

LifeBioBRAIN Found to be a Usable Cognitive Screening Prototype

LifeBio and Brown University collaborate to engage patients living with mild cognitive impairment or early-stage dementia to test usability of new app

MARYSVILLE, OH, UNITED STATES, February 15, 2024 /EINPresswire.com/ -- A [study](#) conducted by Brown University researchers established that geriatric primary care clinic patients, with mild cognitive impairment or dementia, found the LifeBioBRAIN™ [cognitive screening](#) prototype usable.

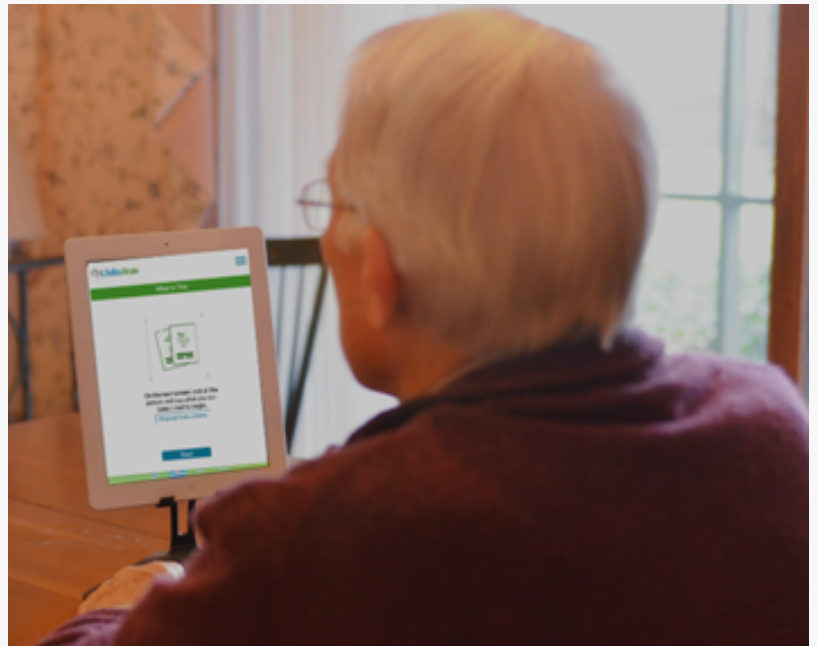
LifeBio will further develop LifeBioBRAIN™ for use by primary care providers (PCPs) and outpatient physicians (neurologists, psychiatrists, neuropsychologists) to utilize as a cognitive screening tool for at-home or in-clinic screening to determine the need for further comprehensive neurological and neuropsychological assessments.

As LifeBioBRAIN (LBB) progresses in development, the goal is for it to be used similarly to traditional pen and paper screening tools (still widely in use today) which could then prompt referral for further neuropsychological testing and/or consultation with a neurologist or neuropsychologist. Development will focus on improving the game-like interface of LBB to identify cognitive function (in areas such as memory, attention, executive function, etc.) while also building out biomarker capture capabilities.

The U.S. population aged 65 or over is expected to be 75 million by 2030; this size of this



LifeBioBRAIN cognitive screening prototype



LifeBioBRAIN cognitive screening prototype

demographic will drive enormous growth in the demand for health care services for older people, many of whom will at some point develop Alzheimer's disease or related dementias.

In the United States, the number of individuals living with Alzheimer's Disease and Related Dementias (AD/ADRD) is expected to increase from 6.7 million to 7.2 million by 2025 and reach 11.2 million by 2040.

Currently, \$345 billion is spent annually

on the costs of care associated with AD in the U.S. (\$222 billion by Medicare, Medicaid alone). In 2021, the annual global cost of dementia was estimated to be more than \$1.3 trillion and is expected to rise to \$2.8 trillion by 2030. This figure includes unpaid care provided by family/friends, direct cost community care/residential/senior living/home care, and the direct costs of medical care (the costs of treating dementia and other conditions in primary and secondary care).

