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## UofSC researcher awarded \$11 million NIH grant for stroke recovery research

University of South Carolina professor Julius Fridriksson has been awarded an \$11.1 million grant from the National Institutes of Health to research stroke recovery and work to improve the lives and communication skills of patients after they suffer strokes.

Fridriksson, a professor in the Arnold School of Public Health, studies how a person's brain recovers from a stroke, paying particular attention to how stroke affects communication. While technology and treatment have significantly improved a person's ability to survive a stroke, there is much work to be done to help those who suffer from communication issues in the months and years afterward, he said.

More than one-third of the people who have strokes suffer from aphasia, a condition caused by a brain injury that affects a person's ability to speak, write, read and understand language. The grant, from the [National Institute on Deafness and Other Communication Disorders](#) (NIDCD) will create the Center for the Study of Aphasia Recovery at Carolina.

"The need is very great," Fridriksson said. "In the U.S., about 1 million people have aphasia and we haven't done a very good job helping them cope with a very difficult situation, because when you can't speak and comprehend very well that makes for a very difficult life. We need to do a lot better in helping them deal with that situation and helping them recover better."

The need is particularly high in South Carolina, a state with the seventh highest stroke death rate in the nation in 2014. It is part of the "Stroke Belt," a group of Southeastern states with high stroke death rates.

Fridriksson's work relies heavily on detailed pictures of the brains of stroke patients made at the MRI scanner at the McCausland Center for Brain Imaging at Carolina. Those pictures show blood flow and functional activity of the brain, allowing researchers to understand changes and workings of the brain related to stroke and recovery. The

grant will be used to research and better understand individual responses and recovery following stroke for patients who have aphasia in both the first days and weeks after a stroke, and in long-term recovery. He is hopeful the research findings will have national and international implications on stroke patients' treatment.

"The study we are about to take on, once we finish it, is going to be the largest study of aphasia recovery in the past couple of decades," said Fridriksson, who has been working on aphasia research since joining the Arnold School 15 years ago. "What we're trying to do here is to get a big data approach to understanding recovery. That doesn't happen unless you get a lot of patients to come in and receive therapy."

The grant will allow work on four major projects:

--Working with chronic patients, assessing a patient's neurophysiology before starting treatment, providing behavioral treatment, and trying to predict who will respond well or poorly to treatment.

--Assessing patients who have just had a stroke, providing aphasia therapy and electrical brain stimulation, which is believed to improve the environment for recovery in the brain. The goal is to understand the best ways to enhance the outcome in patients in the days and weeks following a stroke.

--Building a computationally heavy model of who is most likely to recover and who is not, based on neuropsychological and neurological factors of patients.

--A theoretically based study that looks at neuropsychological models of speech and language in normal people and then relating those to recovery in patients.

"One of the first things we want to know is why is there such variance in who responds to treatment," Fridriksson said. "It's something that we know very little about."

The university will partner with Johns Hopkins University, the University of California Irvine and the Medical University of South Carolina, although most of the research is going to happen at the University of South Carolina, he said. Other researchers on the project include the Arnold School's Dirk den Ouden, Psychology's Chris Rorden and Rutvik Desai and Souvik Sen in Neurology.

## **About stroke**

A stroke is also known as a "brain attack." It occurs when blood flow to an area of the brain is cut off, depriving brain cells of oxygen. When brain cells die during a stroke, the abilities controlled by that area of the brain are lost.

How a person is affected by their stroke depends on where the stroke occurs in the brain and how much the brain is damaged. More than two-thirds of survivors have some type of disability.

Each year nearly 800,000 people experience a new or recurrent stroke.

Stroke is the fifth leading cause of death in the U.S.

Stroke is the leading cause of adult disability in the U.S.

Source: National Stroke Association [www.stroke.org](http://www.stroke.org)