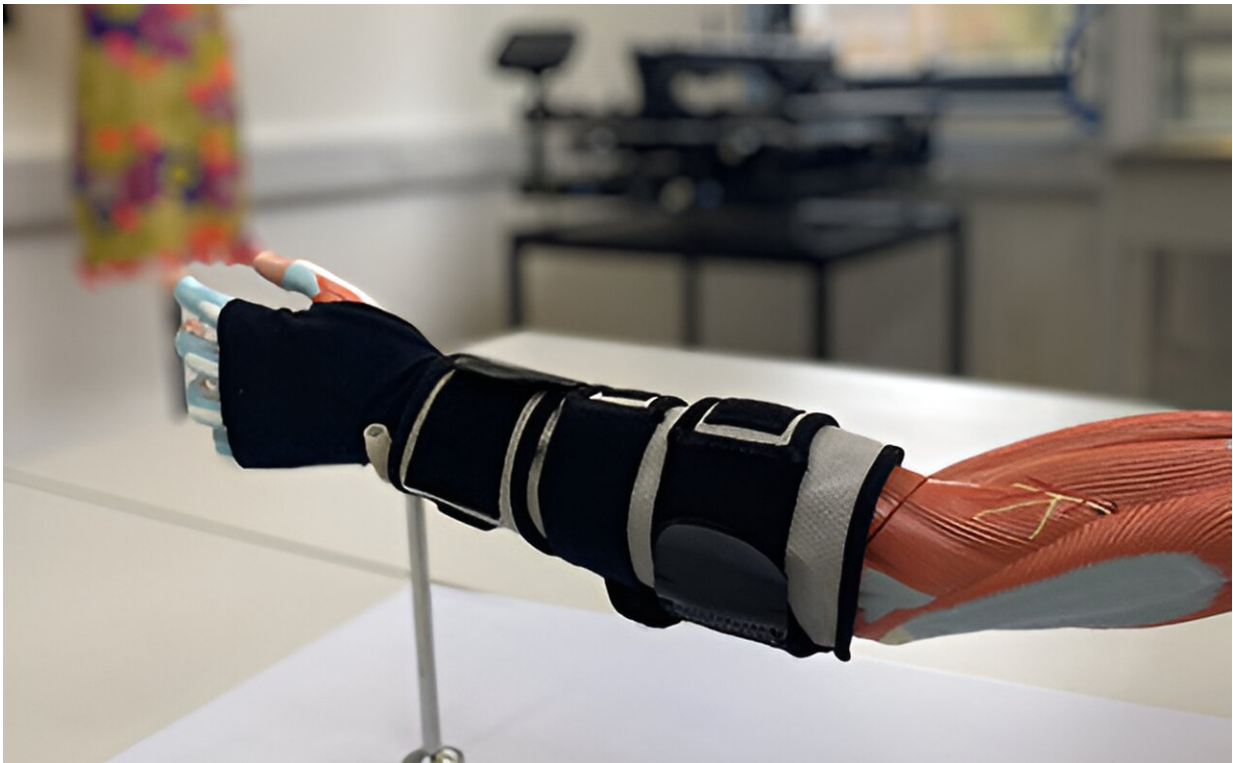


A smart glove to improve stroke rehabilitation

November 29 2023



The stroke glove prototype on a lab model. Credit: University of Southampton

An electronic glove that enables movement in the paralyzed hand of stroke survivors to support their rehabilitation has been invented by a team from the University of Southampton.

The glove has electrodes printed on the sleeve that make contact with the skin. The electrodes send electronic impulses to stimulate the nerves and muscles to produce an artificial movement. It enables [stroke survivors](#) to achieve movement in their weak side, helping them to regain [muscle strength](#) and function.

The glove has been designed and made by Kai Yang, Professor of E-textiles in Healthcare, and her team based at the university's Winchester School of Art. Professor Yang explained, "I wanted to develop something easy for stroke survivors to use at home. People who have suffered a stroke get fatigued easily, so engaging in long rehabilitation sessions is very challenging. This glove enables them to work on their rehab in small blocks of time when it suits them. With stroke rehabilitation, the more you practice movement, the more you regain muscle strength and mobility."

The prototype glove has been developed and made at Winchester School of Art, using the school's industrial knitting machines. The [electrodes](#) are printed inside the sleeve and connected to an electronic control unit, allowing the user to vary the level of stimulation as required.

Professor Yang has worked with Different Strokes Southampton, a [charity](#) run by stroke survivors for stroke survivors, to develop the glove.

Through the charity, she has worked with stroke [survivor](#) Dave Lea, from Chandler's Ford. He suffered a major stroke in 2015, at the age of 54, that has left him largely paralyzed on his right-[hand](#) side. The glove enables him to move his paralyzed right hand. "It's life changing," he said. "It means I can move my hand—something I've been unable to do for eight years."

Mr. Lea's wife, Sarah, added, "It was really emotional seeing Dave test run the glove for the first time—it's incredible that it enables him to

move his hand. It really could change the lives of stroke survivors."

Ranj Parmar, Group Coordinator at Different Strokes Southampton and a stroke survivor himself, added, "The benefits of the [stroke rehabilitation](#) sleeve are extremely impactful. It allows stroke survivors to be able to continue their rehab many weeks and months after their stroke. It enables a stroke survivor to open their affected hand and when performed repeatedly it should enable the opening and closing of the hand more easily."

Professor Yang is now looking to refine the design of the prototype glove by working with more stroke survivors, and then conduct a home usability test with stroke survivors using the glove multiple times every day. Following this, she intends to seek regulatory approval and then work with a manufacturer to scale-up the production of the glove.

"We are delighted with the prototype and would like to see this become a product that's available to all [stroke](#) survivors, to help improve their recovery and their quality of life," she said.

Provided by University of Southampton

Citation: A smart glove to improve stroke rehabilitation (2023, November 29) retrieved 27 April 2024 from <https://medicalxpress.com/news/2023-11-smart-glove.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.