

# NUHS Centres of Excellence



# Pioneering a Healthier Future for All

Faced with an ageing population, the rise of chronic disease and a healthcare manpower crunch, Singapore requires, more than ever, innovative solutions to meet our future needs in health and healthcare.

The NUHS Centres of Excellence are six centres with a mission to create new models of care that aid hospitals and communities in boosting the quality of life of both the healthy and the unwell. Each Centre focuses on a critical area of health and is led by a distinguished domain expert.

As part of the National University Health System (NUHS) and co-located at Alexandra Hospital, the Centres tap on a vast pool of research talent and academic resources for breakthrough innovation, ensuring a Singapore that is ready for tomorrow's challenges and pioneering a healthier future for all.



## NUHS Centres of Excellence

# Centre for Chronic Disease Prevention & Management



As the burden of disease in Singapore shifts towards chronic conditions such as diabetes and cardiovascular illness, we believe the solution lies in a collaborative partnership between proactive individuals and an engaged healthcare provider.

We are working towards patient-centric healthcare – where doctors listen to patients' needs and help them make informed decisions about their health – lowering the barriers to behavioural change, so that patients can make and sustain positive lifestyle adjustments.

empowering patient-centric health decisions

## Centre Director

**Prof Tai E Shyong** is an endocrinology specialist with expertise in diabetes, cardiovascular disease and obesity. His work on metabolic disease has shaped clinical practice guidelines in Singapore, and the risk assessment tool he developed is used to make clinical decisions on cardiovascular disease.

Currently, he runs an inter-disciplinary research programme studying diabetes, public health and human physiology, engaging the fields of behavioural science and food science to examine factors that affect health behaviours such as food choices.

## Signature Programmes

### Patient-Centred Diabetes Care

**Year of Care** is a diabetes care planning programme successfully implemented at the National University Hospital. It emphasises patient empowerment with support from the clinician, resulting in improved control over the disease.

Prior to an appointment, patients receive test results that prompt them to reflect on their health. Upon meeting their doctor, a two-way discussion allows the patient to raise concerns, set goals and develop an action plan. The success of Year of Care has led to **PACE-D**, a large community-based study at the National University Polyclinics.

### Heart Age Singapore

This online self-assessment tool calculates the risk of heart disease based on factors such as BMI, cholesterol and smoking habits. The result, presented as the age of one's heart, is a simple indicator of cardiovascular health (e.g. a heart age higher than your actual age is cause for concern).

By directing users to suitable activities and community programmes – each taking a certain number of years off one's heart age – this web tool is also an engaging method of preventing heart disease and promoting a healthy lifestyle.

### Future Foods for Health

To counter the rise of diabetes, this programme aims to develop low-glycemic index (GI) carbohydrate-based food products.

Combining the fields of food science, biochemistry and physics, our investigators experiment with novel ingredients and micronutrients to create healthy yet pleasant-tasting foods. These can significantly improve the well-being of Singaporeans who frequently consume meals outside the home.

Through collaborative planning with her doctor, Mdm Lim is empowered to live well with her diabetes.



# Centre for Functional Mobility & Enabling Technologies



Functional mobility refers to the physiological ability to move and navigate a variety of environments in order to accomplish basic tasks and participate in the activities of daily living at home, at work and in the community.

To tackle the spectrum of mobility issues arising from ageing, injury and illness, we are adopting a three-pronged strategy: enhancing treatments and resources; introducing preventive measures; and harnessing enabling technologies that generate quantum leaps in the individual's capabilities.

**boosting mobility through education and technology**

## Centre Director

**A/Prof Wilson Wang** specialises in knee and hip replacement surgery as well as other forms of joint repair or reconstruction surgeries. His areas of expertise include clinical orthopaedics, biomaterials and bone cell biology.

He leads an award-winning programme in orthopaedic research, with special interest in implant science and technology. One of his current projects investigates the use of 3D printing in tissue engineering. His accolades include a SkillsFuture Fellowship, presented by the President of Singapore, and an Asia Pacific Orthopaedic Association (APOA) prize for Best Research Paper.

## Signature Programmes

### Enhanced Treatments

Our first priority is to improve and innovate in existing treatments of mobility conditions by placing greater emphasis on increased uptake and enhanced outcomes.

This applies to workflows and surgical solutions such as joint replacement therapy, as well as non-operative treatments such as orthotics, physical therapy and community programmes that enable functional living.

### Preventive Measures

Bone and joint conditions like osteoarthritis, osteoporosis and musculoskeletal injuries can be prevented with the right knowledge and ideal lifestyle choices.

Educational programmes for the general public – particularly the middle-aged group – will be conducted to introduce ways to lose weight, avoid injuries or perform strengthening exercises.

