THE **HEARTBEAT** OF NATIONAL UNIVERSITY HEART CENTRE, SINGAPORE (NUHCS)

National University Heart Centre Singapore

PULSE

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COVER STORY

15th YEARS OF NUHCS AS A NATIONAL HEART CENTRE

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TAKE ME HOME!

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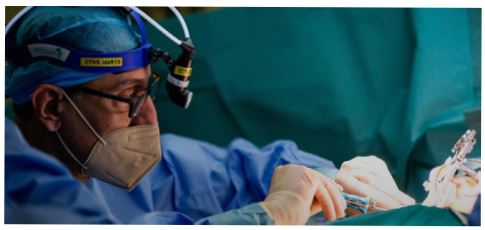
TABLE OF CONTENTS

EDUCATION



CLINICAL

FACES OF NUHCS

RESEARCH

NEWSBYTES

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 SERVICES IN SINGAPORE

NUHCS Heart Clinic @ Ng Teng Fong General Hospital

NUHCS Heart Clinic & NUHCS Vein Clinic @ Alexandra Hospital

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

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.

NUHS National University Health System

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,

2023 marked the 15th anniversary of the National University Heart Centre, Singapore (NUHCS)! As we celebrated this milestone as a national specialty centre, we organised a successful NUHCS Heart Fund Charity Golf & Dinner event, which raised $1.41 million for cardiac patients in need. Additionally, we commemorated our achievement with an annual Dinner & Dance tradition which also celebrated the hard work of our staff.

For the third consecutive year, the centre has been ranked among the world's leading hospitals for cardiac surgery, in a listing by Newsweek magazine. While gaining traction as a leading cardiac centre in the region, we are evolving our identity to better meet the growing needs of Singapore's aging populace in the changing cardiovascular landscape.

Honouring our yearly tradition of a strategic workplan retreat, this year's focus was on better integrating services across and within our various clusters. We aim to move Cardiology services into the Community, aligning with the nationwide Healthier SG transformation, to make a difference in heart care.

Culminating in a partnership with Limbang Constituency at the Yew Tee Community Club – a community node in the west, NUHCS held a public health screening carnival, graced by Deputy Prime Minister Mr Lawrence Wong. The event sowed seeds of heart health awareness in the public by bringing healthcare right into the neighbourhood, with the support of the Singapore Heart Foundation (SHF) and our very own patient support group, the Caring Hearts Support Group (CHSG), which crossed its fifth-year milestone in March.

> ***A full calendar of community engagement, local and regional exchanges, research publication features and outstanding accolades received by our staff members mark a busy, yet most fruitful 2023. 2024 promises to be another fulfilling chapter of community engagement and emerging scientific advances, as we continue to tap on synergies fostered to forge the way forward as a national specialty centre.***

With exciting heart health advances, the commendable efforts of our cardiologists and surgeons did not go unnoticed. We unveiled further advances in cardiac care, such as Pulsed Field Ablation for atrial fibrillation treatment, and "ECPELLA" mechanical circulatory support for heart failure with the creation of a trained multidisciplinary team for patients with life-threatening cardiogenic shock. I am proud to say that NUHCS is currently the only public healthcare institution in Singapore with such a multi-specialist team to respond to acute emergencies.

Big healthy changes start with small healthy steps. To help you and your family live a bit healthier each day, my colleagues at NUHCS have put together content addressing top health and wellness concerns – check out the "Ask the Expert" series on our official social pages (@NUHCS on Facebook and @NUHCSOfficial on Instagram), and be inspired to make small but steady changes on your personal health journey – because your heart deserves more.

With you, for you, to a healthier 2024!

Tan Huay Cheem

Prof Tan Huay Cheem
Senior Advisor of NUHCS

NUHCS CELEBRATES 15 YEARS AS A NATIONAL HEART CENTRE

To excellence in heart care and beyond!

Established in 2008 to meet anticipated growing demand for cardiovascular health services, we crossed our fifteenth year in 2023 – a momentous milestone as a National Centre in Singapore specialising in the treatment of the most challenging heart, lung and circulatory diseases.

As we look forward to realise our vision, we continue to unlock innovations across clinical, surgical and research fronts, towards tackling cardiovascular diseases and improving patient outcomes.

Through many firsts – such as setting up of the nation's first neighbourhood specialty cardiac clinic in Jurong Medical Centre (JMC), and advancing Uniportal Video-Assisted Thoracic Surgery (UVATS)[1] techniques that allows for lung surgery to be performed with just a single 3cm cut, we are synergising the way forward in the evolving field of cardiovascular disease management.

Where research and care go hand in hand, our researchers continue to contribute to the international body of cardiovascular research with high-citation papers, with a few also garnering international accolades. As our people are hard at work making things better for our patients, the centre hopes to share this enthusiasm for patient care and reach further by empowering this sense of community.

Driven by a holistic approach, our vision sets out how we strive to balance the goals of bridging academia and practice, while going beyond providing treatment to foster early diagnosis and healthier living for the Singapore community.

> *"At the centre of everything we do, it is about our people, and our patients. A heartfelt shoutout of thanks to every staff member for your commendable efforts both on the frontlines and behind the scenes; each of you has played a part in shaping NUHCS into a leading centre of excellence today!"*

ONE CENTRE WITH FIVE BEYONDS:

Beyond **N**ational University Hospital to community
Beyond **U**niversity (academia) to practice
Beyond **H**eart to total cardiovascular health
Beyond **C**are to span-of-life care
Beyond **S**ingapore to the world

Hamming it up in unique costumes

Penning wishes on a giant commemorative wall

We kickstarted our 15th year anniversary by celebrating this milestone with our people, who have been the heartbeat of NUHCS on this incredible journey.

Each making a unique difference to patient care, our dedicated team of doctors, nurses, allied health professionals, patient service associates, and support staff, came together for our yearly dinner and dance event on the evening of 28 April 2023, at the Conrad Centennial Singapore.

Themed "Where Movie Characters Come To Life", the gathering was kickstarted with various pre-event fringe highlights, such as penning of wishes for NUHCS' journey of growth on a commemorative booth, and various group photo opportunities, as the evening unfolded into memorable moments of fun and camaraderie!

