

# PULSE

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**Treating Life-Endangering  
Blood Clots**



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**Guarding Hearts  
Amidst Cancer**



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**Amplifying the Love for  
Echocardiography**



**COVER STORY**

## **Unveiling Project RESET: A Bold Mission to Redefine Heart Health**



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e-copy of Pulse!

**TAKE ME HOME!**

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**National University  
Heart Centre  
Singapore**



**NUHCS** is an academic, national specialist centre that brings together the resources, expertise and capabilities in the areas of Cardiology, Cardiothoracic and Vascular Surgery to better meet the needs of the growing number of patients with heart disease and raise the future generation of medical professionals. As a national heart centre in Singapore, NUHCS has honed two Peaks of Excellence and six Core Clinical Programmes that provide leading care and treatment strategies for patients:

#### CORE CLINICAL PROGRAMMES

- Acute Coronary Syndrome Programme
- Congenital and Structural Heart Disease Programme
- Heart Failure & Cardiomyopathy Programme
- Heart Rhythm Programme
- Vascular Medicine and Therapy Programme
- Women's Heart Health Programme

#### INSTITUTIONAL PEAKS OF EXCELLENCE

- Minimally Invasive Cardiothoracic Surgery (MICTS)
- Aortic Centre



**NUHCS Heart Clinic @  
Ng Teng Fong  
General Hospital**



**NUHCS Heart Clinic  
@ Alexandra Hospital**



**National University  
Heart Centre, Singapore  
(NUHCS) at National  
University Hospital,  
Kent Ridge**

## NUHCS SERVICES IN SINGAPORE



**NUHCS Heart Clinic  
@ Jurong Medical Centre**



### Cardiovascular Research Institute (CVRI): Research Pillar of NUHCS

Comprising a team of internationally-recognised cardiologists and surgeons from the cardiothoracic and vascular specialties, NUHCS serves as a referral national centre for cardiothoracic and vascular conditions and provides a comprehensive approach to the treatment of these patients.

The holistic patient-care approach is backed by leading translational research at the Cardiovascular Research Institute (CVRI) and Cardiovascular Metabolic Translational Program, all of which complements these advanced quaternary clinical services to deliver state-of-the-art treatment solutions to the most challenging heart, lung and circulatory diseases.



### National University Health System (NUHS)

*An integrated Academic Health System, serving as one of three public healthcare clusters*

As a member of NUHS, NUHCS collaborates with professionals and centres across the health system to advance the tripartite missions of achieving clinical excellence for patients, developing the next generation of healthcare professionals, and changing the natural history of chronic diseases through research.



# EDITOR'S MESSAGE

Dear readers,

The stories in this issue truly showcase the academic dimension of NUHCS, highlighting numerous research projects, grant awards and publications from the past six months.

We are excited to announce Project RESET, an ambitious initiative introduced by the Minister of Health, Mr Ong Ye Kung, aiming to reduce heart disease by 20% in Singapore over the next five years. This visionary project underscores our commitment to transforming healthcare on a national scale.

Three of our NUHCS clinician-scientists were honoured with the National Medical Research Council (NMRC) Talent Awards 2024. Additionally, the NUHCS CRESCENT randomised clinical trial was selected as one of the featured research presentations at the American College of Cardiology (ACC) Atlanta 2024 meeting, and was simultaneously published in the high-impact Journal of American College of Cardiology (JACC). But that's not all, our NUHCS' senior residents, fellows, and medical students showcased seven outstanding ACC abstracts, making a significant mark on the global stage.

Our momentum continued at the American Heart Association (AHA) 2023 meeting in Philadelphia, United States of America, where our team presented numerous abstracts. Celebrating further victories, our doctors also presented their award-winning clinical case reports

at Transcatheter Cardiovascular Therapeutics Asia Pacific (TCTAP) in South Korea and EuroPCR in Paris, two of the most globally renowned interventional cardiology meetings. Locally, at the Singapore Cardiac Society (SCS) Annual Scientific meeting, NUHCS swept all six finalist slots in the Young Investigators' Competition.

We also delved into the career journey of one of our Senior Medical Technologists with a 20-year tenure in heart imaging, gaining insights into the nature and demands of this role, while exploring their contributions beyond routine work, in mentoring and nurturing the next generation in the field of echocardiography.

Our nursing colleagues are equally inspiring, having established the Cardiovascular Evidence-Based Nurses Collective (CENC) to drive forward various pioneering nursing research projects. This pervasive culture of research at NUHCS has ignited a passion for innovation towards bringing better patient care among our aspiring cardiovascular trainees, propelling them toward new frontiers in medical science.

In an exciting development, NUHCS has expanded our outpatient clinic services to the community with the opening of the NUHCS Heart Clinic @ Jurong Medical Centre (JMC). This initiative eases the hospital workload while bringing quality care closer to our patients' homes, aligning with NUHS' vision of creating a comprehensive healthcare ecosystem in the Western region.

As a training centre with great emphasis on education, our doctors share their expertise both locally and internationally, enhancing patient care through cutting-edge skills, advanced information technology, generative Artificial Intelligence (AI), and groundbreaking device innovations. Dive into the stories of Team NUHCS and be inspired by their unwavering dedication and accomplishments. I hope you enjoy the journey!

*Tan Huay Cheem*

**Prof Tan Huay Cheem**  
Senior Advisor, NUHCS





# Unveiling Project RESET:

## A Bold Mission to Redefine Heart Health

A large-scale initiative aiming to empower Singaporeans to take charge of their heart health

### Could heart disease be lurking in the shadows, silent and undetected?

While many believe that they are in relatively good health, undetected early heart disease exists in as many as one in every three Singaporeans, according to a paper<sup>1</sup> published in May 2023 by a team of local researchers. A top cause of death in Singapore, Cardiovascular Disease (CVD)<sup>2</sup> claims 23 lives each day – and more than one in three deaths are due to heart disease or stroke.

To halt the trajectory of heart disease in our population, a fresh, multi-faceted approach is needed to bridge the gap in public education as well as on the medical front, to help discover

factors and processes that can assist in identifying early stages of CVD in those who still do not showcase any symptoms.

Thus we have Project RESET – a visionary initiative aiming to revolutionise heart health awareness and intervention strategies. Launched on 27 September 2023 at the Heart Disease Prevention Symposium by Minister for Health, Mr Ong Ye Kung, this endeavour marks a pivotal moment in Singapore's healthcare landscape.

Supported by a newly awarded \$25 million grant from the National Research Foundation, Singapore, and the Singapore Ministry of Health's National Medical Research Council<sup>3</sup>, Project RESET is a collaborative effort that harnesses the collective expertise and strengths of multiple institutions including public healthcare clusters and industry and community partners such as NUS Medicine, National Heart Centre Singapore (NHCS), Nanyang Technological University, Singapore (NTU Singapore) and A\*STAR, to study and implement the best ways to tackle heart disease in Singapore.

### Registration Criteria for Project RESET

Participants aged between 40-70 years old, who have any of the following:



**Project RESET**  
Redirecting immune, lipid and metabolic drivers of early cardiovascular disease



High blood pressure



High cholesterol



Fatty liver



Family history of heart diseases or stroke



Obesity



NO prior history of heart attack or stroke or balloon angioplasty/stent placement



## Diving Deep to the Heart: The RESET Approach

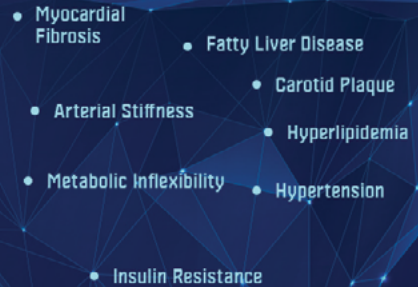
The large-scale study aims to help strengthen preventive efforts by finding measurable signs of early heart disease and developing new methods to tackle them. Using the metaphor of an iceberg to elucidate the approach underpinning the study, Prof Roger Foo, Director, Cardiovascular Research Institute (CVRI), NUHCS, explained that the different factors that contribute to heart disease will be investigated by capturing a variety of data points, from lifestyle information down to genetic variations, to provide a full diagnostic picture for each individual – even those who may appear healthy – on a scale that is unprecedented in Singapore.

“We intend to explore the hidden depths of CVD, examining individuals who are apparently healthy, to uncover the myriad factors contributing to heart disease...”

*Prof Roger Foo, Director, Cardiovascular Research Institute (CVRI), NUHCS*

The ongoing five-year project will engage 10,000 participants as the research cohort, where about 3,000 participants will then be selected for a five-year follow-up programme that deploys and pilots new technologies for heart disease management. To

delve deeper into the causes of heart disease, a stringent set of inclusion criteria such as family history and presence of heart disease risk factors has also been implemented to ensure robust results.



*Tip of the iceberg: One of Project RESET's aims is to uncover the biomarkers of heart disease.*

## A Heart Health Map in the Making

A silent killer in its earlier stages, did you know that up to 80% of Singaporeans may be at risk of heart disease? The arteries supplying blood to our hearts can clog up quietly and slowly, unbeknownst to us, due to factors such as unhealthy food intake, lack of physical activity and also our genetic pre-disposition – as

Mr Mike Tan, a retiree, discovered when he participated in an earlier health study (see Box Story).

In line with efforts to design community spaces for better social well-being, Project RESET will be piloted at Health District @ Queenstown – an initiative designed to support residents in leading healthy and purposeful lives. Through a multi-collaborative,

holistic approach, the project aims to enhance residents' well-being through testing out preventive, science-based health interventions close to their home, before rolling out successful programmes to the rest of Singapore towards making a real-world impact.

## Retiree Signs Up for Project RESET after Fatty Liver Diagnosis

Mr Mike Tan, a retiree, was diagnosed with high blood cholesterol 15 years ago. While he goes to the gym three to four times a week, hikes, cycles and has taken part in half-marathons, he was more lenient towards his diet. “I have been on low dosage statin<sup>4</sup> for 15 to 20 years for high cholesterol levels and my level is well controlled. It's like a security blanket,” the 64-year-old said.

Entering a previous cardiovascular-centred research study known as the NUHCS PICMAN Research Study<sup>5</sup> in early 2024, Mr Tan was given a good diagnosis for his heart health, but was surprised to find out that he had fatty liver disease. Previously unaware of the condition, he learnt that fatty liver might lead to liver inflammation and scarring or hardening (cirrhosis), but is reversible if properly managed. He has since started medication to monitor the condition.

Keen to learn more about his underlying health, Mr Tan readily agreed when invited to join Project RESET, as he felt that being part of the groundbreaking research journey would enable him to contribute to meaningful advancements, as well as learn more about his own heart and metabolic health.

Photo: Mike Tan





## Harnessing Technology for Health Empowerment

In the digital age, technology emerges as a helpful ally in the fight against heart disease. Project RESET embraces this ethos, leveraging innovations to make preventive health accessible to all.

To raise awareness on how there are many like Mr Tan – who may also look well on the outside yet are not exempted from heart health dangers – the Project RESET team intends to harness datasets collected to bridge current translational gaps in research, which will go towards developing effective preventive strategies in the long term.

Eligible participants in the study are equipped with digital smartwatches, tracking vital lifestyle metrics such as physical activity, stress levels, and sleep patterns. Complemented by scans and blood tests, this comprehensive approach enables researchers to better identify the clinical, biological and digital markers of heart disease. This will help to uncover the interplay between underlying conditions and heart dysfunction, and how they lead to higher risk of heart attacks and stroke, explained Prof Foo, who specified that some of these risks include blocked arteries, hypertension, fatty liver and Left Ventricular (LV) fibrosis<sup>6</sup>.

As part of a Randomised Controlled Trial (RCT) to evaluate the effectiveness of digitally-supported lifestyle interventions, a sub-group of individuals will also receive health coaching via technological platforms over a one-year period. Yet, the innovation doesn't stop there. Project RESET will also leverage the use of Artificial Intelligence (AI) and immersive technologies such as the HaptGlove – a virtual reality glove – and Holotechnology, all of which will be used to carry out health discussions with participants. **These tools enables participants to feel their own liver tissue stiffness,**

**organ sizes and heart pulse rates through touch and grip sensations, providing an experiential understanding of their body's warning signs of heart disease. Researchers hypothesise that this approach of providing a more realistic and immersive experience will have a more influential impact on motivating individuals to make beneficial lifestyle changes for their health.**

## Putting the Brakes on Heart Disease Progression

While the study is still in its early stages, Prof Foo shared that preliminary data already reveals out of a cohort of 100 participants studied who are aged 40 to 60, approximately half of the participants have fatty liver disease and arterial calcification – an abnormal build-up of calcium in their arteries. This shocking discovery among seemingly healthy individuals underscores the urgency for proactive interventions. Such screenings can allow for early management or treatments to reverse these health conditions, as those who gain a deeper understanding of their health will be empowered to make necessary lifestyle modifications to lead a healthier, longer life.

With each milestone, Project RESET reaffirms its commitment to empowering individuals and transforming the medical landscape, by encouraging all to take charge of

their health through positive lifestyle actions and a proactive mindset, rather than responding to health crises only when they happen. As we journey towards a healthier, heart-strong Singapore, one thing becomes abundantly clear: the power to redefine health lies within each of us.

Minister Mr Ong Ye Kung tries on the HaptGlove and VR headset during the launch of Project RESET.

From left to right: Mr Ong Ye Kung, Minister for Health, with Prof John Eu-Li Wong, Senior Advisor, NUHS, A/Prof James Yip, Executive Director, NUHCS, and Prof Roger Foo at the welcome party. Image credits: Yong Loo Lin School of Medicine, National University of Singapore.

For more insights and updates on Project RESET, scan the QR codes to access these exclusive reports:

**Scan to Watch**  
@Channel NewsAsia  
Interview:



**Scan to Read**  
@Channel NewsAsia  
Report:



**Scan to Read\***  
@Zaobao News Report:



\*Note: Article is in Mandarin

## Scan to learn more on Project RESET!

Sign up as a volunteer to gain insights into your own heart & liver health and help advance the heart health of our nation:



1. The Lancet Regional Health Western Pacific, [https://www.thelancet.com/journals/lanwpc/article/PIIS2666-6065\(23\)00121-9/fulltext](https://www.thelancet.com/journals/lanwpc/article/PIIS2666-6065(23)00121-9/fulltext).
2. **Cardiovascular Disease:** A group of disorders of the heart and blood vessels, the most common of which includes heart attacks and strokes.
3. **National Medical Research Council:** A government organisation in Singapore that oversees the development and advancement of medical research.
4. **Statin:** Medication which reduces cholesterol production.
5. **NUHCS PICMAN Research Study:** A public health screening outreach that aims to find ways to detect early disease through studying individuals with or without fatty liver and analysing their heart function, towards offering new treatment and preventing heart disease progression.
6. **Left ventricular fibrosis:** Scarring of the heart muscle.





