

# 'Younger' Brain Associated With Lower Risk of Post-Stroke Cognitive Disorders

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March 30, 2022

*The [study covered in this summary](#) was published on MedRxiv.org as a preprint and has not yet been peer reviewed.*

## Key Takeaways

- Patients with greater brain age gaps (BAG, the difference between predicted and chronological brain age) were more likely to have developed neurocognitive disorders (NCD) post-stroke.
- "Younger" brains (lower BAG) appear to be more resilient to injury and are associated with lower risk for NCD up to 36 months after a [stroke](#).
- As BAG is sensitive to cognitive impairment after stroke, it may be used in order to predict cognitive outcome in stroke patients.

## Why This Matters

- Long-lasting mild to major cognitive impairments affect 35%–50% of stroke survivors and may not improve over time, a significant source of disability.
- Brain age calculation could help identify which patients are particularly at risk for post-stroke NCD and could be used to guide treatment and rehabilitation to minimize impairment.

## Study Design

- MRIs from 269 stroke survivors (55.4% women, mean age, 71 years) from the [Nor-COAST](#) study were assessed. MRIs were performed at baseline, 18 months, and 36 months post-stroke.
- Neuropsychological data was collected at baseline, 3, 18, and 36 months post-stroke, consisting of standardized [cognitive testing](#), Global Deterioration Scale, and classification of NCD using the DSM-5.
- Predicted brain age was measured via machine learning models based on cortical thickness, surface area, and gray matter/white matter volume. Associations between cognitive status and longitudinal brain age were assessed using linear mixed effects models and survival analysis.
- Statistical analyses were performed using R v. 3.3.3 and Stata v. 16 to test three hypotheses: 1) whether brain structural characteristics are associated with post-stroke NCD; 2) if a younger appearing brain among patients showing normal cognitive function at baseline is associated with lower risk of NCD at 18- and 36- months follow-up, and 3) whether patients showing preserved cognitive function from baseline onward show less evidence of brain aging over time compared with patients showing cognitive decline.

## Key Results

- "Older" brains (higher BAG) were associated with post-stroke cognitive impairment at 18 and 36 months, confirming that a "younger" brain may confer protective factors against cognitive decline after stroke.
- There was no significant difference in BAG between the group with preserved brain function vs the group with NCD from baseline and across follow-up times.
- Pre-stroke BAG may be a more reliable predictor for future cognitive decline than post-stroke BAG.

## Limitations

- Cleaner analysis methods, requiring less processing, may help yield more precise results.
- Large study attrition at 36 months led to reduced statistical power and possible biases.
- The study primarily included patients with mild to moderate strokes, which is representative of the majority of the

Norwegian stroke population, but this may reduce the generalizability of its findings to patients who have suffered severe strokes.

### Study Disclosures

- The authors have declared no competing interests.
- The study was funded by a research grant from the South-Eastern Norway Regional Health Authority (Helse Sor-Ost).

*This is a summary of a preprint research study, "Longitudinal brain age prediction and cognitive function after stroke," written by Eva B. Aamodt from the Institute of Clinical Medicine, University of Oslo, Oslo, Norway, and colleagues on MedRxiv.org, provided to you by Medscape. This study has not yet been peer reviewed. The full text of the study can be found on MedRxiv.org.*

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Cite this: 'Younger' Brain Associated With Lower Risk of Post-Stroke Cognitive Disorders - *Medscape* - Mar 30, 2022.