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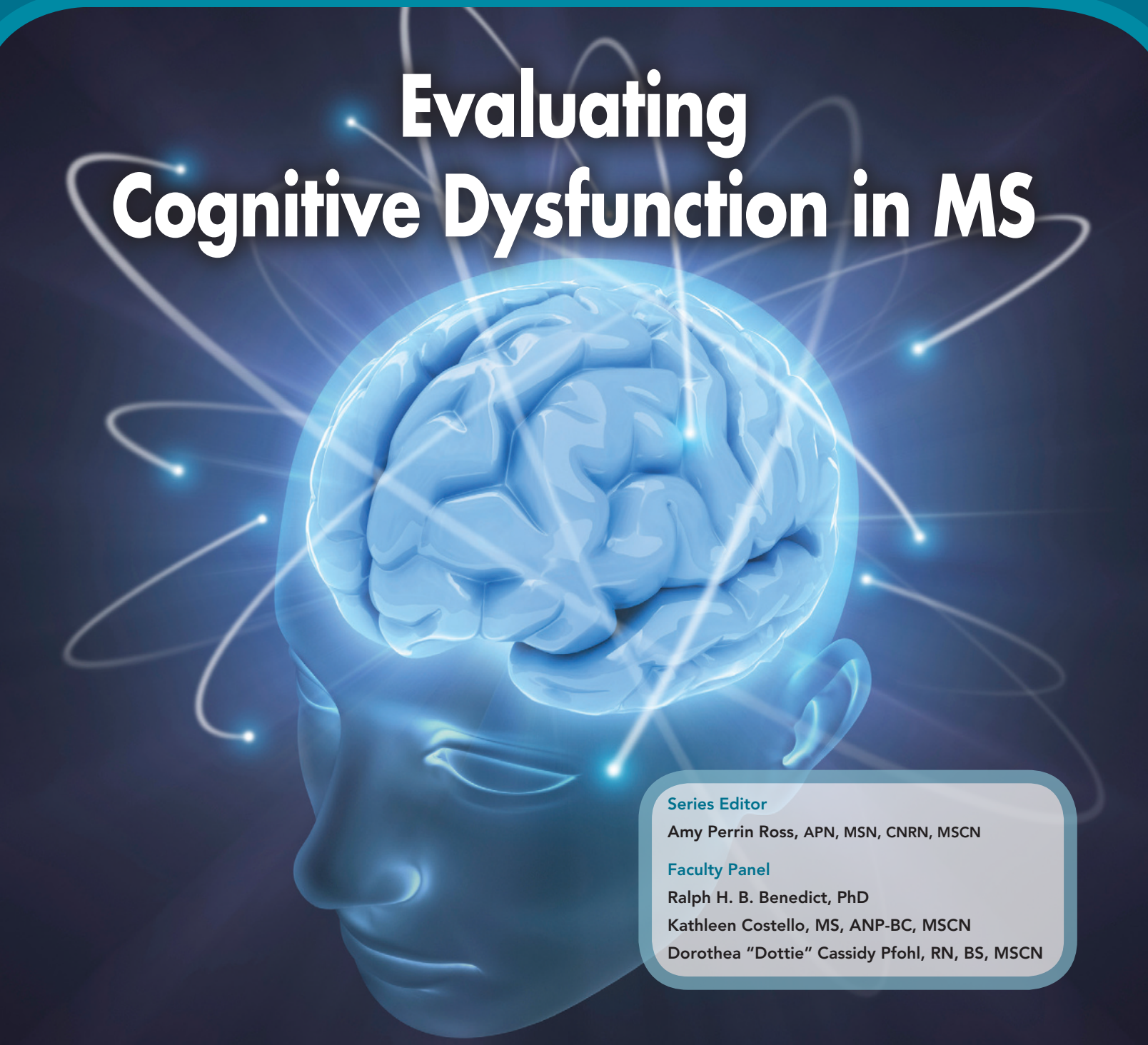
Counseling Points™

Enhancing Patient Communication for the MS Nurse

Evaluating Cognitive Dysfunction in MS



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Counseling Points™

Evaluating Cognitive Dysfunction in MS

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 MS nurses with information and strategies to evaluate and guide treatment decisions in patients with MS who experience cognitive dysfunction.

