

MEDIA RELEASE

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For Immediate Publication

NUHS SPEARHEADS AI-POWERED BRAIN CARE PROGRAMME TO TACKLE UNDERDIAGNOSIS AND IMPROVE PREVENTION OF DEMENTIA

Novel initiative in Asia integrates predictive AI with personalised health coaching to empower early action and prevention



Clockwise from top left: Professor Teo Hock Hai, Provost's Chair Professor of Information Systems, NUS School of Computing; Dr Andrew Makmur, Group Chief Technology Officer, National University Health System; Dr Tan Li Feng, Senior Consultant, Division of Geriatric Medicine, Department of Medicine, Alexandra Hospital; Dr Benjamin Tan, Consultant, Division of Neurology, Department of Medicine, National University Hospital (NUH); Mr Francis Phng, Lead Research Analyst, Health Services Research & Analytics, Ng Teng Fong General Hospital; NUH patient Mr Tan Poh Kee; Mr Koh Keng Hoe, who is a longtime patient of Dr Tan Li Feng, and his daughter Ms Genevieve Koh.

SINGAPORE — Dementia remains a hidden epidemic in Singapore, with slightly more than half of all cases going undiagnosed. According to the Well-being of the Singapore

Elderly (WiSE) 2023¹ study, 51.5 per cent of dementia cases remain undetected. This is a troubling figure given that an estimated 45 per cent of dementia cases are preventable through early lifestyle interventions².

In an effort to close this gap, a multidisciplinary research team from the National University Health System (NUHS) has been awarded SG\$2.33million, which is supported by the Singapore Ministry of Health through the National Medical Research Council (NMRC) Office, MOH Holdings Pte Ltd under the NMRC Healthy and Meaningful Longevity - Cognition Grant Call.

The team's project, titled **"Innovative Methods for Proactive Risk Optimization and adVancEment in Cognitive Health (IMPROVE-COG)"** brings together the power of artificial intelligence, community partnerships, and global expertise to shift the paradigm from late-stage diagnosis to lifelong brain care.

"In the local context, dementia may go unnoticed. Many older adults and their loved ones believe memory loss is simply part of ageing, and may not realise that help is available," says Principal Investigator Dr Tan Li Feng, Senior Consultant, Division of Geriatric Medicine, Department of Medicine, Alexandra Hospital (AH). "With smaller family sizes and more older adults living alone, it can be harder to gather the corroborative observations that help us recognise the early signs of cognitive decline. This means opportunities for early support and intervention are sometimes missed."

Undercoding and missed diagnoses

Studies overseas show that in up to one-third of hospital admissions involving persons with dementia, the condition was not recorded accurately as a diagnosis³. Undercoding and limited clinician awareness are significant contributing factors to the underdiagnosis⁴.

"Even when symptoms are present, they can be overlooked," explains Co-Principal Investigator Dr Benjamin Tan, Consultant, Division of Neurology, Department of Medicine, National University Hospital (NUH). "For example, a patient admitted for pneumonia may have been showing signs of cognitive decline that are flagged in social workers' and therapists' reports, but not formally assessed."

"Relevant patient information may also be scattered across various healthcare encounters, resulting in fragmented data and missing pieces of the puzzle."

Harnessing AI and real-world data

To counter these blind spots, the research team, including the Health Services Research & Analytics team at Ng Teng Fong General Hospital, will develop an AI-powered large language model (LLM) trained on anonymised real-world data from NUHS's DISCOVERY AI platform⁵. The screening and surveillance tool will analyse

¹ [Prevalence of dementia in Singapore: Changes across a decade - Subramaniam - 2025 - Alzheimer's & Dementia - Wiley Online Library](#)

² [Dementia prevention, intervention, and care: 2024 report of the Lancet standing Commission - The Lancet](#)

³ [Under-coding of dementia and other conditions indicates scope for improved patient management: A longitudinal retrospective study of dementia patients in Australia - PubMed](#)

⁴ Existing surveillance approaches rely on International Classification of Diseases (ICD) or Systematized Nomenclature of Medicine - Clinical Terms (SNOMED-CT) codes, but these often do not fully capture and reflect the reality of the situation, due to incomplete medical documentation, miscommunication between clinical coders and physicians, and inherent limitations in coding conventions.

⁵ [Shorter hospital waiting times with artificial intelligence](#)

diverse clinical documentation to identify individuals at risk of mild cognitive impairment (MCI) and dementia, offering a scalable and cost-effective solution for risk stratification and population health surveillance.

