

Cognition and MS

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Cognitive changes related to multiple sclerosis (MS) were first mentioned by Jean-Martin Charcot in 1877; however, it is only within the past 25-30 years that cognitive impairment in MS has received significant clinical study. Despite a growing body of research, though, formal screening of cognitive function is not always part of routine MS clinical care.

Q How common are cognitive symptoms in MS?

Cognitive changes affect up to 65% of patients in MS clinic samples and about one-third of pediatric MS patients.¹ Cognitive deficits occur in all the MS disease courses, including clinically isolated syndrome, although they are most prevalent in secondary progressive and primary progressive disease.¹ Cognitive changes have even been observed in radiographically isolated syndrome, in which MRI changes consistent with MS are observed without any neurologic symptoms or signs.²

Q What cognitive domains are affected in MS?

Strong correlations have been demonstrated between cognitive impairment and MRI findings, including whole brain atrophy and, to some degree, overall white matter lesion burden. Cognitive changes also result from damage in specific areas, including deep gray matter and the corpus callosum, cerebral cortex, and mesial temporal lobe.³⁻⁵

The type and severity of cognitive deficits vary widely among people with MS. However, difficulties with information processing speed and short-term memory are the symptoms most commonly seen in this population. Processing speed problems affect new learning and impact memory and executive function. Other domains that can be affected are complex attention, verbal fluency, and visuospatial perception.¹

Q Are cognitive symptoms in MS progressive?

Not everyone with cognitive symptoms related to MS will show progressive changes. However, in a longitudinal study, increasing age and degree of physical disability were predictive of worsening cognitive symptoms. Also, people who demonstrate early cognitive symptoms may experience greater worsening.⁶

Q What impact do cognitive symptoms have?

Changes in cognition are a common reason for someone to experience performance issues in the workplace and as such significantly affect a person's ability to maintain employment. Impaired cognition is a primary cause of early departure from the workforce and has significant implications for self-image and self-esteem.⁷

Furthermore, cognitive symptoms can impact adherence to medications. They also can negatively affect daily life, through increased risk for motor vehicle accidents, difficulties with routine household tasks, and significant challenges to relationships (particularly but not exclusively those with caregivers).

Q How are cognitive symptoms assessed?

There are several screening tools that take very little time to administer and can be used in the clinic setting. The Symbol Digit Modalities Test (SDMT; www.wpspublish.com/store/p/2955/sdmt-symbol-digit-modalities-test) is validated in MS and takes approximately 90 s to complete. This screening instrument is proprietary and has a small fee associated with its use.⁸

Other possible causes of cognitive dysfunction should be investigated as well. These include an examination of medications being used—such as anticholinergics,



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benzodiazepines, other sedatives, cannabis, topiramate, and opioids—and consideration of other diseases and conditions, including vascular conditions, metabolic deficiencies, infection, tumor, substance abuse, early dementia, or hypothyroidism, which may contribute to or cause cognitive impairment.

Should cognitive problems be identified—either through the history, during the clinic visit, or via screening tests—more formal testing, usually performed by a neuropsychologist, may be useful in identifying the domains of function that are impaired. This information can help to identify and implement appropriate compensatory strategies, plan cognitive rehabilitation interventions, and (in the United States) assist the individual to obtain Social Security disability benefits.

Q How are cognitive symptoms managed?

Multiple clinical trials of cognitive rehabilitation strategies have demonstrated the efficacy of computer-based programs in improving new learning, short-term memory, processing speed, and attention.⁹ Cognitive rehabilitation programs should be administered and/or supervised by a health care professional who is knowledgeable about MS as well as cognitive rehabilitation. Professionals such as neuropsychologists, occupational therapists, and speech language pathologists often direct cognitive training programs.

Medications that stimulate the central nervous system have been used to improve mental alertness. However, clinical trials

are few and have yielded mixed results.

In clinical trials, physical exercise has been shown to improve processing speed. More research is needed to demonstrate the type of exercise that is most beneficial and the extent of improvement in cognitive function that results.

SUMMARY

Cognitive function can be negatively impacted by MS. Activities of daily living, including employment and relationships, can be negatively impacted by changes in cognition. Regular screening of cognition is recommended by the National MS Society, using validated screening tools such as the SDMT. Additional testing is warranted for individuals reporting cognitive difficulties at home or work, or those who score below controls on screening tests. Cognitive rehabilitation may help some individuals improve their cognitive function. More research is needed to identify additional cognitive training techniques, better understand the role of physical exercise, and identify medications that may be of benefit to maintain cognitive function. **CR**

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