### Enabling Technologies

We intend to exploit new technologies to facilitate and streamline the management of functional issues.

Examples include advanced prosthetic and sensor technologies for amputees, telerehabilitation services for stroke patients, assistive devices for Parkinson's patients, and the use of 3D printing to fabricate bone and tissue replacements for sports injuries.



Equipped with a cutting-edge assistive device, Mr Chan is able to overcome his mobility issues.

# Centre for Healthy Longevity



Singapore's rapidly ageing population and rising life expectancy are causes for concern, since ageing is the primary risk factor for frailty, cardiovascular disease, metabolic disorders, and cognitive conditions such as Alzheimer's disease.

Our mission is to add healthy years of life by delaying ageing, prolonging disease-free life and maintaining high functionality. We accomplish this by developing biomarkers to measure ageing, testing interventions to slow ageing and creating implementation strategies to extend healthy life expectancy in Singapore.

**extending healthspan or  
the years of healthy life**

## Centre Director

**Prof Brian Kennedy** is internationally recognised for his research on the biology of ageing and is committed to translating research discoveries into new ways of delaying, detecting, preventing and treating human ageing and associated diseases.

He is a Distinguished Professor in the Departments of Biochemistry and Physiology at the NUS Yong Loo Lin School of Medicine, and is the former President and CEO of the Buck Institute, a pioneer organisation in ageing research. He is also actively involved in multiple biotechnology and pharmaceutical companies, and is a co-editor-in-chief of the journal *Aging Cell*.

## Signature Programmes

### The Biology of Ageing

We investigate the cellular mechanisms of the ageing process (e.g. stem cell function, tissue regeneration, systemic resilience) and develop interventions of diet, exercise and supplements to delay ageing and extend healthspan.

### Ageing Biomarkers

To determine the effectiveness of the interventions, we are validating a platform of biomarkers (e.g. inflammatory cytokines, cell senescence) that provide a composite measure of biologic ageing.

### SG90 and SG60 Longevity Cohorts

Our generational cohort studies will reveal environmental factors that influence ageing in Singapore and fill knowledge gaps regarding ageing among the three major ethnicities.

The SG90 cohort comprises over 1,000 individuals aged above 90. Their offspring, generally in their 60s, form the SG60 cohort. Examining both cohorts helps us understand how the ageing process unfolds over time and discover the factors that promote longevity in the local context.

### Healthy Ageing Promotion Programme for You (HAPPY)

This community programme for seniors promotes healthy ageing through physical and cognitive exercises, in combination with lifestyle and nutrition advice.

Volunteer seniors are trained to lead their peers in activities that delay physical, cognitive and social frailty.

A bigger rollout is underway to community centres and other partner organisations.

**Mr Zahid engages in community programmes for the mind and body to delay ageing and increase healthspan.**



# Centre for Innovation in Healthcare



We are a one-stop hub that facilitates the clinical adoption of health innovations. Whether it is a new device, technology or work process, we maximise impact through two differentiating areas:

- Enhancing value through test-bedding, user feedback, clinical validation and health technology assessment
- Sharing value through partnerships (with healthcare professionals, scientists, engineers, academics, entrepreneurs, government agencies, industry players), business development, and active engagement of health users

**accelerating innovations  
on the path to adoption**

## Centre Director

**Prof Lawrence Ho** is a distinguished clinician-innovator who has held 15 patents in translational products and co-founded two medical technology start-ups: Endomaster Pte Ltd, which invented a flexible robotic endoscopy system, and Endofotonics Pte Ltd, which developed a system for in-vivo diagnosis of gastrointestinal cancer.

A specialist in gastrointestinal oncology, he has led research teams in the areas of stem cell therapy and innovative endoscopy. Among other prizes, he has won the President's Technology Award, the Public Administration Medal (Bronze) and the MOH Distinguished Senior Clinician Award.

## Health Horizons

Chaired by Mr Philip Yeo (Chairman of Economic Development Innovations Singapore and Accuron Technologies), Health Horizons is an exclusive community of innovators, investors, entrepreneurs and enablers who share a mission to accelerate health technologies from idea to impact.

## Health Horizons Hub

This innovation hub consists of a lounge and co-working space for innovators, as well as a showroom to exhibit their latest projects and innovations.

## Our Partners



## Our Innovators



Clive can access the right mentors, funding and test-bedding facilities to bring his ideas to market.

# Mind Science Centre



Mental wellness is a key facet of life quality, and sustaining it helps maximise Singapore's limited human resources.

To build mental resilience and optimise cognitive performance across all ages, we conduct population studies on conditions such as academic stress in youths, occupational burnout among adults, and dementia in the elderly.

Our findings are then applied in the development of non-drug interventions, the training of professionals, caregivers and volunteers, and the running of community programmes that promote mental well-being.

