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Fall 2016
Volume 11, Number 2

Counseling Points™

Enhancing Patient Communication for the MS Nurse

What Is the Role of Stress in Multiple Sclerosis?



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This continuing education publication is supported by educational grants from Sanofi Genzyme and Teva Pharmaceuticals.

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

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Counseling Points™

What Is the Role of Stress in Multiple Sclerosis? Continuing Education Information

Target Audience

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

Purpose

To provide nurses with information and practice advice about managing stress and its impact on the disease course and symptoms of multiple sclerosis (MS).

Learning Objectives

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

- Review findings from research about stress in relation to MS pathology and disease progression
- Explore stress-related issues with patients and assess how this might affect treatment adherence, self-care, relapse risk, and other factors
- Educate patients about how to individually tailor stress-management techniques

Continuing Education Credit

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Laurie Scudder, DNP, NP, served as Nurse Planner and reviewer for this activity. She has declared no relevant financial relationships.

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This program expires October 31, 2018.

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welcome

Dear Colleague,

For a person with multiple sclerosis (MS), stress management is not so much an option as a necessity. But stress management is actually much easier said than done, especially for a person who has a chronic, progressive, unpredictable, and often-debilitating condition.

Telling a person to “avoid stress”—particularly someone who has MS—is unhelpful and even a bit demoralizing. Consider, for example, the case of J, a woman recently diagnosed with MS who was seen in an ophthalmology practice for evaluation of new visual symptoms. J was told that her problems were partly related to inflammation in the eye, which can be made worse with stress. She was told by one of the staff members, “Try to relax more.” As J related to her MS nurse specialist, “How can I manage stress related to my MS, when MS is the *cause* of most of the stress?”

This patient’s experience sums up the vicious circle of MS and stress, but the circle can be broken with appropriate knowledge and support. Some of the most well researched stress management techniques are yoga, meditation, and similar mindfulness exercises. But simply suggesting these is usually not an effective way to get patients to adopt them into their daily lives. Patients with MS need tools, resources, and encouragement to pursue stress management strategies, as well as information about how high stress levels can impact exacerbations of MS, pseudoexacerbations, and many MS symptoms.

The close relationship MS nurses develop with patients makes them well suited to help manage stress. To gain further insight on this issue, *MS Counseling Points* worked with Megan Weigel, DNP, ARNP-C, MSCN, who speaks regularly on wellness practices in MS and leads yoga classes for groups of MS patients. I hope you find this information beneficial for your practice.



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What Is the Role of Stress in Multiple Sclerosis?

Prolonged emotional stress has proven links to illness. Stress can make chronic illnesses worse, and might even be partly responsible for triggering some illnesses. Living with multiple sclerosis (MS) is in itself a chronic stress-producing situation. So advising our patients with MS to “avoid stress” can be both unproductive and discouraging. This article will review current information about the impact of stress on MS pathology, disease course, and daily living. In addition, we explore some solutions that MS nurses can suggest to patients that will provide constructive advice and encouragement for managing stress.

What is Stress?

“Stress” tends to be a blanket term used to describe both the cause (a challenging or “stressful” situation) and the effects. Technically, there is a “stressor”—a cause or stimulus—and a physical and emotional response to the stressor. The situations that produce stress differ for every person. A certain amount of stress can be beneficial up to a point, such as deadline pressure or a demanding

situation that inspires a person to spring into action. However, there is a point at which it becomes detrimental, as illustrated on the “human stress response” curve (Figure 1).¹ It is usually the person’s individual response to stress, and not the actual stressor per se, that leads to short- or long-term detrimental health effects. A person may be more susceptible to illness or worsening of an existing condition with prolonged, unrelenting stressful situations over which the person has ineffective abilities to cope.

An individual’s threshold for tolerating stressful situations is normally lowered in the presence of a chronic illness like MS. Fatigue, cognitive dysfunction, and the frustration of dealing with mobility limitations and other symptoms compound the everyday human experience of stress.¹

