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Supplementary appendix

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Supplement to: Benedict RHB, Amato MP, DeLuca J, Geurts JGG. Cognitive impairment in multiple sclerosis: clinical management, MRI, and therapeutic avenues. *Lancet Neurol* 2020; **19**: 860–71.

Supplement. Table of Conventional person-administered neuropsychological tests and computer-assisted tests of cognitive processing speed (CPS) and memory frequently used in MS publications.

Conventional tests are fully vetted and validated in multiple sclerosis samples¹⁻⁴ demonstrating good reliability and validity.

	Cognitive Domain	Stimulus	Mode of Response	Equipment Needed Other Than Response Form	Time in min.
<i>Conventional Psychometric Tests</i>					
Symbol Digit Modalities Test ⁵	CPS; Learning	Paper Visual Display, Symbol Number Pairs	Oral Speech	None	5
Paced Auditory Serial Addition Test ⁶	CPS; Working Memory	Recorded Auditory Numbers	Oral Speech	Computer or Other Sound Player	5
Controlled Oral Word Association Test ⁷	CPS; Word Retrieval	None	Oral Speech	None	5
Semantic Verbal Fluency ⁷	CPS; Word Retrieval	None	Oral Speech	None	2
Stroop Color Word Test ⁸	CPS; Response Inhibition	Paper Visual Display, Single Words	Oral Speech	None	10
Rey Auditory Verbal Learning Test ⁹	Learning and Memory	Person Spoken Word List	Oral Speech	None	10
California Verbal Learning Test ¹⁰	Learning and Memory	Person Spoken Word List	Oral Speech	None	10
Selective Reminding Test ¹¹	Learning and Memory	Person Spoken Word List	Oral Speech	None	10
Brief Visuospatial Memory Test Revised ^{12, 13}	Learning and Memory	Paper Visual Display, 2x3 Matrix of Figures	Manual Paper and Pencil Renderings of Figures	None	5
10/36 Visual Recall Test ¹⁴	Learning and Memory	Checkboard, 10 Spaces Highlighted	Manual Placement of Checkers	Checkerboard Key	5

Computerized Neuropsychological Assessments					
CogState Detection Task ¹⁵	CPS; Manual Response Speed/Psychomotor Function	Screen Visual Display, Playing Cards	Computer Keyboard or Touchscreen	Personal Computer or iPad	2
Computerized Symbol Digit Modalities Test ¹⁶	CPS	Screen Visual Display, Symbol Number Pairs	Oral Speech	Personal Computer	2
Computerized Speed Cognitive Test ¹⁷	CPS	Screen Visual Display, Symbol Number Pairs	Oral Speech	Personal Computer	2
Processing Speed Test ¹⁸	CPS	Screen Visual Display, Symbol Number Pairs	Touchscreen	iPad	5
CNS Vital Signs Processing Speed Test ¹⁹	CPS; Visual Perception; Manual Response Speed	Screen Visual Display, Symbol Number Pairs	Computer Keyboard	Personal Computer	4
NeuroTrax Information Processing Speed Test ²⁰	CPS	Screen Visual Display, Single Digit Numbers and Basic Arithmetic Problems	Mouse Click	Personal Computer	5
Computerized Test of Information Processing ²¹	CPS; Manual Response Speed/Reaction Time	Screen Visual Display, Single Letters and Words Presented Consecutively	Computer Keyboard	Personal Computer	15
NeuroTrax Memory Composite ²⁰	Learning and Memory	Screen Visual Display, Word Pairs, 2X4 Matrix of Figures	Computer Keyboard	Personal Computer	10
CNS Vital Signs Composite Memory ¹⁹	Learning and Memory	Screen Visual Display, Word List and Geometric Figures Shown One-at-a-time	Computer Keyboard	Personal Computer	6
CogState One Card Learning Test ¹⁵	Learning and Memory	Screen Visual Display, Playing Cards	Computer Keyboard or Touchscreen	Personal Computer or iPad	6
CogState Continuous Paired Associate Learning Test ¹⁵	Learning and Memory	Screen Visual Display, Masked Abstract Patterns Surrounding Center Stimulus	Computer Keyboard or Touchscreen	Personal Computer or iPad	7

CANTAB Paired Associates Learning Test ²²	Learning and Memory	Screen Visual Display, Masked Abstract Patterns Surrounding Center Stimulus	Touchscreen	iPad (previously a touch-sensitive personal computer)	8
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Please see Wojcik et al²³ for a detailed review of computer-assisted testing approaches. Some computer-based tests are less subject to ceiling and floor effects because they vary the test difficulty based on performance.

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