Wee Seng Kwee

Senior Principal Physiotherapist, Rehabilitation Centre, TTSH
Associate Professor, Singapore Institute of Technology

Research Interests:
- Neurorehabilitation – Traumatic Brain Injury, Stroke, Spinal Cord Injury
- Vestibular Rehabilitation
- Rehabilitation Technology – Robotics, Virtual Reality, Brain-Computer Interface, Wearable Sensors
- Neuromodulation
- Regenerative Medicine and Rehabilitation

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Biography

Associate Professor Wee Seng Kwee is a Senior Principal Physiotherapist who has been working in Tan Tock Seng Hospital Rehabilitation Centre, Singapore, for the past 31 years. He graduated from King's College London with BSc(Hons) Physiotherapy in 1994, under the Public Service Commission (PSC) Scholarship. He obtained his PhD in Neurorehabilitation from the University of Southampton, United Kingdom in 2015. Currently, he holds the joint appointment as Associate Professor at the Singapore Institute of Technology, teaching in the undergraduate physiotherapy, occupational therapy and nursing programmes. In addition, he is a Research Scientist at the Rehabilitation Research Institute of Singapore (RRIS), a joint research institute by NHG, NTU and A*STAR.

He is a Certified Brain Injury Specialist and a Vestibular Rehabilitation Therapist who manages patients with acquired brain injury, balance and vestibular dysfunction. He has been sharing his expertise in neurorehabilitation, vestibular rehabilitation and robot-assisted therapy via workshops conducted in Asia-Pacific and Europe since 1999. Prof Wee has published and presented papers on vestibular rehabilitation, traumatic brain injury, stroke, spinal cord injury, rehabilitation technology, neuromodulation and regenerative rehabilitation in local and international scientific conferences. He serves as an Executive Committee Member of the Neuro-Vestibular Special Interest Group of the Singapore Physiotherapy Association.

In 2022, he was conferred the *Outstanding Physiotherapist Award* by the Singapore Physiotherapy Association in recognition of his impactful and enduring contributions to the profession, exemplary

leadership, commitment to learning, and role-modelling qualities. That same year, he also received the *Honour Roll Outstanding Clinical Educator Award* from Tan Tock Seng Hospital. In 2024, he was further recognised with the *Clinician Innovator of the Year Award* by the Academy of Clinician Scientists and Innovators (ACSI) for his leadership and contributions to advancing health technology innovation.

Selected Publications

- **Wee SK**, Ng ZYV, Phua MW, Lui WL, Rahim FMA, Ker JRX, Ng WH, Wan KR (2025). Synergistic integration of epidural spinal cord stimulation with robotic therapy and neurorehabilitation to facilitate functional recovery in chronic motor complete spinal cord injury: A Case Series. *Advances in Rehabilitation Science and Practice* 14: 1-26. doi:10.1177/27536351251343738

- Misbaah F, Lui WL, Ng ZYV, **Wee SK**, Phua MW, So RQ, Premchand B, Susanto K, Saffari SE, Ker JRX, Ng WH, Wan KR (2025). Recruitment Challenges in Spinal Cord Stimulation Trial for Motor Recovery in Patients with Chronic Complete Spinal Cord Injury. *Journal of Clinical Medicine* 14(11):3925. https://doi.org/10.3390/jcm14113925

- Wan KR, Ng V, **Wee SK**, Rahim FMA, Lui WL, Phua MW, So RQY, Maszczyk TK, Premchand B, Saffari SE, Ker JRX, Ng WH (2024). Recovery of volitional motor control and overground walking in participants with chronic clinically motor complete spinal cord injury: RESTORES trial - A preliminary study. *J Neurotrauma* 41(9-10):1146-1162 doi: 10.1089/neu.2023.0265

- Lee CJW, Lim CJY, Das AK, Quah ASK, **Wee SK** (2025). Walking speed and distance requirements for functional community ambulation in Singapore. *Hong Kong Physiotherapy Journal*. https://doi.org/10.1142/S1013702525500088

- Tanczak N, Yurkewich A, Missiroli F, **Wee SK**, Kager S, Choi H, Cho KJ, Yap HK, Piazza C, Masia L, Lambercy O (2025). Soft Robotics in Upper Limb Neurorehabilitation and Assistance: Current Clinical Evidence and Recommendations. *Soft Robotics* 12(3):303-314. doi: 10.1089/soro.2024.0034.