## AMERICAN HEART ASSOCIATION SCIENTIFIC SESSIONS 2023

# CARDIOLOGY AT THE FOREFRONT

The American Heart Association (AHA) Scientific Sessions 2023, held on 10-13 November 2023 in Philadelphia, USA, is a renowned premier cardiology event. Bringing together delegates across the globe to unveil the latest breakthroughs and exchange transformative insights, this event featured over 700 educational sessions, 4,000 abstracts, and attracted participants from over 105 countries.

### AMERICAN HEART ASSOCIATION (AHA) SCIENTIFIC SESSIONS

The AHA Scientific Sessions is a premier global event focused on discussing the advancements in cardiovascular science and medicine. Serving as a platform for scientists, clinicians, researchers and other healthcare professionals in the field of cardiology to gather and exchange knowledge on the latest innovations, this conference unveils advanced research and clinical updates on cardiovascular disease.

Kickstarted with exciting late-breaking clinical trials, this conference captivated a large audience eager to explore the diverse realms of cardiology, from preventive measures to interventional approaches<sup>1</sup>. One notable trial was SELECT – revealing advancements in obesity treatments for significant improvement of cardiovascular outcomes, and Orbita-2, which shed light on the efficacy of percutaneous coronary intervention<sup>2</sup> in treating and managing stable angina<sup>3</sup>.

Alongside the scientific presentations, the event also spotlighted cutting-edge medical devices to improve patient care, including a new heart failure prescription medicine that stood out for its subcutaneous infusion<sup>4</sup> of a standard dose of Frusemide – typically 80mg – with a similar absorption rate of intravenous delivery. Its potential to transform home-based or ambulatory care, reducing inpatient admissions, intrigued all attendees, including myself.

Beyond the lectures and presentations, attendees immersed themselves in hands-on experiences at the Simulation Zone, exploring Critical Care and Interventional Cardiology.

Mentored by Adj Prof Poh Kian Keong, Senior Consultant, Department of Cardiology, NUHCS, I presented my ongoing research project titled “Prognostic Value of the Global Left Ventricular Contractility Index in Patients with Severe Mitral Regurgitation and Preserved Left Ventricular Ejection Fraction”, marking a significant life milestone. This moderated digital poster presentation earned recognition, allowing me to share my findings with a diverse, international audience at the AHA Scientific Sessions.

I am deeply grateful to Adj Prof Poh Kian Keong for his invaluable mentorship throughout my research project. With enthusiasm, I look forward in pursuing similar projects in the future, drawing inspiration from the expertise I have gleaned from.

Amidst the conference, I also found moments to explore the historic charms of Philadelphia, affectionately known as the ‘City of Brotherly Love’. From the Independence Hall, where the Declaration of Independence and the United States Constitution were signed, to the iconic Liberty Bell symbolising freedom, the city’s rich heritage left a lasting impression.

The AHA Scientific Sessions offered an eye-opening view of the latest research in the multidisciplinary cardiology field and the technological innovations driving the future of cardiac care, inspiring me to channel newfound insights into advancing cardiovascular care and enhancing patient care at NUHCS.



#### ARTICLE BY

#### Dr Vinay Bahadur Panday

Senior Resident,  
Department of Cardiology, NUHCS

Dr Vinay is a final-year Cardiology senior resident with a strong interest in research and quality improvement. In his spare time, he enjoys jogging, watching movies and reading.

- Interventional approaches** – Procedures to diagnose and treat cardiovascular diseases using minimally invasive techniques involving catheters through the heart or blood vessels.
- Percutaneous coronary intervention** – Minimally invasive procedure used to treat narrowed or blocked coronary arteries.
- Stable angina** – Type of chest pain or discomfort that occurs when the heart muscle does not get enough blood flow through the blood vessels.
- Subcutaneous infusion** – Medical procedure where medication or fluids are delivered into the layer of fat beneath the skin, using a small needle or catheter.





# Care for the Rare: ATTR-CM Unmasked

Transthyretin Amyloid Cardiomyopathy (ATTR-CM) is a rare heart condition caused by misfolding of the native transthyretin protein<sup>1</sup> into insoluble amyloid fibrils<sup>2</sup>. These abnormal amyloid fibrils accumulate in various organs, including the heart, leading to organ dysfunction. ATTR-CM can manifest as either an inherited condition, or as an effect of ageing.

The symptoms of ATTR-CM cloak themselves in ambiguity, often eluding detection until their grip tightens. Patients often feel tired more easily, get dizzy from posture changes and notice their legs swelling up. At times, they could have also been silently battling numbness in their hands and feet, or have feelings of weakness in their legs for a period of time.

Traditionally, diagnosing ATTR-CM requires individuals to undergo an invasive heart muscle biopsy<sup>3</sup>. However, with advancement in technology, ATTR-CM can now be diagnosed through blood tests and a non-invasive nuclear scan<sup>4</sup>. Plus, new medicines have also been introduced in the past few years, bringing hope to patients with this condition that was once deemed untreatable.

With the growing accessibility of diagnosis and emergence of new treatments options, there has been a resurgence of interest in this previously under-diagnosed condition. The National University Heart Centre, Singapore (NUHCS), organised the "Getting to know Cardiac Amyloidosis" event, on 7 October 2023, with the aim to bring together like-minded ATTR-CM patients and caregivers journeying with this rare heart condition, giving them a platform to better understand the condition and how to self-manage symptoms.



Asst. Prof Lin Weiqin, kickstarting the event.

This event also served as an opportunity to introduce the ATTR-CM patients and families to the NUHCS Caring Hearts Support Group (CHSG) – a patient support and advocacy group, by patients for patients, that offers support to fellow heart patients.



Commencing the event, Asst Prof Lin Weiqin, Clinical Director of the Heart Failure and Cardiomyopathy Programme and Senior Consultant, Department of Cardiology, NUHCS, introduced the audience to ATTR-CM and the genetic basis of this condition.

Following that, Ms Aisha Aziz, Case Manager, Dept. of Cardiology, NUHCS, imparted invaluable self-management methods for patients dealing with heart failure and volume overload<sup>5</sup> – an issue commonly faced by ATTR-CM patients. The attendees also had the valuable opportunity to hear a recount of an ATTR-CM patient (late Mr Ong), on his personal journey battling this condition.

A virtual embrace spanned continents where Ms Jaime Christmas, Chief Executive of the New Zealand Amyloidosis Patients' Association, lent her voice to the cause, as a caregiver herself to her late husband, who was also an ATTR-CM patient. She shared on the importance of patient advocacy in advancing treatment of rare conditions such as cardiac amyloidosis.

As the event drew to a close, Ms Magdalene Chia, Programme Lead of the CHSG, beckoned the audience to partake in a vibrant tapestry of support and camaraderie. Introducing the breadth of activities and support that CHSG provides, Ms Chia welcomed everyone to join in, with the aim to foster a nurturing community where individuals can find solace and assistance.

It was heartwarming to see that attendees acquired greater knowledge on ATTR-CM, with hope that this event also left them feeling empowered in their journey with this condition, and that support is always accessible for them when needed.

## ARTICLE BY

### Asst Prof Lin Weiqin

Clinical Director, Heart Failure and Cardiomyopathy Programme and Senior Consultant, Department of Cardiology, NUHCS



Asst Prof Lin is trained in the management of acute heart failure with temporary mechanical circulatory support, as well as caring for advanced heart failure patients with implanted durable left ventricular assist devices (LVADs) or heart transplantation. Aside from heart failure, his other subspecialty interests include cardiomyopathies and echocardiography.

1. **Transthyretin protein** – A tetrameric protein mainly produced in the liver and choroid plexus of the brain, acting as a crucial transportation of thyroxine (T<sub>4</sub>) and retinol (Vitamin A) in the blood and cerebrospinal fluid.

2. **Amyloid fibrils** – Tiny structures formed from misfolded proteins that clump together abnormally and accumulate in tissues.

3. **Invasive heart muscle biopsy** – A medical procedure where a small sample of heart tissue is taken for examination through a catheter, to diagnose or evaluate heart conditions.

4. **Non-invasive nuclear scan** – Imaging procedure that involves the use of radioactive tracers to visualise specific tissues or organs within the body without surgery or biopsy.

5. **Volume overload** – The state in which one of the heart chambers has too large a volume of blood to pump out, forming excess retention of fluid in the heart that can worsen heart failure symptoms.



# INSPIRING CARE FROM THE Heart

*Prof Tan connects with readers at his official book launch event*

Presented at the City Reading @ SG Festival, organised by Singapore Press Holding (SPH)'s Chinese publication Lianhe Zaobao, the official launch event of Prof Tan Huay Cheem's latest book "Clinical Insights: New Knowledge on Prevention and Treatment of Heart Disease, Volume Three 《临床心得：心脏病防治新知三集》" took place on 25 May, Saturday, at NAFA Campus 3, Studio Theatre! Launched to a full-house turnout, attendees to the ticketed event were eager to catch a glimpse of Prof Tan, and learn more about his latest release.



*Prof Tan shares insights into his new book during an interview by Ms Woo Mun Ngan, Lianhe Zaobao Associate Editor, at the annual reading festival. Picture courtesy of Lianhe Zaobao 《联合早报》李冠卫摄*

Prof Tan, a distinguished figure in the field of cardiology, serves as Senior Advisor to the National University Heart Centre, Singapore (NUHCS). His impressive portfolio includes participation in over 500 international conferences and 70 international live case demonstrations globally. Additionally, he has published numerous articles in international medical journals. Currently, he chairs the Singapore Heart Foundation (SHF), passionately advocating for public education on cardiovascular health, to bring clarity and debunk common myths surrounding heart disease, a leading cause of death.

The third instalment of his acclaimed book series delves into insights from his illustrious three-decade-long career and dedication to cardiology patient care, focusing on the latest knowledge in preventing and treating heart disease. Through his regular column in the Chinese daily, Lianhe Zaobao, Prof Tan distils practical advice and breakthrough research on cardiovascular care. His previous compilations, released in 2011 and 2017, have been well-received, and this volume promises even more interesting and updated insights.



## About the NUHCS Heart Fund

The NUHCS Heart Fund, a sub-fund of NUHS Fund, was established to assist financially disadvantaged patients in their journey towards better heart health.

NUHCS Heart Fund steps in to provide financial assistance to patients and their households when other avenues of financial support are not available or insufficient. 85% of applications in the past year to the NUHCS Heart Fund come from the lowest 20% per capita income group in our community.

Beneficiaries are able to draw strength and resilience to continue their road to recovery from the generous gifts to the fund.

*The generosity of your donation to the NUHCS Heart Fund provides renewed hope to our patients in rebuilding a healthier, better tomorrow.*

ARTICLE BY

NUHCS PULSE Editorial

## Hope for A Healthier, Better Tomorrow

In an effort to contribute further to patient care, all sales proceeds of Prof Tan's latest book 《临床心得：心脏病防治新知三集》 at the City Reading @ SG Festival event were donated to the NUHCS Heart Fund, a sub-fund of NUHS Fund Limited, to raise funds for financially disadvantaged heart patients and support them on their journey towards better heart health.



*Enriched by heart health insights, attendees not only had a chance to get up and close with Prof Tan, but also had their book copies autographed! Picture courtesy of Lianhe Zaobao 《联合早报》李冠卫摄*



**NUHCS Heart Fund**



**Keen to make a difference?  
SCAN THE QR CODE TO DONATE**

Donations of \$10 or more are eligible for tax deductions of 2.5 times the donated amount. 100% of your donations go towards helping our patients in financial need.

To make a donation or find out more, visit [bit.ly/NUHCSHeartFund](http://bit.ly/NUHCSHeartFund)

# Spearheading Cardiovascular Research at ACC24

## PIONEERING INNOVATIONS AND BREAKTHROUGHS IN HEART HEALTH

Marking the 75<sup>th</sup> year anniversary of the American College of Cardiology (ACC) this year, the Annual Scientific Session 2024 (ACC24) was a momentous congress held from 6 to 8 April 2024 in Atlanta. The ACC Annual Scientific Session gathers thousands of cardiovascular professionals from all over the world to exchange ideas, showcase cutting-edge technology, and foster new connections within the cardiovascular community.

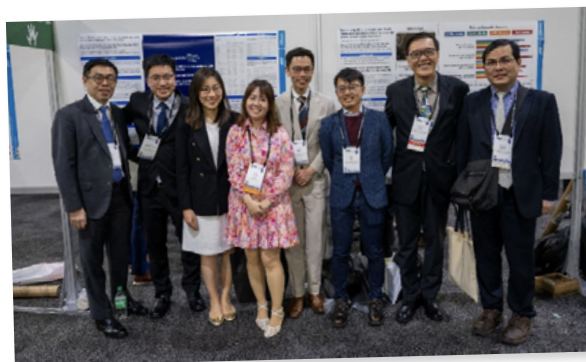


### American College of Cardiology (ACC)

A non-profit medical society, dedicated to enhance the lives of cardiovascular patients through continuous improvements in patient-centered care, education, research and advocacy. Consisting of a diverse group of cardiology professionals including cardiologists, cardiac surgeons, fellows, residents, nurses, and researchers, this organisation offers a range of educational and research opportunities for advancements in the field of cardiovascular health across the globe.

The ACC24 conference saw a strong representation of 9 delegates from the National University Heart Centre, Singapore (NUHCS), led by faculty Adj Prof Poh Kian Keong, Prof Ronald Lee, and Adj A/Prof William Kong, Senior Consultants at the Department of Cardiology, NUHCS. The NUHCS team made a significant impact, presenting a record total of 14 free paper and moderated oral presentations across various clinical topics ranging from multimodality imaging, valvular diseases of aortic stenosis and mitral stenosis, structural interventions, heart failure, electrophysiology, cardiovascular health and prevention, ischemic heart disease, and bench-to-bedside research.

The conference commenced with an opening speech by ACC President, Dr B. Hadley Wilson, followed by a captivating acapella performance by the Voice of Atlanta Choir. After the welcoming opening, attendees delved into cutting-edge clinical trial sessions including EMPACT-MI, REDUCE-AMI, Danger-shock and Ultimate-DAPT, and many more.



NUHCS delegates



Prof Ronald Lee presenting his research findings  
Photo by © ACC/Matt Herp 2024

### Representing Singapore in Atlanta

One highlight for the team was the plenary in bicuspid aortic valve<sup>1</sup>, chaired by Prof Poh and A/Prof Kong alongside prolific names in the field. The CRESCENT Trial, helmed by Prof Ronald Lee, was also featured in the clinical research during the Late-Breaking Clinical Trials session showcasing the effectiveness of Mandibular Advancement Device (MAD) versus the Continuous Positive Airway Pressure (CPAP) device in reducing blood pressure outcomes in patients. This was a proud moment for NUHCS, placing Singapore on the global map of cardiovascular research.

