MS Nursing
Introduction to Multiple Sclerosis Nursing Care

National Multiple Sclerosis Society

Mobility in Multiple Sclerosis

Patricia Kennedy, RN, CNP
Brian Hutchinson, PT

The University of New Mexico • Health Sciences Center
School of Medicine

OBJECTIVES

After reading this article, nurses who are new to the care of people with MS will be able to do the following:

- Identify factors which may lead to activity limitations, and assess clients for problems with mobility.
- Identify specific mobility limitations.
- Describe management strategies for the various mobility limitations.

INTRODUCTION

Mobility is a primary area of concern for healthcare professionals treating people with multiple sclerosis (MS). Mobility limitation is often the result of several impairments that are common in MS and can affect a person's vocational and recreational activities, one's self-esteem and quality of life.

Mobility problems are considered an activity limitation as defined by the *International Classification of Functioning, Disability and Health* (ICF). According to the ICF, an activity limitation is defined as "difficulties an individual may have in executing activities" (World Health Organization, 2001). Mobility limitations can lead to a participation restriction. A participation restriction is defined as "problems an individual may experience through involvement in life situations" (World Health Organization, 2001). As health-care professionals we are often faced with patients experiencing mobility limitations and participation restrictions.

FACTORS AFFECTING MOBILITY AND COMMON LIMITATIONS FOR PEOPLE WITH MS

Many impairments and deficits can influence the mobility of a person with MS. Some of the factors that may affect one's mobility include spasticity, weakness, balance and coordination impairment, sensory and visual disturbances, fatigue, cognitive deficits, and emotional problems such as depression. Many times mobility limitation is due to multiple factors requiring a multidisciplinary treatment approach.

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Mobility can be separated into different categories including bed mobility, transfers, ambulation, stair climbing, wheelchair propulsion, power mobility, and driving.

- Bed mobility generally includes activities such as rolling, scooting, and moving to and from a lying position.
- Transfers include activities such as moving to and from a chair (or wheelchair), toilet, bed, tub/shower, floor and vehicle.
- Ambulation includes walking with or without an ambulatory aid.
- Stair climbing includes the ability to ascend and descend stairs
- Power mobility includes the ability to operate manual wheelchairs, power wheelchairs, and scooters.
- Driving includes the ability to operate a vehicle and/or access public or private transportation.

This module will discuss four common physiological factors affecting mobility: weakness, balance/sensory impairments, spasticity, and tremors.

Assessment

It is essential to conduct a thorough assessment. Symptom management through medications and rehabilitation therapies is important in addressing the impairments leading to the mobility activity limitation. When assessing a patient for mobility issues, obtain a subjective history. Routinely ask about problems patients experience in walking, standing, wheelchair use, transfers, and movement in bed. Inquire about accessibility in the home and in the community. Ask about falls or near falls they experience, where they occur, and under what circumstances.

When problems are identified, try to define associated or contributing factors. Patients may report that they walk well until they are at a large mall or on a long walk or hike. Then they may notice a foot will drag or one leg will tire. They also may notice that if they rest a short time, the symptom improves. Others report less ability to ambulate well when they are tired or hot.

Patients using scooters or wheelchairs may report similar problems with transfers. If strength or balance is affected, people may experience profound difficulty when they are ill with an infection. Patients may report no weakness but notice themselves off balance, or dizzy. This may occur on uneven ground, stairs, or even smooth surfaces. It is important to ask if support is used: handrails, walls, surfaces, cane, or another person. It is also important to find out if they are falling or tripping and if they have sustained injuries.

Ask patients to describe, in their own words, what the mobility problems they experience are or feel like. They may describe a dragging foot but deny weakness. They may trip frequently but not realize their toe is not picking up off the ground. They may notice a sore knee but not be aware that spasticity and weakness are causing the knee to lock in place. Frequently patients will state that “my legs simply won’t move” or “my legs won’t support me in a transfer” or “I can’t

roll over in bed". Patients who use wheelchairs for some of their mobility may report that they can't propel their manual chairs for any distance because they are tired or weak.

Most people are ingenious in devising methods to alleviate the problems they experience. Unfortunately, some ingenuity may not be safe or practical. People who have weakness or balance problems hold on to whatever is closest to them. Walls are often used but don't offer any stability if someone begins to fall. Small tables and chairs move when leaned on. Counters have sharp edges. Toilet paper holders and soap dishes are not always well secured.

Discuss compensations used with patients. If they tire at the mall or on a walk, do they sit down? Do they use rails on stairs? If they are feeling particularly weak (or ill) do they avoid walking or transferring alone? Do they ask for help with a manual chair if they are overtired? Do they stay home if it is extremely hot?

