

MU researcher developing test for swallowing disorder treatments

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Muscle degeneration and confinement to a wheelchair are the hallmarks of Lou Gehrig's disease, Parkinson's, muscular dystrophy and other neurodegenerative diseases. One of the silent, and most serious, symptoms of these diseases is losing the ability to swallow. Swallowing impairment, or dysphagia, affects about 500,000 people annually in the U.S., but little is known about the disorder and only a few temporary, behavioral treatments are available. Now, a University of Missouri researcher is developing a test that might help pinpoint the neurological or physiological origins of swallowing disorders, leading to possible life-saving treatments.

"A lot of these diseases attack the limbs, but you don't die because your limbs don't work," said Teresa Lever, assistant professor in department of Communication Science and Disorders at the MU School of Health Professions. "Even though we can give patients feeding tubes with all the nutrients they need, there is no cure for swallowing disorders associated with [neurodegenerative diseases](#), and patients still die early. I am trying to determine what is driving that mortality. If it is swallowing impairment, we need to know how the impairment starts and how we could treat it successfully, which would then improve patients' lifespan and quality of life."

Lever is trying to determine which components of the nervous system that control swallowing are impaired in patients with neurodegenerative diseases. To swallow, the brain must first sense the need to swallow, and then it must activate the right muscles to complete the process. In her

study, she is developing an electrophysiological technique for use with mouse models of human neurological diseases that will show which regions of the brain are being used to swallow and which are short-circuiting. After finding which regions of the brain are not working correctly for each disease, treatments, such as [stem cell therapy](#), [gene therapy](#) or certain medications, might be used to target those regions. The first disease that she is focusing on is Lou Gehrig's disease, also known as amyotrophic lateral sclerosis or ALS.

"Instead of just treating a behavior, I am trying to determine the source of that behavior," Lever said. "Swallowing is a reflex - you sense the need to swallow and then you have a muscular response. If we find that the sensory component of the swallowing reflex is being impaired along with the neuromuscular component, then many of these neurological diseases may be much more complex than we have been led to believe. It would tell us that our evaluation and treatment of swallowing disorders should not just focus on the muscles and the nerves that stimulate them, but also on the sensory input. It would really create a paradigm shift in the research, especially for ALS which is classified as a motor neuron disease."

Lever recently received a \$300,000 grant from the National Institutes of Health for the study. She said that testing will begin in July and expects substantial results in the next two to three years.

Lever's research has been published in the journal [Dysphagia](#).

Provided by University of Missouri-Columbia

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