

## R **S** **Ca**

Establishing a new understanding of the root causes, pathologies, and mechanisms of stroke

→ [page 1](#)

## Q **a** **D** **O**

A collaborative, data-driven approach to neurocritical quality improvement adherence

→ [page 3](#)

## Ta **H a a** M **a**

Cutting-edge studies focus on headache diagnosis, treatment, and therapy adherence

→ [page 5](#)

**#7**

In U.S. Ne &  
W d Re

**261**

Neurology  
faculty

**95K+**

Outpatient  
visits in 2019

**\$41.5M**

In new and continuing  
grant funding



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EN L. GALE, A, MD

Philip K. Moskowitz, MD Professor and Chair of Neurology  
Professor of Neurology and Ophthalmology

**A** quality of care is the shared endpoint of initiatives to eliminate complications during patients' hospital stays and is part of our comprehensive simulation program to impart best practices to our residents.

The importance of quality is observed in our stroke care, as we seek to understand and prevent stroke in at-risk patients. We also see quality of life as a theme for our novel behavioral and therapeutic approaches to relieve patients from refractory headache and to expand applications for RS-tDCS for MS and other disorders.

Likewise, quality care is the shared endpoint of initiatives to eliminate complications during patients' hospital stays and is part of our comprehensive simulation program to impart best practices to our residents.

As we continue to uncover transformative insights to treat a variety of neurological disorders, the shared pursuit of quality will continue to enhance our patients' lives and their outcomes.



Cover image: The fiber tracts involved in aging, the splenium and genu of the corpus callosum, and the fornix and the cingulum bundles.  
RENDERING: GETTY IMAGES

At NYU Langone Health's Comprehensive Stroke Center, researchers are engaged in groundbreaking investigations across the spectrum of stroke care, deepening their understanding of the root causes, pathologies, and mechanisms to redene quality in stroke care and prevention.

#### UNCOVERING CLUES FOR STROKE RISK STRATIFICATION

A central body of research led by Shadi Yaghi, MD, assistant professor of neurology, is elucidating stroke risk by revealing biomarkers associated with initial or subsequent strokes. "Although we've advanced the treatment of known risk factors such as hypertension, diabetes, and hyperlipidemia, stroke remains a leading cause of morbidity and mortality," notes Dr. Yaghi. "Our research focuses on understanding the origins of stroke at a deeper, more nuanced level in order to better target prevention and treatment approaches to each patient."

One line of research is applying advanced imaging to stratify risk in patients who have experienced a previous stroke. The research, funded by the American Heart Association and published in 2018 in the *Journal of Stroke and Cerebrovascular Diseases* and in 2019 in the *Journal of Cardiovascular Computed Tomography*, uses contrast-enhanced CT scans to





REDUCTION IN  
READMISSIONS  
RATE TO

**5.3%**




**0.3%**

OBSERVED-TO-EXPECTED



Headache specialists at NYU Langone are engaged in cutting-edge studies designed to advance the diagnosis, treatment, and therapy adherence for headache. A range of active clinical trials are targeting the expanded adoption of approved, evidence-based prevention approaches, while others are testing the efficacy of novel drugs and behavioral treatment strategies to prevent and treat even the most severe and refractory headaches.

ELIMINATING BARRIERS 

Physician education often takes the form of close multidisciplinary collaboration, as referrals within the NYU Langone network reflect the nuanced diagnosis and treatment approach needed to manage headache, which is associated with more than 300 medical conditions. “There’s a lot of interplay across specialties as patients are evaluated, not only due to overlap with other neurological conditions, but because so many secondary conditions—from Lyme disease to TMJ dysfunction—can ultimately be discovered at the root of a patient’s headaches,” notes Lawrence C. Newman, MD, professor of neurology and director of the Division of Headache.

A prospective study in development proposes a population-based approach to evaluate the impact of migraine education on outcomes, focusing on NYU Langone employees who experience migraine. An employee education campaign will disseminate information about symptom

management and migraine treatment, while a clinician lecture series will educate priiMJon cutanisici 5-12.1 (e)-15.2 (s)-5 (



## STANDARDIZING CLINICAL SCENARIOS THROUGH SIMULATION

The curriculum applies objective structured clinical examinations (OSCEs)—simulated scenarios enacted by actors dubbed standardized professionals—across a range of scenarios that could be encountered within neurological practice. In the simulations, the resident interacts with a standardized professional playing the role of a patient, a family member, or a medical colleague in 10-minute, predetermined scenarios and then receives immediate, direct feedback from an observing faculty member based on tenets of effective communication and professionalism.