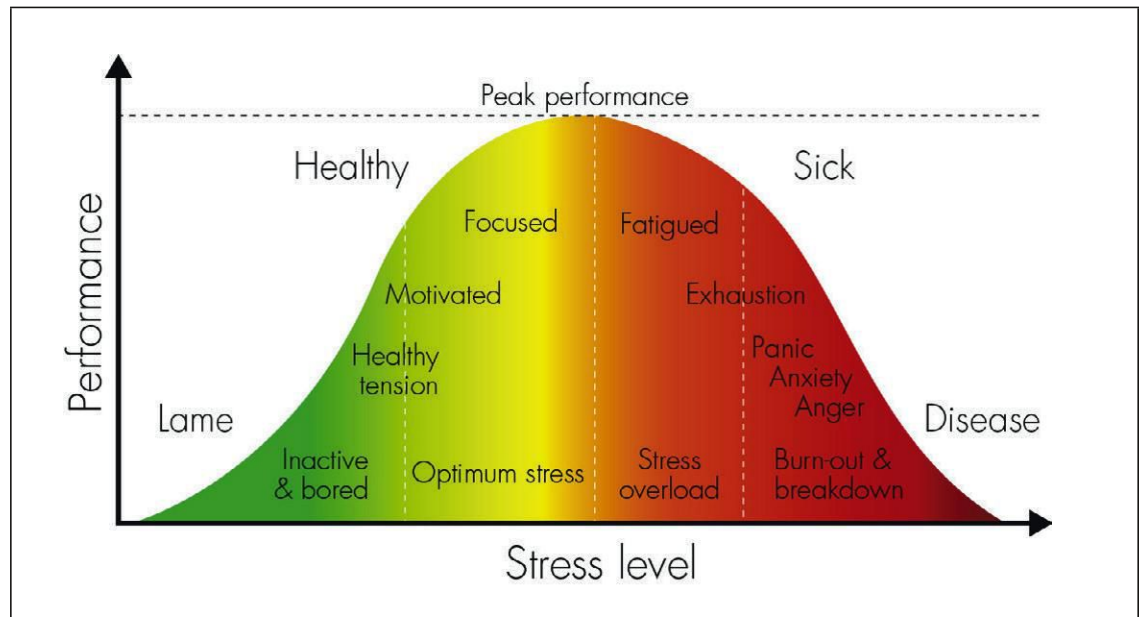


Figure 1. Human Stress Response Curve

Performance increases with physiologic or mental arousal (tension or stress) up to a point. When levels of stress become too high, performance drops and illness may follow.²

People who are conscious of the warning signs that indicate a stress overload—such as sleep disturbance, change in eating patterns (either over- or under-eating), poor concentration, mood changes, symptoms such as headaches or abdominal pain—can take steps in an effort to better manage their stress.

Does chronic stress, or even a single highly stressful life event, precipitate disease? Many studies have linked chronic stress to health conditions ranging from cardiovascular disease, outcomes such as myocardial infarction and stroke, certain types of cancer, and depression.³⁻⁶ In some of these conditions, stress has been associated with a state of systemic inflammation. Because “stress” is such an intangible concept, it’s no surprise that there are conflicting findings in the research. For example, a study of 106,000 women with breast cancer refuted an association between chronic stress and the risk of breast cancer.⁵

What are the Physiologic Effects of Stress in MS?

Stress and inflammatory cytokine production

Although we don’t understand the exact cause of MS, there is evidence that certain biological systems associated with stress may be involved in MS pathology.⁷ These include the hypothalamic-pituitary-adrenal (HPA) axis, a neuroendocrine system that controls responses to stress as well as regulating many bodily processes. Also involved may be the sympathetic nervous system, known for activating the “fight or flight” response we often associate with stress. A study by Gold and colleagues suggested that in people with MS, there may be interruptions in the communication between the immune system and these two stress response systems.⁸

Sorenson and colleagues compared peripheral blood mononuclear cells from 42 patients with

MS and 36 controls to determine if perceived stress is associated with elevated proinflammatory cytokines and MS symptoms.⁹ During times of emotional stress, increased cytokine expression was observed in both groups but with different inflammatory behaviors involved, as shown in **Table 1**. Of note, the subjects with MS exhibited a fourfold increase in the production of IL-12 during stress.⁹

Stress as a precipitating factor in MS onset

Information about whether stress is associated with the risk of developing MS is scant, with direct correlations difficult to find.¹⁰ One study conducted by investigators from Bosnia/Herzegovina assessed the association between intense life event stressors and the development of a first clinical episode of MS.¹¹ The study analyzed 109 consecutive newly diagnosed patients (80 female and 29 male) over a 2-year period as well as 41 patients with a previous diagnosis of MS. The results suggested that stress may be a triggering factor in the onset of MS and in the worsening of previously established disease.¹¹

A study conducted in Denmark looked at whether there is an increased risk of developing MS after an exceptionally stressful event: the death of a child. The study used national data on over 21,000 parents who had lost a child under the age of 18 and a control group of nearly 300,000 parents who did not lose a child. They found that

