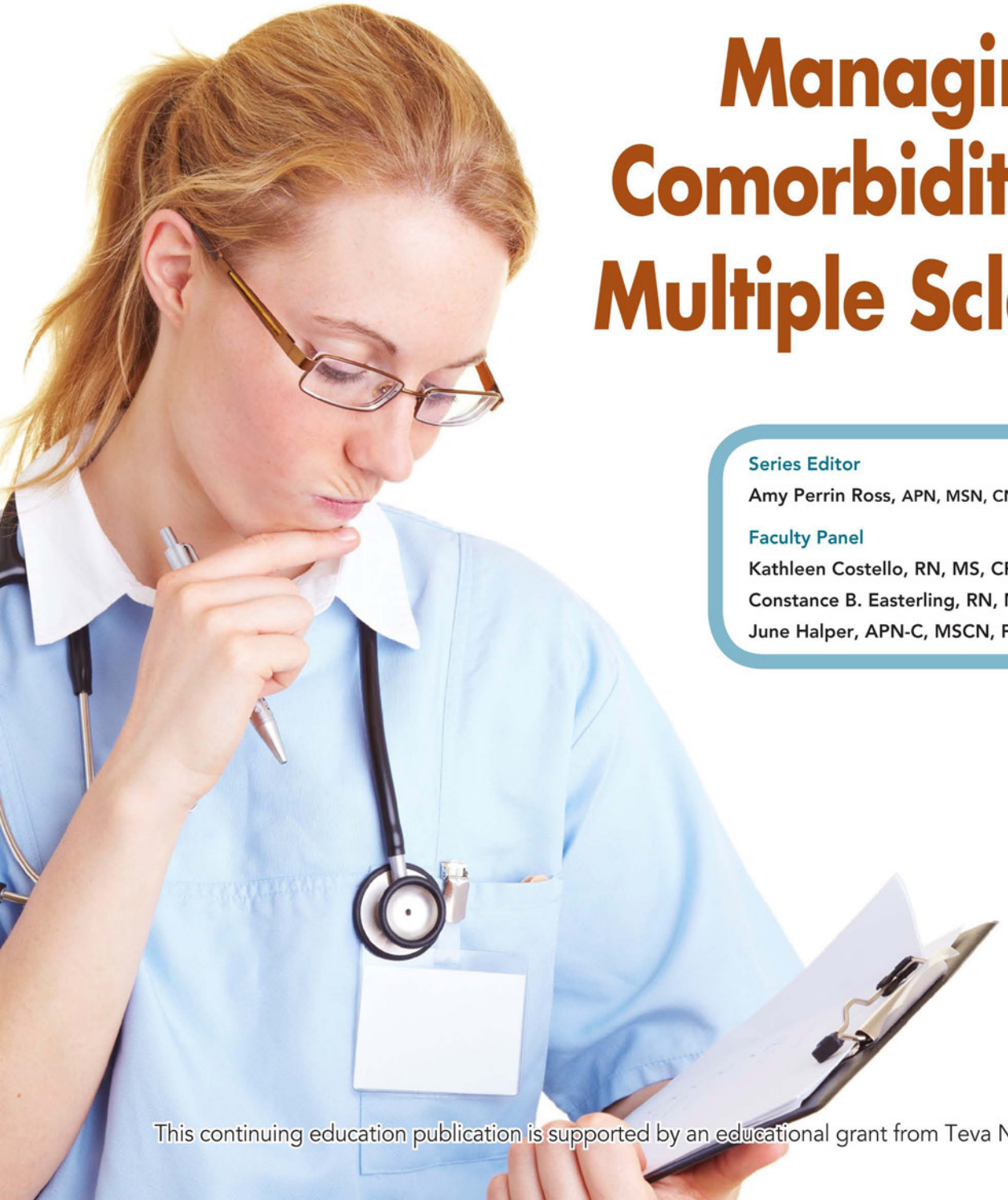
Now Offering Complimentary Continuing Education Credit for Nurses

Summer 2011
Volume 7, Number 2

Counseling Points™

Enhancing Patient Communication for the MS Nurse



Managing Comorbidities in Multiple Sclerosis

Series Editor
Amy Perrin Ross, APN, MSN, CNRN, MSCN

Faculty Panel
Kathleen Costello, RN, MS, CRNP, MSCN
Constance B. Easterling, RN, MSN, ARNP, MSCN
June Halper, APN-C, MSCN, FAAN

This continuing education publication is supported by an educational grant from Teva Neuroscience.

FACULTY:

Series Editor

Amy Perrin Ross, APN, MSN, CNRN, MSCN
Neuroscience Program Coordinator
Loyola University Medical Center
Maywood, IL

Faculty Panel

Kathleen Costello, RN, MS, CRNP, MSCN
Adult Nurse Practitioner, Research Associate
The Johns Hopkins MS Center
Baltimore, MD

Constance B. Easterling, RN, MSN, ARNP, MSCN
Adult Registered Nurse Practitioner
Clinical Coordinator
MS Care Center of Neurological Services of Orlando
Orlando, FL

June Halper, APN-C, MSCN, FAAN
Executive Director
Consortium of Multiple Sclerosis Centers (CMSC)/International Organization of MS Nurses (IOMSN)
Hackensack, NJ

Faculty Disclosure Statements

Amy Perrin Ross has received honoraria for consulting and participating on the Speakers' Bureaus for Bayer HealthCare, Inc., EMD Serono, Novartis, Pfizer, Inc., and Teva Neuroscience.

Kathleen Costello has received honoraria for serving as a consultant for Acorda Therapeutics, Biogen Idec, Novartis, and Teva Neuroscience. She has served as a speaker for Biogen Idec, EMD Serono, and Teva Neuroscience.