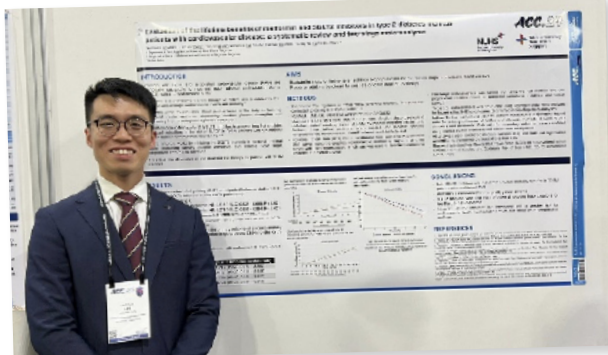


Beyond the didactic sharing from presenters and faculty in joint keynote sessions, learning hubs, as well as specialty bootcamps, the ACC24 also provided many fun learning opportunities and sharing from industry partners. The NUHCS delegates engaged in an escape room activity named 'Cath Lab Conundrum', which emphasised on teamwork and critical thinking as they decode the various components of the clinical case. To provide a knowledge and adrenaline boost for participants and audience alike, a Fellow-in-Training (FIT) Jeopardy session was also included. Such immersive hands-on simulation experiences provided in the skills centre helped to hone procedural techniques of pericardiocentesis and Impella management in critical care cardiology.

Prof Poh Kian Keong and Prof Ronald Lee also attended the Assembly of International Governors meeting, with Prof Lee serving as the Singapore's ACC Chapter Governor, and Prof Poh as the ACC Assembly of International Governors' global immediate past Chair. Prof Poh presented a new observership programme, where early-career professionals get to spend 3-4 weeks at a major US institution, gaining cardiology experience and networking opportunities. A plaque of appreciation was conferred to Prof Poh, in recognition of his leadership, vision and dedication to the success of the ACC international conferences, where he played a major role in organising and co-chairing, especially during the challenging COVID-19 period. The ACC24 concluded with the yearly international presidential dinner at the Atlanta Aquarium and a convocation ceremony that inducted new fellows and welcomed the new ACC President, Cathleen Biga, MSN, FACC.



*Bicuspid aortic valve session chaired by Prof Poh and A/Prof Kong*



*Presentation by Dr Norman Lin at the ACC24*

The ACC24 was an invaluable learning opportunity for the NUHCS delegates, providing them a platform to exchange innovative ideas with the global cardiovascular community, and spotlighting on Singapore's contributions to cardiovascular research. The NUHCS team looks forward to an even greater participation in future ACC conferences.

Amidst all the intensive learning and exchange of ideas, the delegates also thoroughly enjoyed the unique sights and offerings of Atlanta beyond the conference setting, where they had the chance to experience the heartwarming Southern cuisine, culture and hospitality.

For many members of the delegation, this was their first ACC attendance – including Dr Norman Lin, Resident, Dept. of Medicine, NUH, where the ACC24 was his first international conference presentation. This experience has been fruitful, allowing them to network and forge new friendships with like-minded individuals.

#### ARTICLE BY



**Dr Lin Huangyu Norman**  
Resident, Department of Medicine,  
National University Hospital (NUH)

Norman is a first year Resident with the Internal Medicine Residency at NUHS. With a keen interest in Cardiology, he intends to pursue further training and focus his medical education in this field.



**Dr Joy Ong**  
Senior Resident,  
Department of Cardiology, NUHCS

Dr Joy is a third-year Cardiology Senior Resident at NUHCS. She hopes to contribute in areas of research, education and innovation in Cardiology.



# Heart Health in Play

Women Slay!

NUHCS Women's  
Heart Health  
Campaign 2024

Commemorating International Women's Day in the month of March, NUHCS launched its Women's Heart Health Campaign championing cardiovascular health and wellness at several community outreach events, as part of this year's overarching theme, #EmpowerHER!

Kickstarting the month with a series of educational social media posts, this year's slogan *"Heart Health in Play, Women Slay"* was chosen to bring women's heart health to the forefront.

DO WOMEN REALLY GAIN  
MORE FROM EXERCISE?



SCAN  
to find out



MEET OUR NUHCS WOMEN'S  
HEART HEALTH TEAM!



SCAN  
to watch

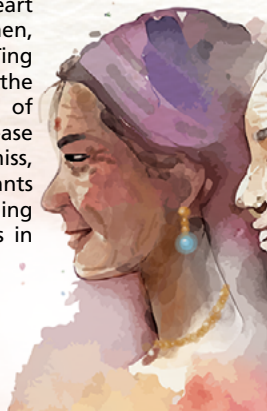
## Keeping The Momentum, Inspiring Greater Awareness

In collaboration with United Overseas Bank (UOB), a tailored Women's Heart Health corporate workshop "Heart Health in Play, Women Slay" was held for 48 of its staff, jointly presented by Adj A/Prof Low Ting Ting, Director of Women's Heart Health Programme and Senior Consultant, Department of Cardiology, NUHCS, and Ms Janice Chen, Senior Occupational Therapist, Department of Rehabilitation, National University Hospital (NUH).

*Women Vs. Men*  
2X increased risk of death  
30 days after a heart attack



Delving further into the key differences between heart disease in men and women, Adj A/Prof Low Ting Ting shared insights into the subtle warning signs of women's heart disease which are easier to miss, and equipped participants with a better understanding of the various subtleties in "feeling" a heart attack!





## Discovering Mindfulness Through Art

To beat chronic stress, a cause of heart disease, art was introduced as a practical self-care tool. Ms Janice Chen led participants to unleash their creativity in a hands-on art wellness and relaxation session, which provided a creative outlet for stress relief and fostered a mindful approach in managing one's mental health.



Participants unleashing their inner Picasso!

Dr Jeanne Ong shares on women's cardiovascular health



Posing after a lively Zumba workout session



## Fostering Stronger Heart Health In The Heartlands

Public health event "Take Charge of Your Health" at NUHCS @ Jurong Medical Centre (JMC) engaged residents in the Jurong Boon Lay community on the importance of heart health.

Raising the alarm on the unique risk factors women faced throughout different phases in life, Dr Jeanne, Consultant, Division of Cardiology, Department of Medicine, NUHCS @ Ng Teng Fong General Hospital (NTFGH), unfolded the important link between menopause and heightened Cardiovascular Diseases (CVD) risk due to the fall in oestrogen levels during the menopausal transition. Raising relevant concerns on women's heart health during the short Q&A session following the talk, even male participants engaged in questions to prove how much they cared for the women in their lives!

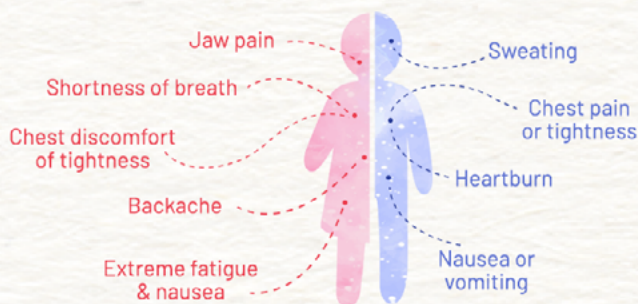
Another heartland event, "EmpowerHER: A Celebration of Women's Strength and Resilience", held on 10 March 2024 at Yuhua Community Club offered

complimentary medical screenings and health tips, with many drawn to the educational game play at the NUHCS booth – where they tested themselves on heart health awareness, carnival-style!

Emphasising how one in three Singaporean women dies from cardiovascular disease (CVD), Dr Marie Houdmont, Senior Resident, Department of Cardiology, NUHCS, shared insights into CVD in her "Heart-to-Heart" themed talk which dived into practical tips on exercise and eating right!

*Know the difference*

Warning signs of heart attack differ between men and women



(Centre) Minister for Sustainability and the Environment, Ms Grace Fu, at the NUHCS booth during the #EmpowerHER event.

Reminding women of the need to be vigilant about their heart health



Championing heart health and well-being through a spectrum of community engagement and outreach initiatives, the **NUHCS Women's Heart Health Team** looks forward to sustaining our campaign efforts in the year ahead, to empower more women on their individual heart health journeys!



### ARTICLE BY

#### Adj A/Prof Low Ting Ting

Director of Women's Heart Health Programme and Senior Consultant, Department of Cardiology, NUHCS



Adj A/Prof Low is a cardiologist with special interests in adult congenital and structural heart disease interventions, pulmonary hypertension, pregnancy and heart disease, female phenotype coronary syndromes and invasive haemodynamics. She is active in leading clinical trials and multi-centre registry work as well as research in advancing therapies for rarer conditions. She is also an active educator at NUHCS and the National University of Singapore (NUS).

#### Christine Tioh

Case Management Officer, Department of Cardiology, NUHCS



Christine Tioh is a registered nurse with 24 years of experience, the last 10 spent in patient case management. She became a certified health coach in 2019, combining her passion for nursing and wellness promotion.



# Finding Light Through Maternal Depression

Despite being a time of joy, it is not uncommon to experience behavioural and emotional changes known as “postpartum blues” or “baby blues” after delivery. Unlike postpartum blues which lasts for about 2 weeks after delivery, **postpartum depression** can persist and show up in constant worry that disrupts sleep and daily life.



## MENTAL WELLNESS & HEART HEALTH – THE INTRICATE LINK

*Depression during pregnancy puts women at higher risk of developing Cardiovascular Disease (CVD) in the two years following childbirth.*

Pregnant individuals with perinatal depression have increased risks of developing:

- Cardiomyopathy (poor heart function)
- High blood pressure
- Ischemic heart disease (issues caused by poor blood flow to the heart usually from narrowing of blood vessels)
- Abnormal heart rhythms and cardiac arrest

Perinatal: During pregnancy  
Postpartum: After childbirth



## RISK FACTORS OF POSTPARTUM DEPRESSION

Circumstances that could make one vulnerable include:

- Past history of depression or other psychiatric disorders
- Body image issues
- Pregnancy complications (e.g. severe nausea and vomiting)
- Traumatic birth
- Conceiving through Assisted Reproductive Techniques (e.g. In-vitro Fertilisation (IVF))
- Unwanted/unplanned pregnancy
- Experiencing stressful life events
- Lack of strong social support or relationship difficulties

Postpartum depression affects around **7-10%** of pregnant women in Singapore. It can affect the parent's ability to bond with his/her child.



## SIGNS & SYMPTOMS TO LOOK OUT FOR

- Depressed mood
- Change in appetite and weight
- Poor concentration or attention span
- Loss of interest, appetite or sleep
- Loss of confidence or self-esteem
- Change in psychomotor activity
- Low in energy levels
- Excessive self-blame or feelings of worthlessness
- Thoughts of death and suicide

“Part of taking care of your baby is taking care of yourself.”

Postpartum depression can affect anyone and is no fault of the mother. It is important to seek help and prioritise self-care – making time for friendship, and the activities you enjoy, can make a big difference!

## AVAILABLE HOTLINES

Institute of Mental Health Helpline:  
6389 2222 (24 hours)

Samaritans of Singapore:  
1800 221 4444 (24 hours) / 1767 (24 hours)

Singapore Association for Mental Health:  
1800 283 7019

## ARTICLE BY

### NUHCS PULSE Editorial

Content contributed by Dr Jeanne Ong, Consultant, Division of Cardiology, Dept. of Medicine, NUHCS @ Ng Teng Fong General Hospital (NTFGH); and Dr Judith Ong, Associate Consultant, Division of Reproductive Endocrinology and Infertility, Dept. of Obstetrics and Gynaecology, NUH and Associate Consultant, National University Centre for Women and Children (NUWoC) Women's Clinic in Jurong Medical Centre.



# TRANSFORMING THE FUTURE OF INTERVENTIONAL CARDIOLOGY

*Through international collaborations*



(Fifth from left) Prof Tan Huay Cheem at the EuroPCR2024. © EuroPCR website.

## ABOUT EUROPCR

*EuroPCR is the world-leading course in Interventional Cardiovascular medicine and the official annual meeting of the European Association of Percutaneous Cardiovascular Interventions (EAPCI). The annual conference is created by and for the cardiovascular community to share knowledge, experience and practice through a series of case presentations, meetings, workshops and discussions. Encouraging the advancement of cardiovascular medicine, awards are also given out in recognition for innovative research and clinical breakthroughs.*

## World-leading course in interventional cardiovascular medicine



Wrapping up on a resounding note, the recently concluded EuroPCR congress, held in the traditional venue of Palais des Congrès, Paris, France from 14 to 17 May 2024, saw a record turnout of over 12,000 attendees at the world's largest interventional cardiology meeting!

A unique opportunity for the exchange of knowledge, skills and experience, the NUHCS team shone on the global stage, led by Prof Tan Huay Cheem, Senior Advisor, NUHCS, and A/Prof Adrian Low, Senior Consultant, Dept. of Cardiology, NUHCS, who participated as invited faculty members.

Along with the unveiling of the latest clinical evidence and insights across four days of exceptional learning and networking, Prof Tan and A/Prof Low were actively involved in various roles as chairpersons, panel discussants and facilitators, leading attendees to dive into a wide range of topics in cardiovascular care.

Engaging the international attendees in meaningful discussions, Prof Tan not

only facilitated exciting live polling and interactive discussions on innovative techniques in modern interventional cardiology, but also tapped on his own expertise by sharing selective strategies in managing high thrombus<sup>1</sup> burden in STEMI<sup>2</sup> patients to help optimise cardiovascular outcomes, and dived into treatment approaches for navigating the side branch in non-left main bifurcations<sup>3</sup>, another challenging topic spotlighted. Weighing in on diverse topics, he steered effective discussions revolving around randomised trials and extended follow-up in the field.

Taking the lead during two enriching sessions as discussant, Prof Low fostered lively discourse and interactions on the immensely useful technique of intracoronary imaging in routine clinical practice, as well as delved into the pros and cons of imaging and other modalities in optimising PCI<sup>4</sup> outcomes.

Shining the light on learning points in their noteworthy clinical cases, Dr Sim Hui Wen, Consultant, Dept. of

Cardiology, NUHCS, and Dr Andrico Tobing, interventional fellow, NUHCS, also delivered featured presentations on the management of challenging NSTEMI<sup>5</sup> patients, and strategies to tackle Chronic Total Occlusions<sup>6</sup> (CTO) in the coronary arteries respectively, to the rapt attention of participants.

Demonstrating our expertise as a national centre, NUHCS is honoured to have played a part in shaping the meaningful exchange of knowledge, experience, and practice at this international congress of significance. The team will continue the collaboration at this year's edition of the 2024 AICT-AsiaPCR congress – the official course of the Asian Pacific Society of Interventional Cardiology (APSIC) in collaboration with the larger PCR family, scheduled to be held from 3 to 5 October – where NUHCS will serve as one of the two live transmission centres showcasing important techniques and practice from the NUHCS' Catheterisation Lab<sup>7</sup> to a global audience!