Table 1. Cytokines Elevated During Emotional Stress⁹

Patients with MS (n=42)	Controls (non-MS; n=36)
• IL-6	• TNF- α
• IL-10	• IFN- γ
• IL-12	

IL= interleukin; TNF= tumor necrosis factor; IFN=interferon

parents who encountered this major stressor were at higher risk of developing MS by the 8-year follow-up point (hazard ratio 2.13 vs. 1.33).¹²

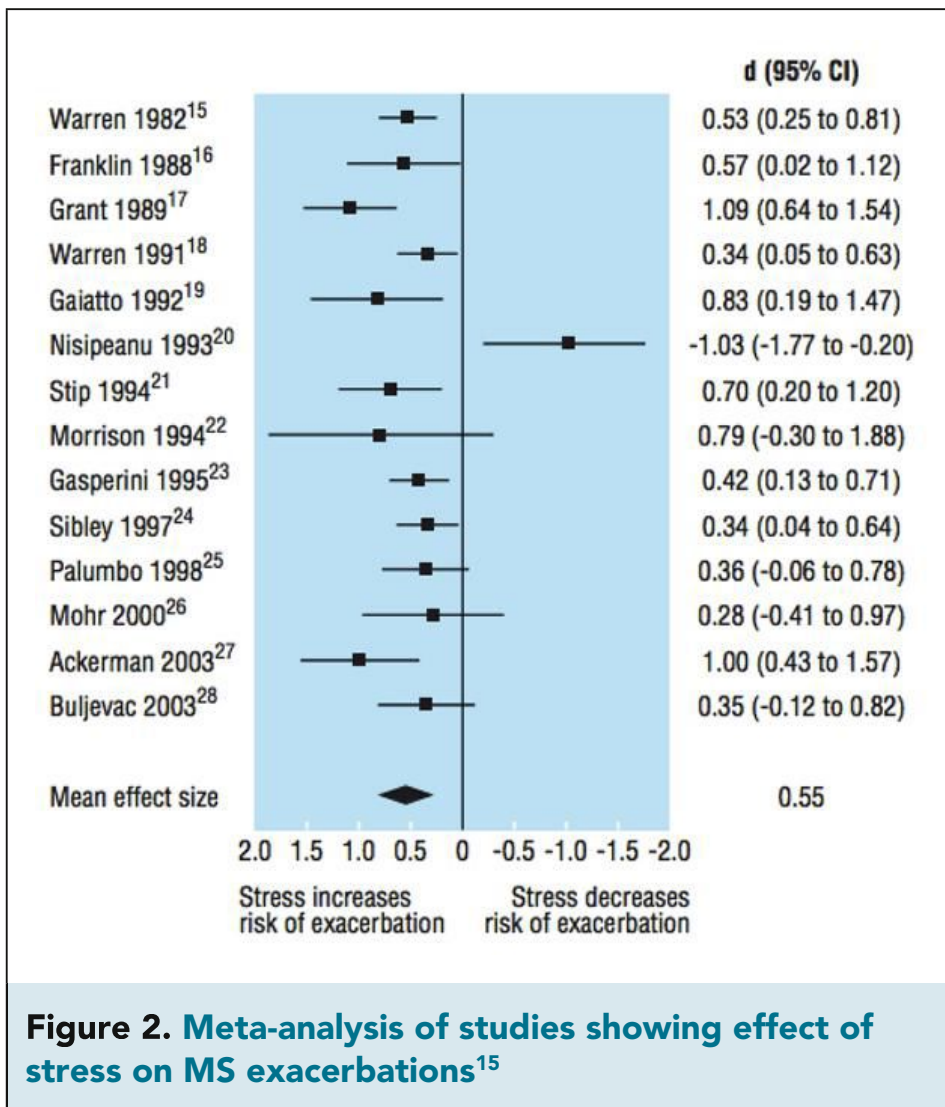
However, another study did not show a greater risk of MS among 369 people with MS identified through the Nurses' Health Study (NHS) database of 238,000 subjects. When the investigators looked at extremely stressful life situations—severe physical abuse during childhood or adolescence and being forced into sexual activity in childhood or adolescence—they did not find an elevated incidence of MS among those affected.¹³

Stressful events and neuroimaging markers

Researchers at Northwestern University studied 121 people with MS to determine whether stressful events were associated with the development of gadolinium-enhancing (Gd+) and T2 lesions.¹⁴ All participants had weekly MRI scans, and half the group participated in stress management therapy for the duration of the 48-week study. These investigators found that negative life events (including moderate stressors and “major” stressors such as a threat to the family structure) did contribute to advanced inflammatory activity on MRI. Meanwhile, positive stressors, such as planning a wedding or starting a new job, were associated with a lower risk of new or enlarging T2 lesions. Those participants who underwent stress management therapy had significantly fewer Gd+ lesions during the study.¹⁴

Does stress increase risk of MS exacerbations?