Constance B. Easterling has received honoraria for consulting from Acorda Therapeutics, EMD Serono, Pfizer, Inc., and Teva Neuroscience. She has participated on Speakers' Bureaus for Acorda Therapeutics, EMD Serono, Novartis, Pfizer, Inc., and Teva Neuroscience.

June Halper has received honoraria for consulting from Acorda Therapeutics, Questcor Pharmaceuticals, and Teva Neuroscience. She has participated on the Speakers' Bureau for Acorda Therapeutics.

Planners and Managers

The following planners and managers have declared no relevant financial relationships: Joseph J. D'Onofrio, Frank Marino, Nancy Monson, Katherine Wandersee.

PUBLISHING INFORMATION:

Publishers
Joseph J. D'Onofrio
Frank M. Marino
Delaware Media Group
66 South Maple Avenue
Ridgewood, NJ 07450
Tel: 201-612-7676
Fax: 201-612-8282
Websites: www.delmedgroup.com
www.counselingpoints.com

Editorial Director
Nancy Monson

Medical Writer
Katherine Wandersee

Art Director
James Ticchio

Cover photo credit: © Robert Kneschke / Veer

Counseling Points™

Managing Comorbidities in Multiple Sclerosis

Continuing Education Information

Target Audience

This educational activity is designed to meet the needs of nurses who treat patients with multiple sclerosis (MS).

Purpose

To inform MS nurses about how to identify and manage medical comorbidities in MS and how to coordinate care and screening among multiple health practitioners.

Learning Objectives

Upon completion of this educational activity, the participant should be able to:

- Identify common comorbid medical conditions occurring with MS
- Explain the impact of comorbidities on outcomes and management of MS
- List primary care management steps that should occur in conjunction with MS treatment
- Discuss the coordination of care between the primary care provider, MS management team, and specialists treating comorbid health conditions

Continuing Education Credit

This continuing nursing education activity is co-provided by Delaware Media Group and NP Alternatives.

NP Alternatives is accredited as a provider of continuing nursing education by the American Nurses Credentialing Center's Commission on Accreditation.

Laurie Scudder, DNP, NP, served as nurse planner for this activity. She has no significant financial relationships to declare.

Methodology used to resolve faculty conflict of interest: Faculty do not make treatment recommendations in this activity.

This activity has been approved for 1 contact hour (0.0 contact hours are in the area of pharmacology). Code: MSCP010211.

Approximate time to complete this activity is 60 minutes.

This program expires July 31, 2013.

Disclosure of Non-endorsement of Products

Approval does not imply endorsement by NP Alternatives or the American Nurses Credentialing Center's Commission on Accreditation of any commercial products discussed in conjunction with an educational activity.

Disclosure of Unlabeled Use

This educational activity may contain discussion of published and/or investigational uses of agents that are not approved by the FDA. Teva Neuroscience and Delaware Media Group do not recommend the use of any agent outside of the labeled indications. The opinions expressed in the educational activity are those of the faculty and do not necessarily represent the views of Teva Neuroscience and Delaware Media Group.

Disclaimer

Participants have an implied responsibility to use the newly acquired information to enhance patient outcomes and their own professional development. The information presented in this activity is not meant to serve as a guideline for patient management. Any medications, diagnostic procedures, or treatments discussed in this publication should not be used by clinicians or other health care professionals without first evaluating their patients' conditions, considering possible contraindications or risks, reviewing any applicable manufacturer's product information, and comparing any therapeutic approach with the recommendations of other authorities.

welcome

Dear Colleague,

If life were fair, multiple sclerosis (MS) would be more than enough of a challenge for one individual. Other illnesses would remain at bay, leaving the patient to focus on MS and its symptoms. But the person with MS is just that—a person, with normal health risks unrelated to this chronic neurologic disease, as well as potentially heightened health risks that are related to MS. Hence, care of the whole person is an important area of emphasis for the MS nurse.

How comorbidities affect the person with MS often depends largely upon the individual. Age, degree of disability, socioeconomic status, and many other factors influence a person's overall health and how well he or she is able to cope with multiple medical conditions.

One challenge faced by MS nurses is that of coordinating care among health practitioners. There is a common assumption that any health complaint must be a consequence of MS. Thus, practitioners tend to blame a patient's headache, fatigue, or sleep disturbance on MS rather than looking further for possible causes.

Comprehensive MS care centers often employ a whole-person, wellness-oriented approach, but many people with MS do not receive care at these facilities. Nurses in the community and in MS centers must focus on screening for comorbidities, essential primary care, and appropriate referral to outside specialists when needed. In this issue, our expert faculty panel provides critical input related to each of these areas. We hope it is of value to you in your practice.

Amy Perrin Ross, APN, MSN, CNRN, MSCN (series editor)
Neuroscience Program Coordinator
Loyola University Medical Center
Maywood, IL

Managing Comorbidities in Multiple Sclerosis

Multiple sclerosis (MS) does not occur in isolation. Inevitably, most people with this disease will be affected by other medical conditions. Some medical comorbidities are believed to be directly linked to MS, but others occur as a result of diet and exercise habits, the aging process, or randomly, just as they do in the rest of the population. The impact of comorbid medical conditions is gaining recognition in many areas of health care, including MS. Several new studies have examined the types of comorbidities that occur commonly in MS and how they affect many aspects of patient care.[1-3]

Mechanisms of Comorbidities in MS

Comorbidities have been defined as "the total burden of illness other than the specific disease of interest," and are distinct from complications of the disease.[4] **Table 1** reviews some of the mechanisms by which comorbidities can occur in MS.

