



Chua Sui Geok Karen

Senior Consultant, Rehabilitation Medicine, Tan Tock Seng Hospital

Associate Professor, LKCMedicine, Nanyang Technological University

Research Interests:

- Neurorehabilitation
- Brain injury & stroke rehabilitation
- Rehabilitation robotics and technology
- Brain computer interfaces
- Telerehabilitation

Email: karen.chua@nhghealth.com.sg

Biography

Dr Chua, (MBBS, MRCP, FRCPE, FAMS), has 30 years of clinical rehabilitation medicine practice at the TTSH Rehabilitation Centre and TTSH-CART (Clinic for Advanced Rehabilitation Therapeutics, National Healthcare Group (NHG), with sub-specialization in brain injury rehabilitation and neurorehabilitation. She obtained her clinical fellowship in Brain Injury Rehabilitation from Baylor College of Medicine, Houston, Texas, USA under a year-long MOH HMDP programme in 1997. She also has a practicing license in medical acupuncture with the TCM Practitioners Board, MOH since 2001. She is a core faculty member of the NHG rehabilitation medicine senior residency programme. Dr Chua was appointed director, Institute of Rehabilitation Excellence (IREx) in 2024 and is currently the vice chair, rehabilitation health academic clinical programme (recovery and reconstruction) and Co-Director, Rehabilitation Research Institute of Singapore (RRIS) and has a mentor role at LKC Medicine Academy of Clinician Scientists and Inventors (ACSI). She was awarded NHG outstanding citizen in 2012, NHG research innovation team award (NRIA) in 2021, NHG mentor of the year award in 2023 and NHG Innovate (NIA) award in 2025. She has also received TTSH teaching awards in 2002, 2009, 2010, 2018 & 2022. Dr Chua currently holds research grants in robotics-aided telerehabilitation, upper limb stroke technology-aided rehabilitation brain computer interface (BCI), neurological related sarcopaenia. Her research collaboration projects include digital gait motion capture and cognitive motor dissociation for conscious disorders after brain injury. She has co-authored >90 publications including 2 review articles, 4 book chapters and holds 4 joint-patents. She is guest associate editor for Frontiers Rehabilitation Sciences and LIFE Physical Medicine and Rehabilitation.

Selected Publications

- **Chua, K. S. G.**, Cheong, Z. J., Yee, E., & Krishnan, R. R. (2025). Correlates of Rehabilitation Length of Stay in Asian Traumatic Brain Injury Inpatients in a Superaged Country: A Retrospective Cohort Study. *Life*, 15(7), 1136. <https://doi.org/10.3390/life15071136>
- Tay MRJ, Kim JM, Ong PL, Khin LW, Wong CJ, Kong KH, Tan BY, Lee ES, Sim SZ, Lim WS, Yam MGJ, Chew JL, Tan AWK, Sidarta A, Yee E, **Chua KSG**. Targeting osteosarcopenia and multimorbidity for frailty prevention through identification and deep phenotyping methods in healthy ageing and high-burden disease cohorts (OPTIMA-C): a longitudinal observational cohort study protocol for neuromusculoskeletal muscle health. *BMJ Open*. 2025 May 23;15(5):e094279. doi: 10.1136/bmjopen-2024-094279. PMID: 40409965; PMCID: PMC12104916.
- Sidarta A, Lim YC, Kuah CWK, **Chua KSG**, Ang WT. Relearning Upper Limb Proprioception After Stroke Through Robotic Therapy: A Feasibility Analysis. *J Clin Med*. 2025 Mar 23;14(7):2189. doi: 10.3390/jcm14072189. PMID: 40217638; PMCID: PMC11989307.
- **Chua KSG**, Piravej K, Kang JH, Chou LW. Editorial for the Special Issue "Physical Medicine and Rehabilitation: Trends and Applications". *Life (Basel)*. 2025 Mar 7;15(3):419. doi: 10.3390/life15030419. PMID: 40141764; PMCID: PMC11943755.
- Tay MRJ, Seah JD, **Chua KSG**. Incidence And Associations Of Unplanned Acute Care Unit Readmissions Of Primary Brain Tumour Patients During Rehabilitation: A Retrospective Study. *J Rehabil Med Clin Commun*. 2025 Apr 1;8:41974. doi: 10.2340/jrm-cc.v8.41974. PMID: 40201415; PMCID: PMC11977410.
- Sidarta, A., Lim, Y. C., Kuah, C. W. K., **Chua, K. S. G.**, & Ang, W. T. (2025). Relearning Upper Limb Proprioception After Stroke Through Robotic Therapy: A Feasibility Analysis. *Journal of Clinical Medicine*, 14(7), 2189. <https://doi.org/10.3390/jcm14072189>
- Aguirre-Ollinger G, **Chua KSG**, Ong PL, Kuah CWK, Plunkett TK, Ng CY, Khin LW, Goh KH, Chong WB, Low JAM, Mushtaq M, Samkharadze T, Kager S, Cheng HJ, Hussain A. Telerehabilitation using a 2-D planar arm rehabilitation robot for hemiparetic stroke: a feasibility study of clinic-to-home exergaming therapy. *J Neuroeng Rehabil*. 2024 Nov 26;21(1):207. doi: 10.1186/s12984-024-01496-6. PMID: 39593101; PMCID: PMC11590240
- Lo YT, Lim MJR, Kok CY, Wang S, Blok SZ, Ang TY, Ng VYP, Rao JP, **Chua KSG**. Neural Interface-Based Motor Neuroprosthesis in Poststroke Upper Limb Neurorehabilitation: An Individual Patient Data Meta-analysis. *Arch Phys Med Rehabil*. 2024 Apr 4:S0003-9993(24)00910-9. doi: 10.1016/j.apmr.2024.04.001. Epub ahead of print. PMID: 38579958.

