NTU system for post-stroke therapy cuts costs too

By **NG SAI YING**

RESEARCHERS at the Nanyang Technological University (NTU) have taken after-stroke therapy forward with a system that tracks patients' brain and muscle signals, and racks up cost savings for hospitals and patients.

Clinical investigations are ongoing at Tan Tock Seng Hospital, and further development is being done on the system to make it usable by the patient at home.

The system has so far been effective in rehabilitating stroke patients who have undergone conventional rehabilitation for a year or more and have stagnated in their improvement. Some have since managed to make significant progress again, recovering as much as 70 per cent of their motor function in just a month during the patient trial.

The system is known as the Synergistic Physio-Neuro Platform, or SynPhNe (read "Symphony"). It consists of easy-to-use computer software and a device which receives signals from a headset and an arm glove worn by the patient. The headset and glove have sensors to track brainwaves and muscle movement, respectively.

The computer interface comes pre-loaded with instructional video tutorials for rehabilitation exercises as prescribed by therapists, presented in a format which patients can follow.

Dr Heng: *Patients gain a higher level of freedom with the system*

Attached sensors simultaneously provide feedback on the stress, attention, and relaxation levels of the patient's mind, together with signals of muscle activity or inhabitation. Patients can chart their progress in these tutorials, thus gaining insight into their recovery process.

John Heng, a senior research fellow at NTU's School of Mechanical and Aerospace Engineering, explaining the cost savings made possible, said: "In the past, it was one therapist to each patient, with the therapist spending two to three hours guiding the patient through the exercises. This machine can do it on behalf of the therapist."

With the aid of SynPhNe, therapists become supervisors rather than administrators of rehabilitation exercises. They can also oversee the rehabilitation sessions for more patients at any one time.

At the same time, patients gain a higher level of independence, and savings in therapist hours. Less caregiver support is needed as well.

More importantly, hospitals free up bed space, because in-patient bed hours are reduced. Patients will eventually able to continue their rehabilitation from home, when the current prototype is developed into a portable stroke-therapy kit for home use.

Dr Heng said that the fact that patients can be discharged from hospital sooner while continuing their rehabilitation at home makes for "very dramatic cost savings" for hospitals.

"We're not just looking at saving those few hours of therapy time, but all the associated time that the patient needs to be there, staying in hospital. The cost savings are very significant."

Apart from planning patient trials with National University Hospital, Singapore General Hospital and Max Healthcare in India, the NTU researchers are looking to commercialise the product within the next two to three years.