



## Managing Cognitive Dysfunction in Multiple Sclerosis: A Snapshot of Changes in Screening, Assessment, and Treatment Practices

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### ABSTRACT

**BACKGROUND:** Cognitive dysfunction is prevalent in multiple sclerosis (MS) and can have a negative effect on several aspects of the daily lives of individuals with MS. In 2010, members of the Consortium of Multiple Sclerosis Centers (CMSC) were surveyed to understand MS clinicians' screening, assessment, and treatment practices for cognitive problems. Given the advancements made in the field in the past decade, it was deemed time to reevaluate how cognitive dysfunction is managed in the clinical setting.

**METHODS:** An online questionnaire was completed by 56 CMSC members. They were asked to describe their clinical practices, procedures for screening and further evaluation, and treatment recommendations for cognitive dysfunction. Participants were also asked whether their practice had changed in terms of the number of cognitive screenings, prescriptions for cognitive problems, and referrals for neuropsychological assessment and cognitive remediation in the past 5 years to allow for clinicians who had not been in practice for 10 years.

**RESULTS:** Participants reported an increase in the number of cognitive screenings and referrals for neuropsychological assessments and cognitive remediation during the past 5 years. Compared with 2010, participants endorsed greater use of person-administered screening measures, such as the Symbol Digit Modalities Test, and fewer prescriptions for medications to improve cognitive functioning.

**CONCLUSIONS:** Clinical practices are becoming more in line with the literature, with increased use of cognitive screening and remediation. Continued attention to cognitive problems will be an ongoing important component of MS-related care.

*Int J MS Care. 2022;24(3):104-109. doi:10.7224/1537-2073.2020-139*

Given the prevalence<sup>1</sup> and impact<sup>2-4</sup> of cognitive dysfunction on individuals with multiple sclerosis (MS), early baseline screening with follow-up annual screening and a comprehensive evaluation (eg, a neuropsychological assessment) if the screening is positive is recommended.<sup>5</sup> In lieu of comprehensive assessments, brief cognitive tests may also be used to monitor for clinical status changes potentially associated with relapse.<sup>6</sup> Treating cognitive dysfunction has historically been problematic, with inconsistent evidence on the benefits of pharmacologic and nonpharmacologic interventions.<sup>7</sup>

In 2010, Consortium of Multiple Sclerosis Centers (CMSC) members (n = 207) completed a survey about their cognitive-related practices.<sup>8</sup> Approximately 49% of respondents had no formal screening procedures but were attuned to the symptoms and signs of cognitive impairment, and another 3% had no formal procedures and gave little attention to these issues.<sup>8</sup> Approximately 26% of respondents indicated that they refer 21% to 40% of their patients with suspected cognitive impairment for further evaluation, and another 25% said they refer 10% or fewer.<sup>8</sup> Regarding treatments, 58% of respondents reported that they would prescribe a medication and 31% said they would recommend cognitive remediation.<sup>8</sup>

During the past decade, several advancements have been made, including improved screening/monitoring batteries such as the Brief International Cognitive Assessment for MS (BICAMS),<sup>9</sup> evidence of the benefit of cognitive-focused interventions,<sup>10</sup> and professional recommendations for screening

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Note: Supplementary material for this article is available at [ijmsc.org](http://ijmsc.org).

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**TABLE 1.** Types of Screening Procedures Used in 2010 and 2020

Screening procedure	2010 data, % (n = 274)	2020 data, % (n = 60)	P value
There is no formal procedure, but clinicians are very attuned to the symptoms and signs of cognitive impairment and routinely assess and query patients.	48.5	53.3	.501
There is no formal procedure and little specific attention to the problem by clinicians.	3.3	1.7	> .99
Use of self-report instruments such as the MSNQ-P or PDQ	11.7	8.3	.649
Use of informant-report instruments such as the MSNQ-I	6.9	5.0	.777
Use of conventional person-administered cognitive performance tests such as the SDMT	21.2	33.3	.044
Use of computer- or tablet-based cognitive performance tests such as the PST	8.4	11.7	.422

MSNQ-I, Multiple Sclerosis Neuropsychological Questionnaire-Informant; MSNQ-P, Multiple Sclerosis Neuropsychological Questionnaire-Patient; PDQ, Perceived Deficits Questionnaire; PST, Processing Speed Test; SDMT, Symbol Digit Modalities Test.