1. **Thrombus** – A blood clot that forms inside one of your veins or arteries.
2. **STEMI** – ST-elevation myocardial infarction, a type of heart attack that is more serious and has a greater risk of serious complications and death.
3. **Bifurcation lesion** – A coronary artery narrowing which involves a side branch.
4. **PCI** – Percutaneous coronary intervention (PCI), commonly known as “stenting” or “ballooning”.
5. **NSTEMI** – A partial heart attack that usually happens when the heart's need for oxygen cannot be met.
6. **Chronic Total Occlusions** – A complete blockage of a coronary artery for more than three months.
7. **Catheterisation Lab** – Specialised procedure rooms where doctors perform minimally invasive tests and procedures.



## ARTICLE BY

**Prof Tan Huay Cheem**  
Senior Advisor, NUHCS

Prof Tan is a Professor of Medicine at the Yong Loo Lin School of Medicine, National University of Singapore and holds a master of Medicine in Internal Medicine. He is an active clinical researcher, visiting professor at several hospitals in China, and an invited speaker at many international cardiology meetings.



# ADDING HEALTHSPAN BEYOND LIFESPAN

Highlights from the 35<sup>th</sup> SCS Annual Scientific Meeting

## Annual Scientific Meeting (ASM) of Singapore Cardiac Society (SCS)

Started in 1958 by a group of specialists with a special interest in Cardiology, SCS aims to advance the knowledge and practice of cardiovascular medicine to maintain a high level of cardiac care in Singapore, promoting research and publications of medical and scientific works, alongside regional and international collaboration in cardiovascular medicine.

To empower healthcare providers and allied professionals in providing holistic patient care, the 35<sup>th</sup> ASM provided opportunities for education in cardiovascular disease prevention, and interaction across care centres and regions to collaborate in clinical care strategies and research.



NUHCS delegates at the 35<sup>th</sup> SCS Annual Scientific Meeting

## Focusing on Healthspan Beyond Lifespan

This year's theme, "Adding Healthspan Beyond Lifespan" focused on optimising health metrics and quality of life for the ageing population through cardiovascular innovations, delivered in the opening address by Dr Colin Yeo, Organising Chairman of the SCS ASM committee, along with Dr Sim Hui Wen, Scientific Chairwoman of the SCS ASM committee and Consultant, Dept. of Cardiology, NUHCS, Dr David Foo, President of SCS, and Guest-of-Honour, Minister for Culture, Community and Youth and Second Minister for Law, Mr Edwin Tong. The new American College of Cardiology (ACC) President, Cathleen Biga MSN, FACC, who chaired the joint ACC-SCS session on 'From the Frontline: Navigating the Challenges of Resuscitation and Sudden Cardiac Deaths', graced this meeting as well.

## Key Discussions and Innovations

Throughout the conference, an array of pressing topics such as management of hyperkalemia<sup>1</sup> in heart failure, advancements in cardiovascular imaging, current perspectives on lipidology<sup>2</sup>, lifelong management of patients with aortic stenosis<sup>3</sup>, and core concepts in conduction system pacing<sup>4</sup>, were covered in various presentation styles. The participation and energy were palpable

over the two days, especially during the clinical trialists' breakout session, state-of-the-art cardiovascular care delivery talks, and joint sessions with our fellow cardiothoracic surgeons, nursing and allied health colleagues.

## Demonstrating Forefront Research

The SCS ASM provided a platform for cardiologists to present cutting-edge research and exchange insightful feedback within the local cardiology community. Highlights included the Young Investigator Award (YIA) and Free Paper Abstract Presentation sessions. This year, NUHCS excelled, securing four out of five free paper prizes. Notably, the team behind the STARFALL-HF team, led by Dr Wesley Yeung, Senior Resident, Dept. of Cardiology, NUHCS, won the first prize for their latest work on using machine learning to predict left ventricular systolic dysfunction<sup>5</sup> from Electrocardiograms (ECGs). This achievement, supported by NUHCS funding, underscores the commitment to advancing cardiovascular care through several years of data gathering, modelling and analysis.

## Honouring Excellence in Cardiology

A/Prof James Yip, Executive Director, NUHCS, provided the citation to this year's Singapore Cardiac Society Lifetime

Achievement Award 2024, Dr Lim Yean Teng. A multi-rounded cardiologist and inspiring leader, he was the recipient of the National Day Commendation Medal for Overcoming SARS and the Courage Star Award in 2003. He is also the Chairman of numerous national-level committees and a founding co-director of AICT-EuroPCR, who has authored over a hundred peer-reviewed journals and abstracts.

With anticipation to witness the emergence of fresh research and cutting-edge innovations tailored to Singapore's healthcare landscape, NUHCS looks forward to the 36<sup>th</sup> SCS ASM.



Dr Wesley Yeung receiving the award on behalf of his team

### ARTICLE BY

#### Dr Wesley Yeung

Senior Resident,  
Department of Cardiology,  
NUHCS

Dr Wesley is a third-year Cardiology Senior Resident with interests in Interventional Cardiology and Digital Health.



#### Dr Joy Ong

Senior Resident,  
Department of Cardiology,  
NUHCS

Dr Joy is a third-year Cardiology Senior Resident at NUHCS. She hopes to contribute in areas of research, education and innovation in Cardiology.



- Hyperkalemia:** A medical condition where one has an abnormally high level of potassium in the blood, causing irregular heart palpitations.
- Lipidology:** A specialised study of diagnosis and treatment of lipid disorders and lipoproteins in the body.
- Aortic stenosis:** A condition where the aortic valve narrows, restricting blood flow from the left ventricle of the heart into the aorta and the rest of the body.
- Conduction system pacing:** A technique in cardiac pacing that involves implantation of permanent pacing leads to stimulate the cardiac conduction system.
- Left ventricular systolic dysfunction:** A condition in which the left ventricle of the heart does not contract effectively, leading to less blood circulation throughout the body.



# Lunar Cheers for Heart Heroes

NUHCS Congenital Heart Surgery Parent Huddle 2024

On 2 March 2024, the National University Heart Centre, Singapore (NUHCS) organised the annual NUHCS Congenital Heart Surgery Parent Huddle in partnership with Congenital Heart Association Parent & Patient Support Group (CHAPPS), bringing together patients and their families in the journey of caring for a child with Congenital Heart Disease (CHD). This year's Parent Huddle was especially significant as it was organised alongside the Lunar New Year festivities, creating a heartwarming atmosphere reminiscent of a family reunion.



Traditional "Lohei" or Prosperity Toss session to welcome the new year.

## What is Congenital Heart Disease (CHD)?

*Range of birth defects affecting the heart's structure and function during fetal development.*

Defects can involve the walls, valves, arteries and veins of the heart. Some common conditions include:

### Septal defect

Hole in the heart's wall that separates the chambers, disrupting blood flow to organs

### Tetralogy of Fallot (TOF)

Combination of four heart defects that reduces or obstructs blood flow to the lungs and body

### Transposition of the Great Arteries (TGA)

Abnormal positioning of the main arteries leaving the heart, causing improper circulation of oxygen-rich blood to the rest of the body

Beyond the traditional gatherings and customary celebrations, the Parent Huddle embraced a spirit of togetherness and resilience from the shared experiences of caregivers alike. From the spirited performances of the lion dance to the heartfelt stories of support shared over light refreshments, a sense of community and belonging was palpable throughout the event.

At the heart of the event lay a series of insightful discussions and sharing of personal experiences. Families had the opportunity to engage with the NUHCS' Congenital Heart Surgery doctors, gaining valuable advice into the management and treatment of heart conditions for their child and/or family member.

In an intimate sharing session, Mr Tan Xing Chun, a 40-year-old CHD warrior, opened up about his personal journey of battling with heart disease through the years and now, living life to the fullest whilst still coping with CHD. Mdm Jeannie, mother and caregiver to her late daughter, Amelia, who was born with CHD, also shared a heartfelt encouragement to all families as she recounted her experiences taking care

of her beloved daughter and the worthy significance of the whole journey.

They each offered glimpses into their personal journeys; each narrative a testament to the courage and resilience of CHD patients and their caregivers. Their words resonated deeply with the attendees, offering hope, inspiration, and assurance in the face of adversity, knowing that those going through CHD are not alone in their journey.

NUHCS is dedicated to delivering comprehensive care to ensure the holistic wellbeing of every patient. This Parent Huddle event fostered heartfelt connections within the community, and offered a supportive space for families with children battling congenital heart conditions.

**"Being a heart patient does not mean that you are labelled. Understand your limitations and work on your strengths. Life is still going to be very colourful and vibrant."**

*Tan Xing Chun (40-year-old CHD warrior)*

**"Although we can't see you anymore, we can feel your presence around us always."**

*Jeannie (Mother and caregiver of her late daughter, Amelia, a CHD patient)*



God of Fortune mascot appearance to bring luck and blessings



Sharing by heart warriors living with CHD



**To find out more on our future events, stay tuned to our social media for the latest updates.**

facebook.com/NUHCS  
@NUHCSofficial  
linkedin.com/company/nuhcs  
@NUHCS

ARTICLE BY

NUHCS PULSE Editorial

Official Launch of

# NUHCS Heart Clinic

## @ Jurong Medical Centre (JMC)

Bringing specialised cardiac care to the community

Singapore's first neighbourhood specialty cardiac clinic – the NUHCS Heart Clinic @ Jurong Medical Centre (JMC) – was officially launched on Saturday, 11 November 2023! Nested in the heart of Jurong, the clinic's opening marks a pivotal advancement for the National Centre in providing accessible and specialised heart care services to residents in the western region of the nation.



Shorter  
appointment  
wait-time



Closer to home  
for patients  
in the west



Availability of  
comprehensive  
cardiac diagnostic tests



Clinical and medical  
services provided by  
the same NUHCS doctors  
at NUH or NTFGH



New Health Coaching  
service for personalised  
patient care



(From left) Dr Chai Ping, Head and Senior Consultant, Dept. of Cardiology, NUHCS, Ms Doreen Chew, Head of Nursing, NUHCS, A/Prof James Yip, Executive Director of NUHCS, Mr Foo Hee Jug, Deputy Chief Executive of NUHS, Mr Patrick Tay, MP for Pioneer SMC, Mr Chua Song Khim, Deputy Chief Executive of NUHS, Dr Wong Weng Hoa, Clinical Director of JMC, and Mr Johnny Chan, Head of Operations at JMC, pictured at the unveiling ceremony.

The inaugural unveiling event was graced by Member of Parliament (MP) for Pioneer Single Member Constituency (SMC), Mr Patrick Tay, along with senior management representatives from JMC and the National University Heart Centre, Singapore (NUHCS).

## Empowering the Community: Health Talks

In line with NUHCS' mission to integrate heart health into the community, Dr Chai Ping, Head and Senior Consultant, Dept. of Cardiology, NUHCS, delivered a Health Talk titled "Risk Factors for Heart Attack". Dr Chai emphasised the significance of raising awareness about cardiovascular risk factors and advocating prevention measures to empower individuals in reducing their chances of developing heart disease.

## A Proud Addition to NUHCS

In a remarkable milestone, NUHCS Heart Clinic @ JMC joins the ranks of NUHCS' existing heart clinic services (see pg 4 for the lineup), further solidifying Singapore's commitment to delivering specialised cardiac care closer to the community.

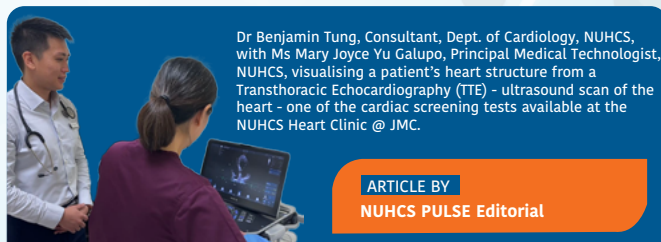
Since its operational inception in January 2023, the NUHCS Heart Clinic @ JMC has already served over 2,000 patients, a testament to its effectiveness in providing specialised heart health services to meet the growing demand for healthcare needs. Supported by a dedicated team of medical professionals including doctors and cardiac technologists from NUHCS, the clinic prioritises patient-centric care, bridging the gap between primary care and specialised treatment through convenient, one-stop access.

**Our aim is to help the primary care doctors take better care of their patients with chronic diseases.**

- A/Prof James Yip, Executive Director, NUHCS

## A Vision for Long-Term Health: Health Coaching

Spearheaded at NUHCS Heart Clinic @ JMC, a novel service known as Health Coaching further aims to address patients' existing health issues and promote preventive care measures for those with heart disease. By offering personalised support and guidance, especially to heart attack survivors, this initiative strives to instil healthy habits and facilitate sustainable lifestyle changes for these patients' well-being in the long run.



ARTICLE BY  
NUHCS PULSE Editorial



SCAN TO READ  
@8world News Report



SCAN FOR  
DIRECTIONS TO  
NUHCS @ JMC



# CONQUERING HIGH BLOOD PRESSURE WITH A *New* BREAKTHROUGH

*Treating hypertension through a novel minimally invasive procedure*



A Renal Denervation procedure done in a Catheterisation Laboratory.

Hypertension, commonly known as high blood pressure, is often dubbed a “silent killer” due to the lack of symptoms or warning signs, and poses significant risks to vital organs such as the heart, brain, and kidneys. Left untreated, it can lead to life-threatening health conditions such as stroke and heart failure.

Conventional treatment methods include medication and lifestyle changes such as reducing dietary sodium intake, maintaining a balanced diet, controlling one's weight, quitting smoking, and engaging in regular physical activities.

Yet, despite these measures, high blood pressure can resist conventional treatments and remain hard to overcome. **About 35% of hypertensive patients on medication still struggle to achieve their ideal blood pressure range of under 130/80 mmHg.**

## Finding the Cause of High Blood Pressure

Our body controls blood pressure through many ways. Did you know that apart from the heart and blood vessels, our kidneys are also involved in controlling our body's blood pressure? In some people, the nerves connected to the kidneys experience excessive activity that interrupts the natural process of blood pressure control, leading to higher blood pressure.

## A Game Changer in High Blood Pressure Management

Opening new doors in blood pressure control, a minimally-invasive procedure known as “Renal Denervation (RDN)” has been clinically proven to treat persistent high blood pressure in patients via a safe and effective method, by calming the excessively active nerves in the kidney to help keep blood pressure under control.

Led by Prof Tan Huay Cheem, Senior Advisor, NUHCS, alongside Dr Christopher Koo, Consultant, Department of Cardiology, NUHCS, their dedicated team performed the first renal denervation treatment therapy at NUHCS on 23 January 2024. This minimally-invasive procedure uses a specialised catheter device<sup>1</sup> to deliver radioactive frequency that disrupts overactive nerve signals sent from the arteries in the kidneys to the heart, brain and blood vessels, thus restoring the body's natural blood pressure.

This promising treatment has received approval from the US Food and Drug Administration (FDA) for the treatment of hypertension, as well as earned consensus from the European Society of Cardiology (ESC) as a treatment option for those with resistant high blood pressure, also known as treatment-resistant hypertension. Suitable for a wide range of patients who may or may not be on blood pressure medication, it is especially beneficial for those who cannot tolerate medication due to side effects or compliance issues.