**building mental resilience  
across all ages**

## Centre Director

**A/Prof John Wong Chee Meng** is an established psychiatrist with a special interest in trauma psychiatry, ADHD, and developmental psychiatry. He serves as the President of the College of Psychiatrists Council and Programme Director of REACH (West), a national initiative which addresses the mental health needs of school-going adolescents.

Most recently, he has inaugurated a regional symposium on Hikikomori (the rising phenomenon of socially isolated youths), pilot-tested new youth diagnostics and supplements, and initiated Mind-Series collaborations promoting mental wellness across NUS faculties.

## Signature Programmes

### Generational Studies

The 10-year **Jurong Ageing Study (JAS)** examines a cohort of 1,000 seniors and the efficacy of approaches like mindfulness practice, horticulture therapy and choral singing in averting dementia and depression. The **Community Health Intergenerational (CHI) Study** investigates emotional resilience and vulnerability factors of the ageing process in a new cohort of 1,000 seniors.

We have also launched a **Youth Epidemiology and Resilience (YEAR) Study** reaching out to 12,000 students, examining the factors that impact their mental well-being in aspects such as academic learning, ADHD, depression and suicide.

### Age Well Everyday (AWE)

This community programme is a translation of the Jurong Ageing Study findings and aims to prevent dementia, depression and anxiety through educational and creative activities like horticulture therapy, art therapy and music reminiscence therapy.

Blended learning with interactive online modules and practical sessions equip volunteers with knowledge of depression, stroke, dementia prevention, lifestyle management, caregiving, and mindfulness practices.

### Mind Art Experiential Lab / Mind Gym

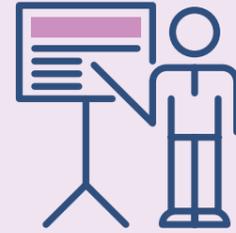
The **Mind Art Experiential Lab** at Alexandra Hospital uses art appreciation as a medium that transcends the boundaries of language, culture and stigmatisation to evoke emotions, awareness and contemplation in participants. Youth, seniors and individuals recovering from chronic illness or emotional fatigue are inspired to reflect on deeper issues of mental wellness, physical health and social well-being.

**Mind Gym** is a programme that helps patients, caregivers and residents to manage stress and strengthen mental resilience through mindfulness-based cognitive therapy.



Targeted student programmes teach Kelly to cope with academic stress and boost mental well-being.

# Centre for Health Professionals Training



We support the continual learning and skills upgrading of our healthcare professionals, with a specific focus on Allied Health Professionals – such as pharmacists, physiotherapists and clinical psychologists – who provide vital care in the community.

To ensure that training is relevant, we conduct thorough needs analyses and consult with healthcare leaders to identify knowledge gaps. Our courses are developed in collaboration with domain experts and institutions of higher learning to update professionals on the latest developments, thereby raising the overall standard of healthcare delivery.

equipping and upgrading  
our health professionals

## Centre Director

**Mr Michael Ong** has extensive experience in radiography and is the Operations and Administration Head of both Clinical Support Services and the Department of Diagnostic Imaging at NUH. Actively involved in the domain of education, he has developed courseware in healthcare informatics and radiography and is an Associate Lecturer at the Singapore Institute of Technology and Parkway College. He is also a member of the Allied Health Professions Council.

In recognition of his contributions, he has received a National Day Award Commendation Medal, an NUH Allied Health Achievement Award and a Singapore Society of Radiographers Platinum Medal.

## Signature Programmes

### Overseas Expert Series

In support of the Ministry of Health's vision to grow a strong local core of healthcare manpower, this series seeks to enhance the skills of Allied Health Professionals.

Courses are developed in collaboration with overseas experts and cater to learning needs in diverse fields, e.g. occupational therapists (*Cognitive Orientation to Daily Occupational Performance*), dietitians (*Nutrition-Focused Physical Examination*) and pharmacists (*Deprescribing Medicine*).

### Supervisory Courses

Workshops such as *Introduction to Supervisory Skills* are targeted at support staff who hold supervisory roles.

Led by specialists in human resources and talent development, these courses help supervisors develop fundamental skills such as team leadership, staff motivation and performance management strategies.

### Strategic and Competency-Based Programmes

We also offer a range of training programmes to upgrade health professionals in broad yet vital skills (e.g. patient motivation) and keep them updated on the latest developments and technologies (e.g. health informatics).

Courses include *Health Psychology*, *Introduction to Health Informatics* and *Delivering Bad News to Patients and Families*.



As a psychologist, Rucha benefits from expert-led courses to improve her delivery of care.



Learn more at [www.nuhs.edu.sg](http://www.nuhs.edu.sg)



For collaborations or more information  
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