“Within the course of medical practice, there are so many variables at play—we can’t guarantee that every resident will obtain sufficient experience delivering a difficult diagnosis or in other specific communication challenges,” notes Dr. Kurzweil. “With simulation, we are able to standardize every resident’s exposure to situations they will eventually encounter within the rigors of real-world clinical care.”

The OSCEs are segmented by levels of training, with four discrete scenarios for junior residents at the beginning of

their training and four more complex scenarios for senior residents with more experience. Junior residents

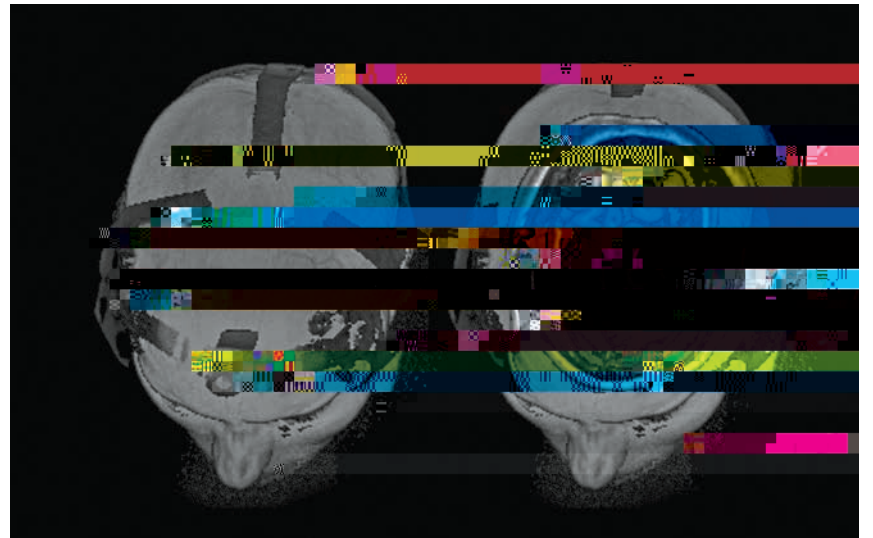
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# PARADISE TAPAS

A growing number of studies from the NYU Langone Multiple Sclerosis Comprehensive Care Center support the benefits of remotely supervised transcranial direct current stimulation (RS-tDCS) in reducing symptoms and improving rehabilitation outcomes for patients with multiple sclerosis (MS), Parkinson's, and other conditions.

The new research builds on groundbreaking studies demonstrating the efficacy of RS-tDCS in reducing MS-associated fatigue and enhancing complex attention and response variability among MS patients. The telerehabilitation protocol, developed at NYU Langone, delivers the therapeutic potential of tDCS through at-home treatment connecting electrodes on the scalp with center experts over HIPAA-compliant live video conference. Despite the extensive safety record and indications in the literature demonstrating benefits, due to the challenges of scientific rigor—accruing a reliable sample size and repeat clinic visits in a population with limited mobility—tDCS is not yet available for clinical implementation.

“Our remotely supervised tDCS protocol is designed to deliver that rigor and accumulate quantitative evidence for tDCS benefits within patients’ homes,” explains Leigh E. Charvet, PhD, associate professor of neurology, who leads the MS-related tDCS research. One trial, funded by the National MS Society, aims to validate the benefits of RS-tDCS on MS fatigue as a primary outcome, and cognitive functioning as a secondary outcome, in at-home stimulation paired with cognitive training. Another study, funded by the Department of Defense, combines RS-tDCS on the motor cortex with occupational therapy to investigate potential benefits for hand function. Separately, research presented at the 35th Congress of the European Committee for Treatment and



Simultaneous tDCS and MRI are used to capture the brain's response to tDCS in real time in order to identify predictors and markers of treatment response. PHOTO: DR. LEIGH E. CHARVET

Research in Multiple Sclerosis found a strong, cumulative effect of tDCS on gait function in 34 patients with MS across repeated in-clinic treatment sessions.

To enhance the treatment's clinical value, a National Institutes of Health-funded study is examining the neural mechanisms of tDCS to identify optimal protocols via variation in response. Participants undergo a baseline scan, then repeated scans with tDCS administered. Initial imaging studies suggest that MS fatigue correlates with decreased cerebral blood flow and neuronal reactivity. Meanwhile, in partnership with the NYU Langone Virtual Health Team,

Center clinicians are integrating RS-tDCS visits into the full suite of



**CENTER CLINICIANS  
HAVE DELIVERED**

**4,000+**

**RS TDCS TREATMENTS**

**FOR TELEREHABILITATION TO DATE**



# A shared pursuit of

