



Fostering Collaborative Partnerships

Working with partners who can contribute complementary expertise to solve healthcare needs is key to the success of any co-development efforts. The basis of these partnerships is the understanding and agreement on a collaboration model that is mutually beneficial. CMTi catalyzes the formation of such collaborative partnerships by bringing together clinicians with their curated clinical needs and well-matched partners with their technology and business expertise.

PARTNERSHIP

Clinical Needs Driven

NHG Clinicians identify the unmet clinical needs and the healthcare and patient context

Clinicians from various medical specialties bring to the table their expertise knowledge vital to the co-development of solutions that can effectively address healthcare needs.

CMTi matches partners with the right expertise and interests and facilitates the discussion between the 2 parties to scope the project effectively.

Technology Push

Partners share their innovative technologies and its potential for clinical application

Technology partners contribute their technical expertise and share knowledge in the generation of viable business models for successful commercialisation of co-developed MedTech solutions.

Successful Translation of Deep Tech into Implementable Solutions

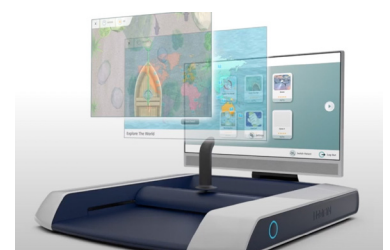
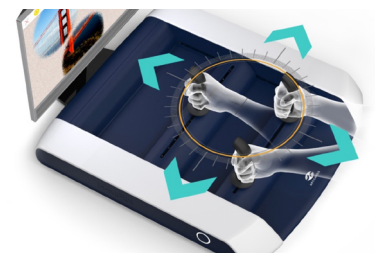
NHG has been actively collaborating with scientists and engineers from academia and research institutions. These collaborations have facilitated the research and development of early-stage deep technologies. With the clinicians' support in the co-development and validation, the clinical applicability of these technologies greatly increases. Project teams have seen the potential of its translation into real-world solutions and applications that can be commercialised to meet the needs of end users including patients and healthcare providers.

H-MAN Rehabilitation Robot

Scientists from **Nanyang Technological University, Singapore (NTU)** have collaborated with rehabilitation physicians and occupational therapists from the **Centre for Advanced Rehabilitation Therapeutics (CART) at Tan Tock Seng Hospital (TTSH)** to develop H-MAN, a portable medical robot designed to help patients undergo upper-limb rehabilitation therapy at home. The training exercises are presented in the form of serious video games (also known as 'exergames'), making rehabilitation with H-MAN an engaging and user-friendly experience. Equally important, rehabilitation plans with H-MAN can be carried out with minimal supervision from therapists and caregivers.

H-MAN has been clinically validated by a [clinical trial](#) led by PI **Dr Karen Chua** and her multidisciplinary team at TTSH-CART. Outpatients using H-MAN showed significant improvement in mobility, on par with the conventional therapy offered in hospitals. The robotic therapy also proved to be more efficient in times of manpower demands.

Upon successful completion of the clinical trials, [H-MAN technology](#) was launched as a commercial venture in 2017 by [Articares Pte Ltd](#). Articares has grown in the span of three years into an established medical technologies company with an international presence.



Since the beginning of the partnership between NTU and TTSH, NTUitive and CMTi have been firm supporters of the team through various local and international medical conferences, guiding the team in their efforts to secure competitive grants from NHIC. In support of the collaboration, CMTi proactively surfaced Articares to Enterprise Singapore on various fronts and was able to help justify the strong unmet clinical needs that Articares is seeking to address. This has given confidence to ESC to further invest in the start-up's continued research and development.

Collaboration between TTSH and Articares has produced a successful integration of clinical and engineering expertise, leading to the development of innovative solutions for rehabilitation and motor training at home and in the community

TTSH and Articares are currently developing an integrated system for robotics-assisted telerehabilitation. This innovation, empowered by artificial intelligence, has the potential to improve the intensity and quality of home-based training exercises, improve therapist productivity, and reduce direct healthcare costs. Through their

partnership, TTSH and Articares aim to contribute to the development of a robust healthcare ecosystem in Singapore, one that is well aligned with the Ministry of Health's (MOH) '3 Beyonds' strategy for future health services: beyond healthcare to health, beyond hospital to community, and beyond quality to value.

