

Cognitive Trajectories and Predictors of Cognitive Decline Following Stroke

A Pilot Study in Thailand

Witsarut Nanthasi^{1,2}, Vorapun Senanarong¹, Chatchawan Rattanabannakit¹, Chitapa Kaveeta¹, Katherine Possin²

¹ Faculty of Medicine Siriraj Hospital, Mahidol University, Thailand, ² Global Brain Health Institute, University of California, San Francisco, USA

Background

Stroke is a leading cause of death and disability, posing a substantial burden. In addition to physical disability, stroke frequently results in cognitive impairment, which substantially affects patients’ quality of life.

Post-stroke cognitive impairment (PSCI)

- Prevalence 44–60%.¹ The cognitive trajectory of PSCI is heterogeneous.
- PSCI predicts dependency and mortality and is correlated with the severity of cognitive impairment.^{2,3}

Risk factors of PSCI

- Factors associated with lower cognitive performance vary across studies and may include older age, lower level of education, vascular risk factors, stroke subtype, stroke severity, and premorbid cognitive decline.⁴

Gaps

- Cognitive assessment is not routinely integrated into post-stroke care. Early PSCI is frequently underdetected.
- Research is needed to identify patients with early PSCI and associated risk factors, which could enable timely interventions.

Impacts

Early cognitive screening enables timely detection of PSCI, facilitating targeted interventions and the implementation of structured care pathways to optimize long-term outcomes in stroke survivors.

References

- Stroke. 2023;54(6):e272–e91.
- BMC Geriatr. 2022;22(1):1009.
- Stroke. 2011;42(4):883–8.
- Circ Res. 2022;130(8):1252–71.
- Alzheimers Dement. 2025;21(7):e70437.

Aims

Aim 1: Identify predictors of cognitive performance at 3 months

- Hypothesis:** stroke-related factors, clinical characteristics, SDoH, and NfL are associated with poorer cognitive performance.

Aim 2: Characterize overall post-stroke cognitive trajectory

- Hypothesis:** post-stroke cognitive trajectories may remain stable over time.
- Predicting post-stroke cognitive trajectories is challenging, as cognitive function can evolve due to multiple factors.

Aim 3: Characterize distinct clusters of post-stroke cognitive trajectories and identify predictors

- Hypothesis:** heterogeneous cognitive trajectories in patients post-stroke.
- We will identify distinct clusters of patients with similar cognitive trajectories, and identify predictors of each cognitive trajectory

Methodology

Study site: Faculty of Medicine Siriraj Hospital, Mahidol University, Thailand

Study subjects

- The target sample size is 120 patients.
- Inclusion criteria:** patients aged ≥18 years with acute ischemic stroke and have radiographic confirmation by CT or MRI.
- Exclusion criteria:** transient ischemic attack, pre-existing dementia, post-stroke delirium, physical disabilities that prevent task performance or aphasia that limits comprehension of task instructions.

Data collection

Stroke unit	3 months	6 months	12 months
- Brain imaging - Clinical data - NfL (day 7) - SDoH	- TabCAT - Clinical data	- TabCAT - Clinical data	- TabCAT - Clinical data

