

# Portable robotic device can help stroke patients with therapy

It helps them rebuild their arm strength, and can be used at home or in hospitals

**Joyce Teo**  
Senior Health Correspondent

A portable robotic device that can help stroke patients with their recovery at home was unveiled at a media event at Tan Tock Seng Hospital (TTSH) yesterday.

Aided by the robot, patients can do the repetitive exercises needed to regain control in their arms and build up their strength, without always having to visit a clinic or hospital for sessions with a therapist.

The portable arm rehabilitation robot weighs 14kg and has been named H-Man. Rather than resembling a man, however, the device sits on a table, its joystick-shaped handle connected to a computer screen and a resting pad.

It may look simple enough, but H-Man is an intelligent device.

It can sense the condition of the patient's arm in terms of strength, coordination and agility, and automatically adjust assistance or resistance according to his needs when he performs the exercises, which involve playing a game shown on the screen, using the joystick.

In this manner, the patient relearns sensorimotor control so that he can resume daily activities.

Furthermore, H-Man will give feedback about the patient's progress to his therapist, who can monitor recovery remotely. This is particularly convenient amid the Covid-19 pandemic.

During the media launch at TTSH, Dr Asif Hussain, chief executive and co-founder of Articares, the company that is developing H-Man, said that the robotic device is used in some hospitals and nursing homes here and overseas, but not at TTSH – although the hospital has plans to incorporate it in one of its post-stroke therapy programmes some time next year.

He said that most robots currently used for rehabilitation purposes weigh up to 70kg and are located at hospitals where their operation is managed by occupational therapists.

These robots are also costly, which makes widespread implementation a challenge.

Stroke is the leading cause of long-term disability, and rehabilitation helps those who have had a stroke relearn the skills they lost when part of their brain was damaged.

Associate Professor Domenico Campolo, co-founder of Articares, said the portability of H-Man can

CLOSER TO HOME

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**ASSOCIATE PROFESSOR DOMENICO CAMPOLO**, co-founder of Articares, on the benefits of using the H-Man at home.

make a difference in the use of such technology for post-stroke therapy.

"When we started, we really wanted to build something for the home... Our definition of portable was anything that fits in a taxi," he said.

The Articares founders said H-Man can be rented or purchased, but they declined to share the cost.

"The traditional way is to bring the patient to the clinic where you have maybe one hour for the therapy. Anything longer than an hour is difficult as the patient will be fatigued," said Prof Campolo, who is also director of the Nanyang Technological University (NTU) Robotics Research Centre.

"But if you have something closer to home, maybe you can have 15 minutes in the morning, 15 minutes in the afternoon. It opens up possibilities to try new therapies as well."

Retiree Seet Jui Luang, 60, who had a stroke in July last year and has weakness in her dominant right arm, was happy to use H-Man to complement the daily hand and arm exercises she did at home.

She was one of 10 patients who experienced the H-Man that was on loan from Articares at TTSH's Centre for Advanced Rehabilitation Therapeutics (Cart) early this year. It has since been returned.

H-Man is the result of more than eight years of work by scientists from NTU, in collaboration with rehabilitation physicians and occupa-

tional therapists from Cart.

Adjunct Associate Professor Karen Chua, a senior consultant at TTSH's Department of Rehabilitation Medicine and at NTU's Lee Kong Chian School of Medicine, led the clinical trials for H-Man from 2014 to 2018.

She said it has demonstrated its efficacy in helping patients improve their upper-limb mobility in combination with conventional occupational therapy, during a clinical trial involving 60 stroke patients undergoing rehabilitation.

"Furthermore, lasting gains up to 19 weeks were observed after training, implying sustainability of the training, and this was associated with high levels of patient safety and self-reported satisfaction in trained subjects," she said, adding that the therapist will set the training goal for the patient and that the exercises must be prescribed.

When the H-Man trial was completed, the technology was commercialised and spun off into Articares, which is incubated by NTUitive, NTU's enterprise and innovation company.

TTSH's principal occupational therapist Christopher Kuah said that H-Man, which can also be used in hospitals, makes repetitive exercises less boring for patients, as they play a game while doing their therapy.

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## Man jailed for cheating bank of over \$2m

**Dominic Low**

A director of a firm which deals with the printing of cardboard packages was sentenced to 30 months' jail after cheating a bank of more than \$2 million in loans between 2016 and 2018.

Chong Teng Siow, 61, pleaded guilty yesterday to eight counts of engaging in a conspiracy to cheat The Bank of East Asia.

Another 20 similar charges were taken into consideration by District Judge Ong Luan Tze during sentencing.

Court documents state that Chong was the managing director of Jit Sheng Graphic & Paper Manufacturing at the time of his offences. The company is now in liquidation, according to an online search.

Jit Sheng and The Bank of East Asia had an agreement where the company could receive loans of up to 95 per cent of amounts owed to it by its customers based on invoices it submitted to the bank, capped at \$500,000.

The court heard that between 2016 and 2018, the company incurred losses due to poor business, financial mismanagement and Chong's health problems.

In order to keep Jit Sheng's operations running, Chong instructed Ms Doreen Toh Bee Ghuon, an administrative assistant at the company, to prepare fictitious invoices on multiple occasions between 2016 and 2018.

These invoices purportedly showed that Jit Sheng had engaged in business transactions with various other firms – such as Sats Catering and Emicakes – for the printing of customised cardboard box packaging. They also falsely stated that the firms had to repay Jit Sheng on "a credit payment term basis".