Learning Objectives

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

- Review the prevalence of cognitive impairment in MS and describe early signs and symptoms
- Discuss the etiology of cognitive dysfunction in relapsing and progressive forms of MS
- Describe methods for evaluating cognitive function in MS, from basic assessments to full neuropsychological evaluation
- Develop strategies for counseling patients about cognitive impairment, including risks, early signs, when to seek evaluation, and interventions

Continuing Education Credit

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In order to earn credit, please read the entire activity and complete the posttest and evaluation at the end. Approximate time to complete this activity is 60 minutes.

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welcome

Dear Colleague,

Cognitive dysfunction is a challenging aspect of multiple sclerosis (MS) management. The knowledge that MS may cause not only loss of mobility or ambulation, but also loss of some aspects of memory and personality, is certainly an added stressor for a person facing this disease. Unfortunately, it is still not clear which patients will experience cognitive dysfunction due to MS, or why. However, there is evidence that cognitive impairment in MS is limited to certain skills or "domains" and in many cases may be amenable to treatment.

Difficulties with mental functioning can arise from many factors unrelated to or indirectly connected to MS, including fatigue, depression, an underlying infection, stress, and hormonal changes. It would be valuable to separate these causes from true MS cognitive dysfunction, but this may not always be possible. Evaluating cognitive dysfunction in MS is a challenge—simple screening tools tend to exhibit a high degree of false positives, and full neuropsychological assessments are prohibitively complex and expensive in many cases.

For this issue, our faculty panel includes noted MS neuropsychologist Ralph Benedict, PhD, along with a panel of MS nurse specialists with expertise in managing cognitive dysfunction. While there is still much to learn about cognitive dysfunction in this disease, MS nurses will certainly gain valuable skills and insight from this continuing education program that can be applied in clinical practice.

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Evaluating Cognitive Dysfunction in MS

Cognitive impairment is common in multiple sclerosis (MS), affecting roughly 50% of patients, and is not necessarily associated with advanced stages of disease.[1,2] It is usually not possible—even for an expert neuropsychologist—to predict whether a person with MS will develop cognitive impairment and when. Some people who have significant physical disabilities due to MS remain fully intact cognitively, while others may experience cognitive impairment early in the disease course, as one of the first signs of MS onset, or even during clinically isolated syndrome (CIS).[3,4] A study by Patti and colleagues of 550 people with MS and mild physical disability (Expanded Disability Status Scale of 4 or less) found that about 20% had signs of cognitive impairment.[5] At the same time, patients with progressive forms of MS (e.g., primary-progressive and secondary-progressive MS) have been shown to be at higher risk for cognitive impairment than those with relapsing-remitting MS (RRMS).[6]

For nurses caring for patients with MS, evaluating and assessing the person's cognitive health is as important as evaluating gait changes or lesion load on magnetic resonance imaging (MRI). This involves evaluating the patient's functional status, assessing how cognitive changes may be affecting the person's quality of life (QOL), determining whether treatments may help (including treatments for related conditions such as fatigue or depression), and counseling the patient.