SDoH, Social Determinants of Health; NfL, neurofilament light chain

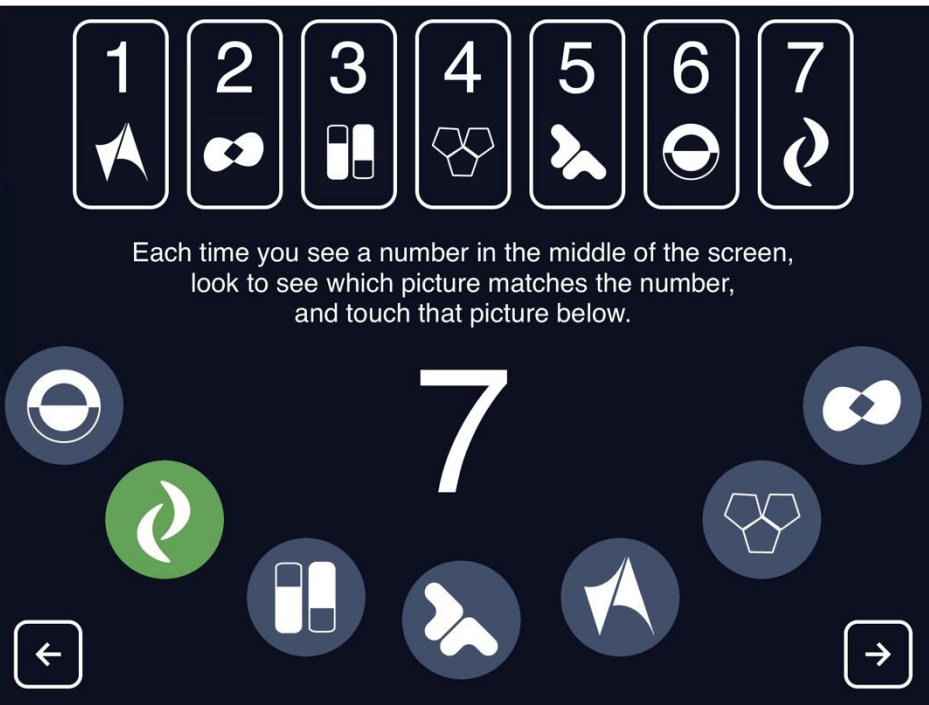
Data analysis

- To identify predictors of cognitive performance at three months post-stroke.
 - Multiple linear regression will be used to identify predictors of cognitive performance with coefficients reported for each predictor
- To characterize overall post-stroke cognitive trajectory.
 - Linear mixed-effects models will assess overall cognitive trends at 3, 6, and 12 months.
- To characterize distinct clusters of post-stroke cognitive trajectories and identify predictors.
 - Latent class growth analysis will be applied to identify subgroups of similar cognitive trajectories.
 - Mixed-effects linear regression models will be employed to identify predictors of the observed cognitive trajectories.