There is a substantial amount of work showing that stress most likely serves as a trigger for exacerbations/relapses in people with MS. A meta-analysis by Mohr et al, “Association between stressful life events and exacerbation in multiple sclerosis,” showed a clinically meaningful correlation between stress and MS exacerbations in 13 of the 14 studies used in meta-analysis (**Figure 2**).¹⁵ The overall effect size of $d=0.53$ signified that stress indeed has a powerful impact on MS exacerbation risk. However the authors caution, “The association between stressful life events and exacerbation



is complex and cannot currently be determined for any individual patient.”¹⁵

Why does stress heighten exacerbation risk? Mohr and colleagues also developed a framework for understanding why stress might trigger excess inflammatory activity in people with MS. “The evolution of an MS exacerbation occurs over a period of many months and involves many different biological processes,” they note. Processes that may be involved include increased mast cell activation at the start of stressor, glucocorticoid resistance in immune cells when stress becomes chronic, and the dropping of high cortisol levels when stress is alleviated.¹⁶

One of the studies included in the meta-analysis involved 23 female patients with MS followed over the course of 1 year. These subjects completed psychiatric assessment interviews weekly. Interestingly, for 85% of the exacerbations recorded, a stressful life event had occurred within the previous 6 weeks, a statistically significant finding ($P < 0.001$). The average time interval between the stressful event and onset of the MS relapse was 14 days.¹⁷

Emotional Challenges Associated With a Diagnosis of MS

Receiving a diagnosis of MS is an immediately stressful situation. In fact, some research has likened the news of an MS diagnosis to posttraumatic stress disorder.^{18,19} The person may feel that his or her life, as they know it, is “over,” until they have figured out how to adjust to a “new normal.”^{18,19} Daily living with MS tends to produce a variety of unique stressors for the individual, including:¹⁰

- **Invisible symptoms:** People with MS do not always “look sick,” and therefore may feel misunderstood by others who do not recognize or appreciate their burdens. This

may even apply to family members or close friends who can’t understand why they don’t just stop complaining and get out of bed.

- **Cognitive impairment:** If cognitive abilities are affected, people with MS may feel even more misunderstood by others.
- **Newly visible symptoms:** As the development of disability increases, the person with MS must deal with other peoples’ reactions to their physical differences and challenges. A large stressor for patients is learning how to navigate new physical limitations and being forced to change habits and schedules as they adapt.
- **Financial complications:** For most people with MS, the costs associated with treatment are a significant burden. A common stressor is the fear of losing employment and then being unable to afford health insurance.
- **Feeling out of control:** The person may feel that the MS is “in charge,” since it is difficult to predict when a good day or a bad day may occur. The sense of a loss of control over the MS may extend to feeling out of control of one’s life.
- **Decisions:** There are many life-changing decisions that must be made in association with a diagnosis of MS, including decisions about which disease-modifying treatment (DMT) to use and how to assimilate that treatment into daily life.

Some of the common signs of stress can overlap with typical symptoms of MS, such as fatigue and muscle tightness. It is not always possible to differentiate whether a symptom is a result of “just life” or MS, but in general MS-related fatigue does not always abate with additional rest.²⁰ Signs of chronic stress and how they overlap with MS symptoms are illustrated in **Figure 3**.¹⁰