Table 1. Potential Mechanisms of Comorbidities in MS[1]

- Disorders co-occur by chance
- Increased use of/access to health services leads to comorbid disease diagnosis
- Comorbidities have related etiological mechanisms (e.g., genetic susceptibility)
- Comorbidities are related to lifestyle (obesity, poor diet, lack of exercise, smoking)
- Multiple disease states are linked to an underlying, unidentified disorder

Common Comorbidities

The research of Ruth Ann Marrie, MD, and colleagues at the University of Manitoba in Winnipeg, Canada has contributed greatly to the understanding of comorbidities in MS.[1,3,5-8] Much of this group's research relies on data derived from the North American Research Committee On Multiple Sclerosis (NARCOMS) Registry, a global registry for MS research, treatment, and patient education with an active database of over 35,000 people with MS. When examining the most common conditions that occur in people with MS, these researchers showed that comorbidities actually tend to coincide with the most common medical conditions occurring in the general population, such as dyslipidemia and hypertension **(Table 2)**.[5]

Table 2. NARCOMS Registry: Most Common Comorbidities in MS*[5]

8,938 participants, self-reported comorbid conditions in 2006

Dyslipidemia	37%
Hypertension	30%
Arthritis	16%
Irritable bowel syndrome	13%
Chronic lung disease	13%

NARCOMS=North American Research Committee On Multiple Sclerosis.
*Occurrence rates are similar to those seen in the general population.

A few comorbidities have been confirmed to occur at higher rates in patients with MS than in the general population, aside from those directly related to MS symptomatology, such as pressure ulcers, fatigue, and spasticity. While study results are often

divided on this issue, some comorbidities found to be more common in MS or to have a particular impact on the disease are summarized here.

Autoimmune Conditions

One prevailing question is whether autoimmune diseases such as inflammatory bowel disease, thyroid disease, lupus, or rheumatoid arthritis (RA) occur more often in people with MS due to a joint underlying susceptibility or inflammatory autoimmune trigger. Studies exploring this question have yielded conflicting findings. A comprehensive population-based study by Somers and colleagues used a large UK database to examine comorbidity in a variety of autoimmune conditions.[9] Somers' results suggest that people with MS do not have an increased risk of developing Type 1 diabetes or autoimmune thyroiditis, and actually have a lower risk of developing RA.

Other studies have reported an increased risk of thyroid disease, especially Graves' disease, in people with MS.[10,11] An Austrian study found a significantly higher prevalence of autoimmune thyroiditis in men with MS (9.4 %) versus male controls (1.9 %; $P = 0.03$), but a similar prevalence in females with and without MS (between 8% and 9%).[11] Thyroid disease is important to consider as a potential source of fatigue in people with MS, and should be included in the fatigue workup rather than it being assumed that these symptoms are strictly MS-related.

Depression and Other Psychiatric Comorbidities

It is well substantiated that depression occurs at a higher prevalence in people with MS. Nearly one in two people with MS will experience clinically significant depression in their lifetimes, a frequency approximately 3-fold greater than that observed in the general population.[12,13] This rate exceeds rates of depression associated with other chronic medical or neurological conditions.[14]

Table 3. Prevalence of Psychiatric Disorders in MS and General Population[15]

	MS (%)	General Population (%)
Depression	22.8	16.2
Suicidal intent	28.6	3.8
Anxiety	36	5.1
Bipolar disorder	0.3	0.2
Psychosis	2–3	0.5–1
Cognitive impairment	40–65	3.2

Anxiety, suicidal intent, and cognitive impairment are other psychiatric conditions shown to have a significantly higher prevalence in people with MS than in the general population, as shown in **Table 3**.[15]

The reason why depression and other psychiatric disorders occur in conjunction with MS is not as straightforward as it may seem. Although the difficulty coping with the diagnosis of MS and its symptoms certainly plays a part, research has shown that other factors may be involved beyond the stress and burden of chronic illness.[15] Some investigators propose that neurological processes related to MS may contribute to serotonergic or noradrenergic dysfunction associated with depression.[16] Supporting this possibility is the finding of inflammatory markers in the brain that correlate with depression.[16]

Both fatigue and depression are common in MS, but one cannot assume that fatigue in MS is being caused by depression, or vice versa.[17] The presence of depression or other psychological disorders in people with MS can aggravate physical symptoms such as fatigue, which further disrupts functioning in the family and workplace. Studies from the Goldman Consensus Group have linked depression in people with MS with poorer cognitive functioning, absenteeism from work, poor medication adherence,

and a lower quality of life compared with patients with MS who do not have depression.[18]

Although depression is a major complication of MS and is one of the strongest predictors of poor quality of life, it remains underdiagnosed and undertreated in this population.[15] People with MS normally respond well to interventions such as antidepressants and cognitive behavioral therapy.[18] In addition, basic in-office depression screening tools are useful for detecting signs of depression in patients with MS and can serve as an indicator of whether a patient should be referred for further psychiatric evaluation.

Cancer Risk in MS

When it comes to cancer risk among people with MS, there might actually be some good news. A UK-based study by Fois and colleagues published in 2010 showed no difference in cancer risk among people with MS versus the population in general.[19] More encouraging still, a Swedish study comparing cancer risk in more than 20,000 people with MS, their parents, and 203,000 non-MS controls found a lower risk of cancer among patients with MS and their families.[20]

To examine these findings further, a meta-analysis was performed by Handel et al, which supported the earlier findings of a small but significantly decreased risk of cancer in the MS population.[21] The reasons for any differences in risk remain unexplained, although the authors were able to rule out shorter life expectancy, as the decreased risk was still present when they corrected for age. Under-reporting of cancers would also be unlikely, given the increased contact with the health system typical for people with MS. The authors were unable to determine whether early identification of cancers in people with MS played a role in the observed decrease in risk.[21]

Osteoporosis and MS

People with MS are at a higher risk for osteoporosis than the general population.[22] Reasons for this elevated risk include their impaired mobility, reduced levels of weight-bearing activity, low vitamin D levels, and the use of corticosteroids for MS treatment.[23] Although osteoporosis risk is considerably higher among women regardless of comorbid diseases, Weinstock-Guttman and colleagues have shown that the presence of MS heightens osteoporosis risk for men as well.[24] Because osteoporosis rates in MS are not in proportion to the person's age and ambulation level, these authors also suggest that there may be a pathological connection between MS and early bone loss.[24]