The first major in-person event since overcoming the COVID-19 pandemic as a healthcare institute, the 2023 Dinner & Dance was an important opportunity to honour the awe-inspiring efforts and resilience of our staff who fought on the front lines of the national healthcare challenge.

NUHCS senior leaders took the lead in raising a toast to the hard work and dedication of all staff, while also shining the light on their varied inspiring contributions beyond their professional duties.

AIProf James Yip with senior leaders of NUHS, Chief Executive, Prof Yeoh Khay Guan and Deputy Chief Executive, Mr Foo Hee Jug, during commemorative cake-cutting

For Patients, by Patients

Taking the excellent opportunity to reflect and revitalise as we embrace the future, NUHCS is proud of the progress made by the Caring Hearts Support Group (CHSG) — a voluntary initiative by cardiac patients of NUHCS and their caregivers — which marks its own 5th anniversary in March 2023.

Showcasing the power of a support system, CHSG's unwavering efforts have empowered many of NUHCS' heart warriors, as well as their caregivers, to navigate through the tough time of living with a heart condition.

Driven by the motto of "No member walks alone", CHSG aims to bring positive impacts to the lives of heart patients and the community. They provide emotional and psychological support to individuals navigating their healing journey from cardiac diseases, fostering a circle of nurturing support and encouragement among one another.

Beyond the celebration of friendships and nudging each other towards heart health progress, CHSG members also found strength and empowerment in connecting and caring for the silver generation and other segments of society, by taking part in various efforts including Patient Advocate Conferences, Focus Group Discussions and volunteering at ElderCare Centres, as well as embracing meaningful exchanges with similar cardiac focused support groups in the region.

To find out more about CHSG, contact ***Magdalene Chia, Programme Lead, at mchia@kucinta.com***

A Pause in Focus

Taking a step back to see how far we have come, NUHCS also organised a Work Plan Retreat in September 2023 with greater clinical outcomes in mind.

The retreat allowed our management staff to envision NUHCS' future goals, create a foresight plan and re-energise the team for the challenges ahead.

Amid strengthening our bonds through fun team bonding activities, the event provided a strong boost of morale and momentum for the coming years. As we move forward in teamwork and togetherness on our journey of bettering cardiovascular care.

Envisioning the future through breakout sessions at our annual Work Plan Retreat!

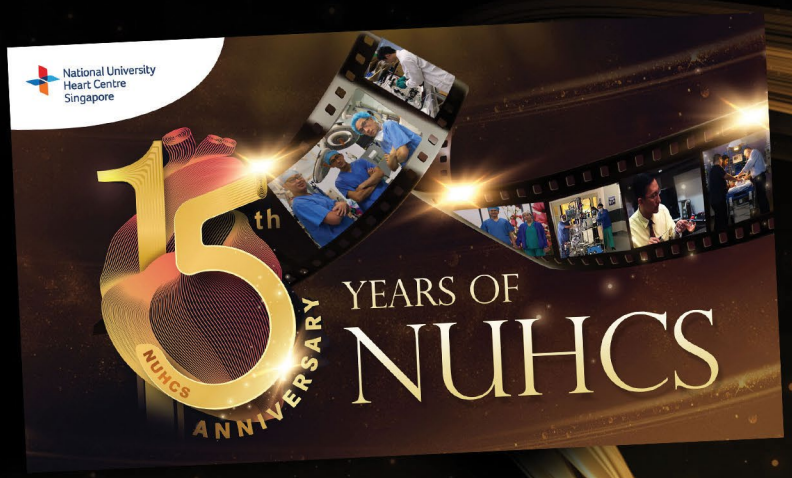
Charting the Future As One

As we continue to pursue excellence in clinical research and care delivery, we are honoured to be awarded Newsweek's World's Best Specialised Hospitals in 2022, 2023 and 2024 – ranking top in Singapore for Cardiac Surgery for three consecutive years.

"We put our hearts into transforming heart health from both inside (the body) and outside (the community). This can only be done with partnership from all our stakeholders who inspire us onwards!"

James Yip

A/Prof James Yip,
Executive Director,
National University Heart Centre,
Singapore (NUHCS)



Scan the QR Code to catch our people in action in this NUHCS 15th anniversary commemorative video!

1. **UVATS** - A minimally invasive technique that uses one small cut to perform the surgery.

Discovering Latest Breakthroughs & Best Practices In Cardiology

NUHCS DELEGATES CONVENED WITH WORLD-RENOWNED CARDIOLOGY EXPERTS AT ACC/WCC 2023

Singapore Representatives from NUHCS posing for a group picture with the ACC logo

From 4 to 6 March 2023, thousands of cardiovascular professionals around the globe came together at the American College of Cardiology (ACC) Scientific Session with the World Heart Federation's World Congress of Cardiology (WCC) 2023, to discuss and impart cutting-edge scientific advancements and innovative practices of cardiac care.

Besides the intellectual pursuits, the cardiologists also immersed themselves in the rich cultural experiences of New Orleans, Louisiana, United States, where the congress was held. The city's classic jazz music, delectable Creole cuisine, vibrant nightlife, and captivating colonial architecture added to their overall experience. Despite being a few weeks after Mardi Gras, the festive atmosphere still lingered as one strolled down Bourbon Street. These experiences provided a sense of genuine normalcy, a much-needed respite after years of the COVID-19 pandemic.

During this conference, at least 12,854 professionals lined up to have their picture taken in front of the prominent ACC logo at the foyer of Ernest N. Morial Convention Center, which stretches to the length of about two football fields.

National University Heart Centre, Singapore (NUHCS) delegated Adj Prof Poh Kian Keong, Director of Research and Senior Consultant, Dept. of Cardiology, NUHCS, Asst Prof Lim Toon Wei, Head of Community Cardiology and Senior Consultant, Dept. of Cardiology, NUHCS, and Asst Prof Lin Weiqin, Clinical Director of Heart Failure Programme and Senior Consultant, Dept. of Cardiology, NUHCS, to exchange insights with interregional experts on cardiology care at the conference.

