

Ms Teresa Tan walking on stage with the aid of an exoskeleton suit and a hospital staff member at the launch of the Temasek Foundation – Improving Mobility via Exoskeletons (iMOVE) programme at Alexandra Hospital yesterday. With them are fellow iMOVE patient Henry Tan and chief of rehabilitation services at Alexandra Hospital, Dr Effie Chew. ST PHOTO: GAVIN FOO



New programme seeks to develop use of exoskeletons in patient rehab

Felicia Choo

A spinal cord injury 15 years ago crippled Ms Teresa Tan and left her in a wheelchair, but wearing a bionic exoskeleton has helped her to walk again.

Ms Tan, 67, is one of 36 patients who are unable to walk independently due to neurological diseases. They are part of a study looking at the effectiveness of using exoskeletons – external skeletons that support and protect the body – in the rehabilitation process.

The Temasek Foundation – Improving Mobility via Exoskeletons (iMOVE) programme will study patient outcomes and assess the viability and potential of scaling up the use of robotic exoskeletons in rehabilitation care, from the hospital to the community.

It will seek to improve the mobility and independence of patients – especially elderly ones – suffering from conditions like strokes and spinal cord injuries, said Professor John Wong Eu Li, chief executive of the National University Health System (NUHS). He was speaking at the programme's launch event, which was held at Alexandra Hospital yesterday.

Robot-assisted devices are increasingly helping therapists to provide high-intensity, repetitive and task-specific treatment, which is hard for patients to achieve once they are discharged from hospital, he added.

Stroke is the leading cause of long-term disability and loss of mobility here. The number of new cases every year has risen from 5,500 to 7,400 over the last decade.

Three exoskeletons will be shared by the NUHS' five partner sites: Alexandra Hospital, NTUC Health, St Luke's ElderCare and St Luke's Hospital and the Stroke Support Station.

NUHS is the first national health system in Asia to study how advanced exoskeleton technology can improve mobility and rehabilitation outcomes across the care system.

The philanthropic organisation Temasek Foundation, together with the non-profit Trailblazer Foundation, will provide a total of \$1.34 million in funding over two years to buy the exoskeletons and train 12 physiotherapists to use them.

The exoskeletons are supplied by United States exoskeleton company Ekso Bionics.

The plan is to recruit a total of 400 patients, with at least 80 per cent of them aged 66 and above, said Dr Effie Chew, chief of rehabilitation services at Alexandra Hospital.

Initial results have shown that four of the six patients who completed the programme have improved in at least one category of functional mobility since using the exoskeleton suit, she added.

Of the 400 patients, 100 will serve as the control group which does not use the exoskeleton suit.

Patients may be eligible for the study if they are not able to walk independently, and will first be assessed by a physiotherapist and doctor. Each patient in the study is entitled to 12 sessions of using the exoskeleton.

Ms Tan, who suffers from inflammation of the spinal cord, has had 10 sessions and now needs only 30 per cent assistance from the exoskele-

How exoskeleton rehabilitation works



SCAN TO WATCH



<http://str.sg/exoskeleton>

ton, less than half of the 70 per cent required initially. "I've improved a lot and I feel excited," she said. "I wish I could continue using it."

Mr Yap Thian Yong, a physiotherapist at St Luke's Hospital, said: "The suit allows for more consistent practice of the joint movements because the motors at the hip, knee and ankle can be adjusted according to how much assistance the patient needs from the machine."

But the exoskeleton is not suitable for patients who have a very limited range of joint motion or have poor upper limb strength, he added.

A national task force to advance the knowledge and use of technology in rehabilitation was also formed on Monday.

The Advance Rehabilitation Technology Special Interest Group, which comes under the Society of Rehabilitation Medicine, brings together rehabilitation professionals such as doctors, therapists, engineers, nurses and care teams.

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TAILORED TO FIT

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MR YAP THIAN YONG, a physiotherapist at St Luke's Hospital.