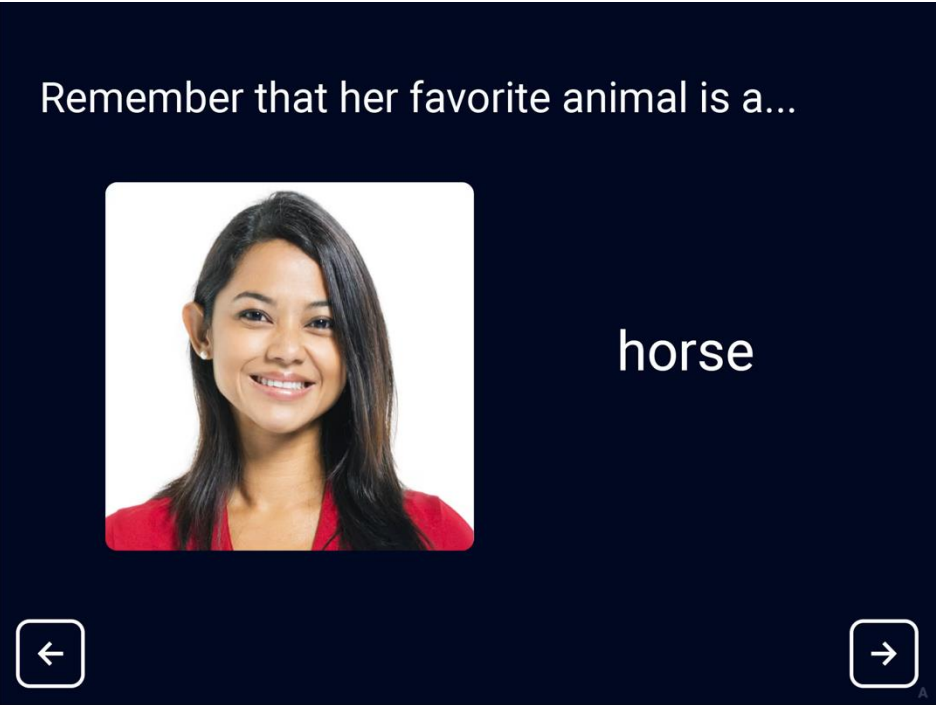


TabCAT-BHA

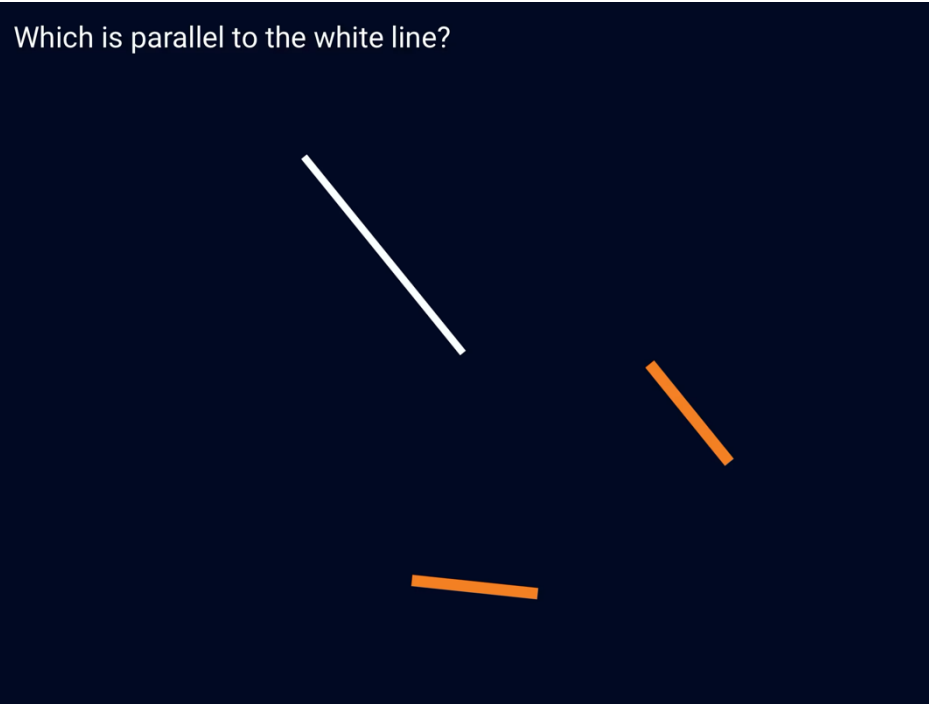
- Digital cognitive assessment tool with strong potential for clinical implementation.
- 10 minutes to administer.
- The tool has been validated against well-established neuropsychological tests and has demonstrated strong validity and diagnostic accuracy to detect cognitive impairment.⁵



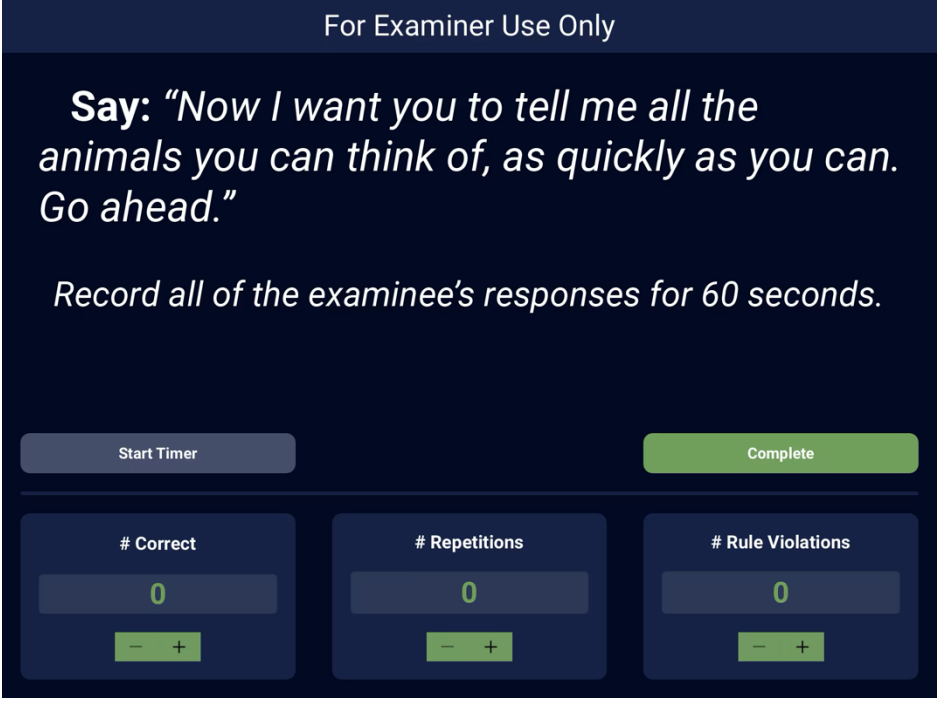
Match
Executive function
Processing speed



Favorites
Memory



Line Orientation
Visuospatial ability



Animal Fluency
Language

