

# Unique walking robot moves into rehabilitation clinic

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The LOPES II rehabilitation robot has been taken into use by the Roessingh rehabilitation centre in Enschede and the Sint

Maartenskliniek in Nijmegen. In the coming weeks, the first patients in the Netherlands with, for example, a CVA or spinal cord injury, will practice with this unique rehabilitation robot in order to learn to walk better again. The novelty of the LOPES II is that the robot only supports the patient when needed during the walking practice. LOPES II was developed by a consortium consisting of the University of Twente and the mechatronic companies Moog and Demcon. Roessingh and Sint Maartenskliniek provided clinical input for the development process.

LOPES II is the redesigned successor to the LOPES I, which was developed by the University of Twente (Department of Biomedical Engineering, Prof.dr.ir. Herman van der Kooij). The [robot](#) has been used for research since 2007. In recent years, the consortium has worked hard to make the move to the clinic. With the installation of two systems, this has now been achieved.

## **Support only when needed**

The robot supports the walking movement of people who are partially paralyzed following a stroke or spinal cord injury. LOPES holds the patient firmly around the pelvis, lower leg and foot. The device continuously measures how the patient walks and provides support when the patient's walking movement is performed incorrectly. During a training programme, this support is adjusted to the patient's walking ability by the physiotherapist. 'Support only when needed' is the starting point for the LOPES II. This encourages the patient to actively contribute to the walking, thereby promoting the recovery.

## **Rehabilitation centre wishes**

The wishes of various rehabilitation centres are explicitly included in the design. Jos Meuleman, who works at Moog and is a PhD candidate at the

University of Twente, explains: "LOPES II has been designed to quickly get patients in and out of the equipment. In addition, both therapist and patient receive feedback on performance during the training to facilitate individual tailoring. Patients also have considerable freedom of movement so that they can learn from their mistakes in a safe environment."

## Enthusiastic responses

The therapists are enthusiastic about the possibilities offered by LOPES II. Hans Rietman, part-time professor of rehabilitation medicine and technology at the University of Twente and director of Roessingh Research and Development (RRD) in Enschede, says: "The robotic walking trainer, developed by means of intensive collaboration between clinic and technology, can, with a real human touch, help patients to walk independently step by step. It is a great asset for rehabilitation."



Bart Nienhuis, LOPES project manager at the Sint Maartenskliniek, adds: "We have already been using treadmill training since the 1990s and are pleased with the development of LOPES II that can take over the 'mechanical work' of a physiotherapist. The physiotherapist is not made redundant, but now has the opportunity to train intensively with individual tailoring by using this robot. The physiotherapy aimed at restoring [walking](#), which we offer in the rehabilitation process, can be offered more intensively with the same manpower and for a wider audience. That makes this equipment so special for us."



In the coming months, the new robot will be used for research purposes and to examine how the robot can best be used for therapy.

Provided by University of Twente

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