If you see someone without an assistive device, don't assume they don't use one. Many people with MS use equipment as needed or are ambivalent about its use. Ask if they ever use a cane, walker or wheelchair. Do they use a wheelchair at the airport? Do they use a motorized cart at the grocery store? Ask if they have a handicap identification for their car and if they use it.

Strength/Weakness

Muscle strength or power is most commonly measured through manual muscle testing. In addition, hand-held dynamometers can be used to provide objective measurement of muscle strength. However, a practical assessment of weakness is also important. The patient may report difficulty walking because of "dragging a foot" or state "my legs feel heavy." These are signs of weakness, which may be mistakenly attributed to other factors. Careful assessment of functional strength by an experienced healthcare professional is imperative prior to prescribing treatment. Sometimes patients will report no weakness when it is apparent that weakness exists.

It is important to separate out weakness secondary to deconditioning and weakness secondary to neurological deficits. People with MS often experience a combination of these two types of weakness.

Recommended strengthening exercises to address deconditioning include progressive resistive exercises, which range from isometrics to resistive tubing to weight training. The correct resistance is based on muscle power, endurance and functional goals established jointly by the patient and healthcare professional. Strengthening exercises should be designed to address weakness secondary to deconditioning.

Abrupt changes in weakness may be due to infection, fever, medications or inappropriate exercise. If a patient experiences an abrupt change in strength that lasts 24–48 hours, he or she should be referred to a physician to rule out these causes. If a patient experiences changes in strength following acute exercise, it is most often due to over exercising. The patient should recover from this type of weakness in less than 24 hours, often less than one hour. This requires modification to the patient's exercise program.

In some cases, assistive devices such as grab bars are necessary to compensate for weakness. Grab bars and other aids can be helpful in providing the necessary assistance for individuals experiencing weakness. Ambulatory aids (i.e. canes or walkers) can improve endurance and safety, while using a power wheelchair instead of a manual wheelchair may improve mobility. Referral to a physical or occupational therapist is helpful in identifying appropriate exercises and/or assistive aids to improve mobility secondary to weakness.

Balance Impairments

Balance impairments are common in people with MS and can adversely affect overall mobility. Generally, balance includes the interaction between visual, proprioceptive (muscle, joint and skin)and vestibular (head position and movement) systems (Herdon & Horak, 2000). Balance can also be affected by spasticity, weakness, cognitive deficits and emotional distress.

Observation of functional movements is the first assessment of balance impairments. Watching your patients enter the clinic will provide valuable information about how any balance impairments may be affecting mobility. How do they get up from a chair? How do they get on and off the treatment table? Are they using walls or a person for support? A careful assessment of sensation, including proprioception, vision and the vestibular system can help direct treatment.

Balance treatments utilize compensatory techniques, which include utilization of intact systems to improve overall balance. A common compensatory technique includes using vision to improve balance in those with vestibular or sensory problems. Other compensatory techniques include utilization of assistive devices to improve balance. Referral to a physical therapist for treatment of vestibular problems is often necessary.

Vestibular stimulation techniques are used to help with balance difficulties, which may be affecting mobility. This type of training utilizes slow, maintained or fast, irregular rocking techniques and can include the use of therapeutic balls, tilt boards, rocking chairs, hammocks or inverted positions.

Physical and occupational therapists can assess the need for ambulatory aids that may benefit the person who has gait limitations. Ambulatory aids are most commonly recommended such as canes, crutches and walkers, which increase the base of support. Assistive aids can also improve functional mobility. Grab bars, floor to ceiling poles, bed rails ambulatory aids and vehicle hand controls can provide the necessary assistance to improve safety and efficiency with overall mobility and function.

Acceptance of assistive aids is often a barrier to treatment. Many patients feel use of an assistive aid is a sign of increasing disability and decreased independence. It is important to educate the patient that these assistive aids are “tools” to increase their independence, overall function and quality of life. The use of a mobility aid may allow participation in activities otherwise inaccessible. Many times people will independently purchase assistive devices. However, it is better to consult a rehabilitation specialist with training in these areas before a purchase is made.

Spasticity

Spasticity is a common symptom in MS patients, usually accompanied by muscle weakness. Even mild spasticity can interfere with normal mobility. Patients may not be aware of spasticity, but will report that they feel stiff when they walk or that they tire more quickly while ambulating. As spasticity worsens, walking becomes more labored causing increased fatigue from effort, pain, abnormal gait pattern, and balance problems. At this point, patients report falling more, secondary to tripping or dragging their toes. Some patients report that they experience spasms (another type of spasticity) and that these may decrease their ability to transfer, get in or out of a car, or be comfortable. Assessment includes objective measurements such as scales to quantify spasticity and observation of movement. When spasticity is present, management needs to take place.

