



# Advancing as one

MEDICINE ACADEMIC  
CLINICAL PROGRAMME 2023




**SingHealth DukeNUS**  
ACADEMIC MEDICAL CENTRE



Singapore  
General Hospital



Changi  
General Hospital



Sengkang  
General Hospital

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# Foreword

Dear Colleagues,

In the face of adversity, we have emerged even stronger, bound together by discipline, agility, and cohesion. The past years have demanded adjustments to support hospital operations and prioritise the safety of our staff and patients. We must continue to be vigilant for a better future.

Despite the challenges, I am proud to share that we have accomplished many milestones and received recognition for these achievements in 2022 and the first-half of 2023.

Clin Prof Chan Choong Meng was named National Outstanding Clinician Educator at the National Medical Excellence Awards 2022. Prof Julian Thumboo was recognised as Distinguished Mentor at SingHealth Excellence Award 2022 while Clin Assoc Prof Limin Wijaya was conferred the Distinguished People Leader and Distinguished Team awards and Clin Assoc Prof Ong Thun How, the Distinguished Outstanding Educator Award.

At the Duke-NUS Hall of Master Academic Clinicians induction ceremony on 23 February 2023, SKH's Clin Prof C Rajasoorya joined the prestigious list of individuals and five of our Medicine ACP clinical faculty members — Clin Prof Lee Lai Heng, Clin Assoc Prof Samuel Chew Teong Huang, Clin Assoc Prof Andrew Kwek Book Eu, Clin Assoc Prof Tan Lay Ling and Clin Assoc Prof Jon Yoong Kah Choun — received special mention for their new appointments as associates and full professors.

For their outstanding work in the field of Emerging Infectious Diseases, Prof Jenny Low and Asst Prof Shirin Kalimuddin were added to the Highly Cited Researchers (HCR) 2022 list — an achievement attained by only 1 in 1,000 of the world's scientists and social scientists.

Congratulations to the role models who have made significant contributions to the healthcare environment. We're privileged to have many esteemed individuals with us, and I look forward to recognising more of you.

A major area of focus in our ACP has been to develop the

culture of quality improvement and nurture our talents in innovation and improvement. Over the last few years, we have seen more quality improvement (QI) faculty who inspire others in their QI journey by generously coaching their peers and juniors in pursuing impactful projects, and budding innovators who have ambitiously applied for grants to start their projects. I'm heartened by this positive growth and encourage more of you to be involved as ultimately, our efforts benefit our patients.

Supporting patients, their families and caregivers, the Medical Humanities Office piloted the Tembusu Connect website in 2022 to provide easy to digest information on medical and well-being related topics. I look forward to the future developments of this initiative as it holds great promise for our healthcare community.

To sustain ongoing efforts in developing our future healthcare workforce and exploring new innovative possibilities, your contribution to the Future of Medicine fund is greatly encouraged. You can help our budding clinician scientists, educators, researchers, and innovators start their careers in their respective fields, which will expand our academic activities.

As we aim to deliver world-class care and treatment, we must embark on the journey towards the Healthier SG vision. This transformation will evolve our healthcare system as we continue to deliver enhanced quality care to our patients.

Here's to another year of reaching new milestones and pioneering groundbreaking innovations that will shape the future of healthcare! Together, we will continue to make a positive impact in the lives of those we serve.

With optimism and gratitude,

**Assoc Prof Loo Chian Min**

Academic Chairman  
Medicine ACP





# Our People



**Joint Medicine ACP Council**

***L-R (standing in back row)***

Clin Asst Prof Oh Choon Chiat, Clin Prof Tan Thuan Tong, Clin Asst Prof Ong Eng Koon, Clin A/Prof Jason Chang, Clin Asst Prof Andrew Ong, Clin A/Prof Tan Chieh Suai

***L-R (standing in middle row)***

Clin Asst Prof Kek Peng Chin, Clin A/Prof Augustine Tee, Clin Asst Prof Sean Loh, Assoc Prof Cindy Ng, Clin Asst Prof Lee Shan Xian, Clin Asst Prof Deanna Lee, Dr Cindy Ng, Asst Prof Shirin Kalimuddin, Clin A/Prof Ong Thun How, Clin A/Prof Andrea Low, Clin A/Prof Warren Fong

***L-R (seated)***

APN Joanna Phone Ko, APN Lee Chen Na, Clin A/Prof Goh Su-Yen, Prof Jenny Low, Clin Asst Prof Kirsten Yeo, A/Prof Loo Chian Min, Dr Crystal Lim

***Not in picture***

A/Prof Melvin Chua, Clin A/Prof Derrick Aw, Clin A/Prof Tham Chee Kian, APN Sri Rahayu Masjum, APN Maslinna, Abdul Rahman, A/Prof Charles Chuah, Asst Prof Lim Tze Peng, Assoc Prof Tan Hong Chang, Dr Lim Siew Hoon (SSN), Dr Orlanda Goh, Clin Asst Prof Troy Puar, Clin Asst Prof Donovan Tay, Dr Lim Siew Hoon, Clin A/Prof George Goh, A/Prof Marjorie Foo, Clin A/Prof Chionh Chang Yin, Clin A/Prof Damien Tan, Clin Asst Prof Jessica Quah, Clin Asst Prof Stanley Angkodjojo, Dr Cheong May Anne, Dr Jonathan Seah SNM Diana Goh, Clin Asst Prof David Teo, Dr Janet Ong, Clin Asst Prof Natalie Woong, Clin Asst Prof Victoria Ekstrom



**Medicine ACP Administrative Office**



**Communication and General Admin Office**



**Education Office**



**Research Office**



**Clinical Service Improvement & Innovation Office**



# Clinical Service Improvement & Innovation

It is imperative that healthcare professionals remain agile in the fast-evolving environment of modern technologies and treatments. And the projects ventured by our clinicians, which have become disruptors in the healthcare industry, are testament to this continuing push for constant advancement.



## CSII Council Members

**L-R:** Clin Assoc Prof Tan Chieh Suai, APN Lee Chen Na, Clin Asst Prof Lee Shan Xian, Clin Asst Prof Kirsten Yeo, Clin Assoc Prof Goh Su-Yen, Clin Prof Tan Thuan Tong

**Not in picture:** Clin Asst Prof Chionh Chang Yin, Asst Prof Damien Tan, Assoc Prof Marjorie Foo, Clin Asst Prof Jessica Quah, Clin Asst Prof Stanley Angkodjojo, Dr Cheong May Anne, Dr Jonathan Seah, Dr Yeang Shu Hui, SNM Diana Goh

## Endovascular Arteriovenous Fistula (EndoAVF)

Dept of Renal Medicine, Department of Vascular Surgery, Department of Vascular & Interventional Radiology, SGH

EndoAVF is a non-surgical procedure to create an arteriovenous fistula (AVF) in the arm of end stage kidney failure patients requiring haemodialysis which is less invasive with shorter procedural time and minimises surgical scarring and arm disfigurement compared to traditional surgical AVF. A pilot launched in October 2021 with 13 patients achieved a 90% success rate. By the end of 2022, a 3-year pilot programme was launched to offer endoAVF to 200 eligible patients across CGH, NUH, SGH, and SKH. Future plans for the project include partnering with community dialysis service providers to shift the model of care from tertiary hospitals to the community.

## Home-Based Cancer Prehabilitation Programme

Dept of Rehabilitation Medicine, CGH

This one-stop screen-and-intervene initiative targeting medical optimisation, physical activity, nutrition and mental health, reduces a patient's time in hospital and focuses on prehabilitation at home. A pilot study on 60 colorectal cancer patients showed significant improvement in functional capacity and mental health, and a drop in length of hospital stay, 30-day readmission and mortality rate. About 200 other patients have been included since and the programme has expanded to cover other surgical cancer patients. The creation of a cancer rehabilitation clinic in CGH, starting with the breast cancer diagnostic groups, is in the pipeline.



## Diabetic Rapid Evaluation of lower extremity Amputation Management (DREAM) Clinic

Dept of Podiatry, Dept of Surgery (Vascular), Dept of Orthopaedic Surgery, Dept of General Medicine (Endocrinology), Dept of General Medicine (Infectious Diseases), SKH

Diabetic foot ulcer (DFU) is a complication of diabetes, with a lifetime incidence of up to 25%. In Singapore, 92.1% of major amputations were performed in people with diabetes between 2008 and 2017. The DREAM clinic at SKH provides holistic, multidisciplinary podiatric treatment and fast access to specialist care for diabetic patients with suspected foot ulcers and gangrene. The day clinic offers walk-in patients same-day reviews by a multidisciplinary team — podiatrists assess and refer to endocrinologists, vascular surgeons or orthopaedic surgeons as required. A two-year study conducted on 91 DREAM patients showed promising outcomes, such as a significantly shorter access time to clinic at 8.74 days and much lower number of A&E and specialist outpatient visits.



