

The Canadian Consortium for Neurodegeneration in Aging (CCNA): Overview of the neuropsychology battery

Natalie Phillips ^{Concordia U}, Jennifer Fogarty ^{Western U}, Nicole Anderson ^{U of Toronto}, Sylvie Belleville ^{Institut Universitaire de Gériatrie de Montréal}, Sarah Best ^{Western U}, Michael Borrie ^{Western U}, Paula McLaughlin ^{Western U}, Mary Tierney ^{U of Toronto}, Angela Troyer ^{Baycrest}, Victor Whitehead ^{Lady David Institute}, and Howard Chertkow ^{McGill University}



Background and Rationale

The CCNA is aimed at understanding the mechanisms of neurodegenerative illness, its prevention, treatment, and improving the quality of life of those with dementia. Neuropsychological assessment is a crucial component of the diagnosis of dementia and the specification of its various etiological subtypes.

The assessment of cognitive function will play two roles in the CCNA.

First, combinations of the measures outlined in Table 1 will contribute to the clinical ascertainment and diagnosis of groups of participants who will form the CCNA Clinical Platform.

Second, an independent and more comprehensive test battery of clinical and experimental measures will assess a broad range of cognitive function (Table 2). Performance on these tests, together with imaging and medical data, will be used to clinically characterize the groups and to provide research data to the CCNA Teams and researchers.

Participants

Diagnosis	<i>n</i>
Subjective Cognitive Impairment ¹	300
Mild Cognitive Impairment (MCI)	200
MCI with silent vascular lesions	400
Mild AD	100
Dementia of Mixed Etiology	200
Lewy Body Disease/Parkinson's Dementia/Parkinson's MCI	200
Frontotemporal dementia spectrum (behavioural variant, primary progressive aphasia, progressive supranuclear palsy, corticobasal syndrome)	200
¹ 240 to be recruited for interventional trials in Montreal & Toronto	

Table 1

Clinical Screening and Diagnosis Measures
MoCA
MMSE
WMS-III Logical Memory I and II
CERAD Word List Recall/Recognition
Benson Complex Figure Copy
Lawson Brody ADLs
CDR

Table 2

Domain	Test	Description	Overlap with CIMA-Q/ONDRI
Premorbid IQ	WAIS-III Vocabulary	Expressive Vocabulary	C
Visuoperceptual and construction ability	Object Decision Test - Birmingham Object Recognition Battery (BORB)	Object perception	C
	Judgment of Line Orientation (split half)	Visual perception	O
	Brief Visuospatial Memory Test Copy	Visuoconstruction	O
Learning and Memory	Rey Auditory Verbal Learning Test	Word-list learning	C,O
	Brief Visuospatial Memory Test	Figure learning	O
	CCNA/CIMA-Q Face-Name Matching	Associative Recall	C
	Digit Symbol - Incidental Recall	Incidental Associative Recall	C,O
	Envelope Test	Prospective Memory	C
Attention, working memory, processing speed	WAIS-III Digit Span forward and backward	Attention span, working memory	O
	WAIS-III Digit Symbol-Coding	Psychomotor processing speed	C
	CCNA Simple and Choice Reaction Time	Reaction Time	O
Executive function	DKEFS Phonemic Fluency	Phonemic (letter) fluency	O
	Reitan Trail Making Test (A & B)	Attention switching	C,O
	DKEFS Color Word Interference	Interference resolution; switching	C,O
	CCNA/CIMA-Q Sentence Completion Test	Inhibition (verbal)	C,O
	NACC ¹ Social Norms Questionnaire	Knowledge of Appropriate Social Mores	
	Social Behavior Observer Checklist	Social behaviour, self-awareness	C,O
	Speech and language	DKEFS Semantic Fluency	Semantic (category) fluency
Speech and language	NACC ¹ Word Reading Test	Reading of regular and irregular words	
	NACC ¹ Semantic Word-Picture Matching Test	Word Recognition and Comprehension	
	NACC ¹ Semantic Associates Test	Semantic Memory	
	NACC ¹ Northwestern Anagram Test	Grammatical knowledge	
	NACC ¹ Sentence Repetition Test	Oral Repetition	
	NACC ¹ Noun and Verb Naming Subtests	Naming of objects and actions	
	NACC ¹ Sentence Reading Test	Reading	

¹NACC = National Alzheimer's Coordinating Center

Procedure and Design Considerations

➤ Development of the battery took place from June 2014 onwards by the CCNA Neuropsychology Working Group, through a series of monthly and *ad hoc* teleconferences and with co-ordination with the CCNA Clinical Platform Working Group.

The Battery is designed to have:

- parallel versions in English and French;
- harmonization with on-going Canadian research initiatives (Consortium pour l'Identification précoce de la Maladie d'Alzheimer - Québec (CIMA-Q); Ontario Neurodegenerative Disease Research Initiative (ONDRI);
- adequate sensitivity to assess the full range cognitive abilities in participants who differ widely in the level and nature of their cognitive function.
- Significant aspects of research staff training, data monitoring, and quality control will be delivered using the Longitudinal Online Research and Imaging System (LORIS) software system.
- Funding will be sought to support the recruitment of healthy older adult controls to provide normative data.



www.ccna-ccnv.ca

E-mail: natalie.phillips@concordia.ca
jennifer.fogarty@sjhc.london.on.ca