

Robotic exosuit will get stroke victims back into their stride

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Stroke patients who have difficulty walking may soon benefit from an invention developed in the United States. A team of researchers has created a soft robotic "exosuit" to help patients to regain the ability to walk around with confidence.

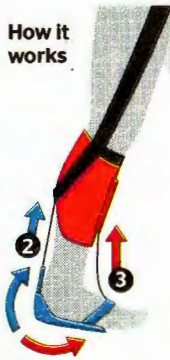
A stroke can cause weakness on one side of the body, leaving many survivors with difficulty sitting or standing. About a fifth can walk but develop a condition called drop foot, where they cannot lift their toes quickly enough.

Previous robotic exoskeletons, designed to help with rehabilitation, have tended to be rigid and bulky and are impractical to wear during everyday activities. The new device consists of an ankle-support system weighing only 0.9kg, the same as two footballs.

It has been developed by engineers, designers, biomechanists and physical therapists from the Wyss Institute for Biologically Inspired Engineering at Harvard University.

Over two days of testing the exosuit, nine people aged between 30 and 67 all showed "more efficient and less asym-

How it works



Fabric suit assists wearer's muscles to make walking easier

- 1 Suit detects muscle movement
- 2 Cord tightens to lift heel
- 3 Then front cord tightens to lift toes

metrical strides when wearing the device, both when walking tethered on a treadmill and over open ground", the Wyss team reported.

Dr Donald Ingber, the founding director of the Wyss Institute, said that the exosuit provided a "glimpse of a new future" in which patients were assisted by human-friendly robots.

"This exosuit looks more like sports clothing than R2D2, yet it is equally programmable and carries out tasks on command. However, the exosuit is lightweight, flexible, virtually invisible to others, and individualises itself for

each patient. We hope that it will soon enter clinical use, where it undoubtedly could transform the lives of stroke patients for the better."

The suit consists of a waist belt with a battery pack and leg straps, connected to a sleeve on the calf. Small mechanical parts exert force on a shoe insole, pushing the person forward and correcting ankle angle problems.

More than 100,000 people in the UK suffer strokes each year, and 1.2 million people are living with the after-effects. Almost two thirds of stroke survivors leave hospital with a disability.