- Pan, J. W., Sidarta, A., Wu, T.-L., Kwong, W. H., Ong, P. L., Tay, M. R., Phua, M. W., Chong, W. B., Ang, W. T., & **Chua, K. S.** (2024). Unravelling stroke gait deviations with movement analytics, more than meets the eye: A case control study. *Frontiers in Neuroscience*, 18. <https://doi.org/10.3389/fnins.2024.1425183>
- Aarthy Nagarajan, Neethu Robinson, Kai Keng Ang, **Karen Sui Geok Chua**, Effie Chew and Cuntai Guan, “Transferring a deep learning model from healthy subjects to stroke patients in a motor imagery brain-computer interface”, *Journal of Neural Engineering (JNE)*, December 2023, DOI: 10.1088/1741-2552/ad152f. (IF: 4.0)
- Ong, P.L.; Rosiana, A.; **Chua, K.S.G.** Characteristics and Functional Impact of Unplanned Acute Care Unit Readmissions during Inpatient Traumatic Brain Injury Rehabilitation: A Retrospective Cohort Study. *Life* 2023, 13, 1720. <https://doi.org/10.3390/life13081720>.(IF 3.2)
- Ong, P.L.; Seah, J.D.; **Chua, K.S.G.** Inpatient Rehabilitation Outcomes after Primary Severe Haemorrhagic Stroke: A Retrospective Study Comparing Surgical versus Non-Surgical Management. *Life* 2023, 13, 1766. <https://doi.org/10.3390/life13081766> (IF 3.20)
- Ratha Krishnan, R.; Ting, S.W.X.; Teo, W.S.; Lim, C.J.; **Chua, K.S.G.** Rehabilitation of Older Asian Traumatic Brain Injury Inpatients: A Retrospective Study Comparing Functional Independence between Age Groups. *Life* 2023, 13, 2047. <https://doi.org/10.3390/life13102047> (IF 3.2)
- Alhossary A, Ang WT, **Chua KSG**, Tay MRJ, Ong PL, Murakami T, Quake T, Binedell T, Wee SK, Phua MW, Wei YJ, Donnelly CJ. Identification of Secondary Biomechanical Abnormalities in the Lower Limb Joints after Chronic Transtibial Amputation: A Proof-of-Concept Study Using SPM1D Analysis. *Bioengineering (Basel)*. 2022 Jun 30;9(7):293. doi: 10.3390/bioengineering9070293. PMID: 35877344.
- Tay MRJ, Lim CJ, **Chua KSG**. Functional and ambulatory benefits of robotic-assisted gait training during early subacute inpatient rehabilitation following severe stroke. *Singapore Med J*. 2021 Nov 26. doi: 10.11622/smedj.2021219. Epub ahead of print. PMID: 34823332.(IF 3.331)
- **Chua KSG**, Krishnan RR, Yen JM, Plunkett TK, Soh YM, Lim CJ, Chia CM, Looi JC, Ng SG, Rao J. 3D-printed external cranial protection following decompressive craniectomy after brain injury: A pilot feasibility cohort study. *PLoS One*. 2021 Oct 28;16(10):e0258296. doi: 10.1371/journal.pone.0258296. PMID: 34710123.(IF 3.4)
- **Chua KSG**, Loke JJY, Lim CJ, Thio JML, Krishnan RR. Rehabilitation outcome after acute subarachnoid haemorrhage: the role of early functional predictors and complications. *Singapore Med J*. 2021 Nov 19. doi: 10.11622/smedj.2021198. Epub ahead of print. PMID: 34808738.(IF 3.331)

