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# S'pore device to strengthen muscles gets approval here and in US

QuantumTX CEO Ivan Goh (left) and Kwong Wai Shiu Hospital CEO Mok Ying Jang with the Quantum Mitohormesis (QMT) device, which uses magnetic pulses to stimulate and regenerate muscle cells. ST PHOTOS: LIM YAOHUI

Dr Mok chatting with Mr Michael Mahendran, a patient at Kwong Wai Shiu Hospital who could benefit from the QMT device after a stroke seven years ago left him unable to walk. With them is staff nurse Bautista Ronnie Anchola.

## Medical device developed here is portable and can be used by bed-bound patients

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A Singapore-developed device to strengthen muscles and reduce pain has gained approval from health regulators in Singapore and the US – allowing it to be sold as a medical device in both countries.

Called Quantum Mitohormesis (QMT), the device uses magnetic pulses to stimulate and regenerate muscle cells, a process similar to what happens during exercise.

It is the next-generation version of the Bixeps device, which has been available here for some years as a fitness device. Unlike Bixeps, QMT is portable and can be used by bed-bound patients. It also has two levels of intensity to cater to the different needs of patients.

Singapore's Health Sciences Authority (HSA) has approved the use of QMT for rehabilitation of patients to improve muscle strength, reduce pain, improve muscle energetics post-injury or surgery, and to increase mobility.

However, the approval is only for the lower intensity level, which is similar to that of the Bixeps device.

The US Food and Drug Administration has approved both intensity levels for prescription use to stimulate healthy limb muscles to improve performance, and to prevent retardation and atrophy of muscles.

As a medical device, QMT has to be operated by a healthcare professional such as a doctor, nurse or physiotherapist.

In Singapore, Kwong Wai Shiu Hospital will be among the first to get the device for its patients, likely in about four months' time when the first batch of 30 machines are produced.

The hospital's chief executive Mok Ying Jang said about 900 of its 1,100 inpatients receive some form of rehabilitation. He hopes the QMT will help to slow down sarcopenia, a condition that occurs when older adults lose muscle mass, strength and function.

A clinical trial of Bixeps conducted by the Chinese University of Hong Kong and the Prince of Wales Hospital in Hong Kong found that, after two 10-minute sessions per week for eight weeks, patients' ability to function improved by 20 per cent and their pain was reduced by 30 per cent.

Currently, about 30 senior centres in Singapore use Bixeps to help seniors regain or maintain their muscle strength.

Mr Ivan Goh, chief executive of QuantumTX, which owns the devices, said some users, especially those who are frail, gain about 250g to 500g of muscle mass after eight weeks of use.

The device has also been used at the Singapore General Hospital (SGH) for the past two years to help patients who have sarcopenia and osteoarthritis, a degenerative joint disease.

Orthopaedic surgeon Tay Boon Keng, who introduced the device to SGH, said his patients appear to benefit from stronger muscles, as seen in the grip-strength test. He also likes that the treatment is non-invasive.

Professor Tay said it is crucial to strengthen the muscles of patients after surgery to reduce the risk of them falling again.

Now that the QMT device has HSA certification, he said: "We look forward to using this more widely in the hospital for patients with sarcopenia. In addition, with the more portable design, we intend to use this for post-operative elderly patients, who would benefit from a quicker and more sustained recovery."

Dr Mok said QMT is better suited than Bixeps for his patients as it can be lifted onto the bed for use by bed-bound patients.

One such patient who will benefit is Mr Michael Mahendran, 81, a retired school teacher who suffered a stroke seven years ago that left him unable to walk.

Mr Mahendran remains mentally alert and spends most of his days watching news programmes on a tablet provided to each patient for entertainment.

Dr Mok hopes the QMT can give Mr Mahendran more strength in his arms so that he can pull himself up.

With one machine, about 160 patients can each have a 10-minute session a week for 12 weeks. Another batch of 160 patients would then have their turn.

Dr Mok plans to start with those who are still mobile so that they can continue doing activities to keep themselves physically fit.

If the device proves useful to his patients, Dr Mok said the hospital will want to acquire more if it can get funding for them.

The primary developer of Bixeps is Associate Professor Alfredo Franco-Obregon, who brought the semi-developed device from ETH Zurich, a Swiss university, when he joined NUS more than a decade ago.

The development of the machine was completed here.

The device produces magnetic pulses that activate the energy-producing mitochondria in muscle cells.

This then triggers a metabolic response in the cells and releases myokines, which aid the regeneration of muscles. The same response occurs during exercise.

Prof Franco-Obregon said that while the magnetic pulses target the limbs, the therapy improves the metabolism of the entire body since the myokines are released into the bloodstream.

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