As Singapore faces an ageing population and rising comorbidities<sup>2</sup>, NUHCS is at the forefront of adopting new treatment methods like RDN to manage high blood pressure, a common comorbid<sup>2</sup> condition and major risk factor for heart disease.

Signalling a significant advancement in cardiovascular care, this new treatment method offers new hope for patients and their doctors in the management of a key risk factor of heart disease that has long been challenging to manage.

**Reducing blood pressure by 10 mmHg can significantly lower the risks of:**

Cardiovascular events  
& stroke by

**30%**

Deaths by

**15%**

**Possible Complications If You Have High Blood Pressure:**



**Atherosclerosis**  
(hardening of arteries)



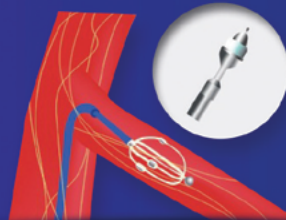
**Cardiovascular and cerebrovascular diseases**



**Stroke**



**Kidney failure**



## SCAN TO READ

**Lianhe Zaobao article**

“New breakthrough in hypertension treatment”  
(Note: Article is in Mandarin)

“While not without its flaws, Renal Denervation serves as the third clinical approach to blood pressure management, along with lifestyle adjustments and medication,”

– Prof Tan Huay Cheem, Senior Advisor, NUHCS

1. Catheter device: A long, thin, flexible tube placed in the body to facilitate a surgical procedure.

2. Comorbidities: Co-existing medical conditions that affect one's treatment and outlook.

ARTICLE BY

NUHCS PULSE Editorial

# TREATING LIFE-ENDANGERING BLOOD CLOTS

Advancing Vascular Care Through Aspiration “Suction” Technology

## VENOUS THROMBOEMBOLISM (VTE)



### Deep Vein Thrombosis (DVT)

Blood clots formed in the legs often due to prolonged periods of immobility, causing swelling and pain.



### Pulmonary Embolism (PE)

Blood clots from DVT can travel to the lungs, causing a life-threatening condition known as Pulmonary Embolism (PE). Without treatment, up to one in four DVT patients may develop PE, and one in four symptomatic PE patients could die within 14 days.



### Inferior Vena Cava (IVC) Clot

Formation of blood clots in the largest vein in the body that is responsible for carrying deoxygenated blood to the heart.

Venous Thromboembolism (VTE), a term referring to blood clots in the vascular or circulatory system, is a serious medical condition that can be potentially life-threatening. Timely diagnosis and treatment are required to manage the potential risks of this condition as these clots can cause major health complications, if left untreated.

Reportedly found in 65 out of every 10,000 cases admitted in Singapore, VTE carries a significant risk of morbidity and mortality. The primary treatment approach involves medications in the form of anticoagulation therapy<sup>1</sup>, aimed at halting the formation of further clots. However, this method can be time-consuming and carries risks of developing clots in the lungs (Pulmonary Embolism) and even death. Fortunately, advanced endovascular techniques now offer minimally invasive procedures<sup>2</sup> also known as “Aspiration Thrombectomy” to physically suction these clots out from the body.

### A SAFER AND QUICKER PROCEDURE

Introduced in 2014, the first generation of aspiration “suction” catheters marked a significant breakthrough by providing continuous suctioning of the blood clots, instead of traditional tedious methods of manually removing the clots through the use of syringes or surgery.

Since then, the catheter technology has continued to evolve with current notable advancements including a larger diameter of up to 5.3mm and atraumatic designs<sup>3</sup>, all to minimise blood vessel damage when navigating the body structure and removing large blood clots.

This innovative device was first made available in the United States in January 2023, with NUHCS introducing it for the first time in January 2024, for clinical use.

### BEATING A DEADLY BLOOD CLOT

Referencing the experience of a man in his early 60s who began feeling leg pain and shortness of breath; doctors found a large clot in his pulmonary artery with accompanying clots in the IVC - the largest vein in the body - causing blockage of blood flow to his lung and heart. Recognising the critical threat that these clots posed, immediate treatment was recommended to address the patient's condition. The patient was swiftly brought to the NUHCS cardiac catheterization laboratory, where “Aspiration Thrombectomy” was performed with the latest devices to promptly remove the clots. With a small incision in his right leg vein and a sheath positioned in the IVC, the catheter

was inserted to the clotted IVC, extracting a significant amount of clot through the catheter and thereby restoring blood flow to the major organs in the body.

### IMPROVING PATIENT RECOVERY

The novel computer detection algorithm also aided the doctors in finding the clots with greater speed and precision, ensuring that only the clots were removed during the suctioning process. Within minutes, the large clot in his pulmonary artery was also quickly extracted. By the end of the procedure, the patient felt instant relief with a noticeable improvement in his breathing. Just two days after the procedure, he was ready to be discharged from the hospital.

VTE therapy is advancing rapidly, with various cutting-edge devices now at our disposal. In this groundbreaking case at NUHCS, the novel device has displayed its effectiveness in restoring blood flow in the IVC and the lungs, treating and removing blood clots from these two separated locations in the body in just one sitting. This revolutionary innovation offers hope as a promising treatment option for acute VTE, with the potential to improve outcomes and reduce morbidities, especially in complex cases.



Radiograph of blood clots found in the patient's body



ARTICLE BY

**Dr Peter Chang**

Senior Consultant, Department of Cardiology, NUHCS

Dr Chang is passionate about diseases affecting blood vessels and therapeutics for peripheral vascular disease. His special interests are in the area of vascular medicine, treatment of peripheral artery disease and deep venous interventions.

1. **Anticoagulation therapy** – Medical treatment aimed at preventing the formation of blood clots or reducing the size/increase of existing clots within the blood vessels.
2. **Minimally invasive procedures** – Medical interventions typically involving small incisions or natural body openings, performed to achieve therapeutic or diagnostic outcomes while minimising trauma to the body.
3. **Atraumatic designs** – Medical devices or instruments engineered to minimise tissue damage or injury during use.





# GUARDING *Hearts* AMIDST CANCER

**First Centre in Asia Accredited  
as a Global Centre of Excellence  
in Cardio-Oncology**

**Cancer and heart disease might seem like separate health issues, but they are actually closely connected.**

While cancer treatments are effective at removing tumours and preventing the spread of cancer cells, they can have serious side effects on the heart, including potentially life-threatening risks of heart failure.

Patients undergoing cancer treatment may be more prone to cardiovascular problems, such as heart attacks or heart failure. Affecting more than one in ten patients with cancer, the risk of dying from heart disease may eventually surpass the risk of dying from the original cancer. Recognising this dire need for specialised heart care among cancer patients, the National University Heart Centre, Singapore (NUHCS), steps up to offer comprehensive cardio-oncology support to address and safeguard their heart health as they receive treatment for cancer.

Playing a pivotal role in transforming the emerging multidisciplinary field of cardio-oncology to provide utmost patient care, NUHCS has become the first centre in Asia to be recognised as a Global Centre of Excellence in Cardio-Oncology by the International Cardio-Oncology Society, marking a groundbreaking milestone for Singapore's healthcare landscape.

Every year, approximately 1,000 cancer patients from the National University Cancer Institute, Singapore (NCIS) are efficiently referred to the NUHCS cardio-oncology team for further assessment and treatment due to possible decrease in cardiac function during the cancer therapy. Through this collaborative effort in coordinating the best care, such patients can then continue to receive therapy for their cancer whilst protecting their heart function while on cancer drugs.

## FORTIFYING RESEARCH AND INTERNATIONAL COLLABORATION

Having made significant strides in research and published multiple research papers on cardio-oncology using Singapore's national database of cancer and heart attack statistics, the NUHCS cardio-oncology team's findings reveal that cancer patients have a higher risk of developing heart attacks and strokes, despite having lower cholesterol levels compared to individuals without cancer. This highlights a major risk factor that necessitates greater awareness and timely intervention for this group of patients.

**“We've seen that existing methods underestimate the risk of heart disease in cancer patients, and new approaches and methods are required for the development of effective treatment strategies and patient care protocols.”**

*Dr Koo Chieh Yang Christopher,  
Consultant, Dept. of Cardiology, NUHCS*

As NUHCS achieves global accreditation in the field of cardio-oncology, Dr Tan Li Ling, Clinical Lead in Cardio-Oncology Service and Senior Consultant, Dept. of Cardiology, NUHCS, anticipates a surge in international collaboration prospects, thereby further enhancing patient care standards. These collaborative endeavours not only unlock avenues for greater research but also pave the way for tailored and improved care for cancer patients, ensuring they receive optimal treatment while minimising treatment side effects to the heart.

## DID YOU KNOW?

Cancer patients in Singapore have

**2x** risk of developing a heart attack

**3x** risk of suffering from a weakened heart



*Dr Tan Li Ling with Mdm Lim Sok Huang,  
a cardio-oncology patient.*

To ensure comprehensive care for patients battling both cancer and heart disease, NUHCS is dedicated to advancing the field of cardio-oncology through multidisciplinary research, education, and clinical care, not just within Singapore, but globally as well.



*Cardio-oncology Team: Dr Koo Chieh Yang Christopher (left), Dr Tan Li Ling (right),  
Dept. of Cardiology, NUHCS*



**Scan to Read**

**@8world news report**

(Note: Article is in Mandarin)

ARTICLE BY

NUHCS PULSE Editorial

# ADVANCING REGIONAL HEALTHCARE

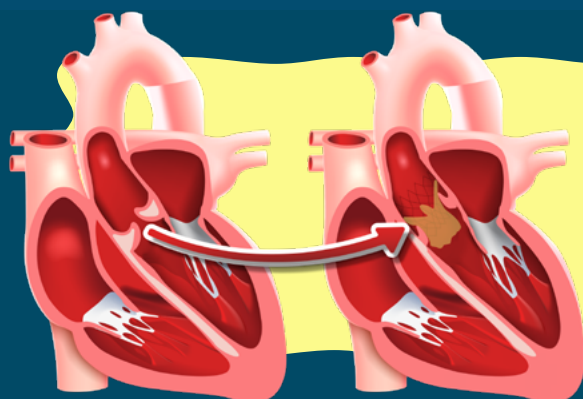
## THE RISE OF NUHCS STRUCTURAL HEART TRAINING CENTRE

NUHCS Structural Heart Team



The National University Heart Centre, Singapore (NUHCS), has undergone a remarkable evolution – transforming from a clinical care centre into a regional hub of excellence that trains and educates healthcare professionals from around the world in structural heart interventions.

In recent years, cardiovascular care has witnessed a profound shift towards Transcatheter Aortic Valve Implantation (TAVI) as the preferred treatment for aortic valve disease<sup>1</sup>.



### Transcatheter Aortic Valve Implantation (TAVI)

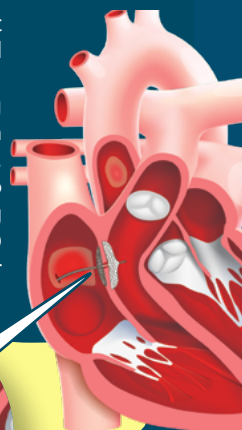
A minimally-invasive surgical procedure where a new valve is inserted into a blood vessel and guided to the heart, through a catheter, to replace the damaged valve and regulate blood flow.

Regional training centres play a pivotal role in this transformation, serving as epicentres of knowledge dissemination and skill enhancement. Recognising the importance of TAVI training centres in meeting the growing demand for this crucial treatment procedure, NUHCS has established itself as a regional TAVI training hub in Asia.

As a regional leader in TAVI excellence, NUHCS is dedicated to advancing the development of TAVI programmes and in nurturing the next generation of structural practitioners in Southeast Asia. NUHCS has hosted fundamental TAVI training courses for new centres in the region embarking on TAVI programmes. These comprehensive courses cover everything from programme development insights to live case observations, equipping new teams with the knowledge and experience to establish their own successful TAVI programmes.

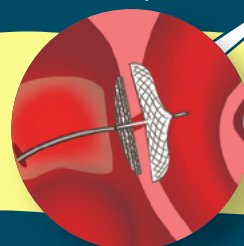
Beyond didactic training, participants are also given the opportunity to join the NUHCS structural team in the catheterisation lab to witness procedures first-hand. By sharing their journey in building a leading TAVI programme, NUHCS empowers other centres to achieve excellence in serving the needs of structural heart patients in their communities.

The journey towards excellence does not stop at TAVI. With Patent Foramen Ovale (PFO) revealed to be a critical contributor to strokes on a global scale, especially in seemingly healthy and young individuals, it has catalysed a paradigm shift in stroke prevention strategies around the world. NUHCS stands at the forefront of the region to advance the field of PFO management, spotlighting the importance of prompt intervention in PFO closure through educating and training doctors for improved heart health and stroke rates in patients.



### Patent Foramen Ovale (PFO)

An opening between the upper chambers of the heart, which failed to close naturally after birth, requiring a minimally-invasive procedure where a small device will be implanted via the catheter through a large vein in the groin, to close the hole.







*Cardiologists from the region during NUHCS' TAVI training programme*

In response to the crucial need for training in the management of PFO closure and the use of latest medical devices, NUHCS spearheaded the first-ever PFO Masterclass – “The Heart-Brain Approach” from 18 to 19 April – bringing together fellow medical professionals from around the world to NUHCS to learn clinical skills and surgical techniques in structural interventions from our Cardiology experts. Co-led by Dr Ivandito Kuntjoro, Director of Structural Heart Programme

and Senior Consultant, Dept. of Cardiology, NUHCS, this session fostered collaboration between cardiologists from NUHCS and neurologists at the National University Hospital (NUH), encouraging multidisciplinary education on the diagnosis and treatment of PFO-related stroke cases.

Regional doctors who participated had the opportunity to observe live PFO closure procedures, gaining understanding on the anatomy, imaging techniques, and procedures essential for successful hole closure, integrating the use of intracardiac echocardiography<sup>2</sup> with hands-on learning about stroke prevention treatment options.

In the ongoing pursuit of advancing structural intervention techniques, NUHCS is also proud to announce the initiation of its Structural Heart Diseases Fellowship programme, aiming to foster comprehensive training incorporating the latest findings and advancements to equip participants with skills necessary to adeptly navigate the diagnosis, management, and intervention of structural cases – ranging from straightforward to the most complex ones.

# 1

## Masterclasses

- Expert-led sessions on diagnosing and managing structural heart conditions
- Hands-on workshops and live procedures using cutting-edge tools
- Simulation training of clinical scenarios in risk-free environments

# 3

## Fellowship programmes

- Comprehensive curriculum on structural heart disease
- Mentorship from experienced cardiology professionals

# 2

## Live demonstration cases

- Observe real-time procedures and have all doubts clarified on the spot
- Engage in immediate discussions with experts and fellow trainees

# 4

## Research opportunities

- Kickstart research projects to drive patient care
- Involvement in latest transformative initiatives within the field

## Transcending Medical Training as an Education Epicentre



*Live PFO case performed during the Masterclass*

“In learning you will **teach**, and in teaching you will **learn**.”