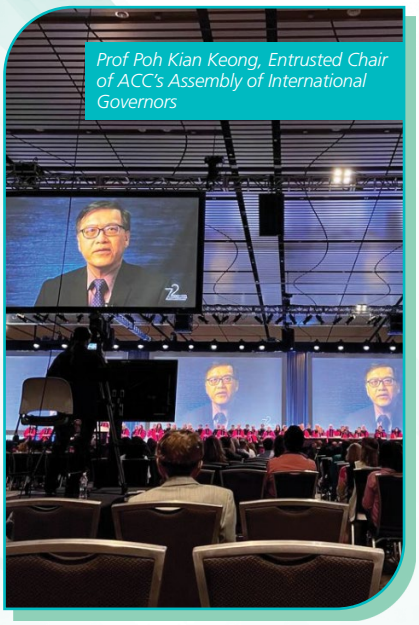
The conference commenced with late-breaking clinical trial sessions that drew an overwhelming number of audiences, covering both preventive aspects of cardiology and groundbreaking innovations in interventional cardiology.

One notable study presented was the CLEAR Outcomes trial, which shed light on a promising hope for managing statin-intolerant patients with the preventive benefits of Bempedoic Acid. The TRILUMINATE study was another intriguing session presented, delving into the innovational and interventional aspects of cardiology by exploring new grounds on Tricuspid Edge-to-Edge Repair (TEER) with the TripClip. Throughout the conference, attendees were endowed with a multitude of interactive and educational sessions, offering an informative experience for all.

Dr Rodney Soh's first poster presentation at the ACC/WCC conference

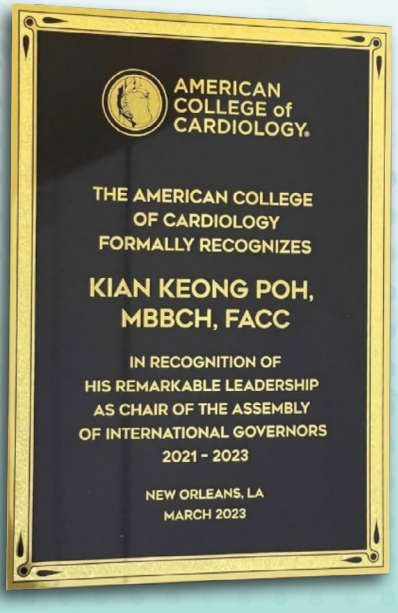
This was the first international cardiology conference that Dr Rodney has been to and it was an honour for him to be given an opportunity to present his ongoing research project on Transcatheter Aortic Valve Implantation. The research project was titled "Impact of Differing Stages of Chronic Kidney Disease on Transcatheter Aortic Valve Implantation Outcome in an Asian Population". It was a great experience for Dr Rodney as he managed to present this topic to an international group of audience and exchange excellent research ideas along the way.

During the ACC/WCC conference, the significant and remarkable contributions of Prof Poh were also honoured. Appointed as the Chair of the Assembly of International Governors (AIG) two years ago, Prof Poh has been actively involved in fostering international scientific collaboration, education and knowledge exchange within ACC and globally.



Prof Poh Kian Keong, Entrusted Chair of ACC's Assembly of International Governors

Despite his many commitments, roles and clinical duties, Prof Poh has successfully led the AIG community which consists of 16,000 members in 42 chapters around the globe. With the ACC, he transformed cardiovascular care and enhanced global health with emphasis on diversity, equity and inclusion. He also spearheaded multiple key projects including quality improvement, enhancing educational resources, leadership, and early career training, and optimised value of care.



Prof Poh is the first and only individual from Asia to be entrusted with this prestigious position. His dedication and accomplishments have indeed raised the Singaporean and NUHCS flags to great heights.

Beyond the intellectual gains, Dr Rodney had the opportunity to interact with different prominent cardiologists and befriend fellows-in-training from this conference. Apart from work, he also had a fair share of fun during his stay in New Orleans, from learning more about history at the National World War II Museum to having New Orleans-flavoured dinner together with his seniors and colleagues. This trip has left an everlasting impression on Dr Rodney and he hopes to be able to attend another ACC conference again in the near future.

Prof Poh Kian Keong, Dr Novi Yanti Sari, Asst Prof Lim Toon Wei at the Heart 2 Heart stage after Prof Poh's panel discussion on UnEDited: ACC Presidential Discussion on Global Collaboration.

Session chaired by Prof Poh Kian Keong at the ACC/ WCC Conference 2023

ACC/WCC 2023 saw immense energy and passion from all attendees and it opened opportunities for them to reconnect with old friends and forge new connections through the various sessions conducted.

Facilitating the exchange of perspectives and knowledge among participants and providing fellows with interactive experiences, this event fostered camaraderie and illuminated a promising path for the future of cardiology.

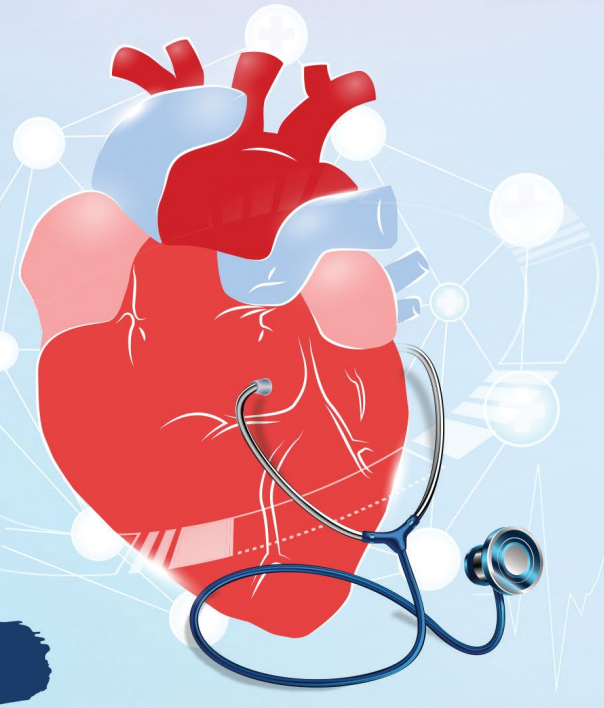
ARTICLE BY

Dr Rodney Soh
Senior Resident, Department of Cardiology, NUHCS

Dr Rodney Soh is a cardiology senior resident who dabbles in cardiology research, medical education and quality improvement projects. He also enjoys music and water sports.