Profile of Cognitive Dysfunction in MS

The onset of cognitive impairment in MS is usually not easy to pinpoint. Some people notice distinct changes in their mental functioning that can be attributed to the disease. These changes might include difficulty remembering where they put things, frustration in trying to learn a new skill at work, feeling slow in the rate of processing information, having unusual difficulty tracking two activities at once, or trouble with finding the right words when speaking. But for most people with MS, determining whether cognitive changes have occurred, and the reasons for these changes, is not straightforward. As outlined in **Table 1**, many symptoms and features of MS as well as unrelated health conditions can affect a person's perception of their own cognitive efficiency, or their

Table 1. Factors that May Affect Cognitive Functioning in MS

- Neurologic changes due to MS (e.g., brain atrophy)
- Stress, anxiety
- Fatigue
- Pain
- Spasticity (e.g., efforts to control spasticity that interferes with concentration)
- Heat
- Drug side effects
- Depression
- Other medical conditions (e.g., thyroid disease, psychiatric conditions)
- Hormonal changes (e.g., menopause)
- Lifestyle issues (e.g., hectic lifestyle, caregiver of the elderly or young children, job stress)

actual cognitive abilities. Determining whether a person's actual abilities are affected by MS usually requires neuropsychological testing.

Initiating a Discussion About Cognitive Changes

Although Charcot recognized the problem of cognitive dysfunction in MS over 100 years ago, the problem was regarded as a "taboo" topic by health care professionals and patients until only recently.[7,8] Asking a person with MS if he or she has noticed any cognitive changes is not always a reliable predictor of whether decline has occurred. Research shows that humans are not necessarily good judges of their own mental acuity—for example, whether they are good at remembering names or organizing tasks.[9] In addition, some patients may be reluctant to admit to mental changes, or may assume that they are to blame for their lack of concentration or forgetfulness. Thus, results from a formal cognitive assessment may differ significantly from the patient's self-assessment. Observations from family members about cognitive changes in an individual with MS are more likely to correlate with findings from a neuropsychological assessment, but one study has shown that family members tend to overestimate the degree of cognitive impairment.[10]

Although the patient's self-assessment of cognition might not tell the full story, it is important to inquire about the patient's cognitive functioning during the initial evaluation and follow-up examinations. Asking a general question such as, "Are you experiencing any problems with your memory?" is unlikely to yield useful information. Instead, it may be more effective to ask questions about specific tasks or circumstances related to the person's life, such as "Have you been able to focus on your work?"

Many people tend to associate cognitive impairment with Alzheimer's disease (AD), and may assume that the pattern in MS is similar to that of AD. While the presentation of cognitive changes in MS differs with each individual, the most common clinical presentation usually involves specific, often-subtle cognitive deficits rather than overt dementia.[2] Research shows that only a small proportion (5% to 10%) of people with MS experience cognitive impairment in multiple spheres and severe enough to markedly interfere with major life roles and activities (i.e., dementia).[6,11] Patients can be reassured that the typical pattern in MS usually does not closely resemble that of AD, in that the course is typically much more benign. The domains most commonly affected in MS are shown in **Table 2**.[7,12] Domains that seem to be relatively unaffected include simple attention and essential verbal skills.

Impact of Cognitive Impairment on Quality of Life

Although some research studies have not shown strong correlations between QOL and cogni-

Table 2. Cognitive Domains Commonly Affected in MS[7,12]

Domain	Description
Information processing speed	Perceiving, attending/responding to incoming information
Cognitive flexibility	Attending to multiple stimuli at the same time ("multi-tasking")
Episodic memory	Problems with storage and retrieval of information
Executive function	Planning, abstract reasoning, problem-solving

tive impairment in MS, it is easy to argue that QOL is, in fact, significantly affected by cognitive changes.[13,14] This is especially true with regard to employment status. Recent studies show that between 50% and 75% of people with MS are unemployed within 10 years of diagnosis.[15] Cognitive impairment is the leading predictor of occupational disability, while physical disability, age, sex, and education contribute less than 15% to the likelihood of being employed.[16]

A recent study presented at the 2012 European Committee for Treatment and Research in Multiple Sclerosis (ECTRIMS) meeting involving patients with CIS and early RRMS found strong correlations between lower levels of cognition and a desire to work less, which, according to the investigators, suggested that the capacity to work is negatively affected even in the very early stages of MS or CIS.[17]