## Remote Vital Sign Monitoring using Respiree

Dept of Respiratory and Critical Care Medicine, CGH

In a collaboration with Respiree and IHiS, the CGH department deployed a sensor patch that can remotely monitor the heart and respiratory rates, SpO<sub>2</sub> and body temperature of patients in the wards. Respiree's dashboard interface allows nurses to review a patient's vital signs at a glance, reducing the man-hours for vital sign monitoring from 90 to 25 hours per day. This project was awarded the National Research Foundation's Central Gap Funding to develop predictive algorithms for detecting decompensation and deterioration in patients for early intervention. The grant will also support the integration and deployment of Respiree's system in one of CGH's general wards as a springboard for further upscaling to the rest of the hospital.



## Detecting Chronic Kidney Disease Using Retinal Imaging and Artificial Intelligence

Dept of Renal Medicine, SGH

Screening and diagnosis in the community are limited for this major health condition — which is associated with significant morbidity, cardiovascular disease and mortality — due to the need for blood-drawing to assay serum creatinine levels. To counter this, a pilot study was conducted to test the accuracy and feasibility of using retinal images on a deep learning system with a convolutional neural network to detect this disease. Singapore Eye Research Institute and NUS School of Computing are partnering National Kidney Foundation to further refine and validate the deep learning algorithm.

## 3D Geospatial Mapping for Disease Outbreak Surveillance System (DOSS)

Infection Prevention & Epidemiology and Dept of Infectious Diseases, SGH

A game development software was used to build digital replicas of SGH's physical spaces, which were then integrated with clinical, laboratory and patient movement data to develop syndromic and disease-specific surveillance systems for hospital-acquired infections. In April 2021 when a healthcare worker was exposed to COVID-19, 44 primary and 162 secondary contacts were successfully identified using this system. The project was awarded the MOH Health Innovation Fund for further integration and implementation in the hospital.

## Awards

### QI Mentor Award 2022 Winners

Recognises individuals who have excelled in promoting and championing quality initiatives.



**Clin Asst Prof Tay San San**  
Senior Consultant, Dept of Rheumatology and Immunology, SGH



**Clin Asst Poh Yih Jia**  
Chief and Senior Consultant, Dept of Rehabilitation Medicine, CGH



**Clin Asst Prof Yeo Yi Wei**  
Senior Consultant, Dept of Dermatology, SGH

### Singapore Bidesign Innovation Fellowship 2022

Six months of intensive, hands-on, team-based training on the value chain of medical technology innovation. With access to training and mentorship in Singapore, Stanford University and Fogarty Institute, the fellowship focuses on developing new medical device technologies for unmet clinical needs in Asia.



**Dr Cheong May Anne**  
Consultant, Dept of Haematology, SGH

### Best QI Project Team Award 2022

Recognises QI project teams that use the Quality Improvement structured methodology to yield positive, innovative solutions.



#### Project IRON

Increasing outpatient Intravenous feRinject administration at OPAT ceNter  
Dept of Infectious Diseases, SGH



#### AMW NEWS Team

To improve compliance to National Early Warning Score (NEWS) response plan in Acute Medical Ward (AMW)  
Dept of Internal Medicine, SGH



#### Team TigerConnect

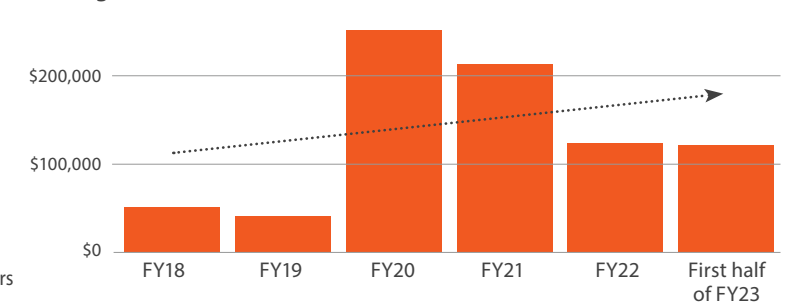
TigerConnect for safe and effective communication between Healthcare Professionals  
Dept of Gastroenterology and Hepatology, CGH

## Statistics

### At a glance:

- Average of 7 to 8 grant applications submitted yearly
- 1 in 3 grant applications were successful in the last 2 years
- General uptrend in the grant funding received in the past few years

### Funding received from Innovation Grants





## Clinician Profiles



**Dr Jansen Koh**  
Chief and Senior  
Consultant,  
Dept of  
Respiratory &  
Critical Care  
Medicine, CGH

Dr Koh initiates and leads innovation projects in a bid to constantly improve the safety and experience of both patients and healthcare providers, who are also his source of motivation.

Dr Koh believes that “innovation is doing things differently for better outcomes” and his rewards are in seeing the materialisation of his ideas and experiencing the process of developing a product that can help others.

And the saying “adversity breeds creativity” rang true for Dr Koh during the COVID-19 pandemic. He created a three-way disposable valve attachment to the breathing circuit of intubated COVID-19 patients that helps maintain PEEP and reduce aerosolisation.

Two grants (COVID-19 innovation and AMII Adoption) were awarded for this innovation that tackled the two main issues faced by patients who had to switch between ICU and transport ventilators in a physical transfer — the loss of pressure required to maintain the oxygen levels and the occurrence of significant aerosolisation that can pose a risk to the healthcare staff in attendance. The valve is currently awaiting mass production, pending HSA approval.

Dr Koh managed this feat of vital innovation even as he juggled clinical work, medical education, research and admin responsibilities as well as working and meeting the expectations of external partners in product development.



**Clin Asst Prof Jessica Quah**  
Lishan  
Consultant,  
Dept of  
Respiratory &  
Critical Care  
Medicine, CGH

Innovation is Dr Quah’s way of having fun, whenever she explores new ideas to approach clinical problems encountered at work.

“It keeps clinical work interesting and engaging when I can create new ideas or tools,” said Dr Quah who draws inspiration from Marvel’s superhero Iron Man, who she describes as the embodiment of constant evolution and improvement.

Clin Asst Prof Quah invented Effidrain in collaboration with the Singapore University of Technology and Design, a drainage regulation device for treating patients with fluid accumulation in the lungs (pleural effusion) or abdomen (ascites).

This programmable chest and abdominal drain fluid regulator, which helps reduce morbidity and care requirements and improve outcomes, has been awarded the JOAM Clinical & Systems Innovation Main Grant for

its clinical validation.

Dr Quah was also co-investigator in the development of the Community Acquired Pneumonia and COVID-19 AI Predictive Engine (CAPE), which uses AI to predict the progression of pneumonia through analysis of chest X-rays. The system can identify patients who are likely to become critically ill, improving patient safety and the quality of treatment.

A team that innovates and solves problems makes work a rewarding experience for Dr Quah, who stresses on the importance of agility in innovation.

“I don’t feel there should be any hard and fast rules about how an innovation project should be ran. It really depends on the nature of the project and the outcomes desired. Depending on resource availability and other constraints, always be ready with alternative back-up plans!”



**Clin Asst Prof Oh Choon Chiat**  
Senior  
Consultant  
Dept of  
Dermatology,  
SGH

Gaps in the delivery of care for skin cancer patients — such as the triaging of patients with skin tumours — prompted Dr Oh to embark on his first innovation project, “Detection of non-melanoma skin cancers with tele-dermatology and machine learning for Asian patients”, which was awarded the JOAM Clinical & Systems Innovation Main Grant.

Through this partnership with Outram Polyclinic, the tele-dermatology service for primary care physicians helps to streamline the backlog of skin tumour patient referrals to SGH Dermatology service, and also provides data for future use in machine learning for skin cancer detection.

Dr Oh also identified the gap in the availability of skin cancer therapy at home and developed a wearable optoelectronic photodynamic therapy (PDT) skin patch for treatment of skin cancer.

Dr Oh faced numerous challenges in navigating the innovation process, from understanding the legal framework of agreements to product management. The rewards far outweighed the challenges however, as Dr Oh is able to mentor and learn from his residents while picking up new technologies from industrial partners and experts in his journey.

On lessons from his innovation experience, Dr Oh shares that “it is vital to keep the various partners engaged throughout the development journey and spend time to work on any unexpected problems that may occur along the way.” He also finds attending courses such as the Duke NUS Clinician Innovator Development Programme to be very helpful for gaining insights from experts in the field and working on one’s blind spots.

## Plans & Priorities

As we emerge from the COVID-19 pandemic, our role in healthcare continues to evolve as we focus on delivering value-driven care and emphasise on community and preventive care with the introduction of Healthier SG.