If spasticity is mild and not interfering greatly with mobility, rehabilitative techniques, such as stretching exercises, may be adequate to manage the problem (Schapiro, 2003). If greater problems exist, adding an antispasticity medication to stretching has greater benefit. Medications commonly used include

- Baclofen (Lioresal®)
- Tizanidine (Zanaflex®)
- Diazepam (Valium®)
- Clonazepam (Klonopin®)
- Dantrolene sodium (Dantrium®)
- Gabapentin (Neurontin®)

It is wise, with each of these medications, to titrate the dosage up slowly, to avoid sedation or increased weakness. Timing of these medications is essential to maximize their peak action times. Good patient education is essential for use of these medications.

When oral medications are not helpful or produce too many side effects, other modalities may need to be considered. An intrathecal baclofen pump is a good alternative for severe spasticity (Frankel, 2001). This system will deliver baclofen from a pump, surgically implanted under the abdominal skin, and through an attached catheter that enters the intrathecal space in the spinal column. The dosage of baclofen can be much lower than an oral dosage and will not produce systemic effects. The pump will deliver steady amounts eliminating the variability of oral dosing.

For spasticity involving small muscles, injections of botulinum toxin Type A (Botox®) may be used. These will weaken the muscle, lessening contraction for up to three months. Large amounts cannot be used at any one time, so smaller muscles make better targets. Patients need to follow up with a physical or occupational therapist one week after injections to maximize stretching of the affected muscles.

At times, injections of phenol will offer a temporary (six months) relief from severe spasticity by ablating the nerve function to a muscle. While this is used less in ambulatory patients, it can be used to improve transfers, comfort and hygiene. Patients who have had severe spasticity may develop contractures. When these occur, surgery will be needed.

Rehabilitative intervention is recommended for people with spasticity over the continuum. Needs will change and frequent reassessment is necessary to help patients remain mobile, comfortable and safe. Assistive aids are frequently recommended and include canes, walkers, and wheelchairs. Bracing, such as ankle foot orthoses, may also be helpful. Barriers to use of aids are discussed under "Balance".

Tremor

The most frequently seen tremor in MS is largely a function of cerebellar involvement (Halper & Holland, 2002). Patients with lesions in the cerebellum will most likely have balance problems as well. Tremor, however, presents its own set of problems. Tremor in the hands, if severe, may interfere with a person's ability to propel a manual wheelchair, drive a power chair or use an ambulatory aid. If body tremor is present, it interferes with ambulation and movement of any type. Tremor may interfere with transfers, bed mobility, balance and safety. Tremor, if severe, is fatiguing. Tremor also interferes with driving an automobile.

Tremor is a difficult symptom to treat. Medications may be prescribed, and include

- Clonazepam (Klonopin®)
- Primidone (Mysoline®)
- Propanolol (Inderal®)
- Isoniazid (INH) (Laniazid®, Nydrazid®)
- Ondansetron hydrochloride (Zofran®)
- Antiepileptic drugs

Rehabilitation therapies such as PT and OT may help patients devise ways to minimize their tremors.

Driving

Driving is a mobility activity often overlooked, which can be affected by any of the symptoms mentioned above. In addition, driving is often adversely affected by an increase in cognitive problems, visual deficits or emotional problems. Interviewing patients about their driving habits and whether or not they use adaptive aids is important. If they are experiencing physical difficulties, recommending adaptive aids may be appropriate or referral to an adaptive driving program may be indicated. Interviewing the family about driving issues is important as patients

may not always see or admit to problems. It may also be appropriate to recommend that the patient discontinue driving until evaluated by a driving specialist. If your patient is not driving, you may want to discuss the patient's ability to access public or private transportation.

SUMMARY

Mobility limitation is common among people with MS. The causes of these limitations can be isolated to one factor, but usually include multiple factors. Due to this diversity of impairments, it may be important to get assessments from several healthcare professionals. Careful screening to determine an appropriate treatment plan is essential, taking into consideration physical, mental, emotional and social factors. Treatment options range from medications to relaxation techniques. The ultimate goals are to improve the overall function, safety and quality of life for people with MS.

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REVIEW EXERCISE

1. The following can cause mobility limitations in people with MS:
   a. Spasticity
   b. Balance impairments
   c. Weakness
   d. Sensory impairment
   e. All of the above

2. Assistive aids can be beneficial because of all of the following except:
   a. Can increase safety and efficiency in those with balance problems
   b. Often improve endurance and safety in those with weakness problems
   c. Replace the need for medications
   d. Increase base of support and may improve balance while walking
3. Mobility limitations are usually due to one symptom.
   a. True
   b. False
4. Medication management of symptoms such as spasticity and tremor adequately treat a person's ability to be mobile.
   a. True
   b. False
5. When assistive devices are needed and recommended, patients will generally
   a. Be relieved to be offered an assistance device
   b. Be initially hesitant to use an assistive device
   c. Acknowledge the need for a device
   d. Know where to go for assistance

Answers: 1 e; 2 c; 3 b; 4 b; 5 b