THE HEART TRUTH SYMPOSIUM

UNVEILING WHAT MATTERS

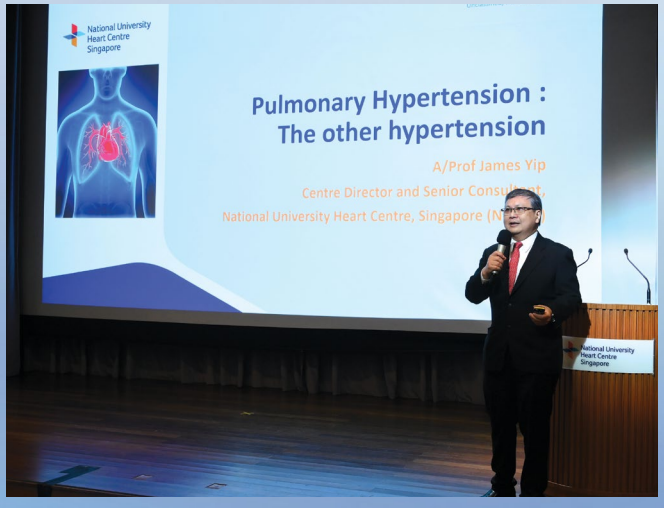


A key event in NUHCS' calendar of public outreach activities, "The Heart Truth" is a yearly talk aimed at increasing awareness about cardiovascular health through sharing of the latest insights by the centre's heart care experts.

> **"We have doubled the life expectancy of (Pulmonary Hypertension) patients to 50% in 10 years with modern treatments."**
>
> – A/Prof James Yip,
> Executive Director, NUHCS

Hosted by local CNA938 presenter Daniel Martin, this year's event took place on Saturday, 24 June 2023 and was attended by over 250 participants at the National University Health System (NUHS) Tower Block Auditorium.

Diving into the lesser known condition of Pulmonary Hypertension (PH) – a type of high blood pressure affecting the arteries in the lungs, A/Prof James Yip, Executive Director and Senior Consultant, NUHCS, highlighted important symptoms including shortness of breath during exertion, which can be easy to miss when relatively mild but worsens as the disease gets more severe. As early detection is crucial, he advised fit and healthy individuals who experience reduced, unexplained exercise capacity to get a prompt check-up.



Debunking the persistent myth that cardiovascular disease is "just a man's disease", Dr Sim Hui Wen, Consultant, Department of Cardiology, NUHCS, shone the light on how women tended to be more vulnerable to heart disease due to the different symptoms they experience compared to men. To raise awareness of heart disease as the number 1 killer of women in Singapore, she shared on lesser-known risk factors that are specific to women, such as a history of pregnancy complications and menopause, whereby the fall in oestrogen levels causes a loss in protective effects against heart disease.

Did you know that up to 6-10% of those who develop Aortic Aneurysm[1] will not experience any obvious symptoms? An aneurysm may also lead on to a rupture, an emergency situation with the risk of sudden death. Adj A/Prof Vitaly A. Sorokin, Director of Aortic Centre Programme and Senior Consultant, Department of Cardiac, Thoracic and Vascular Surgery (CTVS), NUHCS, drew attention to key risk factors of this life-threatening heart condition that is often described as a "ticking time bomb", including hypertension, obesity and cholesterol levels, to help the audience safeguard against the silent threat through good lifestyle practices.

If you thought that hypertension is an "old person's disease" that affects only the elderly, think again! Prof Tan Huay Cheem, Senior Advisor, NUHCS, cautioned that hypertension or high blood pressure has been termed the "silent killer" as it is often asymptomatic[2]. Explaining the main pillars of treatment, he emphasised the importance of prevention through blood pressure self-monitoring, and shared expert tips to ensure accurate readings, such as emptying the bladder and avoiding caffeine, exercise and smoking for 10 minutes before measurement.

Finally, it was time for the lively Q&A session where participants benefited from cardiovascular tips and insights shared by the four heart health experts. Five lucky participants among the audience were also invited on stage for the lucky draw segment, and brought home exciting prizes after a fun and educational game! Each participant also brought home a hearty goodie bag provided by NUHCS and their various supporting partners at the end of the event.

The next public symposium in mid-2024 will be conducted in Mandarin. Keen to be part of the audience? Follow NUHCS' social pages for more details which will be announced closer to date.

MISSED THE SYMPOSIUM?

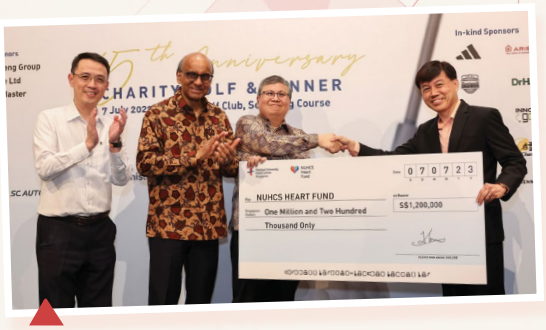
SCAN to watch the recorded version on NUHCS YouTube Channel:

ARTICLE BY
NUHCS PULSE Editorial

1. **Aortic Aneurysm** – Balloon-like bulge or swelling caused by a weak area in the walls of the aorta, can easily rupture even with normal physiological fluctuations in blood pressure
2. **Asymptomatic** – Totally without symptoms or signs of a particular health concern

HEARTS ALIGNED FOR A Gift OF HOPE

NUHCS 15th Anniversary Charity Golf & Dinner Event 2023



From left: Mr Foo Hee Jug, Deputy Chief Executive of NUHS, President Tharman Shanmugaratnam, then Senior Minister of Singapore, A/Prof James Yip, Executive Director of NUHCS and Prof Tan Huay Cheem, Senior Advisor of NUHCS, receiving the NUHCS Heart Fund donation cheque.

Everyone deserves a chance in rebuilding a healthier, better tomorrow. In commemoration of National University Heart Centre, Singapore (NUHCS)' 15th Anniversary, the inaugural Charity Golf and Dinner Event was held on 7 July 2023, with more than S$1.2 million raised in support of financially disadvantaged heart patients on their journey towards greater heart health, and a hopeful future.

Cardiovascular disease is the leading cause of death in Singapore, with almost 1 in 3 deaths caused by heart diseases or stroke in 2022. In view of the increasing number of people suffering from heart disease every year, NUHCS was established in 2008 to bring together specialty resources, expertise and capabilities for the treatment of the most complex heart, lung and circulatory diseases.