People with MS have a high risk for fractures due to falls, and osteoporosis significantly increases this risk. Marrie and colleagues used the NARCOMS database to examine rates of osteoporotic fractures among people with MS.[22] Among a sample of 9,346 people with MS, 25% reported having osteopenia or osteoporosis, and approximately 16% reported a history of fracture. Of these, 35% were wrist fractures, 11% were vertebral fractures, 7% were hip fractures, and over 42% reported multiple fractures.[22] Bone density screening and supplementation with calcium and vitamin D were substandard among this population and thus represent interventions that could be increased among those with MS. (See the special section on vitamin D and MS on page 13). Regular weight-bearing exercise has also been shown to improve bone health.

Sleep Disorders and MS

People with MS have a greater prevalence of sleep disorders than the general population. As many as half of people with MS report sleep problems, which may include sleep-disordered

breathing (apnea), insomnia, rapid-eye-movement sleep behavior disorder, narcolepsy, and restless leg syndrome.[25,26]

To determine the factors contributing to sleep problems in MS, Bamer and colleagues administered sleep questionnaires to a group of 473 people with MS.[27] Over 46% had moderate to severe sleep problems, but most did not use over-the-counter or prescription sleep aids. Factors found to contribute to sleep problems included depression, night-time leg cramps, female sex, fatigue, and nocturia.

These results reinforce the concept that sleep problems in people with MS should be addressed and treated when possible, as they can exacerbate other MS symptoms, increase fatigue, and decrease quality of life.[25,27] The MS nurse should ask patients about sleep quality and refer patients for further help with sleep-related issues when indicated.

Comorbidity or MS Complication?

Determining whether a patient's symptoms stem from a comorbid condition or the MS disease process is not always straightforward. When possible, making this distinction may be helpful in guiding the intervention.[2] Comorbidities often have the effect of exacerbating MS or its symptoms. An example of this might be a sleep disorder such as apnea that serves to worsen MS-related fatigue. In other cases, the condition observed might be a complication of the disease itself or a side effect of MS treatment, rather than a true comorbidity. These might include dermatologic problems related to injection of a disease-modifying drug, or flu-like symptoms associated with interferon use.

All health concerns have an impact on MS and may contribute to symptoms and relapses **(Figure)**. Because of the interrelationship among many MS symptoms to one another and to other health conditions, there is often no realistic way to make the distinction between comorbidities and MS complications.[28]

One troubling MS symptom can trigger a cascade

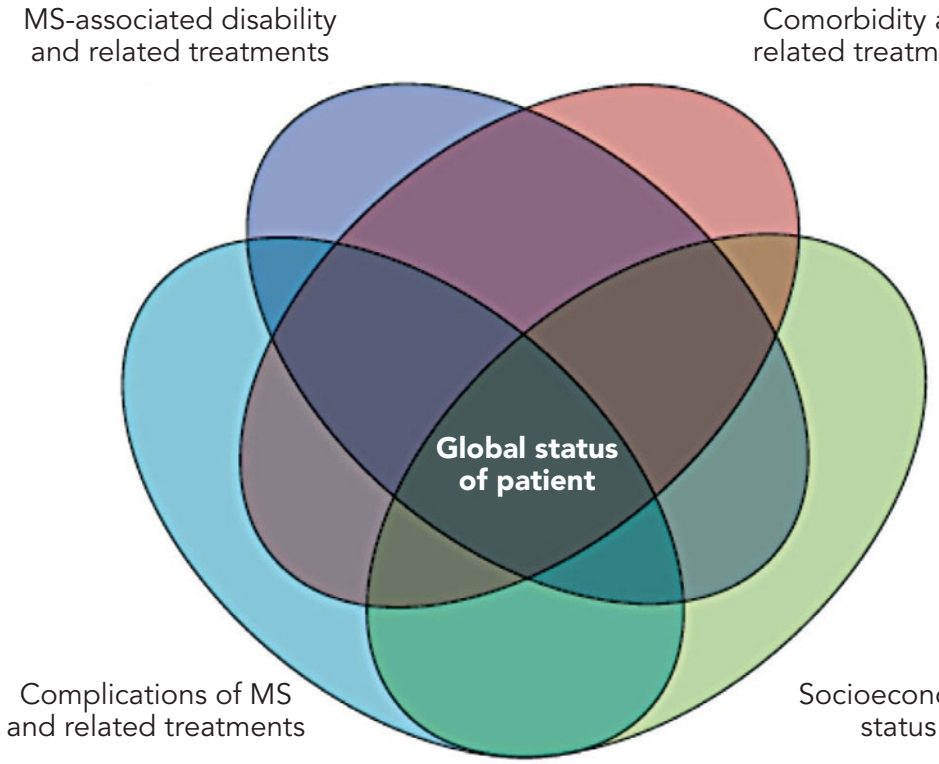


Figure. Factors affecting the health status of people with MS.[1]

Reprinted from Marrie RA, Horwitz RI. Emerging effects of comorbidities on multiple sclerosis. *Lancet Neurology*. 2010;9(8):820-828, © 2010 with permission from Elsevier.[1]
MS=multiple sclerosis.

of other health problems. An example of this might be spasticity, which can interfere with sleep, thus increasing daytime fatigue, which can then impact gait and cognitive functioning. These impairments can interfere with self-care, which may result in skin reactions from medications, pressure ulcers, or poor disease management due to nonadherence. Bladder- and bowel-control problems associated with MS are another common concern that are correlated with symptoms and health complications. Bladder infections are a common trigger of MS exacerbations.[29] Some of the risks inherent to MS that can lead to comorbidities, escalation of MS symptoms, and disability are listed in **Table 4**.

