MedicalXpress

Wearable sensors could improve treatment for motor-skill impairments

August 19 2016

Every year in the United States almost 800,000 people suffer a stroke, an affliction which results in blood flow being cut off from the brain.

Strokes can impair mobility, speech, and cognition, and the recovery process and the ability to return to normal life can be daunting for survivors and their families.

New research being led by UT mechanical engineers could soon change that.

Eric Wade, an assistant professor in the Department of Mechanical, Aerospace, and Biomedical Engineering in the College of Engineering, recently led a team that developed a way to measure functional motor ability in those who have suffered a stroke. Funding from the National Institutes of Health supported that breakthrough.

Wade said the study shows that stroke patients, like everyone else who goes to a doctor, tend to overstate the amount of rehab that they do on their own.

His team helped develop wearable sensors that track how survivors use their upper limbs when they aren't being observed or supervised by their doctor. This knowledge could greatly improve how the design of patient treatment plans.

"It's much the same way that someone might tell their doctor that they

are watching what they eat, or that they are getting plenty of exercise when they really aren't," said Wade. "Many stroke patients were finding ways to compensate for the motor skills they'd lost rather than doing the rehab work they needed to be doing, with the result being that their recovery took much longer if it happened at all."

UT's team focused on the quality of exercise done, not just the amount done.

Through their qualitative monitoring approach, the researchers hope to gain a better understanding of how individual exercises affect patients. That will allow researchers and medical personnel to better predict which activities are most beneficial to specific patients on a case-by-case basis.

"The most important thing is the ability to build models that can predict health outcomes," said Wade. "That would give everyone involved better tools for prescribing patient treatments."

If all goes as planned, Wade said the team could use their sensors to design technology that would specifically improve motor ability.

He said such improvements would help not only stroke patients, but also anyone with a motor skill impairment, such as individuals with Parkinson's disease, Alzheimer's disease, and dementia.

Provided by University of Tennessee at Knoxville