Note: Percentages are based on total number of answers given by participants.

and assessment.<sup>5</sup> Furthermore, given the impact of COVID-19 on health care and telehealth use, COVID-19 may have influenced the management of cognitive dysfunction. As such, it was deemed time to reevaluate practice patterns for changes. It was hypothesized that clinicians would endorse more screenings and referrals for neuropsychological assessments and cognitive remediation, given the increased emphasis on managing MS-related cognitive problems.

## METHODS

### Participants

As in 2010,<sup>8</sup> participants were recruited through the CMSC and were eligible if they identified as providers who see individuals with MS. All the participants were in the United States or Canada. An advertisement was placed in the CMSC's January 2020 e-newsletter, and the CMSC administrative staff sent emails to 2223 members in February and August 2020. Responses were collected via an online survey tool (Qualtrics) through October 2020. The study was approved by the Trinity Health Of New England institutional review board. A waiver of informed consent was obtained, and participants received an electronic information sheet.

### Measures

The items from the 2010 survey,<sup>8</sup> in which participants were asked to describe their clinical practices, their procedures for screening and further evaluation (including their experiences working with neuropsychologists), and their treatment recommendations, were replicated. Participants were asked whether their practice had changed in terms of the number of cognitive screenings, cognition-related

prescriptions, and referrals for neuropsychological assessments and cognitive remediation in the past 5 years. This time frame was chosen because some participants may not have been in the same practice for the past 10 years, a longer time frame may have excluded newer clinicians, and there was a greater risk of recall errors with a longer recall period. Because a third recruitment effort was undertaken after the first wave of COVID-19, these participants were asked whether COVID-19 had affected their screening practices and referrals for neuropsychological assessment and cognitive remediation.

### Statistical Analyses

Frequency analyses were ran using SPSS Statistics for Windows, version 26.0 (IBM). The  $\chi^2$  and Fisher exact tests were computed to compare the frequencies of responses between the 2010 and 2020 surveys and to determine any differences in practices between physicians and nonphysicians.

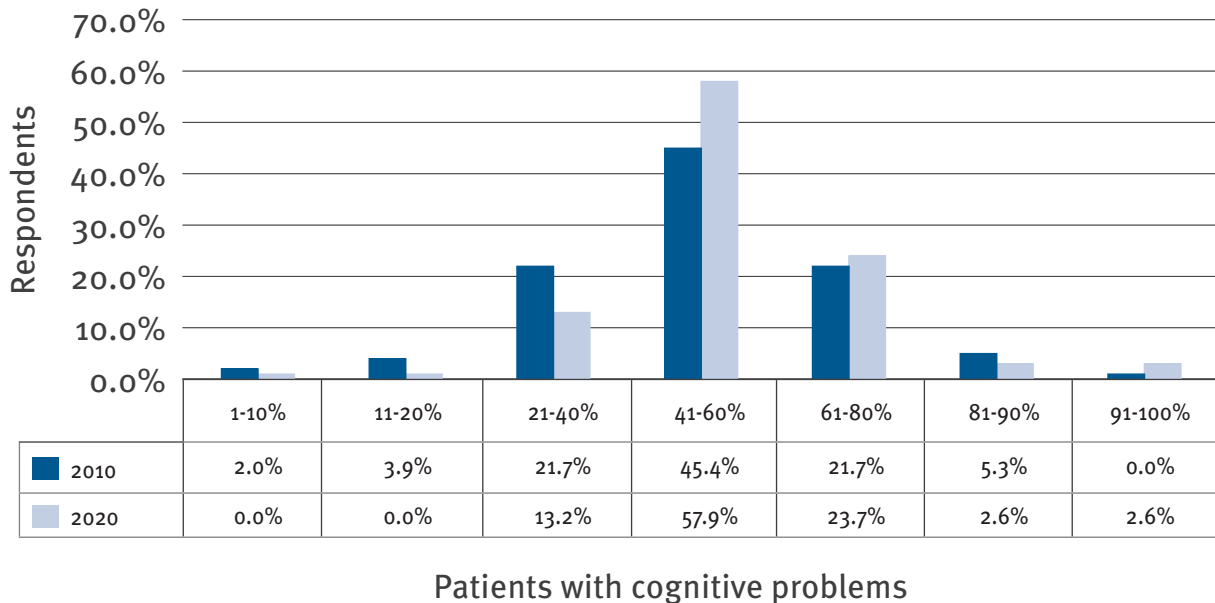
## RESULTS

### Demographics of the Health Care Providers

Fifty-six individuals responded to the survey, which was 27.1% of the 2010 survey sample size. Details about participants' professions and practices are in **TABLE S1**, which is published in the online version of this article at [ijmsc.org](http://ijmsc.org).