As NUHCS continues to be the collaborative educational hub for sharing insights with regional and international medical professionals, its impact and influence shape the future of cardiovascular care globally, ensuring the highest standards of patient care is maintained worldwide.

## ARTICLE BY

### Dr Ivandito Kuntjoro

*Director of Structural Heart Programme and Senior Consultant, Department of Cardiology, NUHCS*



1. **Aortic valve disease** – A condition where the aortic valve of the heart becomes narrowed, restricting blood flow from the heart to the rest of the body.
2. **Intracardiac echocardiography** – An ultrasound imaging involving a catheter insertion into the heart, for a detailed view of the heart's interior to diagnose heart conditions.

Dr Kuntjoro specialises in complex valvular heart disease, congenital heart conditions, and pulmonary hypertension. He has co-authored many research papers published in peer-reviewed journals and has written a book chapter on Structural Intervention. He is also actively involved in medical education as a core faculty of the Cardiology Senior Residency Programme. Before joining NUHCS in 2012, he worked for eight years as an internal medicine attending physician in different hospitals in the United States of America (USA).

# Sharing Knowledge Through International Borders

## NUHCS MEDICAL FELLOWSHIP PROGRAMME TRAINS INTERNATIONAL DOCTORS IN SUB-SPECIALITIES

Empowering excellence in medical education and patient care is a journey that knows no bounds. At the National University Heart Centre, Singapore (NUHCS), this journey becomes a transformative experience for healthcare professionals across the globe. Join us as we delve into the enriching narratives of three of our global fellows who, through the NUHCS Fellowship Programme, have not only honed their skills but have also advanced the landscape of patient care with broadened perspectives!

### About NUHCS International Clinical Fellowship Programme

As part of its mission to shape medicine and transform care for the community, NUHCS offers Fellowship / Clinical Observership Programmes for the specialties of Cardiology as well as Cardiac, Thoracic & Vascular Surgery, to serve as a regional education hub for the next generation of healthcare professionals, and share the latest advances in the field with clinicians and practitioners from across the globe.

## EMBRACING A JOURNEY OF LIFELONG LEARNING

### Cardiothoracic Intensivist Fellowship Programme, Department of Cardiac, Thoracic & Vascular Surgery (CTVS)

In the corridors of the Cardiothoracic Intensive Care Unit (CTICU) at NUHCS, I found my calling. Witnessing an unsuccessful ECMO<sup>1</sup> case during my early training in The Philippines back in 2017 spurred me to seek ownership of my development, and I was fortunate to learn about NUHCS' Advanced Cardiothoracic<sup>2</sup> Intensive Care Unit (CTICU) Fellowship Training Programme.

Over two transformative years, I immersed myself in advanced treatments and complex cases, honing not only my procedural skills but also my confidence and autonomy. The world-class expertise I gained has allowed me to develop my own expertise across clinical and administrative aspects. I am immensely grateful to my NUHCS mentors who were my beacons of wisdom in providing guidance, and specialist staff in the CTICU, who freely shared their rich expertise whenever I sought advice.

Without them, I would not be here today. Thus, I wish to give back through my newly found expertise in critical care management, to bring the best care and support to patients in their most vulnerable moments.



*CTICU prepared me to be confident and successful in managing the sickest of patients as an intensivist.*

*Dr Claudia Alcancia, Philippines, pictured with Adj Prof Graeme MacLaren, Head, Division of Cardiac Thoracic ICU (CTICU) & Senior Consultant, Dept. of Cardiac, Thoracic & Vascular Surgery (CTVS), NUHCS*





# REAFFIRMING MY PASSION IN HEART CARE

Interventional Cardiology Fellowship Programme, Department of Cardiology

*“My fellowship at NUHCS not only deepened my skills, but also fostered enduring friendships and camaraderie, that continue to enrich my journey as an interventional cardiologist.”*

Dr Indah Sukmawati,  
Indonesia



My dream of becoming a cardiac interventionist met with unexpected detours; losing my father due to cancer during the COVID-19 pandemic was another heavy blow. Despite postponing my fellowship, my resolve remained unwavering. Welcomed warmly into the NUHCS family, I found solace in the support of my mentor, Prof Tan Huay Cheem, Senior Advisor, NUHCS.

Immersed in the clinical realm, I cherished the collaborative spirit of NUHCS, including the fellow doctors, nurses, medical technologists, and radiographers, learning not only in procedural techniques, but also fostered my soft skills in clinical decision-making, openness, and patient-centred communication.

The enduring bonds forged and the spirit of compassion instilled at NUHCS continue to fuel my dedication to deliver better cardiac care for my patients. I am immensely grateful for the opportunity to rebuild my dream here at NUHCS and am proud to be able to carry the legacy forward!



Dr Sukmawati (centre) with her mentor, Prof Tan Huay Cheem (right), Senior Advisor of NUHCS, and Dr Christopher Koo (left), Consultant, Dept. of Cardiology, NUHCS.

# EMPOWERED ON THE PATHWAY TO EXCELLENCE

Heart Failure Programme, Department of Cardiology

My time at NUHCS has not only deepened my medical knowledge, but also shaped me into a more skilled and empathetic heart failure cardiologist. Being guided by some of the brightest minds in cardiology, and the hands-on experience of working alongside dedicated nurses and pharmacists has taught me the vital role of teamwork and true meaning of holistic treatment, while strengthening my clinical competencies across diverse heart failure cases.

Delving into cardiac research, I was honoured with the opportunity to showcase our team's findings at international conferences such as the American College of Cardiology (ACC) and the European Society of Cardiology (ESC), and have our hard work recognised during the award sessions, thanks to the support of my incredible mentors!

My experiences at NUHCS have truly inspired my lifelong dedication to better patient outcomes through clinical and research excellence. As I prepare to return to Indonesia, I carry with me the invaluable lessons learned, eager to make a lasting impact on heart failure care in my homeland.



*“The fellowship has truly been a cornerstone of my professional life and inspired me on both my clinical and research journey...NUHCS will forever be a place my heart holds dearly.”*

Dr Novi Yanti Sari,  
Indonesia



1. **ECMO:** Extracorporeal Membrane Oxygenation (ECMO).
2. **Cardiothoracic:** Field of medicine relating to the heart and chest.
3. **Catheterisation Lab:** An examination room where tests and procedures are carried out.

ARTICLE BY

NUHCS PULSE Editorial

## SYNERGISING CARE THROUGH

# CONTINUING MEDICAL EDUCATION (CME)

A gateway for medical professionals to keep pace with the latest clinical updates

**H**ealthcare is a constantly evolving field, where new technical advances, techniques and cutting-edge treatments promise to revolutionise the future of patient care.

To share crucial knowledge and insights in the field of cardiology, and cardiothoracic and vascular surgery, specialists from the National University Heart Centre, Singapore (NUHCS) have come together to organise Continuing Medical Education (CME) sessions to support healthcare counterparts in the primary care settings – including General Practitioners (GPs), polyclinic doctors and nurses – in staying updated on the latest disease management knowledge for enhanced patient care, and to equip them in making specialist referrals for their patients' follow-up treatment.



## Continuing Medical Education (CME) sessions

consists of educational activities that serve to:

- Enhance the knowledge, skills and professional performance of a doctor

CMEs are stipulated by the Singapore Medical Council to be compulsory for doctors in Singapore to:

- Ensure that all doctors are kept updated on changes in medicine and in areas relevant to their own particular practice

At the core of NUHCS' educational commitment lies a dedication to nurturing well-rounded healthcare professionals. From in-depth explorations of Electrocardiogram<sup>1</sup> (ECG) interpretations to comprehensive discussions on the management of Superficial and Deep Venous Disorders<sup>2</sup>, every aspect of cardiovascular care is tailored to equip primary care doctors with the knowledge to keep them well-updated in the evolving medical field.

## Calling All Primary Care Colleagues & Healthcare Professionals!

- Familiarise yourself with the latest research, clinical guidelines and management protocols to aid in potentially lifesaving diagnosis and take better care of your patients
- Learn to identify the different signs/symptoms that would warrant a specialist referral
- Sharpen skills and insights to diagnose and manage various cardiovascular conditions effectively

Stay tuned to our pages and keep a lookout for future sessions:



Events & Registration Page



Latest Happenings on NUHCS LinkedIn

### For Specialist Referrals

To refer your patients to our specialists, simply contact our **General Practitioner Liaison Centre (GPLC)** to make an appointment.

### Opening hours:

Mon-Fri: 8.30am – 6.00pm Sat: 8.30am – 12.30pm ☎ Tel: 6772 2000 ✉ Email: gp@nuhs.edu.sg

1. **Electrocardiogram:** A recording of the heart's electrical activity.
2. **Deep Venous Disorders:** Valve or blood vessel abnormalities.

ARTICLE BY

**NUHCS PULSE Editorial**



# Overview of the CRESCENT TRIAL

## Comparing Treatments for Sleep Apnea and Hypertension

### What is Obstructive Sleep Apnea (OSA)?

A dangerous sleep disorder where the throat muscles relax during sleep, causing airway blockage.

### How Can OSA Hurt My Health?

Characterised by loud snoring and repeated breathing interruptions during sleep, it can lead to a drop in oxygen levels in the body. Left untreated, it can cause hypertension, heart disease, and even stroke.

Hypertension is a leading risk factor for heart disease and stroke, making blood pressure control critically important. Obstructive Sleep Apnea (OSA), which affects 1 in 3 Singapore residents, is a significant and often undiagnosed cause of hypertension. Current medical opinions recommend screening for and treating OSA in patients with hypertension to help manage their blood pressure. Continuous Positive Airway Pressure (CPAP)<sup>1</sup> is the standard treatment for OSA, delivering air through a mask to keep the airway open during sleep. However, many patients either refuse CPAP or find it difficult to use consistently.

### What is a Mandibular Advancement Device?

A Mandibular Advancement Device (MAD)<sup>2</sup> is a small mouthpiece worn during sleep that moves the lower jaw forward to keep the airway open. It is an alternative to CPAP for treating OSA. However, it's not



yet clear if using a MAD can reduce blood pressure in patients with OSA.

### About the CRESCENT Trial

The CRESCENT trial, led by Prof Ronald Lee Chi-Hang, Senior Consultant, Department of Cardiology, NUHCS, aimed to compare the effectiveness of MAD versus CPAP in lowering blood pressure in patients with OSA and hypertension. The goal was to show that MAD is not worse than CPAP in this regard. A total of 220 Singapore residents were recruited between 2019 and 2022 and were randomly assigned to receive either the MAD or CPAP as treatment for OSA. Both the MAD and CPAP groups were supported and guided by a team of medical experts in OSA treatment.

### Results

After more than four years of dedication and commitment, the results of the CRESCENT trial were presented at the American College of Cardiology's Annual Scientific Session in Atlanta as late-breaking<sup>3</sup> clinical research in early April 2024. At the same time, the trial findings

were published online in the Journal of the American College of Cardiology, a prestigious cardiovascular journal. The main findings were that both the MAD and CPAP were effective in reducing the classic sleep apnea symptom of excessive daytime sleepiness. Usage of the MAD device was higher than with the CPAP device, with 56% in the MAD group using it for at least six hours per night, compared to 23% in the CPAP group. Importantly, a 2.5 mmHg reduction in 24-hour mean arterial blood pressure was observed in the MAD group at the six-month follow-up, while no change in blood pressure was observed in the CPAP group. Overall, we found that MAD is not worse than CPAP in reducing blood pressure in patients with OSA and hypertension.

*Spanning six years from inception to completion, the CRESCENT trial was shortlisted as a late-breaking Clinical Trial Presentation at the American College of Cardiology (ACC)'s Annual Scientific Session 2024 in Atlanta, Georgia.*

### Key Message for Singapore Residents

OSA is a common medical condition, particularly in individuals who are overweight or obese, snore during sleep, and feel sleepy during the daytime despite adequate sleep duration. While CPAP is often offered as the first-line treatment, MAD is an approved alternative if you find CPAP uncomfortable or simply want to try a different OSA treatment.

1. **CPAP:** The conventional method of respiratory therapy where a set pressure to the airways is maintained throughout the respiratory cycle by pressurisation of the ventilator circuit.
2. **MAD:** An appliance that treats OSA by increasing the airway diameter with soft tissue displacement in the mouth.
3. **Late-breaking:** Occurring very shortly before publication on the topic.

#### ARTICLE BY

#### Prof Ronald Lee

Senior Consultant, Department of Cardiology, NUHCS



A core faculty of the Cardiology Senior Residency Programme since 2016, Prof Lee has authored or co-authored over 250 articles in peer-reviewed medical journals. He practices general cardiology, interventional cardiology, and sleep medicine. His honours include the Singapore Cardiac Society Young Investigator Award (2010), National Medical Excellence Award (2011), Clinician Scientist Award (2015), and Senior Clinician Scientist Award (2018).



# How Nursing-led Research is Transforming Patient Care

A look into Evidence-based Practices (EBP) in wards and clinics

In the dynamic world of healthcare, keeping up with the latest scientific advancements is important to deliver effective and up-to-date patient-centric care. In the heart of this transformative approach at the National University Heart Centre, Singapore (NUHCS), is the Cardiovascular Evidence-based Nursing Collective (CENC). This dedicated nursing group is redefining the future of patient care through the latest research projects, empowering nurses to make significant impacts on clinical practice.

**Nurturing Research Talents, Improving Care Quality**  
Evidence-Based Practice (EBP) in

healthcare involves the use of the best research evidence, along with a nurse's experience and a patient's preferences, to make better decisions about patient care. Nurses play a crucial role in healthcare and are encouraged to carefully evaluate and apply the latest research and scientific evidence into practical processes, to improve the way they provide care. By doing so, they can enhance the quality of patient support and continuously improve their day-to-day practice.

Celebrated for their impact on patient care, two NUHCS nurses from CENC have been awarded the Nursing Innovation, Clinical Inquiry, Enabling Research (NiCER) award to support their groundbreaking projects. On top of a monetary grant, the NiCER award provides recipients with a comprehensive

suite of resources including modular webinars and dedicated research mentors. These resources were designed to help the nurses achieve new strides in their areas of research interest, and most importantly, to bridge the gap between research and clinical care.

“

*I am passionate in my pursuits for Evidence-based Practice within nursing because I recognise that it ensures our care is grounded in the latest research, leading to better patient outcomes and continuous quality improvement.*

**Lim Ellene, Senior Staff Nurse, Coronary Care Unit, NUHCS**

”

## Awarded Top 5 Oral Presentations at the Official SCS Annual Scientific Meeting 2024

Jolyn Chin, Senior Staff Nurse, and Lee Choy Yee, Advanced Practice Nurse, Ward 63, NUHCS, showcased their research project at the 35th Annual Scientific Meeting 2024 by the Singapore Cardiac Society (SCS) held from 26 to 28 April 2024.