Comorbidities Delay the Diagnosis of MS

A study from Marrie and colleagues published in 2009 shows that the presence of medical comorbidities can significantly delay the time to diagnosis of MS.[30] Using the NARCOMS Registry database, these investigators found that in almost 9,000 people with MS, the diagnosis of the disease was delayed between 1 and 10 years for those who also had comorbid vascular, autoimmune, musculoskeletal, gastrointestinal, visual, or mental health conditions. Obesity and smoking also contributed to a delay in MS diagnosis. The authors inferred that clinicians could mistakenly attribute MS symptoms to the preexisting condition rather than suspecting a neurologic cause.

These researchers also found that patients with MS and these comorbidities are more likely to have moderate disability rather than mild disability at diagnosis. Other research studies have shown similar effects on disability in people with MS who have asthma, vascular comorbidities such as diabetes, and in those who smoke **(Table 5)**.[8,30,31]

Table 4. Factors Contributing to MS Comorbidities

Biological

- Genetic predisposition
- Polypharmacy
- High-risk medications

Lifestyle and Behavioral

- Inadequate diet
- Poor hydration
- Overweight/obesity
- Nicotine/alcohol use
- Sedentary lifestyle
- Deficient personal hygiene

Physical Conditioning

- Muscle weakness
- Myalgia
- Tremor
- Spasticity
- Paresthesia/sensory loss
- Pain
- Incontinence (bowel/bladder)
- Balance problems
- Seizures
- Fatigue
- Sleep disturbance
- Dependent edema (related to autonomic nervous system changes, obesity, sedentary lifestyle)
- Impaired mobility (gait disturbance, ataxia, paraplegia, quadriplegia)

Sources: Kathleen Costello, June Halper

There currently are no specific instruments for measuring comorbidities in MS. Patient self-reporting has been an effective way to detect comorbid conditions such as diabetes, hypertension, dyslipidemia, and thyroid, heart, and lung disease.[32] The MS nurse should document all comorbidities based upon examination of the patient and the medical history. Of course, simply documenting the existence of a

Table 5. Effects of Comorbidity on Disability in MS

Type of Comorbidity	Effect on MS-related Disability
Any comorbidity	Increased severity of disability at diagnosis[30]
Vascular, musculoskeletal, psychiatric, obesity	Increased severity of disability at diagnosis[30]
Asthma	Early gait dysfunction[1]
Vascular disease (e.g., diabetes, hypertension, heart disease)	More rapid progression to ambulatory disability[8]
Smoking	Increased risk of disability progression[31]

comorbid condition does not necessarily indicate its relative severity or its impact on MS.

While comorbidities delay the diagnosis of MS, the same is often true on the other side: a person who has MS may experience delayed diagnosis of a comorbid medical condition. It's not unusual for any health complaint occurring in a person with MS to be ascribed to the neurologic condition or an MS complication rather than a separate problem.

Primary Care in MS

Recommended screening tests for primary care of patients with MS are outlined in **Table 6.** Because MS care is highly specialized, people with MS may focus on managing the neurologic condition while neglecting many aspects of basic primary care, including these recommended health screenings. Providers, as well as patients, also may neglect basic maintenance care. During a neurologic follow-up visit, the focus is often on detecting signs of MS progression, determining whether the patient is administering disease-modifying therapy correctly, and managing any side effects. In the time remaining, there may be little opportunity to delve into whether the patient has been keeping up with recommended gynecologic or cancer screenings.

On the other hand, many people with MS may encounter difficulty receiving preventive care or non-MS treatments in the general health care setting. Primary care providers (PCPs) may refer these patients back to their neurologists, regardless of the nature of the health complaint. Some PCPs may be reluctant to diagnose or manage basic health problems because of the added complexity from the neurologic condition or due to fears of exacerbating the disease in some way. In this manner, a comprehensive MS care center may become the patient's "medical home" where overall wellness is prioritized along with MS-related care. For patients who do not have access to comprehensive care, the challenge of managing these multiple concerns becomes greater.

Table 6. Recommended Screenings: Primary Care in MS

- Mammogram/clinical breast exam
- Pap test and HPV test for cervical cancer
- PSA/clinical testicular and rectal exam
- Hemoccult stool test/colonoscopy
- Influenza vaccine (non-live vaccine recommended)
- Skin inspection for pressure ulcers, melanoma
- Bone densitometry (DEXA)
- Chest x-ray
- Electrocardiogram
- Comprehensive metabolic profile (glucose, liver enzymes, cholesterol)
- Complete blood count with differential
- Thyroid function tests

Sources: Kathleen Costello, June Halper
HPV=human papilloma virus, PSA=prostate-specific antigen.

According to Costello and Halper, the nurse's role in primary care of MS involves:

- Identifying and addressing the patient's primary care needs along a continuum of health as part of holistic care;
- Recognizing and assessing (but not necessarily treating) the patient's symptoms and non-MS-related conditions;
- Referring the patient to appropriate providers;
- Assessing outcomes, including adherence to recommendations, during subsequent visits;
- Educating the patient and other healthcare providers about primary care needs within the context of MS.[33]

The nurse can help to advocate for the patient with PCPs or other providers, identify providers and diagnostic facilities that can accommodate patients with neurologic disease (such as a facility that can manage mammography in a patient with physical impairments), or find resources within the neurology practice or MS center to address health concerns beyond those directly related to the disease.

It's important to remember that patients' personal health beliefs and behaviors can have a significant impact on how they handle MS, their comorbid health conditions, their treatments, and their overall wellness. Positive social/family support and an ability to put their condition into perspective are qualities that have been associated with better coping skills among people with MS.[34] The MS nurse must take into account each person's individual beliefs, recognizing that not all patients are going to be open to the same degree of intervention or remain fully engaged in the care process.

