



JOINT NEWS RELEASE

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AI-powered massage robot to start product evaluation in the United States and clinical trial in Singapore

Singapore robotics firm **AiTreat** will be embarking on a new product evaluation in the United States for their massage robot powered by Artificial Intelligence (AI) at **Mayo Clinic**, USA.

At the same time, a randomised controlled trial (RCT) comparing the efficacy of the massage robot with existing therapies such as manual Tuina – a massage used in Traditional Chinese Medicine (TCM) – in managing chronic low back pain is also being planned in Singapore.

The RCT will be jointly led by the **Biomedical Sciences and Chinese Medicine programme at Nanyang Technological University, Singapore (NTU Singapore)** and **Singapore General Hospital (SGH)**.

The above two research projects will be using *EMMA* – short for Expert Manipulative Massage Automation – the flagship product of AiTreat, a start-up incubated by NTU Singapore through its innovation and enterprise company, NTUitive.

EMMA aims to alleviate the manpower shortage of skilled massage therapists and possibly to augment the work of physiotherapists in managing less complex cases in Singapore and other countries, thus helping bring down treatment costs while providing consistent high-quality treatment to every patient.

Since 2019, the start-up has deployed over 19 *EMMA* units working in 14 locations in Singapore, China and the US, such as in TCM clinics, physiotherapy centres and hospitals, clocking over 41,500 treatment hours.

The new proposed RCT by NTU and SGH is in line with another earlier multi-centre research that compared the efficacy of Tuina with physiotherapy in helping to relieve

chronic low back pain, conducted by **Mayo Clinic** in Minnesota, USA, **SGH** in Singapore, and **Jinan University** in Guangzhou, China.

The earlier multi-centre research used human Tuina therapists instead of robots, and was sponsored by **The HEAD Foundation**, an international charitable organisation that supports quality education and effective healthcare to improve lives in Asia.

How the proposed RCT will be conducted

AiTreat hopes to enrol about 180 patients for the proposed RCT by the end of 2023. If the trial results are positive, it will pave the way for a robotic solution of an integrative East-West approach in the management of low back pain, to be accepted as part of musculoskeletal intervention in mainstream healthcare.

To set the stage for the proposed research collaboration, an EMMA demonstration was included in a four-day workshop held at the Mayo Clinic earlier last week. The proposed clinical research protocol for the efficacy and safety of robotic Tuina was also presented by **Associate Professor Linda Zhong, Director of Biomedical Sciences and Chinese Medicine** at the **School of Biological Sciences, NTU**, and was followed by discussions among the workshop participants.

Assoc Prof Zhong, co-investigator of the proposed RCT, said: “The proposed multi-centre clinical study will combine the concepts of chronic low back pain’s diagnosis and TCM pattern differentiation criteria – which is the analysis and summarisation of the clinical symptoms obtained through four diagnostic methods: inspection, auscultation and smell, inquiry, and pulse taking and palpation. It seeks to assess the effectiveness and safety of robotic Tuina within different population groups more precisely and individually. It will also explore the feasibility of using robotic Tuina in Singapore’s daily clinical practice.”

Dr Brent Bauer, Director of the Mayo Clinic Complementary and Integrative Medicine Programme, said: “Our multi-centre Tuina clinical trial has generated much interest, both from patients and physicians. However, we face a shortage of skilled practitioners in the US – and a growing reluctance in young people to pursue careers in the caring professions. So, we are heading to a perfect storm where we will have clinically proven efficacy, a nearly endless demand, and insufficient practitioners to meet that need. Robotic delivery of Tuina and other massage therapies seems inevitable. I am glad that we can help lead the way by conducting a clinical evaluation of this new technology.”