Current research is also exploring whether MS has an effect on "social cognition," which may include difficulty interpreting changes in facial expressions or identifying with another person's feelings. In another paper from ECTRIMS, people with MS were shown to have significantly impaired social cognition relative to matched controls.[18] These researchers noted that strong social support is an important way for people with MS to balance the impact of the disease on their lives, yet ironically MS may result in impairments that hinder their social interaction.[18]

Evaluation of Cognitive Dysfunction in the Clinical Setting

One of the challenges in evaluating cognitive functioning in MS is that use of basic screening instruments familiar to most neurologists, such as the Mini-Mental State Examination (MMSE), may be too broad and tends to yield a high degree of false-negative results. At the same time, it is not practical to refer every person with MS for a full-scale neuropsychological assessment. Finding a "middle ground" evaluation instrument that can be administered easily in the clinical practice setting—yet is sensitive enough to detect specific cognitive impairments without being a catch-all—has been a considerable challenge. Ideally, such a monitoring tool could be administered inexpensively and easily by an MS nurse to identify patients for whom more comprehensive neuropsychological testing is warranted. A recently developed testing protocol, the Brief International Cognitive Assessment for MS (BICAMS), has this goal, with an estimated completion time of 5 to 15 minutes depending upon which portions are administered.[19,20] The Rao Brief Repeatable Neuropsychological Battery (BRNB) is another group of assessments designed for use in office practice.[21] At the other end of the spectrum is the Minimal Assessment of Cognitive Function in Multiple Sclerosis (MACFIMS), used by neuropsychologists and in research studies as a sensitive instrument to diagnose cognitive dysfunction and detect changes in cognition over time and in response to treatment.[22] The specific tests utilized in each of these protocols are listed in **Table 3**.

Using Imaging Technologies to Identify Cognitive Change in MS

Can MRI be used to "diagnose" cognitive dysfunction? Research using MRI and other forms of imaging such as magnetization transfer ratio (MTR) or diffusion tensor imaging (DTI) have shown correlations between damage to brain structures and cognitive impairment in people with MS.[12] Despite these correlations, there is no definitive marker on MRI that can be used to diagnose or predict cognitive impairment in an

Table 3. Assessment Tools for Evaluating Cognitive Dysfunction in MS[17-22]

Brief International Cognitive Assessment for MS (BICAMS)	Rao Brief Repeatable Neuropsychological Battery (BRNB)	Minimal Assessment of Cognitive Function in Multiple Sclerosis (MACFIMS)
Used in neurology practice as a brief screening assessment	Used in neurology practice or in neuropsychology setting	Used mainly by neuropsychologists as part of a comprehensive assessment
5 minutes: SDMT only 15 minutes: all 3 tests[17,18]	20 to 30 minutes[19]	90 minutes[20]
SDMT	PASAT	PASAT
California Verbal Learning Test	SDMT	SDMT
Brief Visuospatial MemoryTest	Selective Reminding Test	California Verbal Learning Test
	10/36 Spatial Recall Test	Brief Visuospatial Memory Test
	Controlled Oral Word Association Test	Controlled Oral Word Association Test
		Judgment of Line Orientation Test
		D-KEFS Sorting Test

D-KEFS=Delis-Kaplan Executive Function System; PASAT= Paced Auditory Serial Addition Test; SDMT=Symbol Digit Modalities Test.

individual with MS. Furthermore, the findings are not reproducible enough across different scanners and MRI protocols for clinical practice such that a person's MRI results could be compared from one test to another to detect change in clinical practice settings.[23]

Earlier studies revealed only modest associations between whole brain T2 lesion burden and cognitive test performance.[24] More recent research has shown "robust" correlation between cognitive impairment and loss of neural connections in the gray matter, whole brain atrophy, and atrophy in specific areas such as the third ventricle, deep gray matter, and the corpus collosum.[25,26] These changes can be detected quite early in the disease process. For example, Henry and colleagues have detected thalamus atrophy early in MS and have shown that changes in this structure are associated with cognitive disorders in MS.[27]