Conclusion

Evaluating and managing medical comorbidities often complicates the process of caring for patients with MS. Likewise, having MS often hampers a person's ability to lead a healthy lifestyle. Given the prevalence of chronic conditions such as diabetes and cardiovascular disease in the general population, comorbid health conditions are highly likely to become part of the MS care process as a person ages. Caring for the whole person, rather than viewing each disease as a separate entity, can be a helpful perspective for nurses involved in the care of MS.

References

1. Marrie RA, Horwitz RI. Emerging effects of comorbidities on multiple sclerosis. *Lancet Neurol.* 2010;9:820-828.
2. Knox KB. Validating the assessment of comorbidity in multiple sclerosis: Another step towards comprehensive health care. *Neuroepidemiology.* 2010;35:91-92.
3. Marrie RA, Horwitz RI, Cutter G, et al. Association between comorbidity and clinical characteristics of MS. *Acta Neurol Scand.* 2010; doi:10.1111/j.1600-0404/2010.01436.x [Epub ahead of print].
4. Gijsen R, Hoeymans N, Schellevis FG, et al. Causes and consequences of comorbidity: A review. *J Clin Epidemiol.* 2001;54:661-674.
5. Marrie R, Horwitz R, Cutter G, et al. Comorbidity, socioeconomic status and multiple sclerosis. *Mult Scler.* 2008;14:1091-1098.
6. Marrie RA, Horwitz R, Cutter G, et al. The burden of mental comorbidity in multiple sclerosis: Frequent, underdiagnosed, and undertreated. *Mult Scler.* 2009;15:385-392.
7. Marrie RA, Horwitz RI, Cutter G, et al. Smokers with multiple sclerosis are more likely to report comorbid autoimmune diseases. *Neuroepidemiology.* 2011;36:85-90.
8. Marrie RA, Rudick R, Horwitz R, et al. Vascular comorbidity is associated with more rapid disability progression in multiple sclerosis. *Neurology.* 2010;74:1041-1047.
9. Somers EC, Thomas SL, Smeeth L, et al. Are individuals with an autoimmune disease at higher risk of a second autoimmune disorder? *Am J Epidemiol.* 2009;169:749-755.
10. Sloka JS, Phillips PW, Stefanelli M, et al. Co-occurrence of autoimmune thyroid disease in a multiple sclerosis cohort. *J Autoimmune Dis.* 2005;2:9.
11. Niederwieser G, Buchinger W, Bonelli RM, et al. Prevalence of autoimmune thyroiditis and non-immune thyroid disease in multiple sclerosis. *J Neurol.* 2003;250:672-675.
12. Siegert RJ, Abernethy DA. Depression in multiple sclerosis: A review. *J Neurol Neurosurg Psychiatry.* 2005;76:469-475.
13. Feinstein A. The neuropsychiatry of multiple sclerosis. *Can J Psychiatry.* 2004;49:157-163.
14. Patten SB, Beck CA, Williams JV, et al. Major depression in multiple sclerosis: A population-based perspective. *Neurology.* 2003;61:1524-1527.
15. Haussleiter IS, Brune M, Juckel G. Psychopathology in multiple sclerosis: Diagnosis, prevalence and treatment. *Ther Adv Neurol Disord.* 2009;2:13-29.
16. Gold SM, Irwin MR. Depression and immunity: Inflammation and depressive symptoms in multiple sclerosis. *Neurol Clin.* 2006;24:507-519.
17. Mohr DC, Hart SL, Goldberg A. Effects of treatment for depression on fatigue in multiple sclerosis. *Psychosom Med.* 2003;65:542-547.
18. The Goldman Consensus statement on depression in multiple sclerosis. *Mult Scler.* 2005;11:328-337.
19. Fois AF, Wotton CJ, Yeates D, et al. Cancer in patients with motor neuron disease, multiple sclerosis and Parkinson's disease: Record linkage studies. *J Neurol Neurosurg Psychiatry.* 2010;81:215-221.

20. Bahmanyar S, Montgomery SM, Hillert J, et al. Cancer risk among patients with multiple sclerosis and their parents. *Neurology*. 2009;72:1170-1177.
21. Handel AE, Ramagopalan SV. Multiple sclerosis and risk of cancer: A meta-analysis. *J Neurol Neurosurg Psychiatry*. 2010;81:1413-1414.
22. Marrie RA, Cutter G, Tyry T, et al. A cross-sectional study of bone health in multiple sclerosis. *Neurology*. 2009;73:1394-1398.
23. Hearn AP, Silber E. Osteoporosis in multiple sclerosis. *Mult Scler*. 2010;16:1031-1043.
24. Weinstock-Guttman B, Gallagher E, Baier M, et al. Risk of bone loss in men with multiple sclerosis. *Mult Scler*. 2004;10:170-175.
25. Bamer AM, Johnson KL, Amtmann D, et al. Prevalence of sleep problems in individuals with multiple sclerosis. *Mult Scler*. 2008;14:1127-1130.
26. Kaminska M, Kimoff RJ, Schwartzman K, et al. Sleep disorders and fatigue in multiple sclerosis: Evidence for association and interaction. *J Neurol Sci*. 2011;302:7-13.
27. Bamer AM, Johnson KL, Amtmann DA, et al. Beyond fatigue: Assessing variables associated with sleep problems and use of sleep medications in multiple sclerosis. *Clin Epidemiol*. 2010;2010:99-106.
28. Ascherio A, Munger KL, Simon KC. Vitamin D and multiple sclerosis. *Lancet Neurol*. 2010;9:599-612.
29. Metz LM, McGuinness SD, Harris C. Urinary tract infections may trigger relapse in multiple sclerosis. *Axone*. 1998;19:67-70.
30. Marrie RA, Horwitz R, Cutter G, et al. Comorbidity delays diagnosis and increases disability at diagnosis in MS. *Neurology*. 2009;72:117-124.
31. Hernan MA, Jick SS, Logroscino G, et al. Cigarette smoking and the progression of multiple sclerosis. *Brain*. 2005;128:1461-1465.
32. de Groot V, Beckerman H, Lankhorst GJ, et al. How to measure comorbidity. a critical review of available methods. *J Clin Epidemiol*. 2003;56:221-229.
33. Primary-Care Needs in Multiple Sclerosis. In: Costello K, Halper J, eds. *Advanced Practice Nursing in Multiple Sclerosis: Advanced Skills, Advancing Responsibilities*. 3rd ed: Expert Medical Education; 2010.
34. Brajkovic L, Bras M, Milunovic V, et al. The connection between coping mechanisms, depression, anxiety and fatigue in multiple sclerosis. *Coll Antropol*. 2009;33(Suppl 2):135-140.