For the NUHCS 15th Anniversary Charity Golf & Dinner event, it was an honour to have President Tharman Shanmugaratnam, then Senior Minister and Coordinating Minister for Social Policies, gracing the dinner.

Emphasising the key takeaway of this fundraising event, Mr Tharman highlighted that Singapore must never become a welfare state but it can be a welfare society responsible for the wellbeing of others, quoting the NUHCS Heart Fund as an example through which one can play a part in taking care of one another's quality of life.

> We do it not only because it is the alternative to paying the government taxes. We do it because it leads to a more spirited society, a more resilient society, really, a better society where we all take care of the welfare of others, not just in our own families.
>
> *President Tharman Shanmugaratnam, then Senior Minister of Singapore*

This event saw a great turnout with more than 250 distinguished guests including former MP Lee Bee Wah, esteemed golfers and major donors, who came together to build the national centre's ongoing efforts in meeting Singapore's growing healthcare needs.

Beneficiaries of the NUHCS Heart Fund were also invited to the dinner gathering, which served as an opportunity for them to meet donors of the fund in person.

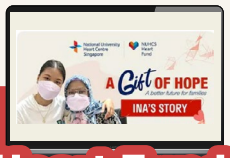
Mdm Ina (not her real name) – one of the many beneficiaries present at the event, was able to convey her appreciation to donors of the NUHCS Heart Fund, who played a part in giving her a new lease of life through their generous contributions. First diagnosed with Congenital Heart Disease (CHD) during her pregnancy 17 years ago, Mdm Ina was very grateful for the financial support from the NUHCS Heart Fund. The assistance that she received has significantly subsidised her medical treatment costs, bringing a peace of mind to her and her family as she is able to continue receiving long term care for her heart condition.

President Tharman Shanmugaratnam, then Senior Minister of Singapore, speaking to beneficiaries of the NUHCS Heart Fund.

Mr Ong Yew Lee, who was also invited as a beneficiary of the NUHCS Heart Fund, suffered from a narrow heart valve that required surgical procedures to treat. This placed a huge financial burden on Mr Ong as he only had sufficient savings for his everyday living needs. Being afraid that he would not be able to afford his treatment procedures, the monetary aid provided to Mr Ong through the NUHCS Heart Fund, rendered hope and assurance to him throughout the process. With the help of donors to the NUHCS Heart Fund, Mr Ong's financial worry has since been resolved and he is currently on the road to recovery.

This event also intended to express NUHCS' commitment in enhancing patient care within the community by spotlighting on the centre's collaboration with General Practitioners (GPs) as part of Healthier SG[1], to set up community cardiology clinics in the heartland. This initiative was put into action with the establishment of the NUHCS Heart Clinic @ Jurong Medical Centre (JMC), Singapore's first specialty cardiology clinic in the community.

With hopes to improve the heart health of the community as the population ages, A/Prof James Yip conveyed NUHCS' strive to foster stronger ties with community partners and enhance accessibility and convenience for more effective patient treatment.



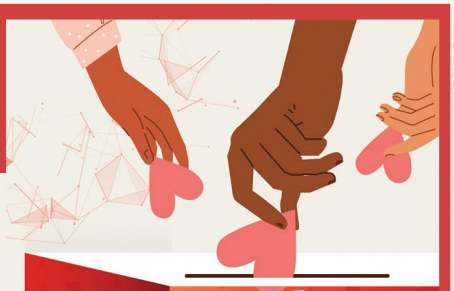
Watch Mdm Ina's Heart Fund story on NUHCS' YouTube here

About 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. 85% of applications in the past year to the NUHCS Heart Fund come from the lowest 20% per capita income group in our community.

The generosity of donors to the NUHCS Heart Fund provides renewed hope to our patients in rebuilding a healthier, better tomorrow. Beneficiaries like Mdm Ina and Mr Ong are able to draw strength and resilience to continue their road to recovery from the generous gifts to the fund.

Watch the NUHCS' 15th Anniversary Charity Golf & Dinner Event coverage on Channel NewsAsia here



If you'd like to make a difference in the lives of heart patients in need, do support our cause by making a donation. Every dollar counts with NUHCS Heart Fund.

Scan the QR code to make a donation via Giving.sg

100% of your donation goes towards helping our patients in financial need.

1. **Healthier SG** – A national initiative by the Ministry of Health (MOH) that aims to help all Singaporeans take proactive steps towards better health and quality of life in the years to come.

ARTICLE BY
NUHCS PULSE Editorial

Don't Lose Sleep Over Snoring

OBSTRUCTIVE SLEEP APNOEA FORUM 2023

On 19 August 2023, NUHCS organised a public health talk titled "Don't Lose Sleep Over Snoring" to spread awareness on Obstructive Sleep Apnoea (OSA) – a condition where the throat muscles relax during sleep, causing airway blockage. With up to one in three Singaporeans suffering from some form of OSA, this forum aimed to provide insightful information and tips on managing this under-diagnosed sleep disorder.

To equip the attendees with greater knowledge on how to effectively recognise symptoms of OSA for early intervention, four specialists were invited to discuss on OSA-related topics, ranging from risk factors to dispelling common myths and methods to mitigate the effects of OSA.

Prof Ronald Lee

Senior Consultant, Department of Cardiology, NUHCS

Commenced the forum with highlighting the correlation between snoring and heart disease.

- Snoring is considered a key indicator of OSA and is a sign not to be taken lightly
- Untreated OSA can significantly increase the risks of:

Hypertension | Stroke | Heart attack

Dr Serene Wong

Consultant, Division of Respiratory & Critical Medicine, Department of Medicine, NUH

Addressed concerns on daytime fatigue and snoring during sleep.

- Endowed practical tips for better rest
- Debunked common misconceptions related to:

Sleep | Snoring | OSA

Dr Juliana Colpani

BDS (Brazil), MS (Brazil), Research Assistant, Department of Cardiology, NUHCS

Delved into the causes of snoring, and its impact on cardiac health.

- Importance of regular follow-ups and oral hygiene in mitigating the effects of snoring and OSA
- Essential role of dentists in tending to snoring cases
- Effectiveness of oral appliances in managing sleep-related issues that can lead to OSA

Dr Crystal Cheong

Consultant, Department of Otolaryngology - Head & Neck Surgery, NUH

Offered advice on preventing the onset of OSA.