Gray matter damage is one of the key factors associated with cognitive impairment in MS. Research by Filippi and colleagues has suggested that gray matter atrophy identified early in the course of MS may be predictive of cognitive impairment and disability progression in later years.[28] In a study spanning 13 years, these investigators showed that, among patients with early MS and gray matter damage at baseline, 66% had significant worsening of disability and 43% were cognitively impaired at the 13-year follow-up. Baseline gray matter fraction and 12-month percentage of change in gray matter on MTR were identified as independent predictors of long-term worsening of disability and cognitive impairment.[28]

Studies involving advanced forms of imaging such as MTR, which is highly sensitive to myelin content, have been found to correlate well with overall cognitive performance.[24,29] With future advances in technology and access to imaging, it may be possible to identify the distribution of gray matter atrophy in order to differentiate patients with cognitive impairment

from those without, and determine why the problem occurs.[12] Some experts predict that identifying changes in gray matter via MTR and other methods may be useful in predicting future disease course as well as response to therapy in individual patients, thus serving as a surrogate marker for the effects of treatment in MS.[23]

Since brain atrophy and MRI lesions are reduced in patients who receive disease-modifying therapy (DMT) for MS, it may be reasonable to assume that treatment has the potential to limit cognitive dysfunction by helping to preserve anatomical structures of the brain.[5]

Treatment of Cognitive Dysfunction

Once cognitive impairment has been identified in a person with MS, what can be done to treat or alleviate this condition? First, patients should be encouraged to begin or remain on an effective DMT. Based on these agents' ability to inhibit inflammation and mitigate the accumulation of brain lesions, it is likely that DMTs exert some degree of neuroprotection that may limit the progression of cognitive impairment.[30]

Few controlled, well-designed trials of DMTs have specifically examined the outcome of cognition in MS. Trials of intramuscular interferon beta-1a showed a significantly beneficial effect on the domains of information processing and learning/memory. Treatment has also been shown to delay the time to sustained deterioration on the Paced Auditory Serial Addition Test (PASAT).[31] Similarly, trials of interferon beta-1b showed improvements in performance on the Visual Reproduction Delayed Recall Test in treated patients.[32] Many recent studies of DMTs have examined outcomes such as reduction of brain atrophy, which may relate to cognition. A study of glatiramer acetate in 30 treatment-naïve patients with MS suggested that the drug's effects on amyloid-beta metabolism in cerebrospinal fluid may influence cognitive function, as demonstrated in performance on PASAT.[33]

While it seems prudent to encourage patients to limit CNS damage by using a DMT, other pharmacologic options for cognitive impairment in MS are limited at this time. Drugs used in AD, such as the acetylcholinesterase inhibitors donepezil and rivastigmine, have not been shown to yield benefits in patients with MS.[1,34] Studies of modafinil, a drug used to treat fatigue associated with excessive daytime sleepiness, has not been shown to affect cognitive dysfunction in people with MS.[1] In addition, controlled studies have shown that *Ginkgo biloba* does not improve cognition in MS.[35]

There is evidence to suggest that exercise training in people with MS has the potential to improve many aspects of cognitive performance. Exercise has been proposed to have positive effects in reducing inflammation and neurologic damage in people with MS. Although little research has been done to correlate exercise training with cognition in MS, some of the preliminary evidence is promising.[36]

Benefits of Cognitive Rehabilitation in MS

Cognitive rehabilitation techniques have been demonstrated in clinical trials to help many patients improve in certain areas of cognition. These services may be available in private practice settings, hospitals, or rehabilitation centers.[37] Cognitive rehabilitation should not be confused with cognitive behavioral therapy, a form of psychotherapy that emphasizes the role of thought patterns in moods and behaviors. Cognitive rehabilitation is intended to correct deficits in memory, concentration and attention, perception, learning,

planning, sequencing, and judgment. The goals of cognitive rehabilitation are 1) to enhance the person's capacity to process and interpret information, and 2) to improve the person's ability to function in activities of daily living.[38]