### Screening Practices for Cognitive Dysfunction

During the past 5 years, 68.8% of respondents reported an increase in cognitive screenings, with another 29.2% endorsing no changes. Screening procedures and comparisons are in **TABLE 1**. In addition, physicians in the current sample were more likely than nonphysicians to have no formal

**FIGURE 1.** Providers' Estimation of Percentage of Their Patients Who Screen Positive for Cognitive Problems

2010, n = 152; 2020, n = 38.

procedures but to be attuned to the symptoms (88.9% vs 42.1%;  $P = .001$ ).

More than 14% of respondents endorsed using a single measure, such as the Symbol Digit Modalities Test ( $n = 3$ ) or the Montreal Cognitive Assessment ( $n = 2$ ). Several participants reported using batteries, including validated batteries, such as the BICAMS (14.3%), and batteries with the measures selected based on patients' needs (32.1%).

Nearly 68% of respondents provided an estimate of how many patients have cognitive problems (**FIGURE 1**). Compared with 2010, there was a trend toward more patients screening positive, with fewer participants endorsing that 1% to 40% of their patients present with cognitive problems ( $P = .064$ ).

### Assessment Practices for Cognitive Dysfunction

Approximately 68% of respondents provided an estimate of how many patients they send for further evaluation (**FIGURE 2**). Compared with 2010, there was a significant reduction in the percentage of clinicians referring 10% or fewer of their patients ( $P = .006$ ). More than 57% of respondents reported referring to an in-house neuropsychologist or psychologist; 17.9% to an outside neuropsychologist or psychologist; 50.0% to another professional (eg, psychiatrist, occupational therapist, or speech therapist); and 19.6% to in-house medical, nursing, or other staff. Compared with 2010, a greater percentage of participants endorsed referring to other

professionals (50.0% vs 15.9%;  $P < .001$ ), and there was a trend toward a greater percentage using in-house neuropsychologists or psychologists (57.1% vs 43.5%;  $P = .069$ ).

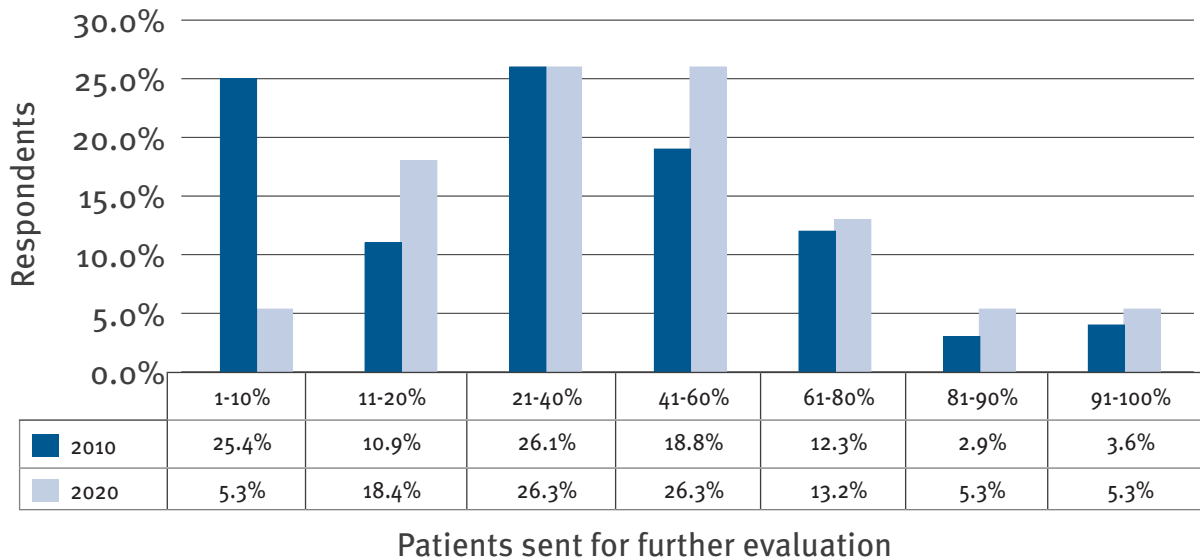
More than 89% of respondents reported having access to an MS-knowledgeable neuropsychologist, similar to the 2010 survey (81.6%;  $P = .174$ ). Of the participants who had access to a neuropsychologist ( $n = 50$ ), 60% noted they were in the same practice or clinic. Most participants indicated that the neuropsychologist had expertise in MS (62.5%) and was board certified (70.0%). During the past 5 years, 56.3% of respondents indicated an increase in referrals for neuropsychological assessments and another 41.7% reported no changes.

