## Introduction

The instruments recommended here are largely consistent with those recommended by the National Institute of Neurological Disorders and Stroke-Canadian Stroke Network vascular cognitive impairment harmonization standards[[1]](#footnote-1), with some minor changes. Validation of the long harmonization battery is in process which may inform the need for additional instrument substitutions. We recognize the value of consistency in measurement across studies, as inconsistent outcomes render findings across studies more difficult to reconcile.

The presentation of two batteries allows researchers to choose cognitive outcome measures according to the time allowances and resources of each study, as well as the questions being addressed. While consistency across studies is ideal, we recognize that some scientific inquiries or sample populations will require the modification of these tests batteries. For instance, while the Digit-Symbol substitution test (WAIS-III) is recommended as a measure of speeded sequencing, the similar Symbol-Digit Modalities Test might be substituted in samples where populations have major motor deficits (e.g., hemiparesis) as an oral version exists. The instruments below have been selected due to extensive and favorable reliability, construct validity, and predictive utility, and/or history of use in the target patient population.

These recommended batteries are aimed to optimize sensitivity to executive and processing speed deficits, while tapping the cognitive domains of memory, language, and visual-spatial functions as well.

The Outcomes and End Points Subgroup’s Emotional and Cognitive Status recommendations are listed below.

For additional information about how to obtain each recommended instrument please consult the Notice of Copyrights (NOC) listed on the NINDS website or click on the links below.

* [Center for Epidemiologic Studies – Depression Scale (CES-D)](http://www.commondataelements.ninds.nih.gov/Doc/NOC/Center_for_Epidemiologic_Studies_Depression_Scale_NOC_Public_Domain.pdf)
* [The Montreal Cognitive Assessment (MoCA)](http://www.commondataelements.ninds.nih.gov/Doc/NOC/Montreal_Cognitive_Assessment_NOC_Link.pdf)
* [Delis Kaplan Executive Functioning System (DKEFS)-Trail Making Tests](http://www.commondataelements.ninds.nih.gov/Doc/NOC/Delis-Kaplan_Executive_Function_System_NOC_Link.pdf)
* [Digit Symbol subtest of the Wechsler Adult Intelligence Scale III](http://www.commondataelements.ninds.nih.gov/Doc/NOC/Wechsler_Adult_Intelligence_Scale_Fourth_Edition_NOC_Link.pdf)
* [Symbol Search subtest of the Wechsler Adult Intelligence Scale III](http://www.commondataelements.ninds.nih.gov/Doc/NOC/Wechsler_Adult_Intelligence_Scale_Fourth_Edition_NOC_Link.pdf)
* [Stroop Test](http://www.commondataelements.ninds.nih.gov/Doc/NOC/Stroop_Test_NOC_Link_Out.pdf)
* [Hopkins Verbal Learning Test – Revised](http://www.commondataelements.ninds.nih.gov/Doc/NOC/Hopkins_Verbal_Language_Test_Revised_NOC_Link.pdf)
* [Rey-Osterrieth Complex Figure Copy and Delay](http://www.commondataelements.ninds.nih.gov/Doc/NOC/Rey_Osterrieth_Complex_Figure_NOC_Link.pdf)
* [Boston Naming Test (BNT) 30-item version](http://www.commondataelements.ninds.nih.gov/Doc/NOC/Boston_Naming_Test_NOC_Link.pdf)
* [Information Questionnaire for Cognitive Decline (IQCODE)](http://www.commondataelements.ninds.nih.gov/Doc/NOC/Informant_Questionnaire_for_Cognitive_Decline_NOC_Public_Domain.pdf)
* [Neuropsychiatric Inventory (NPI) Questionnaire](http://www.commondataelements.ninds.nih.gov/Doc/NOC/Neuropsychiatric_Inventory_Questionnaire_NOC_Link.pdf)
* [Telephone Interview for Cognitive Status (TICS)](http://www.commondataelements.ninds.nih.gov/Doc/NOC/Telephone_Interview_For_Cognitive_Status_NOC_Link.pdf)

1. Hachinski V, Iadecola C, Petersen RC, Breteler MM, Nyenhuis DL, Black SE, Powers WJ, DeCarli C, Merino JG, Kalaria RN, Vinters HV, Holtzman DM, Rosenberg GA, Wallin A, Dichgans M, Marler JR, Leblanc GG. National Institute of Neurological Disorders and Stroke-Canadian Stroke Network vascular cognitive impairment harmonization standards. Stroke 2006;37(9. [↑](#footnote-ref-1)