Neuropsychologists often guide cognitive rehabilitation sessions, assisted by other specialists such as occupational therapists or speech and language pathologists. A neuropsychiatrist may become involved if the cognitive disorder overlaps with a psychiatric condition or results in mood or behavioral changes that may be treatable with pharmacotherapy.[39] Some cognitive rehabilitation programs use computer-assisted cognitive training approaches, while others use an integrated or interdisciplinary approach. Home-based computer-assisted cognitive training has been evaluated in MS, but these programs are still in the early stage of development.[40]

Relatively little is know about the efficacy of cognitive rehabilitation in MS, but studies evaluating this treatment approach have shown promising results.[41] An evidence-based review by O'Brien and colleagues identified 16 studies of cognitive rehabilitation for persons with MS, including four Class I studies and five Class II studies, with most supporting interventions aimed at improving verbal learning, new learning, and memory.[42] Similarly, a Cochrane review found "evidence of effectiveness" of cognitive rehabilitation on outcomes in people with MS.[43] Few studies have looked at interventions aimed at improving executive functioning in people with MS.[38] Deficiencies in processing speed have been shown to be a strong predictor of long-term cognitive decline, with pronounced decline occurring over a period of 8 years, but few or no studies exist showing the effects of cognitive rehabilitation in this area.[38]

Does "Brain Training" Help?

Certain electronic games and puzzles have been touted as a way to keep the brain nimble and even stave off the effects of AD and other causes of memory loss. The notion here is that speed tasks, memory builders, and repetitive skills build neural connections that are more resistant to the effect of aging and other potential causes of diminished cognition. This is an intuitively appealing idea, but at present there is no definitive evidence that particular training techniques are better than others.

The concept of "cognitive reserve" has been widely discussed in relation to AD and is of growing interest in MS. By some definitions, the concept of cognitive reserve suggests that a person's innate intelligence or other life experiences (e.g., educational or occupational achievements) may supply reserve—or increased neuroplasticity—that allows some people to cope with brain pathology better than others.[44] This implies that people with lower levels of cognitive reserve are at higher risk for impairment from MS, with the theory that more highly intelligent people have brains that are better able to compensate.

Research on cognitive reserve in MS is in its infancy. At the same time, little is known about the specific benefits of brain training websites for people with MS. If the programs are something the person enjoys doing and feels he or she can gain skills from it, there's no harm in trying them. However, there is no hard evidence that these programs work better than other types of cognitively challenging pursuits, such as reading a novel and reviewing its content with another person. At this time, people with MS should not feel pressured to do brain training exercises because they believe they must either "use it or lose it." If certain tasks are adding to a person's stress or frustra-

tion, other mental activities or creative hobbies should be substituted.

Counseling Patients With Cognitive Dysfunction

A person with MS who is struggling with cognitive impairment needs support and reassurance, and in some cases additional counseling support from a therapist or mental health professional. Patients may fear that their mental function may decline rapidly, that the pattern may mimic that of AD, or that they will be unable to care for themselves or for loved ones in the future. The impact on employment is a significant concern, depending upon the type of work the person does and whether workplace adaptations can be made.