We must invest in digital transformation and innovation if we are to dream boldly for the future of healthcare. And as Medicine ACP makes strides into uncharted waters, we must progress as one and align ourselves with national and SingHealth priorities.

“We are committed to forge strategic collaborations within and beyond the Medicine ACP community as we believe working with like-minded partners will create more impact and yield better results.

An example of this is the SGH@Home project, a Mobile Inpatient Care at Home programme, which supports the early discharge of patients whose treatment can be managed safely at home.



The programme was the result of a collaboration between Family Medicine, Population Health and Integrated Care Office, and Medicine ACP. SGH@Home helps reduce healthcare-associated infections and healthcare costs and alleviates the demand for beds in hospitals.

Expanding on our networking and collaborative efforts, we visited the A\*STAR Institute of Bioengineering & Bioimaging in early 2023 for our clinicians to understand their capabilities and explore potential projects. Some of our key appointment holders also visited overseas centres renowned for their strong culture of innovation, such as the UCSF School of Medicine, Stanford University and Fogarty Innovation in San Francisco. The trip gave us invaluable insights into how to create a comprehensive support system for innovation in healthcare institutions. Insights which we hope to translate to the Medicine ACP context to nurture a culture of innovation.

We will continue to support the training and development of our staff and prioritise resources for strategic initiatives that align with national or SingHealth priorities. Our people are our greatest strength.

**Clin Prof Tan Thuan Tong**  
Vice Chair, Clinical Service Improvement &  
Innovation (CSII)





## Education

Our clinicians are advocates of the sharing of knowledge and are driven in inculcating the next generation of doctors through programmes, collaborations and a conducive learning environment. We strive to make our mark as a world-class academic medical centre as we continue our education efforts.



### Education Council Members

**L-R (seated):** Dr Cindy Ng, Clin Asst Prof Deanna Lee, Clin A/Prof Ong Thun How

**L-R (standing):** Clin Asst Prof Kek Peng Chin, Clin Asst Prof Andrew Ong, Clin A/Prof Jason Chang, Clin Asst Prof Sean Loh

**Not in picture:** Clin A/Prof Derrick Aw, Clin Assoc Prof Tham Chee Kian, APN Maslinna Abdul Rahman, APN Sri Rahayu Masjum



### Residency Open House

The in-person SingHealth Residency Open House resumed in 2022! The Medical Subspecialty Senior Residency (SR) Open House hosted 91 attendees while the Internal Medicine (IM) Junior Residency Programme hosted 94. The 14 Medical Subspecialty SR and IM programmes saw big crowds visiting the booths. Programme Directors, Faculty members and existing Residents were also present to mingle and initiate inspiring conversations with junior doctors and House Officers.

### Entrustable Professional Activities (EPA) Implementation

Entrustable Professional Activities (EPAs) are the focal point in Residency, shaping the transition to Accreditation of Postgraduate Medical Education Singapore (APMES). EPAs are a means to operationalise competency-based education, which helps to examine the students' ability to perform professional tasks. The Ministry of Health's Professional Training and Assessment Standards Division (MOH PTAS) is helping to facilitate the nationwide rollout of EPAs as a fundamental component of our Residency assessment framework.

In Medicine ACP, Clin. Asst Prof Andrew Ong, has created a five step EPA implementation framework and advisory sessions has been conducted to support programmes in their assessment framework and implementation.

### Academic Appointments & Promotion Committee

In 2021, the Academic Appointments & Promotion Committees (AAPC) led by Prof Julian Thumboo and A/Prof Charles Chuah were setup to evaluate and support eligible faculty members for promotion to the rank of Professors and Associate Professors respectively. In addition, the faculty appointment team refreshed their website, and organised several webinars to provide information on the appointment process and dossiers required for promotion.

### McMaster Faculty Development Programme

The McMaster Faculty Development (FD) Programme is an important pilot initiative that serves to engage and develop faculty members. Geared towards young educators and individuals, the programme enhances their skills for education-related projects. By completing a specific number of online modules, participants are empowered to drive change within their departments. With a flexible timeline, the programme allows participants to complete the modules at their own pace within a year.



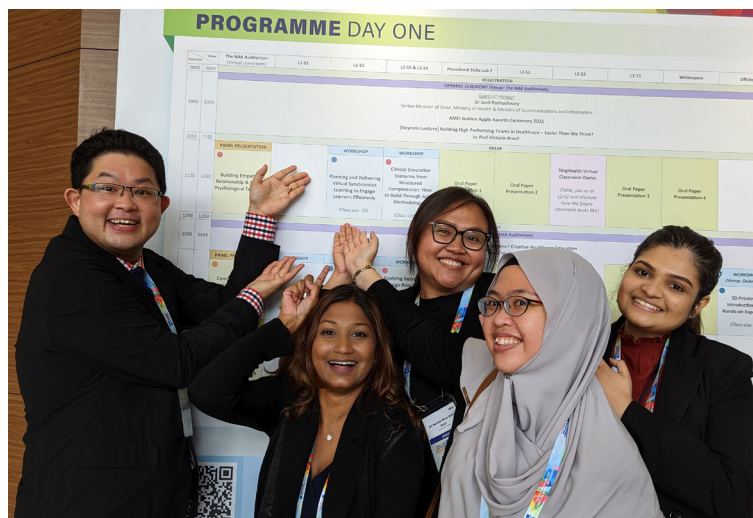
# GUTS & GLORY

## THE SGH GASTROENTEROLOGY PODCAST

### Guts & Glory — The SGH Gastroenterology Podcast

Each episode of Guts & Glory delves into a topic built around a captivating case vignette, featuring in-depth discussions with consultants and senior residents from the department. The podcast has also welcomed guest hosts, including students from Duke-NUS and Yong Loo Lin School of Medicine. The podcast's ability to educate while allowing listeners to multitask has been invaluable, particularly during the challenging times of the pandemic.

As evidence of its global appeal, Guts & Glory has crossed the remarkable milestone of 20,000 downloads within a short span of 1.5 years. Its international reach has further solidified its position as a trusted source of information in the field. At its peak, the Guts & Glory podcast achieved impressive rankings, placing 4<sup>th</sup> in the Hepatology category and 6<sup>th</sup> in the Gastroenterology category worldwide. These rankings reflect the exceptional quality of the podcast and the caliber of its hosts and guests.



### Virtual Synchronous Learning Workshop at SingHealth Duke-NUS Education Conference 2022

Medicine ACP administrators — Mr Gary Ong, Ms Nur Suhaila Ishak, Ms Latashni Gobi Nathan, Ms Naeemah Mohamed Isahak and Ms Siti Nurkiah Mohd Amin — led the workshop for more than 30 healthcare professionals, equipping them with instructional frameworks and tips on how to design effective remote learning. The participants also got to try out a range of digital engagement tools that can help them promote sustained interactions between faculty and learners in a virtual classroom setting.



## Awards

### Medicine ACP Education Awards 2022



**EDUCATION LEADER AWARD**  
Clin Asst Prof Zhu Ling, *SGH*

**SENIOR EDUCATOR AWARD**  
Clin Assoc Prof Damien Tan, *SGH*  
Clin Asst Prof Tay Tunn Ren, *CGH*  
Clin Asst Prof Wong Yu Jun, *CGH*  
Clin Asst Prof Raymond Goh, *SKH*  
Clin Instructor Joel Yee, *CGH*  
Clin Instructor Moses Koh, *SKH*  
Clin Instructor Guo Wei Wen, *SKH*

**JUNIOR EDUCATOR AWARD**  
Dr Ray Peh, Resident, *Internal Medicine Residency Prog*  
Dr Toh Ching Han, Resident, *Internal Medicine Residency Prog*  
Dr Wilbert Ho, Senior Resident, *Cardiology Senior Residency Prog*  
Dr Bertrand Lian, Senior Resident, *Dermatology Senior Residency Prog*  
Dr Charlotte Choo, Senior Resident, *Endocrinology Senior Residency Prog*  
Dr Timothy Toh, Senior Resident, *Respiratory Senior Residency Prog*

**TEAM EDUCATION AWARD**  
Towards effective and safe anticoagulation management  
  
Clin Prof Ng Heng Joo, Senior Consultant, *Haematology, SGH*  
Clin Asst Prof Tan Chuen Wen, Senior Consultant, *Haematology, SGH*  
Dr Yeang Shu Hui, Principal Clinical Pharmacist, *Pharmacy (Inpatient), SGH*  
Clin Instructor Cheong May Anne, Associate Consultant, *Haematology, SGH*  
Dr Wong Wan Hui, Principal MLS (Clinical), *Haematology, SGH*  
Ms Melissa Chow, Principal Clinical Pharmacist, *Pharmacy (Outpatient), SGH*