- Shed light on 'hypoglossal nerve stimulator' – an implantable device that triggers tongue movement, to avoid possible upper airway obstruction, allowing for a peaceful night's sleep

ARTICLE BY
NUHCS PULSE Editorial

TRANSFORMING OUTCOMES: MULTI-DISCIPLINARY APPROACH FOR THE FAILING HEART

NUHCS held the first Cardiogenic Shock Masterclass for medical professionals in the Asia-Pacific region

Rising in incidence in recent years, Cardiogenic Shock (CS) – a devastating condition where there is sudden dysfunction of the heart leading to low blood pressure and poor organ perfusion[1] – has seen patient survival rates plateau at 40% to 50%. Meanwhile, the advent of new treatment protocols and the introduction of Mechanical Circulatory Support (MCS) devices has resulted in a paradigm shift in the care and management of the cardiac condition.

Shining light into the serious medical emergency, the National University Heart Centre, Singapore (NUHCS), organised its inaugural NUHCS Cardiogenic Shock Masterclass on 13 May 2023 for medical professionals to learn more about this increasingly prevalent condition. Attended by more than 260 participants from around the region, the virtual webinar uncovered emerging technical advances and new directives in the evolving CS field.

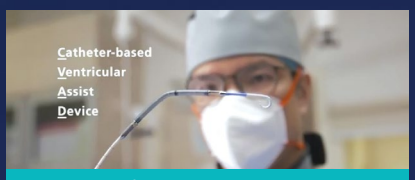
Recognising the importance of early detection and prompt intervention to tackle this life-threatening condition is crucial for effective patient care. Studies have shown that the inclusion of multidisciplinary insight, complemented by increased awareness and greater agility in haemodynamic-guided[2] management through a protocolised bundle-of-care approach[3], is key to restoring vital life signs and improving the outcomes of this group of fragile cardiac patients.

Experts from the Department of Cardiology, NUHCS, including Dr Anand Ambhore, Clinical Director of the Coronary Care Unit and Senior Consultant, Asst Prof Lim Shir Lynn, Director of Clinical Trial Unit and Senior Consultant, Asst Prof Robin Cherian, Consultant and Dr Shaun Chook, Associate Consultant, Department of Cardiology, NUHCS, spoke on the basics of cardiogenic shock and the latest therapeutics available. This includes updates on the latest definitions and classification systems in CS, the utilisation of invasive haemodynamics in treatment, to MCS devices available with echocardiography[4], an essential tool for patients on MCS devices, and the patient specifics to consider during implementation.

Adj A/Prof Ramanathan Kollengode, Senior Consultant, Division of Cardiothoracic Intensive Care Unit (CTICU), Department of Cardiac, Thoracic and Vascular Surgery (CTVS), NUHCS, then introduced the role of Extracorporeal Membrane Oxygenation (ECMO)[5] in CS, while Asst Prof Lin Weiqin, Clinical Director of Heart Failure Programme and Senior Consultant, Department of Cardiology, NUHCS expounded on his expertise as chief of the CS heart team, to highlight on the management and approach to forming a robust CS Team.

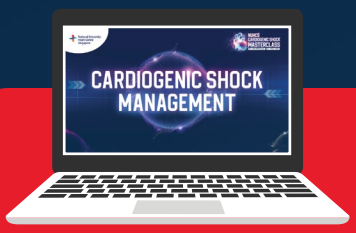
Synthetising the key learning pointers during the masterclass, Asst Prof Lin reiterated the components of shock management including the strengthening of protocol-based workflows, early diagnosis and initiation of CS therapies, and a multi-disciplinary, team-based care approach geared towards improved patient outcomes — guided by the principle of "better", more comprehensive management, rather than pursuing "faster" as a central paradigm.

It is hoped that through the masterclass, all attendees have developed a deeper appreciation of the nuances of CS management to help make further inroads in enhancing decision-making during the treatment procedure, and gained valuable insights on setting up a similar specialist team in their hospital,to combat this life-threatening condition.



The use of MCS devices must be tailored according to the patient's characteristics.

> "A multi-disciplinary approach towards management of cardiogenic shock, employing early invasive haemodynamic monitoring and early mechanical circulatory support can potentially improve outcomes for this deadly condition."
>
> *Asst Prof Lin Weiqin, Clinical Director of Heart Failure Programme and Senior Consultant, Department of Cardiology, NUHCS*



Scan the QR code to discover the NUHCS' multidisciplinary team behind the management of Cardiogenic Shock

ARTICLE BY

Asst Prof Lin Weiqin

Clinical Director, Heart Failure 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. **Organ perfusion:** Circulation or supply of blood to organs, maintained by cardiac output, blood volume and arterial blood pressure
2. **Haemodynamic-guided:** Based on monitoring of primary vital signs such as respiratory rate, heart rate, pulse, blood pressure, etc.
3. **Bundle-of-care approach:** A collection of best-practice interventions that may be applied to the management of a particular condition
4. **Echocardiography:** The use of ultrasound to produce live images of the heart
5. **ECMO:** A highly specialised therapy used to support the heart and/or lung functions of critically ill patients with cardiopulmonary failure.

HEARTFELT JOURNEYS OF YOUNG HEART WARRIORS AND THEIR FAMILIES

NUHCS Congenital Heart Surgery Parent Huddle 2023

The NUHCS Congenital Heart Surgery Parent Huddle was held on 22 July 2023, in partnership with Congenital Heart Association Parent & Patient Support (CHAPPS), bringing together congenital heart patients and their families to learn more about Congenital Heart Disease (CHD) and meet other parents who are also in the journey of caring for a child with CHD.

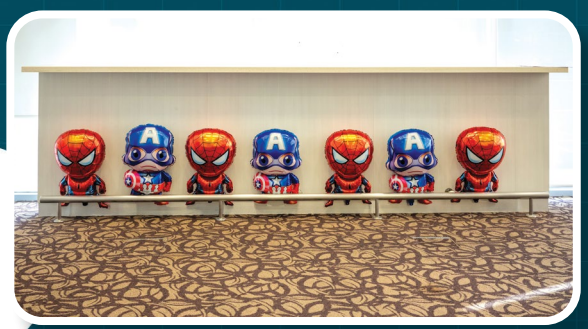
WHAT IS CONGENITAL HEART DISEASE (CHD)?