Participants who refer to a neuropsychologist were asked to rate their experience (**FIGURE S1**). Compared with 2010, participants had similar ratings for the time to get a report ( $P = .466$ ), clarity and readability of the report ( $P = .183$ ), and quality of the recommendations ( $P = .211$ ). In terms of the time to get an appointment, a lower percentage rated it as "good" in 2020 compared with 2010 ( $P = .006$ ).

### Treatment Practices for Cognitive Dysfunction

More than 39% of respondents reported that their practice would consider prescribing a medication, which is a decrease from 2010 (58.5%;  $P = .001$ ). Additionally, 20% of participants endorsed a decrease in prescriptions during the past

**FIGURE 2.** Providers' Estimation of Percentage of Their Patients With Suspected Cognitive Problems Who Are Referred for Further Evaluation



2010, n = 138; 2020, n = 38.

5 years and 45% indicated no changes. Among those who reported prescribing (n = 22), the most common medications were antifatigue agents (86.4%), followed by stimulants (77.3%), disease-modifying therapies (45.5%), dopamine agonist antidepressants (40.9%), cholinesterase inhibitors (40.9%), and glutamate modifiers (31.8%). Compared with 2010, a lower percentage of participants endorsed prescribing cholinesterase inhibitors (40.9% vs 83.5%;  $P < .001$ ), with trends toward fewer glutamate modifier prescriptions (31.8% vs 52.1%;  $P = .081$ ) and more stimulant prescriptions (77.3% vs 56.2%;  $P = .064$ ).

Cognitive remediation was one of the most common treatment-related referrals, as indicated by 60.7% of participants, which is an increase from 2010 (31.3%;  $P < .001$ ). Furthermore, 46.2% reported an increase in referrals during the past 5 years, with 51.3% noting no change. Besides cognitive remediation and other referrals for occupational therapy (8.9%) and speech therapy (5.4%), other endorsed treatment referrals included psychological services (eg, psychotherapy for depression; 73.2%), sleep evaluations (48.2%), neuropsychological counseling (44.6%), exercise training (44.6%), vocational rehabilitation (30.4%), and neurology (16.1%).

### Impact of COVID-19 on Practices

Participants noted several barriers due to COVID-19. With cognitive screenings (n = 15), 60% noted a negative impact because of issues such as less

face-to-face contact, virtual visits being less convenient for screenings, and decreased access to neuropsychological services for follow-ups. More than 46% of the cohort (n = 15) reported a negative effect on their referrals for neuropsychological assessments, citing limited access to services, difficulty scheduling appointments, and increased wait times. Regarding referrals for cognitive remediation (n = 12), 33.3% noted a negative impact because of no current face-to-face services and longer wait times.

## DISCUSSION

During the past 10 years, there seems to be a greater recognition of the need to manage cognitive dysfunction in MS. Approximately 69% of respondents endorsed an increase in screenings in the past 5 years, which is likely contributing to the observed trend of more patients screening positive than in 2010. Although having no formal procedures but being attuned to the symptoms and signs unfortunately remained the most frequently endorsed screening procedure, especially among physicians, there was a significant increase in the percentage of clinicians using conventional person-administered measures. In particular, the Symbol Digit Modalities Test has been recommended as a screening measure for MS-related cognitive dysfunction, as a stand-alone measure,<sup>5,11,12</sup> or as part of a battery.<sup>9,13</sup> Note that although the use of standardized cognitive screenings is low among neurologists,<sup>14</sup> the clinical

interview alone has not been shown to accurately detect individuals with cognitive impairment.<sup>15</sup>

Clinicians indicated an increase in patients receiving further evaluation for suspected cognitive problems. Besides more referrals for neuropsychological assessment, there was a significant rise in other referrals. Although this may be partly due to participants being able to select multiple options, it may also reflect the importance of a multidisciplinary approach for managing cognitive dysfunction. Although most participants indicated having access to a neuropsychologist, other practices may not, or the patient may face barriers (eg, not covered by their insurance). In terms of working with a neuropsychologist, several aspects were rated as “excellent” or “good,” such as the clarity and readability of the report (87.5%) and the quality of the recommendations (80.9%). However, there seems to be dissatisfaction with the time to get an appointment, which was rated as “fair” or “poor” by 62.2% of respondents, with several participants noting long waits, especially with COVID-19. This may also contribute to more providers referring their patients to other professionals.