### NUS YLL Awardees (AY21/22)



**CLINICAL TRAINING EXCELLENCE AWARD**  
Department of Psychiatry, *Phase IV Psychological Medicine, SGH*

**CLINICAL TRAINING MERIT AWARD**  
Department of General Medicine, *Phase V Medicine, SKH*

**DEAN'S AWARD FOR TEACHING EXCELLENCE**  
Dr Lim Weiying, *SGH*  
Prof C Rajasoorya, *SKH*

**DEAN'S HONOUR ROLL FOR TEACHING EXCELLENCE**  
Prof C Rajasoorya, *SKH*

**SPECIAL RECOGNITION AWARD**  
A/Prof Phua Ghee Chee, *SGH*; A/Prof Dennis Seow, *SGH*  
Dr Kanthaya Mohanaruban, *CGH*

### Residency in SingHealth Excels (RISE) Awards



*Most Improved Medical Subspecialty Programme Award*  
Infectious Diseases Senior Residency Programme

*Best PGY 1 Training Site (3rd Place)*  
Dept of Internal Medicine, *SKH*

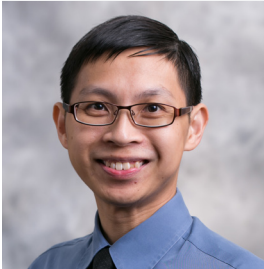
*Best Medical Subspecialty Programme Award*  
Endocrinology Senior Residency Programme



## Clinician Profiles

### Clin A/Prof Warren Fong

Senior Consultant, Dept of Rheumatology & Immunology, SGH



A/Prof Warren Fong wears many hats — Programme Director of SingHealth Rheumatology Senior Residency Programme, Co-Director of Duke-NUS Phase 1 Clinical Skills Foundation Course, mentor at Yong Loo Lin School of Medicine (EnRICH programme) and Core Faculty member of SingHealth Internal Medicine Residency Programme, to name a few.

His journey started with helming postgraduate education in his department. Over time, he deepskilled through courses such as ESME, CRAFD and AMEI. He mentored resident-led programmes and facilitated the Junior Educator Development Initiative (JEDI).

A/Prof Fong has received grants for his medical education researches — which share a focus on curriculum planning — to help him validate assessment tools and gamify medical procedures learning. He counts the

development of learner-centered curriculum for SingHealth Rheumatology Senior Residency Programme, implementation of programmatic assessment and promotion of medical humanities among his momentous professional milestones.

A/Prof Fong's list of accolades includes Outstanding Faculty Award, Medicine Academic Clinical Programme Education Award, AMEI Golden Apple Awards — Outstanding Educator Award and Quality Improvement Mentor of the Year Award.

With his sights set on promoting the humanistic practice of medicine, enhancing faculty development and promoting professionalism among medical doctors, he hopes to leave a mark in the education and development of the next generation of healthcare professionals.

### Clin Asst Prof Deanna Lee

Consultant, Dept of Internal Medicine, SKH



Dr Deanna Lee is a passionate in nurturing the growth and development of her learners. Her commitment to teaching is evident in her role as the undergraduate medical lead for her department, where she oversees the curriculum, teaching activities, and assessments for undergraduate students.

She also coordinates the Duke-NUS CPX2 Exam and takes care of faculty development and growth, planning workshops and collaborating with the education office in SKH. Dr Lee is also actively involved

in faculty development initiatives, such as in the AMEI and Centre for Clinician Educator Development (CCED), and has received grants for educational research on professional identity formation in SingHealth.

As an educator, she believes in not just imparting knowledge but also teaching learners how to acquire knowledge and innovate in the face of change. In her own words, "seeing the growth of your learners and how competent they have become – that reward is more than enough."

### Clin Instructor Joel Yee

Consultant, Dept of Internal Medicine, CGH



Dr Joel Yee, who is a champion of medical education, is currently pursuing a Masters in Health Professions Education at MGH Institute of Health Professions.

As a Core Faculty of the SingHealth Internal Medicine Residency Programme, he has spearheaded numerous education initiatives for both undergraduate and postgraduate students. He is also heavily involved in the education development of junior educators and faculty development in CGH.

His contributions have earned him the 2022 Rise Award and both 2021 and 2022 Medicine ACP Senior Educator Award for his efforts in improving the education landscape of SingHealth.

Dr Yee strives to continue leading innovative education programmes to ensure the agility and adaptability of future generations of healthcare professionals.

## Plans & Priorities

The Medicine ACP Education Office strives to improve the quality of medical education and has identified key priorities for the upcoming year, such as the development of an improved patient database system for exams, EPA training for faculty, harmonisation of undergraduate teaching resources to improve consistency and efficiency, and the identification and nurturing of educators to support the development of future leaders in medical education.

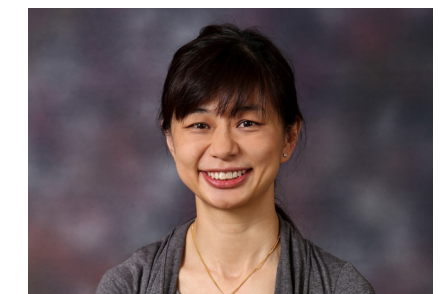
The patient database will enable the efficient tracking of patients recruited for educational purposes. An improved system allows security measures that ensure patient confidentiality.

EPA training for faculty will prepare residents for the clinical environment, ensuring they are equipped with the necessary skills and knowledge to provide quality care to patients.

The harmonisation of teaching resources ensures consistency in educational materials across courses and exams, which in turn will streamline the department's operations.

Identifying and nurturing educators will support the development of future leaders in medical education and promote the continued growth and success of the Office.

We aim to continue to build on the successes of previous years and meet the challenges of the ever-changing healthcare landscape.



Clin Assoc Prof Ong Thun How  
Vice Chair, Education



# Research

The Medicine Academic Clinical Programme (ACP) Research Office nurtures clinician scientists, investigators, innovators and health services researchers by supporting research and its integration into clinical care and education in our bid to push the boundaries of scientific discovery and enhance healthcare.



## Research Council Members

**L-R:** Dr Orlanda Goh, Dr Lim Tze Peng, Dr Shirin Kalimuddin, Dr Tan Hong Chang, A/Prof Charles Chuah, Dr Oh Choon Chiat, A/Prof Andrea Low

**Not in picture:** Prof Jenny Low, A/Prof George Goh, Dr Troy Puar, Dr Donovan Tay, Dr Lim Siew Hoon

## Project Pensieve — AI tool for scaling early detection of dementia

Project Pensieve (PP) is scheduled for completion on 31 December 2023. The collaboration between Singapore General Hospital (SGH) Department of Psychiatry and GovTech aims to develop an AI-enabled digital tool to scale the early detection of dementia. With Singapore's growing aging population, dementia is becoming a pressing issue, with 7 in 10 cases undiagnosed until advanced stages.

PP's primary outcomes include developing a digital tool to administer a screening process within 5-10 minutes, providing dementia screening to 1,000 senior volunteers, and collecting drawing test stroke data to train an AI model to detect dementia with an accuracy rate of more than 80%. The project also aims to develop a pre-implementation study to assess nationwide readiness.

### APPROACH

PP will develop a digital tool that self-administers and auto-scores cognitive tests capable of detecting early signs of dementia. The tool will be installed in a tablet and can be utilised by laypersons such as community volunteers and caregivers.

The AI-enabled tool can expedite the triage process and reduce the reliance on trained healthcare personnel, which in turn will enable proactive outreach and large-scale dementia detection among high-risk, community-dwelling seniors.



**A/Prof Liew Tau Ming**  
Principal Investigator; Senior Consultant,  
Department of Psychiatry, SGH

### IMPACT

Reducing triage time from over 20 minutes (using existing cognitive tests) to less than 5 minutes will improve the outreach rate of healthcare providers and consequently allows earlier detection and intervention. The tool is also expected to increase the reach of healthcare delivery by enabling laypersons to administer the cognitive tests, reducing the reliance on trained healthcare professionals and enabling proactive outreach. Early detection and intervention of dementia will lead to better outcomes and reduced healthcare costs.

### PROGRESS

PP has made significant progress, with over 500 participant assessments completed and drawing stroke data collected. DSAID's AI model has achieved an accuracy rate of more than 80%, exceeding the project's target.

The team delivered Version 3 of the digital tool, which was deployed for data collection by senior volunteers, achieving an 80% user satisfaction rate. These achievements mean the project is on track for completion by 31 December 2023.

### NEXT STEPS

PP's next steps include studying the approach in using the tool in a nationwide roll-out of screening for early signs of dementia in the community.