The invoices were used to deceive the bank into disbursing credit facilities to the company.

When forging some of the invoices, Ms Toh would use a photocopied version of the respective firm's company stamp, which she had obtained from documents used in genuine transactions between Jit Sheng and the firms.

Chong or Ms Toh would also sign on these invoices to make them appear genuine.

The duo's actions led the bank to issue more than \$2 million in credit facilities to Jit Sheng.

The court heard that Chong has made restitution of nearly \$1.6 million, and that he had voluntarily surrendered himself to the police even though the bank did not make a police report.

District Judge Ong later granted his request to defer his jail term to Nov 9, so that he can go for a medical appointment next week to collect medication for his existing health issues.

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Madam Seet Jui Luang, 60, who had a stroke in July last year, using the H-Man device yesterday during a media demonstration, under the guidance of Mr Christopher Kuah, principal occupational therapist at Tan Tock Seng Hospital. Madam Seet was one of 10 patients who experienced using H-Man earlier this year to complement the daily hand and arm exercises she did at home. ST PHOTO: ONG WEE JIN

## Former MPs Lam Pin Min, Ang Hin Kee in new transport, co-op roles

**Justin Ong**

Two former People's Action Party (PAP) MPs who left politics this year have taken on new roles.

Dr Lam Pin Min, former senior minister of state for transport and health, has joined car rental firm Lumens Auto as a senior adviser, while unionist Ang Hin Kee has been appointed chief executive of the Singapore National Cooperative Federation (SNCF).

For Dr Lam, 51, an ophthalmologist, the new role is on top of being the CEO and director of paediatric ophthalmology at Eagle Eye Centre. His move to the private sector follows the PAP team's defeat by the Workers' Party in Sengkang GRC at the July 10 General Election.

Dr Lam, who became an MP in 2006, said in a Facebook post on Tuesday that his work at Lumens Auto involves advancing the com-



Dr Lam Pin Min (left) and Mr Ang Hin Kee are former People's Action Party MPs who left politics this year.

pany's business development and growth.

He told The Straits Times (ST) yesterday that although he is now "unable to contribute at ministry-level, I am still passionate about playing a role in helping the industry navigate through this challenging period".

"I hope, with my experience in the transport sector and my understanding of the economic and health impact of the coronavirus pandemic, I would be able to help Lumens Auto

shape its policy and planning."

The company supplies cars to the private-hire industry, whose major players include Grab and Gojek. It said Dr Lam would, among other things, help strengthen its partnerships with key stakeholders.

Mr Ang, 55, who is assistant director-general of the National Trades Union Congress (NTUC), will helm SNCF from Sunday, the federation said yesterday. It is the apex body for Singapore's cooperative movement, whose enterprises provide help in areas such as healthcare, daily essentials, education and training.

Mr Ang, who chose not to contest this year's polls after being an MP for Ang Mo Kio GRC for nine years, told ST there is "synergy" between his SNCF appointment and his role at NTUC, in terms of doing good for the community. "I hope to use what I've done in the political and union fields to broaden the outreach of the cooperatives," he said.

Mr Ang said the pandemic underscored the social role of cooperatives in helping members tide over difficult times. "Covid-19 presents opportunities for the cooperative movement to help build a new normal that is more caring and inclusive," he added.

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## Jail, caning, fine for 25-year-old man who molested teenage boy

**Shaffiq Alkhatib**  
Court Correspondent

A man befriended a 13-year-old boy who had disciplinary issues and promised the latter's father that he would "guide and advise" the teenager.

Instead, the 25-year-old man molested the boy on two occasions in March.

The Singaporean offender was yesterday sentenced to two years' jail with five strokes of the cane and a fine of \$2,500. He pleaded guilty to one count of molestation and an unrelated charge of criminal breach of trust.

He is not named owing to a gag order to protect the victim's identity.

The man got to know the victim in early March through a mutual friend. He later asked the boy to join him on an overnight fishing trip.

Deputy Public Prosecutor Kenneth Kee said: "The victim was not

ordinarily allowed by his parents to stay out overnight, so the accused spoke to the victim's father.

"During this conversation, the victim's father informed the accused about his concern that the victim had been having disciplinary issues."

The man then assured the father that he could "guide and advise" the teenager "appropriately".

The two went on a fishing trip on March 16 and continued to spend time together thereafter.

On March 19, the man invited the boy to stay overnight at his Choa Chu Kang flat and they shared a bed.

DPP Kee said that the man molested the boy in the wee hours of March 20. "The victim, who did not consent to the act, was shocked, scared and uncertain as to how he should have reacted at the time. Nonetheless, the victim kept silent and pretended to stay asleep on the bed," he added.

After they got up, the boy joined

the man in setting up some decorations for a wedding.

Later that day, the man sent the boy's mother a text message, asking if she would allow her son to stay over for one more night. The woman agreed as she thought he was a good role model for her son.

The boy agreed to return to the man's flat as he had left his belongings there. They were resting in bed in the wee hours of March 21, when the man molested him again.

The boy later told his parents about his ordeal. He lodged a police report on March 22, the court heard.

Separately, the man was working as a deliveryman from Feb 24 to March 6 when he was tasked to deliver some items to a warehouse. But he made off with items including four pairs of shoes and three jackets worth \$1,360 in all.

He was caught and has since made full restitution.

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