- Cheng H-J, Chin LF, Kanzler CM, Lehner R, Kuah CWK, Kager S, Josse E, Samkharadze T, Sidarta A, Gonzalez PC, Lie E, Zbytniewska-Mégret M, **Wee SK**, Liang P, Gassert R, Chua K, Lambercy O, Wenderoth N (2023) Upper limb sensorimotor recovery in Asian stroke survivors: a study protocol for the development and implementation of a Technology-Assisted dIgitaL biOmaRker (TAILOR) platform. Front. Neurol. 14:1246888. doi:10.3389/fneur.2023.1246888

- Li L, Foo MJ, Chen J, Tan KY, Cai J, Swaminathan R, Chua KSG, **Wee SK**, Kuah CWK, Zhuo HT, Ang WT (2023). Mobile Robotic Balance Assistant (MRBA) - A Gait Assistive and Fall Intervention

Robot for Daily Living. *Journal of NeuroEngineering and Rehabilitation* 20:29 https://doi.org/10.1186/s12984-023-01149-0

- **Wee SK**, Warner MB, Hughes AM, Burridge JH (2022). Longitudinal Analysis of the Recovery of Trunk Control and Upper Extremity in People with Subacute Stroke: An Individual Growth Curve Approach. *Topics in Stroke Rehabilitation* 29(1):58-73.doi.org/10.1080/10749357.2021.1878333.

- **Wee SK**, Ho CY, Tan SL, Ong CH (2021). Enhancing Quality of Life in Progressive Multiple Sclerosis with Powered Robotic Exoskeleton. *Multiple Sclerosis.* 27(3):483–487. doi: 10.1177/1352458520943080.

- Alhwoaimel N, Turk R, Warner MB, Verheyden G, **Wee SK**, Hughes AM (2018). Do Trunk Exercises Improve Trunk and Upper Extremity Performance, Post Stroke? A Systematic Review and Meta-analysis. *Neurorehabilitation* 43(4):395-412.

- Lin J, Anopas D, Milbreta U, Lin PH, Chin JS, Zhang N, **Wee SK**, Tow A, Ang WT, Chew SY (2019). Regenerative Rehabilitation: Exploring the Synergistic Effects of Rehabilitation and Implantation of Bio-functional Scaffold in Enhancing Nerve Regeneration. *Biomaterials Science.* 7(12):5150-5160. doi: 10.1039/C9BM01095E.

- Liang P, Kwong WH, Sidarta A, Yap CH, Tan WK, Lim LS, Chan PY, Kuah CWK, **Wee SK**, Chua K, Quek C, Ang WT (2020). An Asian-centric Human Movement Database Capturing Activities of Daily Living. *Scientific Data-Nature*. 7:290. https://doi.org/10.1038/s41597-020-00627-7

- Alhwoaimel N, Warner MB, Hughes AM, Ferrari F, Burridge JH, **Wee SK**, Verheyden G, Turk R (2020). Concurrent Validity of a Novel Wireless Inertial Measurement System for Assessing Trunk Impairment in People with Stroke. *Sensors*. 20:1699. doi:10.3390/s20061699.

- Lambercy O, Lehner R, Chua K, **Wee SK**, Rajeswaran DK, Kuah CWK, Ang WT, Liang P, Campolo D, Hussain A, Aguirre-Ollinger G, Guan C, Kanzler CM, Wenderoth N and Gassert R (2021). Neurorehabilitation From a Distance: Can Intelligent Technology Support Decentralized Access to Quality Therapy?. *Front. Robot. AI* ; 8:612415. doi:10.3389/frobt.2021.612415.