- Budhota A, **Chua KSG**, Hussain A, Kager S, Cherpin A, Contu S, Vishwanath D, Kuah CWK, Ng CY, Yam LHL, Loh YJ, Rajeswaran DK, Xiang L, Burdet E, Campolo D. Robotic Assisted Upper Limb Training Post Stroke: A Randomized Control Trial Using Combinatory Approach Toward Reducing Workforce Demands. *Front Neurol.* 2021 Jun 2;12:622014. doi: 10.3389/fneur.2021.622014. PMID: 34149587; PMCID: PMC8206540
- 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. PMID:34026855
- **Chua, K. S.**, Earnest, A., Chiong, Y., & Kong, K. H. (2010). Characteristics and correlates of rehabilitation charges during inpatient traumatic brain injury rehabilitation in Singapore. *Journal of rehabilitation medicine*, 42(1), 27–34. <https://doi.org/10.2340/16501977-0476> IF 3.959)

Notable Research and Innovation Awards & Grants from Past 5 Years

Name of Awards & Grants	Year Obtained
National Healthcare Group Research Innovation Award - HMAN for robot aided rehabilitation	2021
Smart robot therapy for stroke upper limb rehabilitation: A proof-of-value trial of clinic to home robotics-assisted telerehabilitation. Temasek Fund, Singapore	2021
NHIC_I2I (2104007): Robotics Assisted Telerehabilitation at Home: a Solution for Clinical Adoption	2022
NHG Research Mentor of the Year Award	2023
Mobility Frailty Falls – the OPTIMA-C programme: Targeting osteosarcopenia and multimorbidity for frailty prevention through identification and deep phenotyping methods in healthy aging and high-burden disease cohorts	2023
NHIC_I2Adopt (2305004) Telerehabilitation Robotics for Upper Limb Rehabilitation after Stroke (TRUST): a study of multi-cluster adoption	2024
National Healthcare Group Innovate award (NIA)	2025

Translating Research and Innovation Into Healthcare

- <https://www.straitstimes.com/singapore/health/modernising-rehabilitation-medicine-as-the-sector-in-singapore-marks-golden-jubilee>

- <https://www.straitstimes.com/singapore/engineering-student-gets-3d-printed-finger-after-bike-accident>
- <https://www.straitstimes.com/singapore/wearable-robot-detects-and-prevents-falls-especially-in-the-elderly-reducing-reliance-on-caregivers#:~:text=Called%20the%20Mobile%20Robotic%20Balance,can%20counter%20falls%20and%20imbalances.>
- <https://www.washingtonpost.com/technology/2022/09/10/fall-prevention-robot/>
- https://www3.ntu.edu.sg/CorpComms2/documents/2022/09_sep/businessinsider_220911_mrb_a.pdf
- https://www.straitstimes.com/singapore/health/robot-helps-stroke-patients-with-their-rehabilitation-at-home?xtor=CS3-18&utm_source=STiPhone&utm_medium=share&utm_term=2020-10-29%2020%3A10%3A41

Patents pending (selected)

- Head Protection Prototype Device (HPPD) and method of manufacturing for Post-Decompression Craniectomy Patients, filed in 2021, PCT/SG2021/050161
- Transfer Assistive Cobot (TAC), provisional patent application 0202250455 R (Singapore), filed 2022