Steps in counseling include:

1. Assessment. Get more information about what's going on and whether changes could be attributed to other causes such as drug side effects.
2. Impact. Discuss how cognitive changes affect this individual. How is the person's employment or ability to run a household affected?
3. Reassurance. Cognitive decline in MS often does not progress to outright dementia. It may be limited to certain mental domains, and patients can learn ways to help compensate for certain skills. At the same time, patients must be reassured that they are not "going crazy;" that the cognitive decline in MS is real and they are not at fault.
4. Explore treatments. DMT limits brain lesions and atrophy and thus is likely to help curtail cognitive decline, although direct treatment associations have been difficult to establish in clinical trials. Side effects from DMT or other drugs used to treat MS symptoms such as spasticity or depression may affect cognition, so a possible association should be ruled out. Cognitive rehabilitation therapies have the best evidence at this time for helping patients to improve certain types of skills.
5. Provide resources and additional support if needed. Patients can be referred to an occupational therapist to assist with adaptation of certain skills or to a psychosocial therapist for assistance with coping and stress reduction.
6. Follow up. Evaluate changes in cognitive functioning over time. Discuss the person's coping strategies and resources to find out if more support is needed.

Cognitive impairment may affect how patients absorb and retain instructions about the dosage and/or administration of medications, dates and times of follow-up appointments, and other aspects of MS self-care. Without "talking down" to the person, it is a good idea to present complex information in small, manageable portions and to review instructions carefully. Providing instructions in both verbal and written form is advisable, and in many cases an electronic or video form of some instructions can be helpful.

While it's important to empathize with patients, health care professionals should avoid comments such as, "Oh, I lost my keys this morning, too." To patients, this type of comment may seem to discredit their problems or make it appear that their cognitive difficulties are not taken seriously. Instead, one should acknowledge to patients that their problems are real, they may be arising from multiple causes, and there are processes available to address some of these concerns.

Conclusion

Cognitive dysfunction in MS is no longer the taboo subject it was at one time. Several helpful books (including first-person accounts) and pamphlets are available to provide patients with more

Table 4. Resources for Patients on Cognition in MS

- National Multiple Sclerosis Society (NMSS) Web page on cognitive function. http://www.nationalMSsociety.org/Cognition
- LaRocca N. Talking About Cognitive Dysfunction. National Multiple Sclerosis Society. 2009. Available at: www.nationalmssociety.org/download.aspx?id=177
- Gingold JN. Facing the Cognitive Challenges of Multiple Sclerosis. New York, NY: Demos Medical Publishing, 2006.
- MS Trust. Staying Smart. http://www.stayingsmart.org.uk/

information about the topic (**Table 4**). A pamphlet from the National Multiple Sclerosis Society (NMSS) by LaRocca provides additional advice to assist health care professionals in counseling patients with MS about cognitive dysfunction.[39] While patients may find many resources in print and on the web, it is essential to remind them that every individual's course is unique, and the cognitive deficits experienced by one person may not be representative of what they will experience, even though they may have the same diagnosis.

Cognitive dysfunction in MS is becoming more widely discussed, but also better researched in terms of the specific areas of the brain affected, the testing modalities that work best for evaluation, and the effects of treatment such as cognitive rehabilitation. Future goals will be to detect which patients will be affected so that early, targeted interventions can be applied.

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Counseling Points™

Evaluating Cognitive Dysfunction in MS

- Cognitive dysfunction in multiple sclerosis (MS) is difficult to predict. Some people with significant physical disabilities remain fully intact cognitively, while others may experience cognitive impairment early in the disease course and as one of the first signs of MS onset.
- Difficulties with mental functioning can arise from many factors unrelated to or indirectly connected to MS—including fatigue, depression, an underlying infection, stress, and hormonal changes.
- Finding an evaluation instrument for cognitive dysfunction is challenging: Screening instruments are too broad and full assessments may be cost-prohibitive. Some brief instruments have been developed for use in clinical practice that may identify patients who require more comprehensive evaluation.
- Imaging studies used in MS, including magnetic resonance imaging (MRI) and magnetization transfer ratio (MTR), have yielded useful information to expand knowledge of cognitive dysfunction. Despite correlations in research, there is no definitive marker on MRI that can be used to diagnose or predict cognitive impairment in an individual with MS.
- Since brain atrophy and MRI lesions are reduced in patients who receive disease-modifying therapy (DMT) for MS, it is reasonable to assume that treatment has the potential to limit cognitive dysfunction by helping to preserve anatomical structures of the brain.
- Among treatment approaches examined for cognitive impairment (other than DMT), the most effective shown to date for people with MS has been cognitive rehabilitation. More study is needed on this approach to determine its benefits in MS.
- "Brain training" is a popular way for people to incorporate mental exercises into their daily lives, but there is no specific evidence to prove that these techniques can help preserve cognition in people with MS.