**Dr Lim Tze Peng**  
Principal Investigator;  
Senior Principal  
Pharmacist Researcher

### Evaluation of the Efficacy and Safety of Antibiotic Therapeutic Drug Monitoring (TDM) in Patients with Difficult-to-Treat Gram-Negative Bacterial (DT-GNB) Infections

Antimicrobial resistance results in drug-resistant bacterial infections that are harder to treat. Patients who are severely ill with bacterial infections may not be receiving adequate antibiotic exposure and experience adverse outcomes as a result, possibly due to infection caused by antibiotic-resistant or less antibiotic-susceptible bacteria or that gravely ill patients often have haemodynamic instability (unstable blood pressure or kidney function).

This will require therapeutic drug monitoring (TDM) to measure the antibiotic concentrations in the body to determine the right antibiotic dose to treat these infections.

The goal of this study is to evaluate a new TDM strategy. Management with this TDM assistance allows doctors to offer personalised treatment of patients with "difficult-to-treat" Gram-negative bacteria infections instead of taking a one-size-fits-all approach.

Ultimately, TDM-guided antibiotic dosing service will be made available to all infectious disease clinicians in Singapore. We envision developing the new TDM into a diagnostic assay kit for commercialisation. This will speed up its adoption by routine laboratories worldwide, reducing the need for trained manpower and extensive validation tests.

### Discovery of potential drug target through loss-of-function genetic variation

Naturally occurring human genetic variations help us understand disease pathogenesis and develop novel drugs. Using a bench-to-bedside approach, we discovered novel genetic variations in the bile acid gene CYP8B1, which disrupts bile acid synthesis via the 12<sub>α</sub>-hydroxylation pathway. Importantly, the altered bile acid composition improved skeletal muscle insulin sensitivity, which is impaired in patients with obesity and Type 2 Diabetes Mellitus. Our findings pave the way for developing a new class of diabetes drug.

We started this project by identifying complete loss-of-function mutations in CYP8B1 using stored DNA samples from volunteers of two large local cohort studies. We identified 23 variants and to examine the physiological impact of CYP8B1 haploinsufficiency in vivo, we put carriers of these variants through deep metabolic phenotyping. On discovering the improved metabolic profile in the carriers, we conducted additional skeletal muscle cell experiments to identify the mechanistic pathway responsible for our clinical findings.

This project was co-led by Dr Roshni Singaraja



from NUS/A\*STAR and Dr Tan Hong Chang from SGH. It was made possible with the participation of multiple local and overseas research institutes and support from SingHealth Investigational Medicine Unit.

**Dr Tan Hong Chang**  
Principal Investigator;  
Senior Consultant,  
Department of  
Endocrinology, SGH

## Awards

### National Medical Research Council (NMRC) Transition Awards (TA) & Clinician Scientist Awards (CSA)



#### TA Awardees:

Dr Oh Choon Chiat (SGH Derm)  
Dr Troy Puar (CGH Endo)



#### CSA Awardees:

Dr Lim Tze Peng (SGH Pharmacy)



### Publish! Award

Honouring SingHealth researchers who publish outstanding articles in international scientific or medical journals. The award aims to encourage junior researchers to strive to raise the quality of SingHealth's research publications and international and national profile of SingHealth's research, as well as promote translational and clinical research collaborations for the cluster.



#### 2023 Awardees

Dr Chen Kaina (SGH Gastro)  
Dr Tseng Fan Shuen (SGH Endo)



#### 2022 Awardees

Dr Chan Tze Wei (SGH Haem)  
Dr Manjeri Aditi (SGH Haem)

### SCRI Distinguished Contributor Award for CRCs

Recognising the steady work of CRCs who form the backbone of Singapore's clinical research community. They propel the progress of scientific research, leading to the development of new treatment, drugs and therapies.



**Navreen Kaur Gurdip (Merit Awardee)**

### Highly Cited Researchers

Highly Cited Researchers (HCRs) have shown great clout with their publication of highly cited papers over the last decade. Of the world's population of scientists and social scientists, HCRs are 1 in 1,000, which makes this accomplishment truly outstanding.



**Prof Jenny Low**



**Dr Shirin Kalimuddin**

### Nurturing Clinician Researcher Scheme (NCRS) Award

Aims to nurture young clinicians to become successful clinician-researchers of SingHealth Duke-NUS Academic Medical Centre (AMC) by supporting them with resources, including funding and protected time. This optimises research competencies and experiences, as well as competitiveness for external research grants and readiness to embark on a sustainable research career.



#### 2023 Awardee

Dr Danny Tng (SGH ID)



#### 2022 Awardees

Dr Michelle Loh (SGH RCCM); Dr Loh Wann Jia (CGH Endo); Dr Sue-Ann Ng Pei Lun (SGH RHI)



#### 2021 Awardee

Dr Anthony Yii Chau Ang (CGH RCCM)



## SingHealth Duke-NUS Research Team Project 2021



**1st prize winner**  
**Dr Shirin Kalimuddin**  
 Defining the Adaptive Immune components that Protect Against COVID-19



**1st prize winner**  
**Prof Jenny Low**  
 Rapid determination of SARS-CoV-2 Spike T cells in whole blood of vaccinated and naturally infected individuals

## Clinical Trialist and Investigators

Applicant	Department	Duration (Years)	Category
<b>Clinical Assistant Professor Daphne Gardner</b>	Endocrinology	2	CIVA
<b>Clinical Assistant Professor Suresh Rama Chandran</b>	Endocrinology	2	CIVA
<b>Clinical Associate Professor Jason Choo Chon Jun</b>	Renal Medicine	2	Clinical Trialist
<b>Clinical Associate Professor Lee Haur Yueh</b>	Dermatology	2	Clinical Trialist
<b>Dr Chan Fu Zi Yvonne</b>	Infectious Diseases	2	Clinical Trialist
<b>Clinical Assistant Professor Rajneesh Kumar</b>	Gastroenterology & Hepatology	2	Clinical Trialist
<b>Clinical Assistant Professor Webber Prof Chan Pak Wo</b>	Gastroenterology & Hepatology	2	Clinical Trialist
<b>Clinical Associate Professor George Goh Boon Bee</b>	Gastroenterology & Hepatology	2	Master Clinical Trialist
<b>Assistant Professor Lao Zhentang</b>	Haematology	2	Master Clinical Trialist

## Clinician Profiles



**Dr Danny Tng**  
**Recipient of Nurturing Clinician Researcher Scheme (Innovator Award) 2023**

An aspiring clinician innovator with a keen interest in diagnostics and vaccinology in infectious diseases, Dr Tng's research journey began in 2012, while pursuing his PhD in electrical engineering at Nanyang Technological University. He developed nanomaterials for sensing and drug delivery applications.

After completing his MD in 2019, Dr Tng melded his two passions — engineering and medicine. During the pandemic, he invented a high-sensitivity COVID-19 saliva diagnostic, which got licensed and commercialised in 2021. He continues to develop new diagnostics and is currently a medical-scientific advisor for the company.

Dr Tng is also passionate in vaccinology. He is a co-investigator in several clinical studies investigating the immunology of vaccine and infection. He has recently received the Nurturing Clinician Research Scheme (NCRS) award and is working on utilising engineering concepts to improve vaccine immunogenicity. This includes investigation of novel nanomaterials, vaccine delivery methods, vaccine targets and how they may be translated into platforms for next generation vaccines.

He aspires to become an independent principal investigator and is working towards competitive national level fundings in innovation.



**Navreen Kaur**  
**Senior Clinical Research Coordinator**

Armed with a degree in biomedical sciences from National University of Singapore (NUS), Navreen dived into the various fields of science and health, looking to get into patient-facing roles — a fulfilling post she enjoyed during her internships. That was how she landed the position of clinical research coordinator (CRC) with SGH Medicine ACP's Research Efficiency Enhancement Program (REEP) team.

Her role as a CRC involves project design and planning, obtaining regulatory approvals, creation of study documents, subject recruitment, sample and data collection and management of administrative matters such as study files and finance matters. She liaises with stakeholders like investigators, participants, finance, lab technicians, external vendors/sites and grant funding agencies.

Studies Navreen is involved in can range from blood and data collection of transplant patients with cutaneous skin carcinoma and multi-site

studies monitoring diabetes patients to large-scale sample collection from participants in the Burns Unit with life-threatening Steven Johnson's Syndrome.

After 5 years of working experience, Navreen upskilled through the Master's in Public Health programme at NUS. It gives her a deeper understanding of the general health population and allows her to design beneficial studies.

Navreen thrives when posed with challenges. She counts her best and most rewarding professional experiences to be those that involved complex studies and challenging projects.