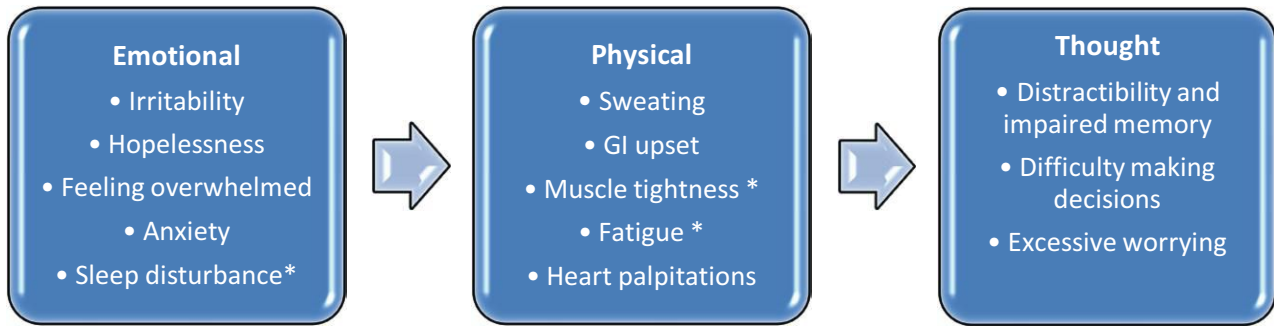


Figure 3. Signs of Chronic Stress¹⁰

*Sign common to both stress symptoms and MS symptoms

Correlation between stress and depression

Depression is a common comorbidity in MS, with a prevalence as high as 50% in people with this disease.²¹ Some of the symptoms associated with chronic stress or a stressful event may coincide with symptoms of depression.¹⁰ Depression has been shown to heighten systemic inflammatory responses, leading to a worsening of MS symptoms which in turn lead to worsening depression.²² A useful instrument for screening patients for depression in an office setting is the 21-question Beck's Depression Inventory; others validated for patients with MS can be found on the National Multiple Sclerosis Society website under Assessment Measures. There is a role for the use of antidepressant and anxiolytic medications in patients who are diagnosed with mood disorders.⁷

Stress Management Techniques for People with MS

Stress in MS can become a kind of “vicious circle.” Stress can worsen the perception of MS symptoms or the symptoms themselves, but that in turn makes it even harder to cope with the disease (thus heightening the stress). The feeling of being under stress tends to zap a person's energy, which compounds the difficulty of everyday MS

management. The period of time soon after a new diagnosis is especially difficult.¹⁸ Transparency in communication is crucial during this time period. **Table 2** summarizes some strategies nurses can employ during this time to help patients become informed while staying positive.

One way to evaluate a patient's stress levels is simply to bring up the topic during an office visit. The nurse might approach the patient's stress as a conversation, rather than a quiz. Instead of asking, “Are you under stress?” the interviewer can lead with an open-ended question such as “How are you doing with your job?” or “How have you been sleeping?” While there is evidence that prolonged, high-level stress can trigger an MS relapse, we also know that an exhausting or stressful day or period of time can provoke *pseudoexacerbations*, which are often mistaken for the real thing. An example might be a person who attends a family reunion, becomes overtired and overheated (and possibly emotionally distressed), and the next day experiences a feeling of malaise and worsening of an existing symptom. The definition of pseudoexacerbation is “a transient event that generally resolves when the precipitating factor is removed.”²³ A true relapse, on the other hand, is defined as “an acute episode of neurological

Table 2. Managing Stress at the Diagnosis and Early MS Phase

- Prepare the patient for what he or she might expect with the disease
- Assist the patient in identifying individual disease-related stressors (diagnosis, treatment options, side effects, fear of disability, impact on the family)
- Work with patient to recognize and reduce triggers for relapse
- Provide patient with high quality information and resources
- Provide encouragement and hope
- Refer patients to positively focused support programs and groups, especially those geared for newly diagnosed patients
- Provide patients with solutions for what to do under various situations
- Discuss options for disease-modifying therapies (DMTs), emphasizing that there is a wide range of treatment options
- Manage expectations: DMTs do not “erase” MS, but help to limit further progression in many people. There is no guarantee that any one individual will have a full response to a given therapy.

disturbance that lasts at least 24 hours and occurs after at least 30 days of clinical stability.”²³ **Table 3** provides some tips for talking with patients about stress in the course of MS care.

The most beneficial techniques for relieving stress will differ for each individual. When counseling patients, it helps to be well versed in a variety of techniques, and to use honest dialogue to assess which technique might work best for each person. By helping a person to identify his or her individual stressors, a stress management plan can be individualized. Some stress management techniques that have been shown to be helpful in people with MS are described below.

- **Yoga.** Practicing yoga can help people with MS feel more in control of their stress and

Table 3. Talking to Patients About Stress Levels

- Ask the patient about his or her stress levels
- Try to assess stress through conversation, rather than using surveys or tools
- Ask about role changes within the family and any new adaptations that have occurred due to MS
- Ask if any major life changes have occurred—such as a job change, new schedule, or sick parent—that could contribute to increased stress
- Explain the differences between a pseudoexacerbation and a true MS relapse, and the impact of stress on each
- Suggest realistic, concrete, and enduring methods of controlling stress (don’t just say, “go get a massage” or “try to relax more”)
- Write a “prescription” for 5 to 10 minutes of meditation each day, or 5 minutes of deep breathing exercise, journaling, or whatever relaxation approach may best suit the patient.

anxiety as well as their MS symptoms. Studies have shown that yoga can help alleviate fatigue, anxiety, depression, bladder dysfunction, pain, spasticity, and weakness, as well as increasing energy and feelings of well being.²⁴⁻²⁹ Many yoga programs have been developed specifically for people with MS and can be adapted to the individual’s needs, even in those with significant disability. The National Multiple Sclerosis Society’s web page (Living Well with MS/Health and Wellness/Exercise) provides resources, links, and discussion on the benefits of yoga for people with MS.

