

Dr. Abhishek Jaywant receives NIH Career Development Award to Study Intervention for Post-Stroke Depression and Executive Dysfunction

Hemiparesis, mobility limitations, and speech disturbances are among the most readily apparent and common symptoms after a stroke. But many individuals recovering from a stroke may also suffer from “invisible” symptoms that have significant impacts on daily functioning and quality of life: depression and cognitive (executive) dysfunction. Approximately a quarter of stroke survivors experience a “depression-executive dysfunction syndrome” characterized by persistent depressive symptoms and deficits in executive cognitive skills such as attentional control, multitasking, and working memory. These individuals experience a “double hit” in which their social function and independence in activities of daily living are more limited than stroke patients with either depression or executive dysfunction alone.



Unfortunately, treatments for comorbid depression and executive dysfunction are limited and difficult for individuals with stroke to access. Though beneficial for depression, antidepressants can have side-effects and typically do not improve cognitive function. Behavioral treatments like cognitive-behavioral therapy and cognitive rehabilitation are typically used for depression or executive dysfunction alone, but not together. Behavioral treatments can also be difficult for patients to access because of the frequent clinic visits that are required.

With funding from a K23 Career Development Award from the National Institute of Mental Health, Dr. Abhishek Jaywant, a clinical neuropsychologist and Assistant Professor at Weill Cornell Medicine, aims to address these gaps and study the efficacy of a mobile digital intervention called “AKL-T01” (Akili Interactive) for comorbid depression and executive dysfunction in chronic stroke patients.

AKL-T01 is an iPad-based program that uses an immersive, video game-like environment to train executive cognitive skills. It aims to target connectivity in the executive control network, a brain network hypothesized to underlie in part the manifestation of depression and executive dysfunction after stroke. Work from Dr. Jaywant’s colleagues and mentors has shown that in older adults without stroke, use of the AKL-T01 program is associated with improved depressive symptoms and executive functions, as well as increased functional connectivity in the executive control network.

As part of the study, Dr. Jaywant will collect anatomical, diffusion, and functional MRI sequences before and after treatment to examine intervention-related brain changes and test the hypothesized mechanism of action. He also plans to use neuroimaging to explore how structural and functional connectivity at baseline might predict response to the intervention. This can

ultimately inform the personalization of treatment and help to better match patients to the treatment.

Dr. Jaywant's study builds on pilot work and training he received as a K12 scholar through the Neurorehabilitation and Restorative Neuroscience Training Network at Georgetown University. As part of that pilot study, he investigated the efficacy of a cognitive intervention in acute inpatient stroke rehabilitation and the use of clinically acquired MR/CT images in predicting response to the intervention. The new K23 grant aims to extend this work by providing support for a large randomized controlled trial that incorporates cutting-edge neuroimaging.

"This mentored research award will allow me to further my technical skills, scientific knowledge, and career development under the guidance of exceptional mentors," says Dr. Jaywant. "The study will provide important data on how a potentially scalable digital intervention may help those who have had a stroke and suffer with mood and cognitive difficulties. Ultimately, I hope that my research contributes to treatments for patients with acquired brain injuries that are accessible, personalized, and target the neural mechanisms of depression and executive dysfunction."

ASNR is honored to support and celebrate the careers and achievements of Dr. Jaywant and other ASNR members who are advancing basic and clinical research to improve the lives of people with neurological disorders.