There has been a shift since 2010 in treatment practices, with fewer prescriptions for cognition-related medications and more referrals for cognitive remediation. This may suggest that clinical practice is beginning to coincide with the literature, which shows insufficient evidence for pharmacologic treatment<sup>16</sup> but growing support for the use of cognitive-focused interventions.<sup>10</sup> However, additional research is needed to increase clinicians’ confidence to make these treatment recommendations.<sup>7</sup>

COVID-19 seems to have had a negative effect on cognition-related services, primarily because of decreased face-to-face services and reduced access to services. Although remote-based testing has been shown to be feasible in MS,<sup>17-20</sup> and there is growing utilization of mobile health tools for cognitive evaluations and training,<sup>21</sup> clinicians and patients may experience barriers that affect their ease of providing or using cognition-related telehealth services, such as translating services to a digital platform, digital literacy, and limited cellular network. Besides ensuring the assessment is being performed in a secure location with a strong internet connection, clinicians may consider brief trainings with the device if the patient is unfamiliar with it and making adjustments to improve ease of use (eg, larger text if there are visual impairments).<sup>21</sup>

Although this study has several strengths, such as the inclusion of multiple professions, an evaluation of changes during the past decade, and the influence of COVID-19 on services, there are limitations to consider. Despite multiple recruitment

## PRACTICE POINTS

- » Multiple sclerosis clinicians are reporting that they are conducting more cognitive screenings. Although most still endorse having no formal procedures, there has been a significant increase in the percentage of clinicians using measures such as the Symbol Digit Modalities Test.
- » Clinicians indicated an increase in the number of referrals for neuropsychological assessment. There has also been an increase since 2010 in the percentage of providers referring to psychiatrists, occupational therapists, and speech therapists for further evaluation.
- » Referrals for cognitive remediation have also increased, and fewer providers are recommending cognition-related medications, which is consistent with the evidence in the literature on efficacies of these treatments.

efforts, only 56 clinicians participated, representing slightly more than a quarter of the sample size of the 2010 survey<sup>8</sup> and less than 3% of the current CMSC membership. Recruiting at the CMSC annual meeting or offering an incentive for participation may have increased the membership’s awareness and involvement in the study. Participants may be more involved in the management of cognitive dysfunction and thus more motivated to participate. Therefore, these results should be viewed as a snapshot into current practices and may not be generalizable to clinicians in non-MS-specific practices or outside of the United States and Canada. Future research may consider including follow-up questions to elucidate some of the findings, such as whether physicians’ higher rate of no formal procedures for cognitive screening are because they are delegated to other colleagues. Because both surveys were anonymous, they could not be linked, and individual changes could not be measured. Finally, because these are retrospective estimates of referrals, it remains unclear how many individuals with MS are receiving these services. There has been 1 study examining utilization of neuropsychological services,<sup>22</sup> but this was limited to veterans in the US Department of Veterans Affairs system, who served during the Iraq and Afghanistan conflicts.

Overall, there has been increased attention to MS-related cognitive dysfunction in clinical practice, with clinicians endorsing increases in cognitive screenings and referrals for neuropsychological assessments and cognitive remediation. Besides highlighting evidence-based treatments, there is a continued need to use validated screening measures, routinely monitor for cognitive problems,



and refer individuals with possible cognitive dysfunction for further evaluation. □

**ACKNOWLEDGMENTS:** The authors thank June Halper and her team for assistance in distributing the survey to CMSC members.

**FINANCIAL DISCLOSURES:** Dr Benedict has received honoraria, speaking fees, or consulting fees from Biogen, Celgene, EMD Serono, Genentech, MedDay, Novartis, and Roche; research support from Biogen, Genentech, and Novartis; and royalties from Psychological Assessment Resources. Dr DeLuca has received funding from EMD Serono and Biogen; has served on advisory boards for Celgene, Novartis, Roche, and MedRhythms; has served as a consultant to Celgene, Roche, and Novartis; and has served a speaker for Biogen and Sanofi Genzyme. Dr Foley has received honoraria, speaking fees, or consulting fees from Biogen, EMD Serono, and Novartis; has received research support from Biogen; and has served on advisory boards for Biogen and Roche. Dr Gromisch declares no conflicts of interest.

**FUNDING/SUPPORT:** None.

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