Their interventional study that compares the effects of Early Ambulation<sup>1</sup> (EA) and Complete Rest in Bed (CRIB) in Non-ST Elevation Myocardial Infarction (NSTEMI)<sup>2</sup> patients prior to coronary angioplasty<sup>3</sup>, showed that allowing NSTEMI patients to mobilise and walk earlier as compared to the traditional process of complete rest in bed, had reduced irregular heart rhythm events and did not compromise on patient safety before receiving coronary angioplasty treatment.

Based on its promising results and potential to change practice, this research study has emerged as one of the Top 5 Oral Presentations, underscoring the transformative potential of nurse-led research.



Jolyn Chia, Senior Staff Nurse, (second from right) celebrating with the NUHCS nurses at the SCS Annual Scientific Meeting 2024.



## Pioneering Better Ways to Care

By challenging conventional practices and championing evidence-backed ideas, having the CENC within NUHCS sets the stage for cardiac nurses to take the lead in health innovation and promote optimal patient outcomes. It does so by grooming Evidence-based Resource Nurses (EBRN) within each cardiac unit, providing a structured framework for nurses to raise relevant questions, and leverage on the best available evidence to guide their decision-making on care interventions. In addition, the CENC constantly monitors the outcomes of newly launched measures to ensure their sustainability and relevance in the clinical setting, in turn boosting patient safety and the standard of care.

### Learn how nurses drive positive change through Evidence-Based Practices:



#### Reducing patient discomfort after procedures through early ambulation

For patients going through coronary angiographic procedures, a period of bed rest is usually recommended to prevent any recovery complications. However, extended rest in bed up to 24-hours can cause back pain, urinary discomfort and urinary retention, collectively resulting in frequent feedback of patient discomfort and dissatisfaction.

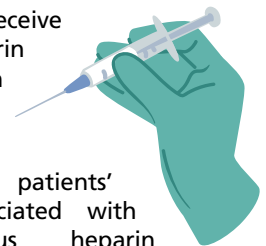
To address these issues, Lim Ellene, Senior Staff Nurse, and her team of nurses within the Coronary Care Unit, NUHCS, spearheaded a project to identify the safety and effects of empowering patients to get up and moving four-hours after the invasive coronary angiographic procedure.

By encouraging patient mobility four-hours after the procedure, the team found that back pain, urinary discomfort and urinary retention were reduced significantly, yet maintaining low levels of complication rates. The outstanding results from the pilot study has driven a change in practice guidelines within the cluster.



#### Reducing pain & bruising through the Subcutaneous Heparin Injection Technique

Commonly, patients who receive subcutaneous<sup>4</sup> heparin injections tend to complain about site pain and discomfort.



With the aim to reduce patients' bruising and pain associated with traditional subcutaneous heparin injections, a group of nurses from NUHCS led an EBP project titled Subcutaneous Heparin Injection Technique in the Cardiology general ward. This project illustrated that by training nurses to perform the "10-second give, 10-second wait and 10-second hold" technique, it resulted in a drastic reduction of pain score and occurrences of post-injection bruising in patients.

Due to its preliminary success, the project has been widely implemented by nurses across various units within the cluster, as part of daily practice.

The effect of these projects led by our EBRNs ripples across the cluster, motivating nurses to challenge the status quo and strive to refine the standards of patient care.

Setting a precedent, the above-mentioned successful implementations by the CENC serves as an inspiration for more nurses across all settings to take ownership of their practice. By translating their EBP / research insights into clinical advances, nurses are actively transforming care by deriving better clinical decisions and patient outcomes.

1. **Ambulate** – the practice of getting patients up and moving.
2. **NSTEMI** – a partial heart attack that usually happens when the heart's need for oxygen cannot be met.
3. **Coronary Angioplasty** – a minimally invasive procedure used to open blocked coronary arteries caused by coronary artery disease.
4. **Subcutaneous** – a mode of injection under the skin within the fatty tissue.

Follow **Cardiovascular Evidence-based Nurses Collective (CENC) @cenc\_ebp** on IG to learn more!



ARTICLE BY

**Lim Ellene**  
Senior Staff Nurse,  
Coronary Care Unit,  
NUHCS

Lim Ellene is a senior staff nurse in the Coronary Care Unit who is driven by a passion for advancing patient care through rigorous research and evidence-based practices.

# Amplifying

## THE LOVE FOR ECHOCARDIORAPHY

Honouring 20 years of service in heart imaging

“Wherever the art of Medicine is loved, there is also a love of Humanity.”

~ Socrates



As a Senior Medical Technologist at the National University Heart Centre, Singapore (NUHCS), Geronica's two-decade-long career is a testament to Socrates' famous quote. In addition to inspiring co-workers with her strong technical expertise and investigative skills in **echocardiography**<sup>1</sup>, the veteran professional has also cultivated a deep understanding of the human side of healthcare, touching countless patient lives in the process.



As Geronica looks to embrace her next chapter of retirement, the PULSE Editorial Team catches up with the sprightly 68 year-old to learn more about her remarkable journey as a cardiac medical technologist, what keeps her heart for echocardiography beating, and her unique perspectives at the past, present, and future of this exciting field!

### Share more about your career journey, and what inspired you to pursue the field of echocardiography?

**Geronica:** I've always been intrigued by the human anatomy, and this curiosity led me to explore the world of medical imaging<sup>2</sup>. After completing my education and training, I practiced as a medical technologist in various countries such as the Philippines and Saudi Arabia. I eventually settled in Singapore and NUHCS appealed to me with its diverse and collaborative environment, where I could combine my passion for healthcare and technology to make a meaningful impact.

### Could you walk us through a typical day as a cardiac medical technologist at NUHCS?

**Geronica:** Each day brings a unique set of challenges and opportunities. First of all, my role involves performing ultrasound scans, capturing images to accurately assess the heart's structure and function in situations where heart disease is suspected or known, to help classify heart failure and guide treatment.

Besides preparing and operating the ultrasound equipment to ensure my patients receive the highest quality of care, I also collaborate closely with the cardiologist, or research personnel and other staff, to resolve issues and provide insights, wherever cardiovascular diagnostic procedures or equipment are concerned.

### What are some of the challenges you face in your role, and how do you overcome them?

**Geronica:** One of the challenges we face is dealing with patients who may be anxious, upset or in pain. As patients and their family may come to us with some degree of anxiety due to the possibility of a heart problem, it is important to set a calming tone to help them understand what they need to go through and ensure that they feel comfortable before and during the procedure.

Interpreting ultrasound images accurately can sometimes be complicated, especially in patients with unique anatomical variations. Having a mindset of continuous learning, even after many years on the job, helps me to navigate any challenges.





**“Staying passionate and maintaining a joyful heart throughout my decades-long career has helped me keep up my vitality and youthfulness!”**

~ Geronica, Medical Technologist of 20 years at NUHCS

### Could you share some of the rapid advancements in medical technology; how do you stay updated in this ever-evolving field?

**Geronica:** Advances such as better image quality and more sophisticated diagnostic capabilities have made waves in the world of medicine. I attended workshops, conferences, and training programmes to stay abreast of the latest innovations and techniques in the field, so I can further enhance the quality of care I provide to patients.

### Apart from your routine work at NUHCS, do you also engage in educating and mentoring?

**Geronica:** Yes, I enjoy sharing the knowledge and experiences I have gained across different modalities with the doctors and my fellow medical technologists. I believe that it is paramount to nurture the next generation to instill in them the confidence, compassion, and a commitment to excellence in echocardiography. Empowering myself by staying active, and preparing teaching materials for my students, further allows me to value-add to the knowledge depository.

### What do you feel are the essential qualities for a career as a cardiac medical technologist? Any advice for those keen to enter the field?

**Geronica:** To excel in echocardiography, one must have a strong foundation in the human anatomy and physiology, and attention to detail. Equally important are excellent communication skills, compassion and patience, when working with patients, who may be going through a difficult time.

Stay committed to lifelong learning, and cherish the relationships you build with patients and colleagues. This field will not be stagnant and will only continue to evolve, but your dedication and passion for echocardiography will keep you moving forward.

### Lastly, could you share what you will miss most following your retirement?

**Geronica:** The daily interactions with patients, the thrill of solving diagnostic puzzles, and of course, the camaraderie at NUHCS! I am immensely thankful for the amazing support from all my colleagues at NUHCS throughout my years here!



ARTICLE BY

NUHCS PULSE Editorial

1. **Echocardiography** – A painless and non-invasive ultrasound test to visualise the heart's structures, for diagnosing issues such as enlargement of the heart, structural abnormalities, blood clots, etc.
2. **Medical Imaging** – Use of technologies to take pictures of internal areas of the body to guide diagnosis and treatment.



# Revolutionising Healthcare through Information Technology

*Cardiologist Dr Jason Chen dives into the technicalities of being a Medical Informatics Officer*

*I look forward to witnessing how technology can open doors for patients, providing them with the access to the best possible care.*

Medical Informatics, a sub-discipline of health informatics, focuses on using technology to improve how healthcare data is organised and analysed, ensuring patients receive the best possible care. From acquisition to storage, retrieval to utilisation, medical informatics help support decision-making, research, education and administration in healthcare settings, enhancing the efficiency, quality and safety of healthcare services.

With the advancement of health informatics for greater precision and accessibility in healthcare operations, Information Technology (IT) is now a core component in Medical Informatics for healthcare delivery within Singapore.

Ultimately, this shift towards having patient-centric information available 24/7 in an integrated IT system allows for a safer and more efficient healthcare system.

## Tasks digitally handled by Computer/IT software



In this dynamic age of healthcare, where medicine meets technology, we interviewed Dr Jason Chen, Consultant, Dept. of Cardiology, National University Heart Centre, Singapore (NUHCS), for a look into his new role as Assistant Chief Medical Informatics Officer, National University Hospital, where he dives into the intricate technicalities of this position - driven by a passion to optimise patient care through innovation.



## What does your role as a Medical Informatics Officer in NUHCS and the National University Health System (NUHS) entail?

**Dr Chen:** My primary responsibility is to merge medical expertise with technological proficiency. Besides needing in-depth knowledge in navigating various medical IT systems for seamless workflow, understanding cyber security is also paramount in safeguarding patient information and ensuring data privacy. My team and I oversee the performance of hospital IT systems to ensure they remain robust, secure, and user-friendly, enhancing operations and staff efficiency.



## Why is a cardiologist also serving as a Medical Informatics Officer? How do these two roles complement each other?

**Dr Chen:** Cardiology is a data-rich specialty, with many cardiology treatments being built upon an understanding of a patient's condition history over the years. There are dedicated Cardiac Information Systems that still contain the records of patients' electrocardiograms<sup>1</sup>, echocardiograms<sup>2</sup>, ultrasonographic studies<sup>3</sup>, and angiographic data<sup>4</sup>, allowing an almost instantaneous retrieval of information at any time, to facilitate proper review and management of the cardiac patients' conditions throughout decades of follow-up.

Originally developed and launched by A/Prof James Yip, Executive Director of NUHCS, this vital healthcare infrastructure has been progressively updated and it is my honour to follow in his footsteps and oversee these crucial systems, which directly enhances patient care. However, the complexity of these systems may pose as a challenge to doctors and medical professionals who are unfamiliar to IT technicalities. Hence, it gives me the opportunity to combine the expertise of a doctor with that of medical informatics to help fellow doctors navigate these intricate IT systems, while advancing healthcare management and delivery.

## What is the largest IT-related healthcare innovation you have spearheaded or facilitated in NUHCS and NUHS?

**Dr Chen:** A notable project was implementing the Next-Generation Electronic Medical Records (NGEMR)<sup>5</sup> system at the National University Hospital (NUH), which took several years from planning to execution, that allows medical professionals across various healthcare settings to seamlessly retrieve patient records, fostering efficiency and improved patient care. At NUHCS, our latest project involves migrating our Cardiac Information System to a centralised Data Center, akin to "moving houses" in IT terminology, to enhance system reliability, security and scalability. Like any relocation, this transition presented logistical complications. However, the process unfolded smoothly, with no compromise in patient care.



## What is the biggest challenge of integrating technology in healthcare today?

**Dr Chen:** With the constant evolution of technology, harnessing available technology to its full potential is one of the greatest challenge. Hence, comprehensive training and ongoing support are essential to empower healthcare providers in leveraging technology effectively. Additionally, we must navigate ethical and privacy concerns, especially with the integration of AI technology into healthcare. While this presents exciting prospects, we must remain vigilant of potential ethical, privacy, and safety concerns, ensuring patient data remains secure and confidential. Nevertheless, with proper integration, we anticipate transformative outcomes for our healthcare system.

1. **Electrocardiogram** – A medical test used to record electrical activity of the heart to assess symptoms of possible heart conditions.
2. **Echocardiogram** – A medical imaging test using ultrasound waves to create visual images of the heart, to assess the heart's structure and function.
3. **Ultrasonographic studies** – Non-invasive imaging techniques using high-frequency sound waves to create images of structures within the body, to assess and monitor the functionality of internal organs.
4. **Angiographic data** – Information obtained from angiography, a medical imaging technique used to visualise and examine the structure of blood vessels and the heart's chambers.
5. **Next-Generation Electronic Medical Records (NGEMR)** – A single unified electronic medical record across the NUHS and National Healthcare Group (NHG) institutes that records the entire patient journey across different care settings, to enhance management and delivery of treatment.

ARTICLE BY  
NUHCS PULSE Editorial

# FROM SCIENCE TO HEART CARE

Prof Roger Foo shares his vision for his new role as head of NUHCS' research arm

Taking over the leadership baton from Prof A. Mark Richards, who has been at the helm of the Cardiovascular Research Institute (CVRI) – the research arm of National University Heart Centre, Singapore (NUHCS) – since October 2010, Prof Roger Foo, accoladed clinician-scientist and Senior Consultant, Department of Cardiology, NUHCS, is set to unfold the next chapter of cardiovascular research in Singapore and take CVRI to new heights.

Prof Foo shares more on his new role with PULSE.

**PULSE:** Hi, Prof Foo, can you tell us more about what CVRI does, and its vision or mission?

At CVRI, our scientists are actively engaged in the process of using research to uncover new medical breakthroughs that can be applied to improve the care of patients with Cardiovascular Disease (CVD)<sup>1</sup>. Focused on heart health research, CVRI's approach is to deep dive into the frontiers of disease mechanisms, accelerating new treatment innovations and setting medical best practices.

Research is at the heart of important discoveries, driving the process of bringing medical expertise from bench to bedside, to propel the availability of new treatment options, medicinal drugs, or health services.

The journey behind beta blockers<sup>2</sup> in the 1950s illustrates this. Beta blockers were first tested in a lab following the discovery of the beta adrenergic receptor in the body, with no known knowledge of the receptor's link to heart health yet – until research went on to demonstrate that if you block the receptor, the heart slows down. Further research showed that this reduction in heart rate could be applied as a treatment option for patients with heart failure, hence the creation of beta blockers medications. Today, beta blockers are commonly prescribed for heart rhythm disorders, to lower blood pressure and improve survival rates for heart failure, and so if you or your loved ones are taking them, it is all thanks to the research efforts behind this medication!

