

Cerebral reperfusion of reading network predicts recovery of reading ability after stroke

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Dr. Boukrina is a research scientist in the Center for Stroke Rehabilitation Research at Kessler Foundation. She applies neuroimaging techniques to her research into the mechanisms of reading ability, how people recover their ability to read after stroke, and the design of new rehabilitative strategies for restoring reading ability and language competence. Credit: Kessler Foundation/Jody Banks

A team of New Jersey stroke researchers has linked recovery of reading and language competence with cerebral blood flow in the left reading network. Their findings may contribute to new approaches to identifying and treating reading deficits after stroke. The open access article, "Cerebral perfusion of the left reading network predicts recovery of reading in subacute to chronic stroke" was published on August 26, 2019 in *Human Brain Mapping*. The authors are Olga Boukrina, Ph.D., and A.M. Barrett, MD, of Kessler Foundation, and William Graves, Ph.D., of Rutgers, the State University of New Jersey.

Despite the fundamental role of reading ability in everyday living, little research has been conducted on patterns of reading [recovery](#) after [stroke](#), or the development of interventions to improve reading outcomes. In this study of left-brain stroke, a team of New Jersey scientists examined patterns of cerebral perfusion bilaterally, including left and right networks of brain areas important for healthy reading, the area surrounding the stroke lesion, and the corresponding contralateral area.

They enrolled 31 participants during inpatient rehabilitation, within 5 weeks of left-sided stroke. All underwent [functional magnetic resonance](#) imaging, psychometric testing, neurological examination and tests for phonological, orthographic and semantic impairments. Fifteen participants had follow-up studies at 3 months post stroke. Analysis of data from the subacute and chronic phases showed that recovery of reading and language competence correlated with increases in [cerebral blood flow](#) in the left reading network.

"Our findings support the utility of cerebral perfusion as a biomarker for recovery after stroke," said Dr. Boukrina, research scientist at the Center for Stroke Rehabilitation Research at Kessler Foundation, "and indicate that early reperfusion of the left reading network is essential to reading performance. We also found that increased perfusion of the right reading network correlated with worse reading performance, which

challenges the belief that this increased activity is a necessary transition in the recovery process."

The team plans future studies of larger populations, with inclusion of additional time points in order to better define the trajectory of recovery after stroke. "Reading deficits hinder the ability to participate fully in rehabilitation, to return to work, and function effectively at home and in the community," Dr. Boukrina remarked. "Pursuing this avenue of research will help us discover ways to restore function and improve outcomes for individuals recovering from left-brain stroke."

More information: Olga Boukrina et al, Cerebral perfusion of the left reading network predicts recovery of reading in subacute to chronic stroke, *Human Brain Mapping* (2019). [DOI: 10.1002/hbm.24773](https://doi.org/10.1002/hbm.24773)

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