

Convalescing at home after a stroke

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Once every three seconds, somewhere in the world, someone suffers what's commonly referred to as a stroke: a haemorrhage or infarction of the brain. Circa 75% of the people who survive a stroke are left with temporary or permanent motor limitations in the arm or hand. Ard Westerveld, doctoral candidate at the University of Twente, has developed a (prototype) system that will allow patients to convalesce at home in the future, without the need for a therapist. Westerveld will obtain his doctoral degree next 13 March. He is affiliated with the University of Twente's MIRA research institute.

For his research, Westerveld combined robotics technology with [electrical stimulation](#). For some time now, robotics has been used to help patients with reduced muscular strength by supporting their arm and hand movements. Electrical stimulation focuses on activating muscles. By combining the technologies, Westerveld has developed an automated convalescence instrument. Robotics supports reaching movements and electrical stimulation activates movements for holding and letting go.

Westerveld has developed a prototype. Westerveld: "The results of my research confirm the technical feasibility of an automated convalescence instrument. This will enable patients to train their hand and arm movements at any moment they want, at home and without the assistance of a therapist. This leads to therapy becoming more intense, promoting the recovery of patients. In addition, the burden on care professionals is greatly reduced. Home convalescence is the future."

Westerveld made a short movie about his research findings. The movie

shows how test subjects move their arm and hand without supporting it themselves. Westerveld asked his test subjects to relax completely. Moving a person who is passive is the most demanding task for the system.

Provided by University of Twente

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