Counseling Points™

Managing Comorbidities in Multiple Sclerosis

- It is important for clinicians to remember that people with multiple sclerosis (MS) have the same risk of developing other medical illnesses as the rest of the population and that they need appropriate screening and management.
- People with MS are at increased risk of developing certain types of medical comorbidities, including psychiatric conditions such as depression and sleep disorders, and possibly autoimmune conditions such as thyroid disease.
- MS complications and medical comorbidities can be difficult to distinguish and often occur in an interrelated, interdependent complex of symptoms.
- While a specific comorbidity screening instrument for MS is not available, utilization of standard health screening techniques (e.g., physical examination, medical history) is important for the health of people with MS.
- Primary care for people with MS can present challenges because of the tendency to focus on the neurologic disease and to "blame" any symptoms or complaints on MS.
- Primary care providers may be hesitant to treat patients with MS because of the complexity of the disease and out of concern that an MS-related health issue may be overlooked or exacerbated.
- MS nurses have the responsibility to care for the "whole person," including recognizing and assessing non-MS-related symptoms and conditions, referring patients to appropriate providers, educating patients, and assessing outcomes on subsequent visits.

Vitamin D and MS: A Smoking Gun or Just Smoke and Mirrors?

The role of vitamin D in multiple sclerosis (MS) treatment and prevention is generating a lot of buzz recently, with patients and health care providers alike wanting answers to two key questions:

- Does vitamin D supplementation prevent MS, and if so, what is a safe and effective supplement dose?
- Does vitamin D supplementation at high doses provide any treatment benefit in MS, and if so, what is the recommended dosage?

The geographic distribution of MS has long led experts to suspect that absorption of sunshine as a means of producing vitamin D or some other mechanism plays a role in the susceptibility to the disease. A few groundbreaking studies have shed some light on this issue. A large case-control study by Munger and colleagues looked at the records of 7 million US military personnel for whom serum samples had been stored, finding that those with the highest serum vitamin D levels (at least 99 nmol/L) had a 62% reduced risk of developing MS.[1]

The same authors prospectively investigated vitamin D intake in 200,000 US women.[2] In a subgroup of 300, those in the top quintile of vitamin D intake (mean 75 nmol/L) had a 33% reduced rate of developing MS compared with those in the lowest quintile (mean 55 nmol/L). The incidence of MS was 41% lower among women who took vitamin D supplements (400 IU per day or more) compared with nonusers.

The therapeutic potential of vitamin D in people who already have MS was explored by a University of Toronto team led by Jodie Burton, MD.[3] In a 1-year study involving 49 patients with MS, 25 received calcium and vitamin D supplements (with doses escalating as high as 40,000 units per day and then titrated downward) and 24 received no vitamin D supplementation. The supplemented group had an impressive 41% reduction in new MS events, and demonstrated improvements in physical function. These effects were absent in the control group. Supplementation at these high doses did not result in meaningful adverse effects and blood calcium levels remained normal, the authors observed. It may bear noting that the study participants all had mild disease (mean age of 40.5 years, with a mean Expanded Disability Status Scale score of 1.34).

Newer data are helping to piece together the vitamin D story in MS. For example, an in vitro study from Switzerland showed that when key immune cells involved in MS (CD8+ T cells) were exposed to vitamin D, they expressed fewer pro-inflammatory cytokines.[4] And in a comprehensive review published in *Lancet Neurology,* Munger, Ascherio, and colleagues, authors of some of the largest studies on vitamin D in MS, conferred a sweeping recommendation for the prophylactic use of vitamin D:

"On the basis of the results of the only longitudinal study of serum 25-hydroxyvitamin D and MS onset, and assuming that these results are unbiased and vitamin D is truly protective against MS, over 70% of MS cases in the USA and Europe could be prevented by increasing the serum [vitamin D] concentration of adolescents and young adults to above 100 nmol/L."[1,5] The authors added that serum vitamin D concentrations that high are found mainly among people who live in sunny regions and have outdoor lifestyles, "but could be reached in most people by taking 1,000 to 4,000 IU cholecalciferol daily."[5] Many other MS experts are holding out for better evidence before they recommend mega-dosing with vitamin D for people with MS or for the general population.

References

1. Munger KL, Levin LI, Hollis BW, et al. Serum 25-hydroxyvitamin D levels and risk of multiple sclerosis. *JAMA*. 2006;296:2832-2838.
2. Munger KL, Zhang SM, O'Reilly E, et al. Vitamin D intake and incidence of multiple sclerosis. *Neurology*. 2004;62:60-65.
3. Burton JM, Kimball S, Vieth R, et al. A phase I/II dose-escalation trial of vitamin D3 and calcium in multiple sclerosis. *Neurology*. 2010;74:1852-1859.
4. Lysandropoulos AP, Jaquiery E, Jilek S, et al. Vitamin D has a direct immunomodulatory effect on CD8+ T cells of patients with early multiple sclerosis and healthy control subjects. *J Neuroimmunol*. 2011;233:240-244.
5. Ascherio A, Munger KL, Simon KC. Vitamin D and multiple sclerosis. *Lancet Neurol*. 2010;9:599-612.