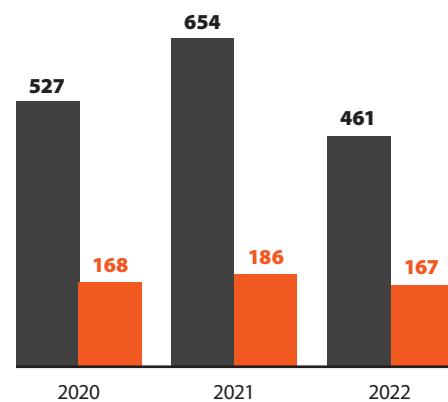
She received the Merit Award from Singapore Clinical Research Institute (SCRI) for the Distinguished Contributor Award in 2022. The accolade meant a lot to her as she feels that CRCs can at times feel unseen or unappreciated, making the SCRI recognition a morale-booster and motivation.

## Statistics

### Total publications: top 20%

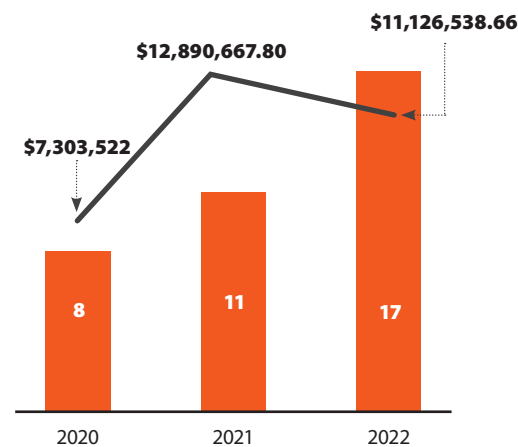
■ Total ■ Top 20%

(Number of publications)



### National grants

■ National grants awarded — Quantum







**Dr Troy Puar**  
Senior Consultant Endocrinologist, CGH

An overseas HMDP fellowship at Radboud Adrenal Centre in The Netherlands sparked Dr Puar's interest in adrenal endocrinology and secondary hypertension and he has been focusing on Primary Aldosteronism (Conn's syndrome) after returning to Singapore.

Primary Aldosteronism (PA) affects 5-10% of patients with hypertension but it often goes undiagnosed. Patients with unilateral adrenal disease can also be cured of the condition, will consequently leads to the cure of hypertension. Identifying unilateral PA currently requires an invasive test (adrenal vein sampling).

In a collaboration with NUS and his mentor Prof Roger Foo (NUHS), Dr Puar piloted a first-in-Asia functional imaging to identify unilateral PA, 11C-Metomidate PET-CT. The pilot study was funded by NMRC-NIG and formed part of his PhD.

Dr Puar received the NMRC TA award to expand this trial, which involves all restructured hospitals in Singapore. He aims to keep improving the diagnosis and treatment of patients with this curable form of hypertension.

## Plans & Priorities



**Assoc Prof Charles Chuah**  
Vice Chair, Research

As we emerge from the COVID-19 pandemic, we will continue to build on our remarkable achievements. The past 2 years saw an increase in number of publications and competitive grant funding. Two of our clinician scientists were awarded the NMRC Transition Award and one was awarded the NMRC Clinician Scientist Award. Nine of our clinicians were awardees in the SingHealth Duke-NUS Clinician Investigator Advancement Programme & Clinical Trialist Development Programme.

In alignment with National and SingHealth strategic directions, our clinician researchers and research peaks are well positioned to make a positive impact in areas of population health, artificial intelligence, digital health, data science and to contribute significantly to enhancing knowledge enterprise and discovery.

## Medical Humanities

Healthcare is more than just attending to the physical well-being of a patient — there are also the social, artistic and even philosophical dimensions to factor in. The treatment and recovery of a patient take on a holistic approach with the integration of humanities into medical practice, shedding light on different perspectives and a broader spectrum of healthcare solutions.



### Medical Humanities Council Members

*L-R:* APN Joanna Phone Ko, Clin Asst Prof Ong Eng Koon, Dr Crystal Lim, Clin A/Prof Warren Fong

*Not in picture:* Clin Asst David Teo, Dr Janet Ong, Clin Asst Prof Natalie Woong, Clin Asst Prof Victoria Sze Min





## Events

### Origami Art Exhibition

Five artists masterfully folded origami to the themes of courage, hope, love and health in a tribute to healthcare workers for their dedication during the pandemic. Lead coordinator Avon Koh, Secretariat at Institutional Animal Care and Use Committee in SingHealth, said origami takes time and dedication. Eleven of his creations — including the award-winning piece folded to the shape of the UEFA Champions League Trophy — were part of the exhibition.



### A Night to Remember

18 Nov 2022

A signature event where the stories and talents of our colleagues and patients are showcased alongside a highlight on our beneficiaries. Last year's theme was "Hand in Hand, Heart to Heart", with a focus on burnout and COVID-19 disruptions. More than \$18,000 were raised for the beneficiaries from SGH, SKH and CGH.

### Networking session with Yong Loo Lin School of Medicine (YLLSoM)

29 Nov 2022

In a collaboration with the Medical Humanities Collective group at NUS Yong Loo Lin School of Medicine, more than 20 medical students and practitioners got an insight into the growth in medical humanities in Singapore. Medical Humanities Director, Dr Ong Eng Koon discussed medical humanities in clinical practice and the involvement of junior clinicians in its research and practice. Medical Humanities Collective group member, Mr Lincoln Lim, said: "We explored medical humanities and shared anecdotes and inspirations in finding new ways to progress together."

### Tembusu Connect: A site for struggling caregivers and patients

Medical illnesses pose challenges, leaving patients and caregivers feeling isolated and overwhelmed. Patients often wonder if their experiences are understood, while caregivers struggle to manage multiple responsibilities.

To address these needs, the office has created Tembusu Connect, a dedicated website providing emotional support and information throughout the care journey. Through Tembusu Connect, the office aims to overcome barriers of isolation, help patients find meaning in their illnesses, facilitate communication with loved ones and healthcare professionals, encourage self-help and self-expression, and enhance access to Medical Humanities content. Currently in the pilot phase, flyers have been distributed and patients were engaged in conversations during walkabouts in selected wards in collaboration with nurses and Office of Patient Experience (OPE) staff.



### The Colours of Tomorrow Art Exhibition

7 Apr-6 May 2022

The second collaborative project with SG Prison Service and Visual Arts Hub, held at the Academia, showcased paintings and ceramics by artists who also shared their dreams, hopes and tales of resilience. The exhibition aimed to inspire, comfort and give a sense of solidarity to healthcare workers during the pandemic.

### Medical Humanities Webinar Series

The webinar series started in 2020 with the aim of fostering and educating healthcare professionals by harnessing the creative and intellectual power of diverse disciplines with the humanities and social sciences.

#### Connecting with Your Inner Self Through Music-Evoked Images

19 Jan 2022

Invited speaker Ms Tammy Lim, Senior Music Therapist, Assisi Hospice, gave an hour-long talk that introduced and demonstrated the Bonny Method of Guided Imagery Music (GIM) and how music can be an effective channel to access and explore our inner world through deep listening. The webinar was attended by 169 participants.

#### Power of Positive Thinking — Insights into A Patient and Caregiver's Journey

12 May 2022

Award-winning Patient Advocates, Ms Violet Oon and Mr Steven Chan of SingHealth Patient Advocacy Network, shared their life experiences as a patient and caregiver, respectively. Ms Oon recounted how stroke forced her to relearn basic skills and she taught stroke patients and their caregivers how to make delicious food that meet their dietary and medical needs. Mr Chan, who was an event organiser, became a caregiver to his father-in-law who had medical issues including dementia.



### Medical Humanities Faculty Development Webinar

17-18 Feb 2022

The inaugural Medical Humanities Faculty Development Webinar, with the theme "Integration, Sustainability and Research", discussed topics such as the landscape of medical humanities, impact of death and dying on healthcare practitioners, and inculcating medical humanities in faculty and residents. Medical Humanities Office Director, Dr Ong Eng Koon said: "The speakers gave deep insights into their topics and gave the team food for thought."

