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Results: After TIA/minor stroke, short-delay (20-30 min) memory testing was unimpaired, but 1-week delayed testing showed an impaired performance compared to stroke-free controls. In the stroke group, ALF was present in 17% of the patients, compared to stroke-free controls, but more prevalent than rapid forgetting after short-delay memory testing.
Conclusions: ALF is present in patients with cerebrovascular disease, despite normal acquisition rates. The relation with neuroimaging findings and the clinical relevance of these results will be discussed.

Categories: Memory Functions/Amnesia
Keyword 1: amnesia

Symposium 13: Addressing Challenges in the Digital Assessment of Cognition: The Mobile Toolbox for Monitoring Cognitive Change

9:00 - 10:30am
Saturday, 4th February, 2023
Town & Country Ballroom C

Chair

Cindy Nowinski
Northwestern University Feinberg School of Medicine, Chicago, USA

Summary Abstract:
Cognitive Impairment (CI) is estimated to affect more than 16 million people, the majority of whom are 65 and older (Centers for Disease Control and Prevention, 2011). Moreover, there are about 5.8 million Americans currently living with the most common type of dementia, Alzheimer's Disease, which is projected to increase to 13.8 million people by 2050 (Alzheimer's Association, 2020). Clearly, the ability to detect early indicators of and risk factors for brain disease AND differentiate these from typical cognitive aging is crucial to supporting healthy aging. To date, there are few sensitive assessment tools for detecting normal and abnormal cognitive change that can be widely deployed in diverse research designs and populations. In addition, clinicians and researchers struggle to conduct assessments with some of the most vulnerable populations because of access issues (e.g., rural communities, rare disease populations), which exacerbates healthcare disparities for these groups. Remote digital assessments can help overcome these barriers by enabling repeated testing in naturalistic conditions, reducing participant burden and expense, and increasing research accessibility for under-represented populations.

This symposium will begin with an overview of the Mobile Toolbox (MTB), an app-based assessment tool and technology platform developed to address challenges in conducting longitudinal cognitive assessments over the adult lifespan. MTB enables completely remote, self-administered assessment using participants' own smartphones with additional capabilities for study set-up and data management and analysis. Our second presentation describes the initial evidence for the reliability and validity of the eight core Mobile Toolbox Cognitive tests, as well as associations with age in a healthy population. The third presentation will describe one site's experience using the MTB platform in a large, remote longitudinal study. The final presentation will consider the issues involved when studies utilize both in-person and remote assessment. Using the NIH Toolbox V3 Examiner version, from which several of the MTB tests were inspired, we will review the advantages and disadvantages of including remote assessments alone and in combination with face-to-face examination. To conclude, we will summarize the state of the current research and recommendations for neuropsychologists interested in using MTB in their future work.
Keyword 1: cognitive functioning
Keyword 2: assessment
Keyword 3: technology

1 The Mobile Toolbox for Monitoring Cognitive Change

Richard Gershon, Cindy J. Nowinski, Aaron Kaat
Northwestern University Feinberg School of Medicine, Chicago, IL, USA

Objective: To present the Mobile Toolbox (MTB), comprised of an expandable library of cognitive and other tests, including adapted versions of NIH Toolbox® measures. The MTB provides a complete research platform for app creation, study management, data collection, and data management. We will describe the MTB project and MTB research platform and demonstrate examples of assessments.

Participants and Methods: MTB is the product of an NIH-funded, multi-institutional effort involving Northwestern University, Sage Bionetworks, Penn State, University of California San Francisco, University of California San Diego, Emory University, and Washington University. The MTB assessment library is a dynamic repository built upon Sage Bionetworks mobile health platform. All MTB measures are created or adapted for a mobile interface using iOS and Android smartphones. Guided by the principles of open science, many components are open source to allow researchers and developers to integrate externally developed tests, including supplemental scales (e.g., passively collected contextual factors) assessing variables such as mood and fatigue that might influence cognitive test performance.

Results: The current MTB library includes eight core cognitive tests based on well-established neuropsychological measures: two language tasks (Spelling and Word Meaning), two executive functioning tasks (Arrow Matching and Shape-Color Sorting), an associative memory task (Faces and Names), an episodic memory task (Arranging Pictures), a working memory task (Sequences) and a processing speed task (Numbers and Symbols). Additional cognitive assessments from other popular test libraries including the International Cognitive Ability Resource (ICAR), Cognitive Neuroscience Test Reliability and Clinical Applications for Schizophrenia (CNTRACS) and Test My Brain are currently being implemented, as are non-cognitive measures from the NIH Toolbox Emotion Battery and the Patient-Reported Outcomes Measurement Information System (PROMIS). The MTB library includes measures suitable for use in research studies incorporating point-in-time and burst designs as well as ecological momentary assessment (EMA).

Conclusions: The MTB was created to address many of the scientific, practical, and technical challenges to cognitive assessment by capitalizing on advances in technology measurement and cognitive research. Initial psychometric evaluation of measures has been performed, and additional clinical validation is underway in studies with persons at risk for cognitive impairment or Alzheimer's disease (AD), diagnosed with mild cognitive impairment (MCI) or AD, Parkinson's disease, and HIV-associated Neurocognitive Disorders. Calculation of norms and reliable change indicators is in progress. The MTB is currently available to beta testers with public release planned for Summer, 2023. Clinical researchers will be able to use the MTB system to design smartphone-based test batteries, deploy and manage mobile data collection in their research studies, and aggregate and analyze results in the context of large-scale norming data.

Categories:
Assessment/Psychometrics/Methods (Adult)
Keyword 1: cognitive functioning
Keyword 2: assessment
Keyword 3: technology
Correspondence: Richard Gershon, Northwestern University Feinberg School of Medicine, gershon@northwestern.edu

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2 Validity and Reliability of Mobile Toolbox Cognitive Assessments

Cindy J Nowinski[1], Aaron Kaat[1], Jerry Slotkin[2], Erika La Forte[1], Yusuke Shono[1], Miriam Novack[1], Sarah Pila[1], Elizabeth Dworak[1], Stephanie R Young[1], Zahra Hosseinian[1], Hubert Adam[1], Richard Gershon[1]
[1]Northwestern University Feinberg School of Medicine, Chicago, IL, USA. [2]University of Delaware, Newark, Del, USA

Objective: To present validation evidence for the first eight cognitive measures available through Mobile Toolbox (MTB). These measures use a remote self-administered platform to assess language, working memory, episodic memory, executive function, and processing speed.

Participants and Methods: We used two separate samples, recruited as part of a larger study, to validate MTB measures. Sample I, comprised of 92 English-speaking adults ages 18-85, was used to assess internal consistency and construct validity. Participants were first administered "gold standard" cognitive measures (Wechsler Memory Scale-IV Verbal