“This project leverages the robust NUHS data infrastructure ecosystem that allows anonymised patient data visualisation, enabling earlier detection and identification, and improvements in clinical care delivery,” says Dr Andrew Makmur, Group Chief Technology Officer, NUHS. “Ultimately, we hope that the LLM will make the process of diagnosing dementia more accurate, efficient and cost-effective.”

Following the development of the LLM, the research team will work with Co-Investigator Professor Teo Hock Hai and his team from the NUS School of Computing to leverage Geographic Information System mapping and spatial analysis to explore the relationship between environmental (e.g., exposure to green spaces) and social factors and cognitive impairment and thereby guiding more effective and equitable healthcare interventions.

Launching Asia’s first digital brain care tool

In line with the Healthier SG programme and recognising the precious window of opportunity for early intervention, the research team will also deploy Asia’s first digital Brain Care Tool, a culturally tailored application that integrates two key innovations:

- The Brain Care Score (BCS): A holistic score that helps individuals track their brain health across physical, lifestyle, and social-emotional domains, from blood pressure and sleep to social engagement and stress. By evaluating 12 modifiable risk factors, the BCS provides a bird’s eye view of overall brain health, which also covers pertinent age-related brain diseases including stroke and late-life depression.
- The Brain Care Coach: A next-generation AI-powered behavioural interventional tool that delivers personalised nudges, tracks progress, and motivates users to adopt brain-protective behaviours such as exercising, improving diet, and quitting smoking.

Originally developed and validated by the Brain Care Labs at Mass General Brigham and Harvard Medical School, the BCS is now a cornerstone of the Global Brain Care Coalition, which aims to reduce the global incidence of dementia, stroke and late-life depression by 30 per cent by 2050.

In Singapore, the tool will be localised and designed to incorporate community inputs to ensure cultural relevance and alignment with the population’s needs. Individuals will be able to engage with it regardless of age, prior diagnoses or digital literacy. The research team will collaborate with community partners, including the Health District @ Queenstown, St Luke’s Hospital, and Yong En Care Centre to pilot and develop the AI-coach. The research team also includes investigators from NHG Health, to scale the AI and digital tools to more hospitals when ready.

“Our long-term goal is to integrate the AI-powered screening and surveillance tool with the digital Brain Care Tool intervention across community settings,” Dr Tan Li Feng says. “Dementia and poor brain health profoundly affect individuals, families and communities. There is much we can do to close existing gaps and adopt a proactive approach to give people a better chance at ageing well, with clarity, purpose and hope.”

“Our vision is to empower every individual to take charge of their brain health. Through accessible, personalised tools and actionable insights, we aim to inspire and enable people to actively care for their brains, making brain health a lifelong priority.”

Chinese Glossary

National University Health System (NUHS)	国立大学医学组织 (国大医学组织)
National Medical Research Council (NMRC) Healthy and Meaningful Longevity Cognition Grant Call	国家医学研究理事会健康充实长寿认知资助申请
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Brain Care Score (BCS)	脑照护评分
Brain Care Coach	脑照护智能助理
Global Brain Care Coalition	全球脑照护联盟

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About the National University Health System (NUHS)

The National University Health System (NUHS) aims to transform how illness is prevented and managed by discovering causes of disease, development of more effective treatments through collaborative multidisciplinary research and clinical trials, and creation of better technologies and care delivery systems in partnership with others who share the same values and vision.

Institutions in the NUHS Group include the National University Hospital, Ng Teng Fong General Hospital, Jurong Community Hospital, Alexandra Hospital and the upcoming Tengah General and Community Hospital; three National Specialty Centres – National University Cancer Institute, Singapore (NCIS), National University Heart Centre, Singapore (NUHCS) and National University Centre for Oral Health, Singapore (NUCOHS); the National University Polyclinics (NUP); Jurong Medical Centre; and three NUS health sciences schools – NUS Yong Loo Lin School of Medicine (including the Alice Lee Centre for Nursing Studies), NUS Faculty of Dentistry and NUS Saw Swee Hock School of Public Health.

With member institutions under a common governance structure, NUHS creates synergies for the advancement of health by integrating patient care, health science education and biomedical research. As a Regional Health System, NUHS works closely with health and social care partners across Singapore to develop and implement programmes that contribute to a healthy and engaged population in the Western part of Singapore.

For more information, please visit www.nuhs.edu.sg.

About the National Medical Research Council (NMRC) Office

The NMRC Office is hosted within the Division of Research and Innovation under MOH Holdings Pte Ltd. It supports the NMRC in the administration of research funding from the Singapore Ministry of Health. Its vision is to translate research for better health and achieves this by promoting excellence in translational and clinical research, nurturing a vibrant research community of clinicians and scientists, and enhancing knowledge translation for better health and economic outcomes.