventions are often multi-faceted, and target modifiable risk factors. Components of fall prevention include:

- education of the patient and family
- rehabilitation (physical and occupational therapy)
- use of appropriate assistive devices and orthotics
- exercise, including aerobic exercise, strengthening (including core strengthening)

- review of medications
- Calcium and vitamin D to help decrease risk of fracture from falling.
- home safety evaluations to check how the patient functions in the home environment and to recommend home modifications

Reducing the risk of injury from falling is also important, and includes:

- teaching how to fall, how to get off the floor
- teaching family members how to help
- advising patients to have an “alert button”
- screening for and addressing medical risk factors for fractures such as osteoporosis
- modifying the home environment, including:
 - o removing throw rugs, loose wires or other objects from floor
 - o installing hand-rails leaving lights on at night or adding nightlights in path from the bedroom to bathroom
 - o Avoid walking backwards
 - o Check railings for stability
 - o Install grab bars in the shower, near a toilet, or near the sink
 - o Modify the kitchen environment to avoid stooping or overhead reaching

An example of comprehensive fall prevention program is the Free From Falls (FFF) proposed by the National Multiple Sclerosis Society since 2011. This group program includes education and exercise, and its efficacy on fall risk indicators and incidence of falls up to 6 months after completion was demonstrated in one study.

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Q. What if a fall occurs in a medical facility?

Individuals with MS are also at higher risk of falling in a medical office or clinic during an outpatient visit. ***An ongoing multi-faceted effort to reduce the incidence and consequences of falls at the Mellen Center comprises patient and family education, staff training to minimize fall risk during transfers and walking tests, environmental improvements (e.g. flooring, bathrooms), and a fall response protocol.***

Resources:

American Academy of Neurology – Quality Measurement Set

https://www.aan.com/uploadedFiles/Website_Library_Assets/Documents/3.Practice_Management/2.Quality_Improvement/1.Quality_Measures/MS%20Measurement_set.pdf

American Academy of Neurology – Assessing your risk for falls

<https://www.aan.com/Guidelines/home/GetGuidelineContent/266>

American Academy of Neurology – Assessing patients in a neurology practice for risk of falls

<https://www.aan.com/Guidelines/home/GetGuidelineContent/265>

National Multiple Sclerosis Society – Minimizing your risk of falls: a guide for people with MS.

<http://www.nationalmssociety.org/NationalMSSociety/media/MSNationalFiles/Brochures/Brochure-Minimizing-Your-Risk-of-Falls.pdf>

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This information is not intended to replace the medical advice of your health care provider. Please consult your health care provider for advice about a specific medical condition.