**You have vast expertise in cardiovascular research. Can you share about your role at CVRI, and your plans for the institute?**

As head of CVRI, my role is to galvanise the diverse research projects in cardiovascular disease on our campus. We have a well-developed national and international network with a strong team of Principal Investigators (PIs) and are now focused on important research projects that aim to connect scientific findings with practical applications.

With access to excellent facilities and resources at CVRI, I hope to build synergies across diverse research teams to realise the greatest impact – addressing the challenge of cardiovascular disease, advancing the discovery of new treatment options, and lowering the burden of disease.



“ Like a glass that is always half full, we want to uncover the missing pieces of heart disease through our ongoing research and testing, which we hope will lead us on to effective preventive measures, to improve diagnosis and treatment in the fight against this prevalent disease. ”

– Prof Roger Foo,  
Director, CVRI and Senior Consultant,  
Dept. of Cardiology, NUHCS



### Could you share more on how CVRI's objectives can directly impact the larger community, or quality of patient care?

As mentioned in the National Medical Research Council (NMRC)'s Five Year Roadmap for CVD Research in Singapore<sup>3</sup>, there is a need for high quality research to identify factors that contribute to the risks of health issues in the community. This is where CVRI is focused on harnessing the power of data and technology to develop local knowledge in heart health.

Tailored to this aim is Project RESET, a large-scale initiative leveraging a wide range of state-of-the-art diagnostics and technology to identify hidden risk factors of CVD and improve heart health delivery in Singapore.

Our research studies have shown how patients who are able to physically comprehend the state of their health through such interactive technologies, or even by seeing vivid images of their own heart blockages, are spurred to make sustained lifestyle changes; something we are hoping to achieve with the use of technology in Project RESET.

Digital health interventions are another way through which we impact the community. On the ground, we collaborate actively with researchers to promote the use of innovative AI-based mobile applications in elders, as a tool to help tackle the growing incidence of frailty in the Singaporean population.

Through emerging scientific insights, we are working relentlessly in the hopes of filling out the gaps in our understanding of heart disease, and investigating the best population implementation strategies.



### What led you to a career in cardiovascular discovery? Can you describe some WOW moments you are most proud of?

Since my undergraduate days, I enjoyed studying genes and cells and often wondered how clinical drugs were discovered and developed. I learnt how the advancements in cancer drug discovery led to huge improvements in cancer survival rates<sup>4</sup> – from one out of four persons to two out of four today – and this inspires me to delve deeper into researching the lesser-known aspects of CVD management so that the same strides in this field can hopefully be unlocked for heart disease patients one day.

My own highlight in cardiovascular research is in the mapping of the heart's epigenetic<sup>5</sup> landscape and in the establishment of The Foo Lab – recognised for being first to publish the epigenome<sup>6</sup> map of the human heart in 2021 to reveal how gene programmes are controlled in the heart.

The gene programme of someone with a healthy heart is hugely different from one with a diseased heart, and this is caused by some genes being *switched on* or *off* in their gene programme. This *switching on* and *off* of genes is what sometimes results in the worsening of one's heart condition.

The dream of publishing the epigenome map of the heart is to one day use this to treat heart diseases.



### What are some of the potential challenges you foresee and how do you plan to push the frontiers?

There are countries where clinician scientists have been part of academic medicine for centuries. Singapore jumpstarted research in the biomedical field only around year 2000, thus a major challenge is in how we can make impactful strides in the landscape of global cardiovascular research with our on-ground expertise.

To raise our game and continue advancing Singapore on the world stage, CVRI must foster a collaborative environment, build a dynamic team and collaborate on thematic research areas across various local or regional healthcare institutions. This will help us build on our innovative capabilities, towards blazing our own trail.

Another key challenge is helping our young doctors achieve the balancing act of managing their patient duties with impactful research. I had taken the classic 80/20 split when I returned to Singapore from UK back in 2013 - spending 80% of the time dedicated to research and 20% seeing patients. While clinical research can guide patient care, the opposite is also true, as patient engagement can improve the quality and relevancy of lab work.

Finding ways to give our promising cardiologists the right support will enable these exceptional researchers to dedicate themselves to the lab studies they are passionate about, while finding fulfilment from engaging in clinical practice.

### Thank you, Prof Foo! Could you share what are your leisure pursuits, outside of work?

Reading, listening to lectures on YouTube, unwinding with Netflix. Yes, cardiologists and researchers have a work-life balance too!

1. **Cardiovascular Diseases:** conditions that affect the heart and blood vessels.
2. **Beta blockers:** A class of medication used to control high blood pressure, treat certain heart conditions, manage migraine and some thyroid disorders.
3. **Cardiovascular Disease Taskforce Report, National Medical Research Council (NMRC):** <https://www.nmrc.gov.sg/docs/default-source/about-us-library/cvd-tf-summary-report.pdf>
4. **Cancer survival rates:** The number of people with cancer who are still alive after a certain period of time after they were diagnosed with or started treatment for cancer.
5. **Epigenetic:** Related to the study of changes in organisms caused by modification of gene expression rather than alteration of the genetic code itself.
6. **Epigenome:** All chemical modifications of DNA and histones of a cell/organism that contribute to regulate gene expression.

ARTICLE BY

NUHCS PULSE Editorial

# HONOURING a Lifelong Legacy

## The CN Lee Professorship in Medical Sciences

With an unwavering dedication to medicine for over 50 years, Prof Lee Chuen Neng, affectionately known as Prof CN Lee, Emeritus Consultant, Division of Adult Cardiac Surgery, Department of Cardiac, Thoracic and Vascular Surgery (CTVS), NUHCS, is a beacon of excellence in the field of surgery. His tireless efforts have saved countless lives and inspired generations of doctors, earning him national and international acclaim for his exceptional medical teaching and mentorship.

### A Crowning Achievement

In recognition of his bold pursuit towards medical advancement and excellence, the Yong Loo Lin School of Medicine at the National University of Singapore (NUS) has inaugurated the CN Lee Professorship in Medical Sciences in his honour.

Officially launched on 5 April 2024, the CN Lee Professorship in Medical Sciences is the latest initiation in a series of professorships, to recognise outstanding Singaporeans and nurture future medical leaders, fostering multidisciplinary collaborations to address healthcare challenges both in Singapore and globally.

In 1985, Prof Lee – a respected leader and surgeon, founded the four sub-specialty divisions of adult cardiac, vascular, thoracic, and congenital heart surgery at NUS Medicine, the National University Hospital (NUH) and the National University Health System (NUHS). He led the

divisions' integration into NUHCS during its establishment as a National Centre in 2008. His visionary efforts laid a foundation for future surgeons, ensuring continued advancements and excellence in medical practices and patient care.

In his 10-year long tenure as NUHS' Chair of Surgery and head of NUS Medicine's Department of Surgery from 2005 to 2015, Prof Lee established the Advanced Surgery Training Centre and developed 14 specialty surgery divisions at NUH. His

“*In medicine, innovation is a duty we owe to our patients — both in the present and future. We achieve true and lasting impact when we pioneer new methods and drive their widespread adoption. By sharing our knowledge and embracing new approaches, we multiply the impact of our expertise — enabling us to save far more lives than we ever thought possible.*”

~ Prof CN Lee

significant contributions and research earned him honourable accolades, such as the International Medal of the Royal College of Surgeons of Edinburgh in 2012, as well as the National Clinician Mentor Award in 2015 from the Ministry of Health, Singapore.



### Nurturing Future Generations

Professorships are prestigious academic positions awarded to distinguished scholars and researchers for their contributions to a specific field, based on a rigorous selection process. One such renowned professorship is the “S. R. Nathan Professorship in Health Innovation (2018),” named after Singapore's sixth and longest-serving president, late Mr. Nathan. He was a fervent advocate for education and research, supporting research initiatives and generously sharing insights and experiences. This professorship honours his impactful efforts and aims to attract and support top academics to enhance healthcare quality and delivery in Singapore.

Recipients of professorships are expected to lead research initiatives and inspire the next generation of experts. Professorships not only benefit the professors who gain research resources and recognition, but also students through high-quality mentorship, institutions through boosted academic standing, and the community through improved care and knowledge from the latest research findings.

The CN Lee Professorship not only recognises Prof Lee's transformative contributions to medical education and advancements, but also fosters partnerships to tackle healthcare challenges and

improve medical practices. Honouring Prof Lee's commitment to uniting people for innovation to enrich patient care, recipients of this professorship are anticipated to strive for excellence and break new frontiers in medical sciences.



ARTICLE BY  
NUHCS PULSE Editorial



# Congratulations!

## AWARDS & ACCOLADES

### Adj Prof Poh Kian Keong

Senior Consultant,  
Department of Cardiology,  
NUHCS



SINGAPORE MEDICAL  
ASSOCIATION (SMA)  
MERIT AWARD 2024

### Adj A/Prof Ramanathan K.R.

Senior Consultant, Division of  
Cardiac Thoracic ICU (CTICU),  
Department of Cardiac,  
Thoracic and Vascular Surgery  
(CTVS), NUHCS



OUTSTANDING MENTOR  
AWARD 2024,  
WONG HOCK BOON  
SOCIETY- SINGAPORE  
MEDICAL ASSOCIATION  
CHARITY FUND (WHBS-SMACF)

### Prof Tan Huay Cheem

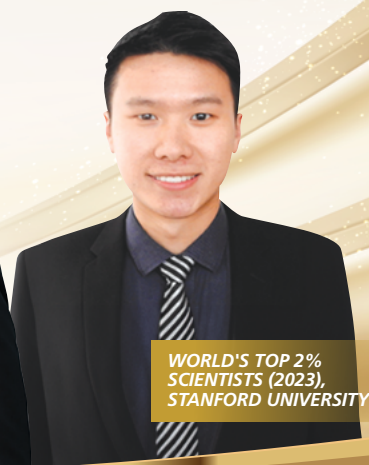
Senior Advisor,  
NUHCS



INTERACTIVE PROFESSIONAL  
DEVELOPMENT INITIATIVES  
FOUNDATION (IPDI FOUNDATION)  
LIFETIME ACHIEVEMENT AWARD

### Dr Nicholas Chew

Associate Consultant,  
Department of Cardiology,  
NUHCS



WORLD'S TOP 2%  
SCIENTISTS (2023),  
STANFORD UNIVERSITY

## PROMOTIONS

WE EXTEND OUR WARM CONGRATULATIONS TO OUR  
NEWLY APPOINTED DOCTORS!

WITH EFFECT FROM JAN 2024



**Dr Li Yue**  
Consultant,  
Department of Cardiac, Thoracic  
and Vascular Surgery (CTVS),  
NUHCS



**Dr Benjamin Tung**  
Consultant,  
Department of Cardiology,  
NUHCS



**Dr Sara Moiz Tyebally**  
Consultant,  
Division of Cardiology,  
Department of Medicine,  
NUHCS @ Ng Teng Fong  
General Hospital

WITH EFFECT FROM  
APR 2024



**Dr Nicholas Chew**  
Associate Consultant,  
Department of Cardiology, NUHCS

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## ABSTRACTS

### **71<sup>st</sup> International Congress of the European Society for Cardiovascular and Endovascular Surgery (ESCVS), Paris, France, 14-16 June 2023**

Management of Aortic Arch Branches in Frozen Elephant Trunk Operation. National University of Singapore Experience.

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Outcomes of Elective and Emergency Percutaneous Coronary Intervention in Seniors - A Systematic Review and Meta-analysis. Lin NHY, Ho JSY, **Djohan AH, Ho V, Teo YN, Teo YH, Syn NL, Aye YN, Chiu J, Soh RYH, Chai P, Yeo TC, Sim HW, Tan HC, Chan MY, Sia CH.**

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### **18<sup>th</sup> Annual Scientific Meeting of the Society of Cardiovascular Computed Tomography, Boston, Massachusetts, USA, 27-30 July 2023**

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### **8<sup>th</sup> World Congress of Pediatric Cardiology and Cardiac Surgery, Washington D.C., USA, 27 August - 1 September 2023**

3D Printing And Surgical Emulation In Pre-operative

Planning In A Case Of Recurrent Pulmonary Vein Stenosis. **Subbian SK, Kiraly L, Aye WMM.**

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### **Asia Pacific Heart Rhythm Society conference, Hong Kong, 1-3 September 2023**

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### **IDWeek 2023, Boston, Massachusetts, USA, 11-15 October 2023**

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### **World Congress of Neurology 2023, Montreal, Canada, 15-19 October 2023**

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### **6<sup>th</sup> Asia-Pacific Extracorporeal Life Support (APELSO) 2023 and 55<sup>th</sup> Annual Meeting of Korean Society for Thoracic & Cardiovascular Surgery (KTCVS), Seoul, South Korea, 2-4 November 2023**

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### **27<sup>th</sup> ASEAN Federation of Cardiology Congress 2023, Hanoi, Vietnam, 3-5 November 2023**

Meta-Analysis of Cardiac Imaging Modalities for the Diagnosis of Left Ventricular Thrombus Following Acute Myocardial Infarction.

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### **American Heart Association Scientific Sessions 2023, Philadelphia, Pennsylvania, USA, 11-13 November 2023**

Prognostic Value of the Global Left Ventricular Contractility Index in Patients with Severe Mitral Regurgitation and Preserved Left Ventricular Ejection Fraction.

**Panday V**, Lai J, Gao NL, Lim

BS, Leow AST, **Sia CH**, Tan RS, Zhong L, **Kong WKF**, **Poh KK**.

### **European Society for Medical Oncology (ESMO) Asia Congress 2023, Singapore, 1-3 December 2023**

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### **European Society of Cardiology Heart & Stroke 2023, Oxford, United Kingdom, 2-3 December 2023**

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### **American Heart Association Epidemiology and Prevention | Lifestyle and Cardiometabolic Health Scientific Sessions 2024, Chicago, Illinois, USA, 18-21 March 2024**

REFUSE (REFusal of discharge Under Specialist Encounter): A qualitative study.

**Panday V**, **Li TYW**, **Soh RYH**, **Woo B**, **Lim YW**, **Lim TW**.

### **American College of Cardiology 2024, Atlanta, USA, 6-8 April 2024**

An Asian perspective on longitudinal outcomes of aortic stenosis stratified by sex.

**Ong J**, **Leow A**, **Loh PH**, **Sia CH**, **Kong WKF**, **Yeo TC**, **Poh KK**.

Association of left ventricular global longitudinal strain and cardiovascular outcomes in patients with hypertrophic cardiomyopathy.

**Li TYW**, **Sari NY**, **Yeo S**, **Lee CH**, **Lee ECY**, **Yeo TC**, **Yip JWL**, **Poh KK**, **Kong WKF**, **Lim YC**, **Lin W**, **Sia CH**, **Wong RCC**.

Combining 2D planimetry and Yeo's Index reliably defines severity of rheumatic MS - A perspective from TEE 3D assessment.

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