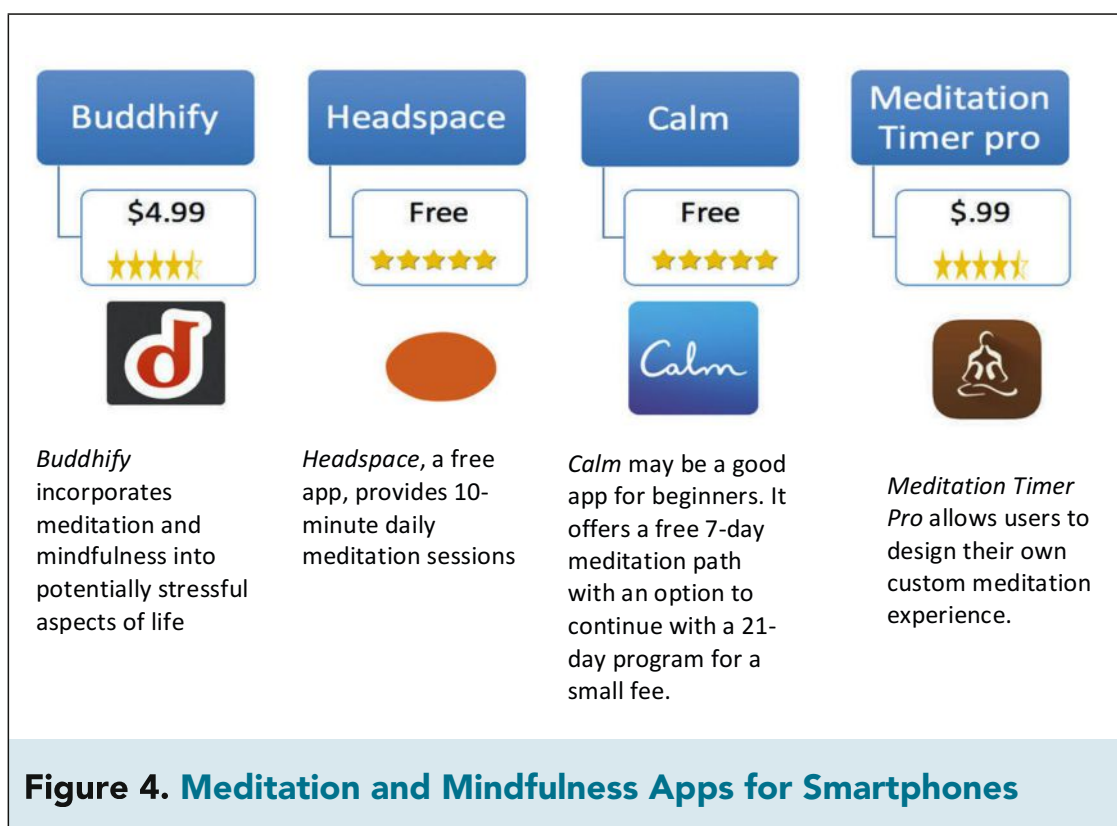
- **Meditation.** Meditation is an umbrella term for myriad of techniques used to control stress. On average, people spend at least half their lives worrying about the past or thinking about the future.³⁰ Meditation helps us stay in the present, tune out run-

away thoughts, and regulate our emotions. Long-term practice of meditation techniques has been associated with symptom reduction in a variety of illnesses and with beneficial structural brain changes on neuroimaging studies.³¹⁻³³ A study of 116 people with MS showed that those practicing meditation used more constructive coping strategies and had lower levels of perceived stress, increased resilience, and better mental health-related quality of life.³³ To launch a meditation practice, beginners should start with brief 5- to 10-minute sessions and build up to longer sessions. Many beginners benefit from guided meditations.³⁰ A smartphone app can be a useful tool for someone just starting meditation and anyone who wants to incorporate mindfulness into the day. Some examples are shown in **Figure 4**.³⁴

- **Mind over matter.** This technique is used in variety of health applications such as managing labor pain, cardiovascular disease, and psychotherapy. Usually, “mind over matter” techniques encompass a combination of meditation and breath work. Like meditation, the technique is reliant on

mindfulness, or the idea of living in the moment and simply accepting it. A proponent and popular author of books on this method is Jon Kabat-Zinn, founder of the Stress Reduction Clinic and the Center for Mindfulness in Medicine, Health Care, and Society at the University of Massachusetts Medical School. One of Kabat-Zinn’s famous quotes is, “You can’t stop the waves, but you can learn to surf.”