“As a foundation with a mission to help improve life, The HEAD Foundation supports the development of healthcare solutions that integrates Eastern medical practices and Western medical practices,” said **Professor Cham Tao Soon, Chairman of the Advisory Board of The HEAD Foundation**

“I am glad that we have the opportunity to support a start-up incubated at NTU while its innovative healthcare product is helping to relieve pain and improve health in our community. It is also a natural extension of the three-centre Tuina clinical research we are sponsoring,” added Prof Cham, who is also President Emeritus and the Founding President of NTU.

Professor Chen Jiayu, Dean of the School of Traditional Chinese Medicine at Jinan University, Guangzhou, highlighted the innovative use of AI and robotics for TCM: “Tuina is an essential form of TCM therapy while artificial intelligence is a very powerful new technology. I am glad they are now being integrated to benefit patients who are suffering from back pain and other musculoskeletal conditions. It will reduce the workload of TCM therapists significantly and allow them to focus on diagnosis and the more intricate parts of the treatment. It also shows that TCM is keeping pace with the progress of modern science and technology.”

Professor Tay Boon Keng, Emeritus Consultant, Orthopaedic Surgery at SGH, said more than 80 per cent of the adult population suffer from back pain at one time or another, which has a serious impact on productivity: “The challenge in Singapore and the rest of Southeast Asia is that we do not have enough qualified TCM practitioners and physiotherapists to treat the large number of patients. If an automated solution like EMMA is proven safe and effective, it will be of great help to both the healthcare community and our patients.”

AiTreat future plans

Using the clinical treatment results gathered through the new trials and deployments, AiTreat will improve the AI algorithms and performance of its robot, and it seeks to launch the next-generation EMMA in Singapore, US and China markets by 2024.

AiTreat was founded in 2015 by Dr Albert Zhang, an alumnus from the NTU’s pioneer batch of its Double Degree programme in Biomedical Sciences and Chinese Medicine. Since then, the start-up has completed a multi-million Series A funding round last year and is currently planning for its Series A+ fundraising later this year.

Investors of AiTreat include US-based venture capital firm BRC Innovation, leading robotics and AI company Flexiv, Tasly International Capital, the investment arm of pharmaceutical company Tasly; Comfort Enterprise, which represents Ogawa, a leading brand for healthcare and wellness.

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About The HEAD Foundation

The HEAD Foundation is an International Charitable Organisation, registered with the Commissioner of Charities in Singapore in 2013. It was set up to carry out philanthropic works in education but later extended its remit to include healthcare to improve lives in Asia, particularly in the less developed parts of Southeast Asia. It supports and funds sustainable education and healthcare projects that develop social and human capital. It strives to identify needs and formulate solutions by working with a network of global and regional universities, public institutions, and domain specialists through the sponsorship of policy, pedagogical and clinical research. To promote awareness of pertinent issues, the Foundation also conducts regular public events and workshops where ideas on education, healthcare, science, culture and the environment are presented and discussed.

headfoundation.org

About Nanyang Technological University, Singapore

A research-intensive public university, Nanyang Technological University, Singapore (NTU Singapore) has 33,000 undergraduate and postgraduate students in the Engineering, Business, Science, Medicine, Humanities, Arts, & Social Sciences, and Graduate colleges.

NTU is also home to world-renowned autonomous institutes – the National Institute of Education, S Rajaratnam School of International Studies, Earth Observatory of Singapore, and Singapore Centre for Environmental Life Sciences Engineering – and various leading research centres such as the Nanyang Environment & Water Research Institute (NEWRI) and Energy Research Institute @ NTU (ERI@N).

Under the NTU Smart Campus vision, the University harnesses the power of digital technology and tech-enabled solutions to support better learning and living experiences, the discovery of new knowledge, and the sustainability of resources.

Ranked amongst the world's top universities, the University's main campus is also frequently listed among the world's most beautiful. Known for its sustainability, over 95% of its building projects are certified Green Mark Platinum. Apart from its main campus, NTU also has a medical campus in Novena, Singapore's healthcare district.

For more information, visit www.ntu.edu.sg