Counseling Points™
Evaluating Cognitive Dysfunction in MS

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.

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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. Which of the following is true about cognitive dysfunction in multiple sclerosis (MS)?
A) It affects mainly people with more advanced disability
B) The risk can be predicted on the basis of magnetic resonance imaging (MRI) findings
C) The risk is higher among people with progressive forms of MS
D) All of the above

2. An accurate way to determine whether a patient has cognitive dysfunction is:
A) ask the patient if he or she has noticed changes in memory or mental function
B) ask family members if they have noticed cognitive changes in the patient
C) compare findings of previous and current MRIs to look for changes in brain atrophy
D) ask the patient to participate in a cognitive assessment test recommended for MS

3. The proportion of patients with MS estimated to have cognitive impairment severe enough to interfere significantly with life roles and activities is:
A) 5% to 10%
B) 20% to 30%
C) 30% to 40%
D) 50%

4. Cognitive domains affected by MS include all of the following *EXCEPT*:
A) information processing speed
B) executive functioning
C) essential verbal skills
D) episodic memory

5. Which of the following factors has been shown to be most significantly associated with occupational disability in people with MS?
A) physical disability
B) cognitive impairment
C) educational status
D) age

6. Which of the following cognitive assessment tools is intended to identify patients who are candidates for a neuropsychological evaluation?
A) Mini-Mental State Examination
B) Brief International Cognitive Assessment for MS
C) Minimal Assessment of Cognitive Function in Multiple Sclerosis (MACFIMS)
D) Short-Form 36 (SF-36) Health Survey

7. Atrophy in the _____ area of the brain has been shown to correlate strongly with cognitive dysfunction in MS.
A) third ventricle
B) parietal lobe
C) cerebellum
D) all of the above

8. Disease-modifying therapy (DMT) for MS is believed to have a protective effect on cognitive function by limiting inflammation and neurodegeneration.
A) True
B) False

9. Which of the following treatment approaches has been demonstrated in research to benefit people with MS and cognitive dysfunction?
A) donepezil
B) exercise
C) modafinil
D) *Ginkgo biloba*

10. Which of the following statements is true about cognitive rehabilitation?
A) It is mainly used for brain injury and has not been studied in MS.
B) It has not been shown to be helpful for people with MS.
C) It has been shown to help people with MS to improve in certain domains.
D) It can only be done in rehabilitation facilities specializing in MS.

11. "Brain training" using specially designed websites is considered essential for people with MS to preserve their cognitive functioning.
A) True
B) False

12. Counseling patients with MS about cognitive dysfunction should include all of the following strategies *EXCEPT*:
A) inquiring about the impact of cognitive difficulties on daily living
B) recommending professional evaluation if indicated
C) reassuring that cognitive disability is often not extensive
D) reminding patients that all of us tend to have occasional lapses in memory

Counseling Points™: Program Evaluation Form

Evaluating Cognitive Dysfunction 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) Review the prevalence of cognitive impairment in MS and describe early signs and symptoms 5 4 3 2 1
2) Discuss the etiology of cognitive dysfunction in relapsing and progressive forms of MS 5 4 3 2 1
3) Describe methods for evaluating cognitive function in MS, from basic assessments to full neuropsychological evaluation 5 4 3 2 1
4) Develop strategies for counseling patients about cognitive impairment, including risks, early signs, when to seek evaluation, and interventions 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

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