- **Exercise.** The benefits of exercise training in people with MS include reduced fatigue and positive effects on cognition, mood, and quality of life.³⁵ In addition to strengthening the muscles and improving walking speed, regular exercise may improve synapses between the neurons and other nerve growth factors.³⁶ Other benefits of physical activity in persons with MS include improved cardiorespiratory health and better management of symptoms such as anxiety



and depression.^{37,38} Exercise is known to be beneficial in stress management, and may be a good adjunctive approach to medications or psychiatric treatment for depression and mood disorders. A meta-analysis by researchers from the University of Illinois identified 12 randomized controlled trials studying exercise training for people with MS.³⁹ In their analysis, exercise training yielded a “small yet statistically significant and reliable reduction” in depressive symptoms in people with MS.

Benefits of Stress Reduction Therapies on MS Symptoms and Overall Health

Stress reduction techniques are not limited to the programs described here and do not need to be highly structured, formalized activities. Stress reduction can come in many forms, from participating in therapy or counseling sessions, fitting in favorite activities or hobbies, or simply unwinding with friends. The idea is for the person with MS to learn new coping strategies as needed and to recognize when additional help and support are required. McGuire and colleagues from the Kessler Institute for Rehabilitation in West Orange, NJ, tested a 90-minute psychoeducational wellness program in a group of 43 people with MS.⁴⁰ According to a paper published in the *International Journal of MS Care*, these sessions were aimed at “improving quality of life by increasing awareness of the various social, intellectual, emotional, and spiritual factors that can affect the overall well-being of people living with MS.” At the 10-week follow-up, improvements in depression, anxiety, overall mental health, perceived stress, and pain were observed in the treatment group compared with controls (people with MS who did not participate in the program).⁴⁰

Are people likely to stick to stress management strategies? “Falling off the wagon” is a common problem that occurs with any behavioral change, especially when stress levels increase due to an exacerbation, worsening of illness, or other difficult life event. It is not uncommon for people who have lost weight or stopped drinking or smoking to go back to their old habits when the stress heats up. In the bestselling book, *The Power of Habit*, Pulitzer-winning author Charles Duhigg explains that humans do this because the brain tries to return to its “comfort level,” or previously ingrained neural pathways, when the going gets rough.⁴¹ Becoming aware of stress triggers and how stress management techniques can offer relief can help a person to avoid a downward slide into a high-stress, illness-provoking state.

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CP Counseling Points™

What Is the Role of Stress in Multiple Sclerosis?

- A person's threshold for tolerating stressful situations is lowered in the presence of a chronic illness like MS. Fatigue, cognitive dysfunction, and the frustration of dealing with mobility limitations and other symptoms compound the everyday human experience of stress.
- Stressful life events most likely serve as a trigger for exacerbations/relapses in people with MS.
- Depression has been shown to heighten systemic inflammatory responses, leading to a worsening of MS symptoms, which in turn lead to worsening depression. A useful screening instrument for depression is the 21-question Beck's Depression Inventory.
- Stress in MS can become a kind of "vicious circle." It can worsen the perception of MS symptoms or the symptoms themselves, but that in turn makes it even harder to cope with the disease.
- MS nurses should assess the impact of stress on the patient's illness. It can be helpful to start the conversation with open-ended questions such as "How are you doing with your job?" or "How have you been sleeping?"
- Beneficial techniques for relieving stress differ for each individual. When counseling patients, it helps to be well versed in a variety of techniques, and to use honest dialogue to assess which technique might work best for that person.
- Some methods that have been proven to help people with MS manage stress while alleviating fatigue and some MS symptoms include yoga, meditation, and exercise. Mindfulness "apps" for smartphones are one way to incorporate meditation habits into a daily schedule.
- Becoming aware of stress triggers and how stress management techniques can offer relief can help a person to avoid a downward slide into a high-stress, illness-provoking state.

Counseling Points™

What Is the Role of Stress in Multiple Sclerosis?

Continuing Education Post-test

To receive contact hours, please read the program in its entirety, answer the following post-test questions, and complete the program evaluation. A certificate will be awarded for a score of 80% (8 correct) or better. A certificate will be mailed within 4 to 6 weeks. There is no charge for 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 Educational Materials > Publications > *Counseling Points* and follow the instructions to complete the online post-test and application forms.