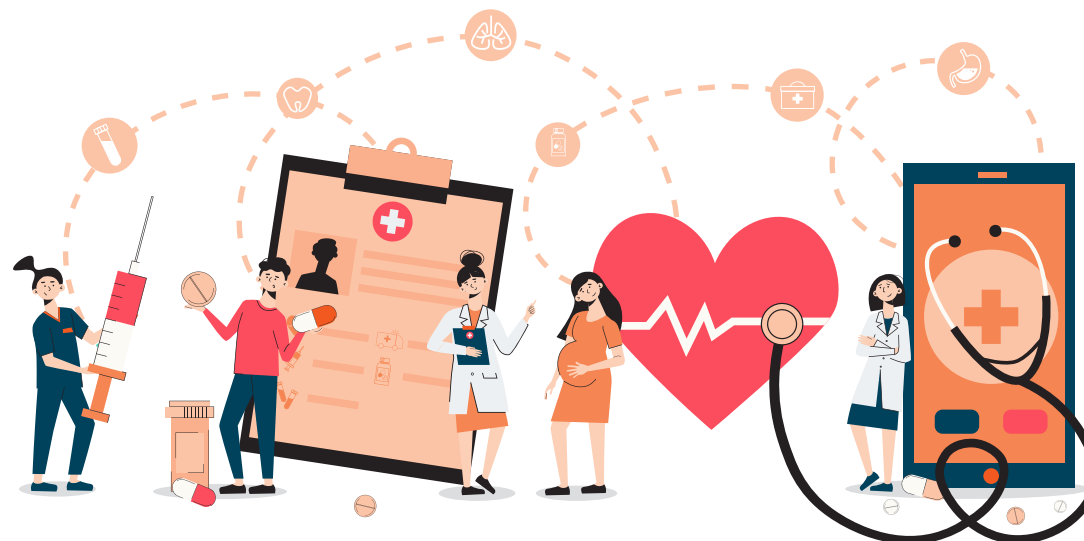
### Medicine ACP Medical Humanities 2nd Introductory Course

13-14 Oct 2022

In a collaboration with Nanyang Technological University School of Humanities, participants discussed clinical communications, philosophy in medicine, creative writing and socio-cultural phenomena. Dr Ong Eng Koon said: "The course was truly inspiring for both the organising committee and participants. The speakers also gave ideas on how our humanities office can create programmes in the future."

## Plans & Priorities

As the Director of the Medical Humanities Office, Dr Ong Eng Koon envisions bringing the human touch into medicine by integrating the arts, humanities and social sciences with healthcare. He has prioritised three main areas of focus.



- 1 To design and implement an array of medical humanities programmes to engage and enrich healthcare professionals, patients and the community.
- 2 To develop academic and research programmes that will support the exploration and expansion of medical humanities. This includes grants and publications that will deepen the understanding of the symbiotic relationship between healthcare and the humanities.
- 3 To explore how medical humanities can be leveraged to enhance resilience, empathy and communication in healthcare.

Dr Ong advocates the advancement of medical humanities and continuing improvement to healthcare. He is a firm believer of medical humanities playing a significant role in enhancing the well-being of both healthcare professionals and patients.

### Clin Asst Prof Ong Eng Koon Director, Medical Humanities



## Clinician Profile

### Clin Asst Prof David Teo Member, Medical Humanities, Medicine ACP Consultant, Department of Psychological Medicine, CGH

Dr Teo is passionate about youth mental health, psychosomatic medicine and psychodynamic psychotherapy. He takes special interest in combining psychotherapy and medications in the holistic treatment of mental health conditions, integrating the medical with spiritual aspects of care. He heads CGH's Health Wellness Programme (ASCAT CGH), a collaboration with primary care physicians and social service agencies to enhance mental healthcare in the community.

The advocate of continued learning leverages cross-sector collaborations in developing inter-professional training programmes. He runs workshops to help clinicians understand and address their patients' values and spiritual concerns

and deliver person-centered care.

Dr Teo also runs Balint groups to promote the awareness of interpersonal dynamics in clinical encounters and treatment. These initiatives aim to help clinicians reconnect with the humanistic aspects of medicine, enhance patient care and improve professional satisfaction.

Dr Teo is a published researcher and was a co-editor for the recently-published textbook *Guide to Psychiatry in Primary Care*. He has also written on spirituality, religion, belief systems and suicide. He is on the Psychodynamic Psychiatry international advisory board and was recently elected World Psychiatric Association's Psychotherapy Section Secretary.





# Philanthropy

Philanthropy is vital for Medicine ACP's Education, Research and Clinical Service Improvement and Innovation initiatives. The continued support from our donors lets us discover new interventions and raises our standards of patient care.



URL: [sgh.give.asia/campaign/support-patients-with-kidney-failures](https://sgh.give.asia/campaign/support-patients-with-kidney-failures)

## Advancing Resources for Kidney diseases (ARK) Fund

Singapore has one of the highest incidences of patients with kidney failure in the world. Every day, three patients start dialysis. This growing number of patients remain at risk from kidney failure, heart attacks, strokes and infection.

To commemorate 50 years of Renal medicine in SGH, the SGH Renal Medicine ARK (Advancing Resources for Kidney diseases) Fund was launched. It aims to: (1) focus on new effective treatments, (2) expedite research efforts to detect and predict the progression of the disease, (3) nurture healthcare professionals to bring the best patient outcomes, and (4) provide first funding for strategic research projects.

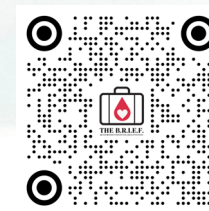
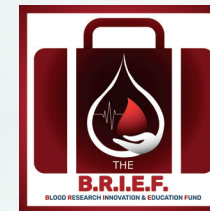
Every dollar of your 250% tax deductible gift will go towards these four strategic areas: prevention through screening and timely diagnosis, a reno-retardation programme to slow down disease progression, kidney transplant procedures, and renal replacement therapies.

Your gift may be presented for 1:1 Government matching, ensuring that more renal patients receive comprehensive and holistic medical care, spanning from prevention and timely diagnosis to effective treatment.

## Blood Research Innovation & Education Fund (B.R.I.E.F)

Every year, we have about 2,000 new cases of blood cancers, including leukaemia and lymphoma in Singapore. Common non-cancerous blood disorders like anemia, thalassemia, bleeding disorders, hemophilia and blood clots can also cause blood cells to function abnormally and may lead to severe illness and diseases.

Gifts to B.R.I.E.F will impact many patients and their families, in Singapore and beyond. Led by a group of very dedicated clinician researchers, innovators and educators, B.R.I.E.F. supports initiatives to further efforts in the study and treatment of blood disorders.



## Building Healthy, Empowered and Active and Inclusive Communities

Made possible by a most generous pledge and gift from the Low Tuck Kwong Foundation since 2021, the Healthy, Empowered and Active Living (HEAL) Programme envisions an empowered community of care by developing innovative care models to support ageing-in-place through harnessing technology and digitalisation, strengthening health-social integration, as well as proactive outreach to vulnerable populations. By working closely with national organisations and community partners, the team is well-placed to efficiently implement holistic and highly accessible healthcare to residents and patients.

Through the HEAL Programme, more than 1,000 seniors and youths have benefited from intergenerational programmes, and Dr Buddy — a remote clinical monitoring software currently used in Hospital at Home and Hospital to Home programmes — has contributed to more than \$7.5 million in cost savings.

## Gift-A-Breath Campaign

Breathing is the most natural thing for all of us. Unfortunately, this may not be the case for approximately 400,000 adults in Singapore who suffer from chronic lung diseases like asthma, bronchiectasis and chronic obstructive pulmonary disease (COPD).

Many of us do not realise the seriousness as the symptoms of the diseases may not be noticeable at first. To help patients who need these treatments but are unable to afford it, online campaigns were launched in 2022 to raise funds for Respiratory Diseases. The campaign aims to raise awareness and funds for patients with chronic respiratory diseases and donations will go towards advancing research, education and patient care initiatives in respiratory diseases.





## Seah Cheng Siang Professorship



The Seah Cheng Siang Professorship was established in 2019 to promote top standards of patient care through medicine, professionalism, education and research. Prof Fong Kok Yong, a leader in academic initiatives, is the inaugural Seah Cheng Siang Professor. Committed to advancing medical education and clinical excellence in Singapore, he sought to identify the digital competencies to be incorporated in the core medical school curricula.

**Defining Clinical Skills in the Digital Age** Studies show that medical trainees who attain the necessary skills in the earlier years of their education have better confidence and competency. They are more adept in utilising electronic health records and leveraging advanced technologies such as Artificial Intelligence, Machine Learning and the Internet of Things.

Through literature reviews and interviews with multiple stakeholders, the study identifies potential barriers to incorporating digital topics into the curricula and the core clinical skills and digital competencies relevant to clinical practices. Findings from the study have been presented at academic conferences and published in these scientific journals:

### 1. Clinical informatics training in medical school education curricula: a scoping review

**Authors:** Humairah Zainal, Joshua Kuan Tan, Xin Xiaohui, Julian Thumboo, Fong Kok Yong; **Journal:** *Journal of American Medical Informatics Association (JAMIA)*, 2022; 30(3):604-616. doi: 10.1093/jamia/ocac245; **URL:** [pubmed.ncbi.nlm.nih.gov/36545751](https://pubmed.ncbi.nlm.nih.gov/36545751)



**Objectives:** This scoping review evaluates the literature on clinical informatics (CI) training in medical schools to determine the essential components of a CI curriculum, identify methods to evaluate the effectiveness of a CI-focused education, and understand its delivery modes.



**Methods:** This review was informed by the methodological guidance of the Joanna Briggs Institute. We searched the PubMed, Scopus and Web of Science electronic databases for articles discussing CI between January 2010 and December 2021.

