

## **Beyond Physical Capacity: Dr. Kristan Leech is Studying How Apathy May Shape Mobility After Stroke**

As a physical therapist, I've treated people after stroke who had similar physical impairments but showed very different levels of motivation during rehabilitation. Some were highly driven and consistently engaged in therapy. Others had difficulty getting started and sustaining effort, often needing repeated prompting to keep going. This is a familiar pattern among rehabilitation clinicians, yet it can be difficult to capture with standard clinical measures of mobility recovery.



Mobility researchers have documented a related disconnect. A [2023 study by Dr. Catherine Lang and colleagues](#) found that people may improve how fast or how far they walk following a physical therapy intervention without walking more in their daily lives. One possible reason is that, in rehabilitation, a therapist structures the walking practice and helps the patient stay engaged. Outside the clinic, walking is largely self-directed, often without that same structure and support.

Bringing these two observations together led me to ask whether post-stroke apathy could be one reason physical gains do not always translate into greater mobility in everyday life. Apathy is one of the most common neuropsychiatric consequences of stroke, affecting roughly one in three stroke survivors. It is characterized by diminished motivation and goal-directed behavior. Yet despite its prevalence and potential relevance to self-directed activity, its role in mobility after stroke has received surprisingly little attention.

### **Examining Mobility Through the Lens of Apathy**

I was excited to begin to untangle the story surrounding apathy in my [Gait Rehabilitation and Motor Learning Lab](#) at the University of Southern California. Our current study, “Examining Mobility Restrictions Through the Lens of Post-Stroke Apathy,” is supported by a Research Project Grant (R01) from the Eunice Kennedy Shriver National Institute of Child Health and Human Development, part of the National Institutes of Health. We plan to enroll 125 adults living with chronic stroke to investigate how apathy relates to walking choices, mobility in daily life, and brain function.

We assess apathy using the [Apathy Evaluation Scale–Clinician Version](#). During a semi-structured interview with the participant, a trained examiner evaluates different features of motivation and goal-directed behavior, including initiative, interest, effort, and emotional engagement. The assessment relies on the participant’s responses together with the examiner’s clinical judgment.

One component of the study examines the walking speed people select. In the laboratory, we measure both how participants typically walk and how fast they are capable of walking. The difference between these measures may be clinically meaningful. Two people with similar physical walking capacity may not choose to use that capacity in the same way. We are asking whether greater apathy is associated with selecting a slower habitual walking speed relative to what a person can physically achieve.

Another aspect of the study moves beyond the laboratory to examine mobility in everyday life. Participants wear activity monitors and global positioning system (GPS) devices for seven days, allowing us to characterize their mobility as they go about their usual routines. The activity monitors tell us how much participants walk, while GPS provides information about the geographic extent and frequency of their travel in the community. We can then ask whether apathy helps explain differences in real-world mobility, even after accounting for physical walking capacity.

We are also using magnetic resonance imaging (MRI) to investigate the brain mechanisms of apathy after stroke. For participants who are eligible to undergo MRI, we assess functional connectivity, or the extent to which different areas of the brain communicate with one another. We are particularly interested in the communications between three relevant brain regions and the rest of the brain. The first two regions are the anterior cingulate and ventromedial prefrontal cortices, which contribute to evaluating rewards and motivating action. The third region is the insular cortex, which helps identify information that is important or worthy of attention. We hypothesize that greater apathy will be associated with weaker communication between these regions and the rest of the brain. This could help us understand how disruptions in brain networks supporting motivation contribute to limited mobility after stroke.

Together, these approaches allow us to connect what participants are physically capable of doing in the laboratory with how they move through daily life and how networks in the brain may contribute to those behaviors.

### **Building a More Complete Picture of Mobility Recovery**

We began enrolling participants in January 2026 and, at the time of writing, have enrolled 25 people. At this early stage, our focus is on continuing recruitment and ensuring that our data capture the dimensions of mobility that matter to people after stroke. Recruitment is ongoing, and readers who know someone who may be interested in participating can direct them to the [study website](#) for more information.

Mobility after stroke is shaped by many physical, personal, and environmental factors; our goal is to determine whether apathy is an important but often overlooked part of that picture. If apathy helps explain the gap between physical capacity and daily activity, the findings could change how clinicians interpret and respond to that gap. This study could provide a foundation

for developing and testing rehabilitation strategies that better support initiation, engagement, and the use of physical gains in daily life. By examining mobility through the lens of apathy, we hope to better understand why improvements in walking capacity translate into greater everyday mobility for some people but not for others.