Cognitive screening for dementia will be important because patients with neurodegenerative diseases including Alzheimer's Disease are negatively impacted by cognitive, motor, and neuropsychiatric difficulties. It is important to differentiate between normal cognition and provided adequate treatment to use possible pharma and non-pharma approaches with the patient for optimal care, thereby assisting the family caregiver or professional caregiver too.

LifeBioBRAIN holds potential for adoption across a spectrum of healthcare settings, from individual practices to large group practices, hospital networks, academic medical centers, and research projects. Early adopters are likely to include individual primary care physician offices seeking to enhance practice efficiency through LifeBioBRAIN's rapid examination capabilities.

Screening for cognitive change sooner may lead to eligibility for new drugs, participation in clinical trials, deployment of meaningful interventions, and overall better health care outcomes. Early detection of major neurocognitive disorders enables more timely deployment of pharmacologic and non-pharmacologic interventions to help both persons living with dementia (PLWD) and their professional or family caregivers. Cognitive screening tools must also become more inclusive for demographically diverse individuals and LifeBioBRAIN plans to address this need as development continues. A body of prior work has documented limitations of screenings that are not sensitive to varying socioeconomic, cultural, racial, or other differences.

Brown University researchers found that take-home mobile device-based cognitive testing is a usable strategy in older adult primary care patients across a range of cognitive function, but less

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Usability of a Tablet-Based Home Memory Test in Older Adults With and Without Cognitive Impairment

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INTRODUCTION

- Traditional pen-and-paper cognitive screenings for older adults may miss early signs and lack inclusivity for diverse populations.
- Modern solutions are needed for better accuracy and inclusivity. Tech-based assessments are emerging as potential alternatives.
- The LifeBio Brain Phase 1 study examines the feasibility of a take-home tablet cognitive test for geriatric primary care patients, especially those with cognitive challenges.

METHODS

- N = 51 volunteers from an academically-affiliated Geriatric Medicine practice.
- Data: Demographics, SLUMS score, device usage.
- Primary outcome: Mean SUS score & 95% CI.
- Analysis: ROC nonparametrically, delong's method.

RESULTS

- Average SUS: 76 (good usability range: 73-85).
- Neurologic correlation: SUS & SLUMS (Pearson: -0.63).
- Participants who withdrew: Median SLUMS = 26.
- Participants who completed: Median SLUMS = 20.
- SLUMS support >15: Predicts completion for 88%.
- ROC AUC for SLUMS predicting completion: 0.78.

System Usability Scale (SUS) rating by St. Louis University Mental Status Examination (SLUMS) score category.

Study	SUS Mean
Oswell	76 (71-81)
SLUMS 27-30	77 (70-84)
SLUMS 21-26	73 (63-83)
SLUMS 8-20	76 (61-87)

Sample Screenshots from LifeBio Brain

DISCUSSION

- Tablet test: Good usability in geriatric primary care.
- Severe cognitive impairments: Less usability (indicated by SLUMS score discontinuities).
- Mobile tests: Convenient alternative to traditional in-office methods.
- Potential benefits: Alleviates provider time constraints.
- Future prospects: Integration of digital biomarkers for enhanced diagnostics.
- Digital tests: Engaging, game-like, possibly superior in sensitivity.

LIMITATIONS

- Limited generalizability: Predominantly White, non-Hispanic sample.
- Requirements: Home WiFi, sensory ability, informed consent representative.
- Potential biases: Self-selection and healthy user effect.
- Emphasis: Need for diverse participants for broader validity.

FINANCIAL DISCLOSURE

- This work was funded by NIA SBIR 1R43AG07341-01.

CONFLICTS OF INTEREST

- There are no conflicts of interest for Brown University personnel.
- The owners of LifeBio, Inc. are creators of the LifeBio Brain app.

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LifeBioBRAIN Poster Presented at Gerontological Society of America 2023

viable in persons with severe cognitive impairment. Take-home mobile device-based screening could be part of a flexible cognitive testing and follow-up strategy that also includes mobile device-based testing in healthcare settings and pen-and-paper cognitive testing, depending on patient preferences and abilities.

Future development of the LBB prototype is necessary before it can be used in market. This work was funded by the National Institute on Aging SBIR program, grant number 1R43AG076341-01.

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