PLEASE SELECT THE BEST ANSWER

- Which of the following statements is consistent with the human stress-response curve theory?**
 - all stress is potentially harmful to one's health
 - stress can be potentially beneficial up to a point
 - most people can handle high levels of stress without getting sick
 - the effects of stress are mainly emotional, not physical
- An effect of chronic stress that has been associated with the onset of diseases like cancer or heart disease is:**
 - buildup of toxins in the bloodstream
 - the body is "wiling itself" to be sick
 - development of systemic inflammation
 - none; there is no definitive links between stress and chronic diseases
- Biological systems that link stress to MS pathology include:**
 - autonomic nervous system
 - hypothalamic-pituitary-adrenal (HPA) axis
 - blood-brain barrier leakage
 - glucagon and insulin metabolism
- During emotional stress, people with MS may have heightened responses associated with which type of inflammatory cells (cytokines)?**
 - interleukins
 - interferons
 - tumor necrosis factor
 - CD20
- Among the following ways in which stress can affect the disease course in MS, the most research is available to support:**
 - exacerbation risk
 - role of stress in the onset of disease in MS
 - progression of relapsing-remitting to secondary progressive MS
 - progression of disability as measured by expanded disability status scale (EDSS)
- Your patient has experienced an exhausting and stressful time surrounding the recent death of her mother. On top of it, she tells you over the phone that her MS symptoms seem to be worse over the past few days. You consider:**
 - she is experiencing depression related to the death of her mother
 - she is having a pseudoexacerbation triggered by the recent events
 - she is having an exacerbation of MS, based on the duration of symptoms
 - you will need an in-person evaluation to determine a cause and next steps
- You want to begin taking a more active role in discussing stress with your patients and its impact on the course of MS. The recommended way to bring up the subject would be:**
 - "You will need to bring your stress levels down or that could start making your MS worse."
 - "Tell me a bit about how you have been coping lately. Is there anything about your job or family life that has been bothering you?"
 - "You should start practicing yoga at least 3 times a week. It's very beneficial in stress management and many of our other patients love it."
 - "We believe that stress activates pro-inflammatory cytokines and may increase the risk of MS exacerbations."
- As a stress-management technique for people with MS, yoga is a great choice for:**
 - someone who is in generally good shape and has few mobility limitations
 - someone with prior experience in practicing yoga
 - anyone who wants a mind-body relaxation method
 - all of the above
- When discussing meditation as a stress-management technique for your patient, he mentions that he has tried it before but is "no good at meditation." An appropriate response would be:**
 - "Then it's probably not a good method for you. Let's talk about some other techniques."
 - "You should just try sitting still and being quiet for 5 to 10 minutes a day."
 - "It takes time to get used to meditation and become better at it. I can recommend some good programs to help you learn, you're interested."
 - "The best way to really learn meditation is to go away on a week-long meditation retreat."
- You have a patient with MS who has experienced high stress levels. Lately she seems less interested in managing her disease than usual, and this is trickling over onto other parts of her life including job and family. You determine:**
 - She needs to get motivated to try to help herself more
 - It's normal for stress to have this effect on people with MS
 - She needs to talk to her family about helping her more
 - She may be suffering from depression, so a screening and/or referral may be in order

Counseling Points™: Program Evaluation Form

What Is the Role of Stress in Multiple Sclerosis?

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) Review findings from research about stress in relation to MS pathology and disease progression 5 4 3 2 1
- 2) Explore stress-related issues with patients and assess how this might affect treatment adherence, self-care, relapse risk, and other factors 5 4 3 2 1
- 3) Educate patients about how to individually tailor stress-management techniques 5 4 3 2 1

To what extent was the content:

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

General Comments

- 8) 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.
- 9) Please indicate any barriers you perceive in implementing these changes (check all that apply):
 - Cost Lack of opportunity (patients) Patient adherence issues Other (please specify) _____
 - Lack of administrative support Reimbursement/insurance Lack of professional guidelines _____
 - Lack of experience Lack of time to assess/counsel patients No barriers _____
- 10) Will you attempt to address these barriers in order to implement changes in your knowledge, skills, and/or patients' outcomes?
 - Yes. How? _____
 - Not applicable
 - No. Why not? _____

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.

Post-test Answer Key	1	2	3	4	5	6	7	8	9	10

Request for Credit *(Please print clearly)*

Name _____ Degree _____

Organization _____ Specialty _____

Address _____

City _____ State _____ ZIP _____

Phone _____ Fax _____ E-mail _____

Signature _____ Date _____

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