59 out of 3,055 articles were included in our final analysis. Components of CI education include its utilisation in clinical practice, ethical implications, key CI-related concepts and digital health. Educational effectiveness are evaluated both internally and externally. Modes of delivery include pedagogical strategies and multidisciplinary teaching of CI.



**Conclusion:** The literature reveals that CI training in the core curricula will complement, if not enhance, clinical skills. We propose 4 recommendations in CI delivery: situating CI curriculum within specific contexts, developing evidence-based guidelines, developing validated assessment techniques to evaluate curriculum effectiveness, and equipping educators with relevant CI training.

### 2. Medical school curriculum in the digital age: perspectives of clinical educators and teachers

**Authors:** Humairah Zainal, Xin Xiaohui, Julian Thumboo, Fong Kok Yong; **Journal:** *BMC Medical Education*, 2022; 22(1):428. doi: 10.1186/s12909-022-03454-z; **URL:** [pubmed.ncbi.nlm.nih.gov/35659212](https://pubmed.ncbi.nlm.nih.gov/35659212)



**Background:** Using Singapore as a case study, the project gleaned the views of local clinical educators about the need to impart digital technology skills to medical students. The study also recommends ways to balance the clinicians' concerns about these technologies with the digital competencies needed for clinical practice.



**Methods:** Findings were drawn from interviews with a purposive sample of 33 clinical educators from Singapore's public and private healthcare sectors. Data was interpreted using qualitative thematic analysis. Participants included vice-deans of education from the three local medical schools and senior consultants of different disciplines.



**Conclusion:** Overall, the findings show that medical students in Singapore would benefit from a curriculum that teaches digital technologies alongside core clinical skills. The participants acknowledged two benefits of equipping students with skills in digital technologies: promoting the culture of innovation and improving work efficiency. They also highlighted four concerns: (i) erosion of basic clinical skills, (ii) neglect of a generalist approach to healthcare characterised by holistic management of patients, inter-professional collaboration and commitment to breadth of practice within each specialty, (iii) rapid pace of technological advances, and (iv) de-personalisation by technology.

### 3. Digital competencies for Singapore's national medical school curriculum: a qualitative study

**Authors:** Humairah Zainal, Xin Xiaohui, Julian Thumboo, Fong Kok Yong; **Journal:** *Medical Education Online*, 2023; 28(1):2211820. doi: 10.1080/10872981.2023.2211820; **URL:** [pubmed.ncbi.nlm.nih.gov/37186901](https://pubmed.ncbi.nlm.nih.gov/37186901)



**Objectives:** Studies have shown that national-level initiatives to equip medical students with relevant digital competencies carry many benefits. Yet, few countries have outlined such competencies for clinical practice in the core medical school curriculum.

This paper identifies current training gaps in digital competencies needed by students from the perspectives of clinical educators and institutional leaders. It bears implications for countries that intend to implement standardised learning objectives for training in these digital competencies.



**Methods:** Findings were drawn from interviews with 19 clinical educators and leaders of local medical schools recruited using purposive sampling. Data was interpreted using qualitative thematic analysis. Thirteen of the participants were clinical educators while 6 were deans or vice deans of education from the medical schools in Singapore.



**Conclusion:** While the schools have introduced some relevant courses, they are not standardised, and the school's niche areas have not been leveraged for training in digital competencies. Participants acknowledged that more formal training is needed in digital health, data management and applying the principles of digital technologies. They also noted that the healthcare needs of the population, patient safety and safe procedures in the utilisation of digital healthcare technologies should be prioritised.

The findings highlighted the need for better collaboration among medical schools in sharing educational resources and expertise. Stronger collaborations with professional bodies and the healthcare system should be established to ensure that the goals and outcomes of medical education and the healthcare system are aligned.

### 4. Exploring the views of Singapore junior doctors on medical curricula for the digital age: A case study

**Authors:** Humairah Zainal, Xin Xiaohui, Julian Thumboo, Fong Kok Yong; **Journal:** *PLoS ONE*, 2023; 18(3): e0281108, <https://doi.org/10.1371/journal.pone.0281108>; **URL:** [pubmed.ncbi.nlm.nih.gov/36862708](https://pubmed.ncbi.nlm.nih.gov/36862708)



**Objectives:** This study aims to explore the perspectives of medical trainees in instilling digital competencies in Singapore's medical school curricula. It also considers how the medical school experience can be strengthened to bridge potential gaps in the integration.



**Methods:** Findings were drawn from interviews with 44 junior doctors from Singapore's public healthcare institutions including hospitals and national specialty centers. House officers and residents from different medical and surgical specialties were recruited using purposive sampling. Data was interpreted using qualitative thematic analysis.

The doctors were in their 1st to 10th year of post-graduate training. Thirty of them graduated from the three local medical schools whereas 14 others were trained overseas.



**Conclusion:** Overall, they felt ill-prepared to utilise digital technologies due to limited exposure to such technologies in medical school. Six issues were identified: lack of flexibility and dynamism within the curriculum, dated learning style, limited access to electronic health records, gradual uptake of digital technologies in the healthcare sector, lack of an ecosystem that promotes innovation, and lack of guidance from qualified and available mentors.

Equipping medical students with skills relevant to the digital age would benefit from a concerted effort from multiple stakeholders: medical schools, medical

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## Future of Medicine Fund

Working in healthcare comes with challenges and dedication, and patients benefit daily from your commitment. Today, we are reaching out to you with an opportunity to make an even greater difference.

By donating, you can play a pivotal role in advancing our institution's mission of providing exceptional care. Your contribution will empower us to develop and sustain academic programmes that advocate research, quality improvement and faculty development for our dedicated medical personnel.

Imagine the possibilities we can achieve together. Your support will enable us to conduct groundbreaking research,

leading to the discovery of new treatments, improved medical technologies, and enhanced patient outcomes. With your generosity, we can pioneer innovative solutions that positively impact countless lives.

Eligible donations will enjoy a 250% tax deduction, and this would be automatically included in your income tax statements. Thank you for your unwavering dedication in our academic journey and for considering this opportunity to make an even greater impact. Your support is truly invaluable.

Make a difference today. Scan the QR code for the donation form and to discover more information. Join us in shaping the future of medicine.



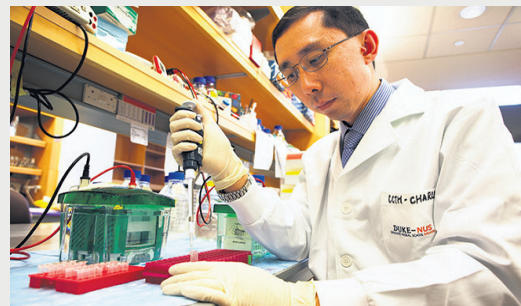
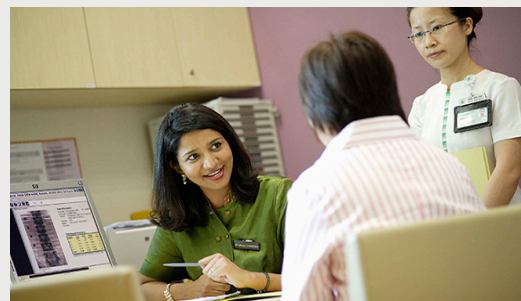
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## Key Contacts

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### ADVISORS

A/Prof Melvin Chua, *SKH*

Clin A/Prof Augustine Tee, *CGH*

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Clin Prof Tan Thuan Tong, *SGH*

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Clin A/Prof Goh Su-Yen, *SGH*

(Quality Improvement)

Clin A/Prof Damien Tan, *SGH*

(Medical Device & Apps Development)

#### Deputy Director

Clin A/Prof Chionh Chang Yin, *CGH*

(Medical Device & Apps Development)

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A/Prof Marjorie Foo, *SGH*

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Clin Asst Prof Stanley Angkodjojo, *SKH*

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(Postgraduate Education)

#### Deputy Director

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(Faculty Development)

Clin Asst Prof Kek Peng Chin, *SGH*

(Undergraduate Education)

Clin Asst Prof Sean Loh, *CGH*

(Postgraduate Education)

Clin Asst Prof Andrew Ong, *SGH*

(Faculty Development)

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### MEDICAL HUMANITIES

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(Research Skills Enhancement & Support)

Clin A/Prof Andrea Low, *SGH*

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Ms Daphne Ng, *SGH*

(Manager, Clinical Service Improvement & Innovation)

Ms Ang Yi Lin, *SGH*

(Assistant Manager, Clinical Service Improvement & Innovation)

Ms Nur Suhaila Ishak, *SGH*

(Assistant Manager, Education and Medical Humanities)

Ms Chue Xiu Ping, *SGH*

(Assistant Manager, Research)

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**Medicine Academic Clinical Programme**

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*Information accurate as at July 2023*