Counseling Points™

Managing Comorbidities in Multiple Sclerosis

Continuing Education Posttest

To receive contact hours, please read the program in its entirety, answer the following posttest questions, and complete the program evaluation. A certificate will be awarded for a score of 80% (9 correct) or better. A certificate will be mailed within 4 to 6 weeks. There is no charge for the CNE credit.

By Mail: Delaware Media Group, 66 S. Maple Ave., Ridgewood, NJ 07450

By Fax: (201) 612-8282

Via the Web: Applicants can access this program at the International Organization of MS Nurses' website, www.IOMSN.org. Click on *Counseling Points* and follow the instructions to complete the online posttest and application forms.

PLEASE SELECT THE BEST ANSWER

1. According to NARCOMS Registry data, the most common comorbidities occurring in people with multiple sclerosis (MS) are:
- A. other autoimmune conditions
- B. cancers
- C. depression and/or anxiety
- D. dyslipidemia and hypertension

2. An Austrian study found a significantly higher rate of _____ in men with MS versus controls.
- A. rheumatoid arthritis
- B. autoimmune thyroiditis
- C. systemic lupus erythematosus
- D. all of the above

3. The lifetime risk of clinically significant depression is:
- A. 1 of every 2 people with MS
- B. 1 of every 4 people with MS
- C. 1 of every 10 people with MS
- D. none of the above

4. Possible factors linking depression with MS include:
- A. neurologic damage from MS on serotonergic and/or noradrenergic receptors
- B. MS-related fatigue that triggers or exacerbates depression
- C. difficulty coping with the disease state and related disability
- D. all of the above

5. Cancer risk has been shown to be higher among people with MS.
- A. True
- B. False

6. Interventions to prevent osteoporosis among people with MS include:
- A. bone density screening
- B. vitamin D and calcium supplements
- C. weight-bearing exercise
- D. all of the above

7. In a study by Bamer, which of the following was NOT found to contribute to sleep problems in people with MS?
- A. male sex
- B. leg cramps
- C. nocturia
- D. depression

8. According to Costello and Halper, factors relating to physical conditioning that contribute to comorbidities of MS include all of the following *EXCEPT*:
- A. muscle weakness and/or spasticity
- B. exercise/physical activity
- C. paresthesias/sensory loss
- D. fatigue/sleep disturbance

9. In a study by Marrie and colleagues, all of the following comorbidities delayed the diagnosis of MS *EXCEPT*:
- A. vascular comorbidities
- B. other autoimmune conditions
- C. other neurologic conditions
- D. obesity and/or smoking

10. To detect comorbidities among people with MS, experts recommend using an MS-specific comorbidity screening instrument.
- A. True
- B. False

11. Other medical conditions occurring in people with MS tend to be overlooked because:
- A. patients and health care providers focus attention on MS-related care
- B. symptoms are "blamed" on MS and other causes are not explored
- C. there is too little time during an MS visit to allow for routine health screening
- D. all of the above

12. According to Costello and Halper, the nurse's role in the primary care of a person with MS includes all of the following *EXCEPT*:
- A. identifying and addressing patient care needs
- B. recognizing and assessing symptoms of MS and non-MS-related conditions
- C. creating a treatment plan for comorbidities
- D. educating patients and other providers about primary care needs in MS

Counseling Points™: Program Evaluation Form

Managing Comorbidities in MS

Using the scale provided (Strongly Agree = 5 and Strongly Disagree = 1) please complete the program evaluation so that we may continue to provide you with high-quality educational programming. Please fax this form to **(201)612-8282** or complete it online as instructed below.

5 = Strongly Agree 4 = Agree 3 = Neutral 2 = Disagree 1 = Strongly Disagree

At the end of this program, I was able to: *(Please circle the appropriate number on the scale.)*

1) Identify common comorbid medical conditions occurring with MS 5 4 3 2 1
2) Explain the impact of comorbidities on outcomes and management of MS 5 4 3 2 1
3) List primary care management steps that should occur in conjunction with MS treatment 5 4 3 2 1
4) Discuss the coordination of care between the primary care provider, MS management team, and specialists treating comorbid health conditions 5 4 3 2 1

To what extent was the content:

5) Well-organized and clearly presented 5 4 3 2 1
6) Current and relevant to your area of professional interest 5 4 3 2 1
7) Free of commercial bias 5 4 3 2 1
8) Clear in providing disclosure information 5 4 3 2 1

General Comments

9) As a result of this continuing education activity (check only one):

❒ I will modify my practice. (If you checked this box, how do you plan to modify your practice?)_____

_____

❒ I will wait for more information before modifying my practice.

❒ The program reinforces my current practice.

Suggestions for future topics/additional comments: _____

_____

Follow-up

As part of our continuous quality-improvement effort, we conduct postactivity follow-up surveys to assess the impact of our educational interventions on professional practice. Please check one:

❒ Yes, I would be interested in participating in a follow-up survey.

❒ No, I would not be interested in participating in a follow-up survey.

There is no fee for this educational activity.

Posttest Answer Key	1	2	3	4	5	6	7	8	9	10	11	12

Request for Credit ***(Please print clearly)***

Name_____ Degree _____

Organization _____ Specialty _____

Address _____

City _____ State_____ ZIP_____

Phone _____ Fax_____ E-mail _____

Signature _____ Date _____

By Mail: Delaware Media Group, 66 S. Maple Ave., Ridgewood, NJ 07450

By Fax: (201) 612-8282

Via the Web: Applicants can access this program at the International Organization of MS Nurses' website, www.IOMSN.org. Click on *Counseling Points* and follow the instructions to complete the online posttest and application forms.

Delaware Media GROUP

www.delmedgroup.com