Structural or functional heart abnormalities that are present at birth which may lead to disruption or blockage of blood and oxygen flow.

SOME COMMON BIRTH DEFECTS INCLUDE:

SEPTAL DEFECT –
Hole in the heart's wall that separates the chambers, causing disruption in the flow of oxygen-poor and oxygen-rich blood in the body

TETRALOGY OF FALLOT (TOF) –
Combination of four heart defects affecting blood flow through the heart



The theme of the event was **"SUPERHERO"**, portraying the mighty strength of a Superhero that every family embodies.

A/Prof Laszlo Kiraly, *Head of Congenital Heart Surgery Division, Department of Cardiac, Thoracic and Vascular Surgery (CTVS), NUHCS,* delivered a welcome speech, encouraging families to hold onto hope and build friendships with other attendees.

Light refreshments were also available throughout the session.

Glitter tattooing and balloon sculpting activities for all children at the event.

Kickstarting the lineup of engaging events, Miguel Espiritu, a resilient 15-year-old young heart warrior at NUHCS, took the spotlight with a guitar performance. Having undergone several major surgeries since 2010 after being diagnosed with Transposition of the Great Arteries (TGA) – a CHD where the heart's main blood vessels are in abnormal positions – his remarkable performance not only served as a source of inspiration to the audience, but also made his parents proud by embodying the essence of living life to the fullest and pursuing his passions against all odds.

Several heart patients and their caregivers were also invited to be part of a panel discussion for this year's NUHCS Parent Huddle, serving as a touchpoint for other attending families to seek advice or address their queries.

The first panel comprised caregivers of heart patients who offered fellow parents enlightenment and encouragement in caring for their children with CHD. One caregiver amongst the panelists recounted his own journey of tending to his 12-year-old son who has the conditions of Down syndrome and Tetralogy of Fallot (ToF).

Following the caregivers' sharing was an exchange of experiences from two heart patients, both currently in their thirties and navigating through their continued recovery progress with ToF.

Through their pursuits to recovery, they became beacons of hope to the children and their families, as their stories of building their own families and even having children of their own served as an inspiration to the attendees.

To conclude the huddle, a Question & Answer (Q&A) session was also conducted for all attendees to share their queries anonymously with our team of CHD doctors and surgeons who provided their professional advice on the questions posed.

NUHCS is dedicated to providing holistic care for the healthier well-being of all our patients. This Parent Huddle event fostered heartfelt connections within the community, and offered a supportive space for families with children battling congenital heart conditions.

"DON'T GIVE UP BEFORE THE MIRACLE HAPPENS."
– Kenny Lee
(Volunteer lead, CHAPPS and parent of CHD warrior)

"I AM NOT ALONE IN THIS, AND I HAVE THE RIGHT PEOPLE AROUND SUPPORTING ME."
– Tan Xing Chun
(39-year-old CHD warrior)

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NUHCS PULSE Editorial

Prof Tan presenting on stage as one of the Course Directors.

BRIDGING *Hearts*, INSPIRING EXCELLENCE

Advancing Cardiology Across Borders at AICT-AsiaPCR 2023

Held from 21 to 23 September 2023 at Suntec City Convention Centre, the Asian Interventional Cardiovascular Therapeutics (AICT)-AsiaPCR 2023 conference saw an impressive turnout of more than 700 participants gathered together, with NUHCS being the founding institution of this global meeting and Prof Tan Huay Cheem, Senior Advisor, NUHCS, as one of the founding Course Directors.

Coming together to uncover the best practices in cardiovascular care across Southeast Asia and beyond, this in-person congress served as a platform for industry partners, experts, clinicians, and researchers to enhance their practical skillsets and exchange insightful perspectives on the advancements in the field.

Featuring more than 300 distinguished faculties and presenters, this conference provided a comprehensive exploration of essential topics in the diagnosis and treatment of different cardiac conditions, allowing participants to gain valuable insights and broaden their exposure in improving patient outcomes.

Use of percutaneous left ventricular support device in complex Percutaneous Coronary Intervention (PCI), led by A/Prof Adrian Low and Dr Gavin Ng.

AICT-AsiaPCR

Formed in 2019, AICT-AsiaPCR is an educational platform built by local practitioners, with the support of centres of excellence in Asia Pacific and Europe, to focus on the diverse needs of patients in the interventional cardiology landscape.

A global meeting hosted in the Asia Pacific region, this platform allows knowledge exchange between peers and the opportunity for healthcare professionals to showcase research and innovation, aimed at contributing to the latest developments in treatment and care possibilities to better serve the region's patients.

Best of AICT-AsiaPCR 2023

Over **700** participants

5 Session rooms covering all the hot topics

Over **330** faculty & presenters

6 live case sessions

396 submissions received

13 supporting industry partners

The NUHCS team showcased four live demonstrations of complex coronary intervention procedures, each led by two interventionalists[1]. The procedures highlighted various state-of-the-art techniques including the Impella[2] percutaneous support system[3], physiology- and intravascular imaging-guided interventions[4], and the treatment of coronary heart disease.

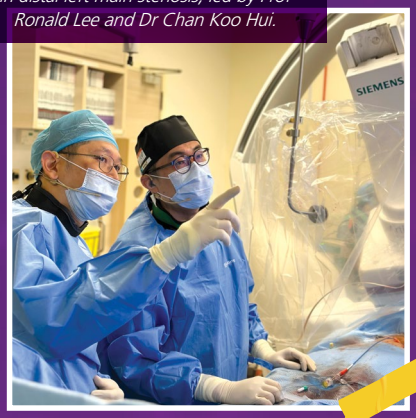
In addition, as the first institution in the Asia-Pacific region to provide a systematic team-based treatment for acute Pulmonary Embolism (PE)[5], the NUHCS structural team led by Dr Ivandito Kuntjoro, Director of Structural Heart Programme, Department of Cardiology, NUHCS, were also invited to present their local data, results, and procedural techniques at the first dedicated PE session of this conference.

