

# Assessing Cognition in MS Clinical Trials: The Cognitive Assessment Interview (CAI)



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## Objective

Our goal was to determine if the Cognitive Assessment Interview (CAI), a patient-and informant-based semi-structured interview addressing cognitive impairment in daily life, is applicable for use in MS.

## Background

More than 50% of individuals with MS have some degree of cognitive impairment. Specific cognitive screens such as the Brief International Assessment of Cognition in MS or BICAMS ([www.bicams.net](http://www.bicams.net)) are useful for detection and as potential outcome in trials, but do not capture the daily experience and impact of cognitive difficulties. Numerous studies of self-reported cognitive impairment inventories have shown that these measures are more strongly associated with mood and general distress rather than objective cognitive measures.

Semi-structured interviews with informant input have been useful for clinical studies in other conditions with cognitive impairment such as Alzheimer's disease. However, these inventories are typically too insensitive for use in MS. The CAI is a relatively new measure that has been useful in measuring cognitive impairment in schizophrenia and as an outcome measure for intervention trials.

## Methods

MS participants meeting criteria for at least mild cognitive impairment (SDMT score one standard deviation below published age normative means) completed a neuropsychological assessment and CAI that included an informant when possible.

Raters are trained with video examples and reach consensus with rating standards. The CAI rates degree of impairment across 10 cognitive domains. Each rating is grounded by examples of impairment. Each of the 10 items are rated for the patient, informant and a composite along a scale of 1 (no to minimal) to 7 (severe) impairment. Raters also provide a Clinical Global Impression (CGI; 1 to 7) and Global Assessment of Function (GAF-Cog; 1 to 100) for cognition.

Neuropsychological measures included the Symbol Digit Modalities Test (SDMT), Selective Reminding Test (SRT), the Brief Visuospatial Memory Test-Revised (BVM-T-R) and the Test of Everyday Cognitive Ability (TECA).

## Results

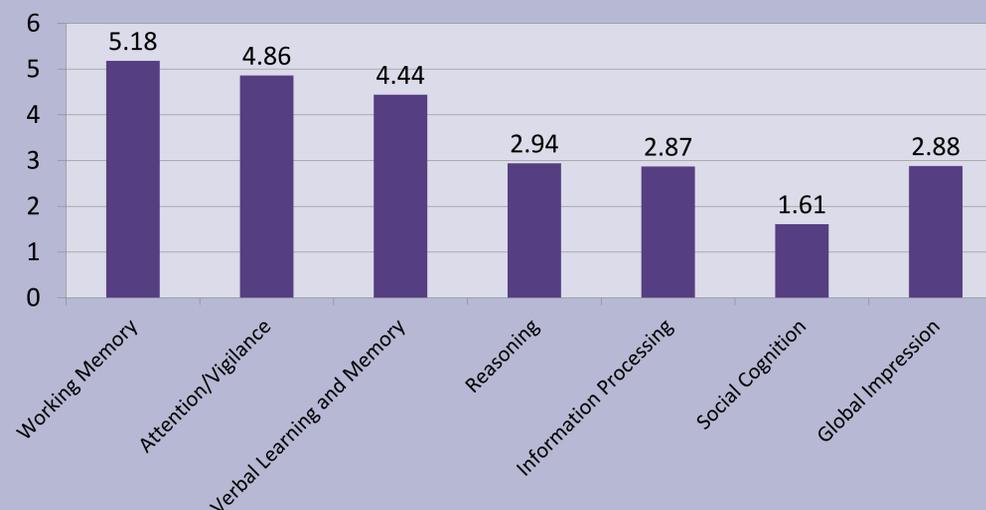
A total of 88 participants were administered the CAI; 59 also had an informant interview.

Table 1. Demographic and Clinical Features of Sample (n = 88)

Demographic		Clinical	
Female v. Male	80% vs. 20%	EDSS	0.0 to 8.0, median 2.0
Age (mean, SD, range)	51 ± 12 (19 to 69) years	Disease Duration	17 ± 12 (<1 to 45) years
Race	89% White, 6% African American, 5% Other	Subtypes	RRMS n = 62 SPMS n = 22 PPMS n = 4
Hispanic	15%		
Education	15 ± 2 (12 to 20) years		

As shown in Figure 1, with a scale of 1 to 7, working memory was the domain most impaired (severe impairment) followed by attention and vigilance, then memory and learning. Overall impairment for the sample was rated as mild, 2.88 ± 0.98 (range 1 to 5).

Figure 1: CAI Impairment Ratings Across Domains (n = 88)



## Summary of Results

Mean GAF-Cog (scale of increasing function from 1 to 100) was 73.0 ± 13.6 (range 49 to 97). MS participants' reports were generally consistent with the informants; however, mean scores for participant vs. informant report indicated significantly more experience on impairment of items of working memory (mean 3.2 v. 2.4,  $p < 0.001$ ), attention (2.6 v. 2.1,  $p = 0.01$ ), and learning (mean 2.6 v. 2.3,  $p = 0.04$ ).

The individual domain ratings did not correspond to objective cognitive measures. As shown in Table 2, there were mild correlations between the composite global measures and representative tests. The composite GAF was more strongly related to cognitive performance than the CGI.

	Composite Global Impression of Impairment	GAF-Cog
Verbal Learning (SRT)	$r = -0.07, p = 0.55$	$r = 0.08, p = .52$
Visual Learning (BVM-T-R)	$r = -0.06, p = 0.58$	$r = 0.10, p = 0.42$
Information Processing (SDMT)	$r = 0.14, p = 0.22$	$r = 0.24, p = 0.04$
Daily Activities (TECA)	$r = 0.17, p = 0.13$	$r = -0.25, p = 0.03$

## Conclusions

MS participants with at least mild cognitive impairment have overall mild functional impairment as well, but with aspects of working memory being the most severely effected. The CAI assesses the impact of cognitive impairment on daily living in MS. It captures aspects of real-world functioning that are distinct from both self-report and objective cognitive testing, and may be useful as an outcome measure for clinical trials.

## References

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