- Alhwoaimel N, Turk R, Hughes AM, Ferrari F, Burridge JH, **Wee SK**, Verheyden G, Warner MB (2021). Instrumented Trunk Impairment Scale (iTIS): A Reliable Measure of Trunk Impairment in the Stroke Population. *Topics in Stroke Rehabilitation*. 28(6):456 – 463. doi.org/10.1080/10749357.2020.1834273.

- **Wee SK**, Hughes AM, Warner MB, Brown S, Cranny A, Mazomenos EB, Burridge JH (2015) Effect of trunk support on upper extremity function in people with chronic stroke and healthy controls. *Physical Therapy* 95(8): 1163-1171

- **Wee SK**, Hughes AM, Warner MB, Brown S, Cranny A, Mazomenos EB, Burridge JH, Yeo SCD, Kong KH and Chan KF (2015) Impact of trunk control on upper extremity function in subacute and chronic stroke patients and healthy controls. *Physiotherapy* 101(Supplement 1): eS1619

- **Wee SK,** Hughes AM, Warner MB, Burridge JH (2014) Trunk restraint to promote upper extremity recovery in stroke patients: a systematic review and meta-analysis. *Neurorehabilitation and Neural Repair* 28(7): 660-677

Notable Research Awards & Grants from Past 5 Years

Name of Awards & Grants	Year Obtained
RIE2020 Advanced Manufacturing and Engineering (AME) Programmatic Fund - Grant Number A20G8b0102: Next-Generation Brain-Computer-Brain Platform – A Holistic Solution for the Restoration & Enhancement of Brain Functions (NOURISH) - Work Package #12 (WP12) Principal Investigator: Clinical – Brain-Computer Interface (BCI) for lower limb - Co-Investigator	2020
Future Health Technologies (FHT) programme - Future Health Technologies programme was established collaboratively between ETH Zurich and the National Research Foundation Singapore - This research is supported by the National Research Foundation, Prime Minister's Office, Singapore, under its Campus for Research Excellence and Technological Enterprise (CREATE) programme. - Module 3: Connected rehabilitation technology and assistive technology to go beyond hospital to community for post-stroke treatment - Co-Investigator	2020
Rehabilitation Research Institute of Singapore (RRIS) Rehabilitation Research Grant 3 (RRG 3) 2020 ⌊ᵢ⌋ SEP - RRG3/19003: Towards Data-Driven Ability Gap Modelling - Co-Investigator	2020
National Innovation Challenge (NIC) on Active and Confident Ageing - Healthy Longevity Global Grand Challenge Award 2021 - HLCA21Jan-0024: Smart Textile for Gamified Fitness - Co-Investigator	2021
National Medical Research Council (NMRC) Clinician-Scientist Individual Research Grant New Investigator Grant (CS-IRG-NIG) 2022 - CNIG21nov-001: RESTORES trial: RESToration Of Rehabilitative function with Epidural spinal Stimulation - Co-Investigator	2022
Ng Teng Fong Healthcare Innovation Programme Grant 2022 - NTF_FY2022_2_C2_CR_05: RESToration Of Rehabilitative function with Epidural spinal Stimulation (RESTORES) - Co-Investigator	2022

Ng Teng Fong Healthcare Innovation Programme Grant 2024 (Innovation Track 4 – Strategic Innovation Track) - NTF_SIP_EMRM_P13: Evaluation of the Safety and Feasibility of an Enhanced version of Wearable Robotic Upper Limb Exoskeleton (EksoUE) for Intensive Rehabilitation - Principal Investigator	2024
Ng Teng Fong Healthcare Innovation Programme Grant 2025 (Pillar B Track 2: Strategic Innovation) - NTF_SIP_Outpatient_P01: Evaluating the Safety and feasibility of an Enhanced Version of Wearable Robotic Upper Limb Exoskeleton for Intensive Rehabilitation - Principal Investigator	2025