During the event, Prof Tan was also honoured with the Lifetime Achievement Award from the Chien Foundation, in recognition of his pivotal role in actively advancing the local development of interventional cardiology. Beyond his significant support in the research and teaching of Percutaneous Coronary Intervention (PCI), Prof Tan has also conducted over 10,000 operations while continuing to train thousands of doctors worldwide. These remarkable contributions spanning more than 30 years were recognised and commended with this prestigious accolade at the AICT-AsiaPCR 2023 meeting.

Prof Tan receiving the Chien Foundation Lifetime Achievement Award.

Drawing delegates from the Asia-Pacific region and Europe, the AICT-AsiaPCR congress remains a source of inspiration for the emerging generations of doctors through shared professional experience, technical expertise, defined techniques and advanced technologies with the latest research and innovations.

PCI of left main coronary disease using two-stent PCI bifurcation technique in distal left main stenosis, led by Prof Ronald Lee and Dr Chan Koo Hui.



Complex PCI with Drug-Eluting Stent (DES) and/or Drug-coated balloons (DCB), led by Dr Loh Poay Huan and Dr Kua Jieli.

Physiology-guided multivessel PCI, led by Prof Tan Huay Cheem and Dr Jason Chen.

1. **Interventionalists:** Medical professionals who specialise in performing minimally invasive procedures to treat coronary artery and related cardiac conditions.
2. **Impella:** A procedure where the Impella device is inserted into the left heart ventricle to pump oxygen-rich blood to the body, guided by a catheter through a small incision.
3. **Percutaneous support system:** An apparatus that provides mechanical circulatory support to vital organs through a minimally invasive procedure, for cardiac failure patients.
4. **Physiology- and intravascular imaging-guided interventions:** Modalities using specialised techniques that provide detailed information on diagnoses for effective decision-making.
5. **Pulmonary Embolism:** Sudden blockage in the blood vessels that transmit blood to the lungs, also known as pulmonary arteries.

ARTICLE BY

Prof Tan Huay Cheem
Senior Consultant, Department of Cardiology, and 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.

NUHCS HEALTH SCREENING CARNIVAL

Bringing health screenings right into the heartlands

The National University Heart Centre, Singapore (NUHCS) commemorated the annual World Heart Day in September with a Health Screening Carnival, filled with fun games and prizes, held at Yew Tee Community Club in partnership with Limbang constituency and People's Association.

Graced by Deputy Prime Minister and Member of Parliament (MP) for Marsiling-Yew Tee GRC, Mr Lawrence Wong, the event was attended by over 300 participants who engaged in various fun and insightful activities.

In line with the nationwide Healthier SG initiative in driving preventive health, chronic screening tests for high blood pressure, diabetes and high cholesterol were made available at no cost to eligible registered participants to help diagnose for any underlying conditions.

As a key event highlight of the NUHCS Health Screening Carnival, painless and non-invasive Electrocardiogram (ECG)[1] tests were also conducted for participants on-site to pick up irregular heart rhythms and allow for early diagnosis of possible heart conditions.

Guest-of-Honour for the event, Deputy Prime Minister, Mr Lawrence Wong, pictured with attendees

Did you know that foot ulcers and leg pain during rest can be signs of early Peripheral Arterial Disease (PAD)[2]?

Raising awareness of early lower limb PAD whereby symptoms can be easily missed, participants were offered a clinical assessment of their lower limbs and pulse by the podiatrists to help detect any abnormalities.

Two engaging themed talks further shone the spotlight on key topics of concern. Sharing about the risk factors of PAD, NUH Senior Podiatrist Ms Thasvhinni Nas, explained the importance of early detection and intervention, in preventing PAD – which is usually caused by plaque build-up in arteries, resulting in un-healed wounds and limbs amputation.

As finding time to exercise in our busy lives gets harder, Dr Benjamin Tung, Consultant, Department of Cardiology, NUHCS, shared in his talk on "Exercise and Heart Health" on how a sedentary lifestyle, including prolonged sitting, increases the risk of heart disease by 14% and death by 24%.

(Left)
NUH Podiatrist conducting foot screening

(Right)
NUHCS Cardiologist Dr Benjamin Tung encouraged everyone to work towards cardiovascular wellness through daily efforts

For every minute without CPR and AED[3], the chances of survival for out-of-hospital cardiac arrest drops by 10%.

With a growing incidence of out-of-hospital heart attacks over the years, the event also highlighted the role of Cardiopulmonary Resuscitation (CPR) in increasing chances of survival in critical situations. Through a live CPR demonstration, the NUHCS team of certified nurses showcased correct techniques for resuscitating victims of breathing and cardiac emergencies.

Participants young and old shared unforgettable moments and camaraderie through fun and educational activities

Participants as young as three years old were challenged to carry out hands-on CPR techniques on real-life mannequins, alongside coaching and guidance from the NUHCS nursing team, thus walking away with greater confidence and knowledge in the life-saving skill.

(Left)
"Hands-on with CPR" booth

(Right)
Introducing Caring Hearts Support Group (CHSG), a volunteer-run cardiac patient support group of NUHCS

To encourage fellow heart patients with cardiac conditions, Ms Magdalene Chia, programme lead of Caring Hearts Support Group (CHSG), took to the stage to share more about the group's initiative, where she introduced other CHSG heart warriors who provided support and encouragement to one another on their recovery journeys.

A fun yet insightful way to pick up heart health tips, the carnival also saw booths set up in collaboration with various vendors, with attractive highlights including redemption of goodie bags and light snacks for participants who completed their carnival stamp card.

Empowered on their health journeys, the event concluded with participants gaining a stronger understanding of how small lifestyle changes and efforts can go a long way in building an active, healthy life. **Watch out for more exciting activities by NUHCS when World Heart Day comes around again in 2024!**

An active heart is a happy heart: participants join in a mass exercise activity arranged by the Limbang Grassroots team

About World Heart Day

World Heart Day highlights Cardiovascular Disease (CVD), including heart disease and stroke, as the world's leading causes of death claiming 18.6 million lives a year. It emphasises how at least 80% of premature deaths from heart disease and stroke could be avoided by controlling lifestyle risk factors such as tobacco use, unhealthy diet, and physical inactivity.

1. **Electrocardiogram (ECG):** A test that records electrical activity of the heart to investigate symptoms of possible heart conditions
2. **Peripheral Arterial Disease (PAD):** A chronic condition where narrowed arteries reduce blood flow to the limbs, mostly the legs or lower extremities.
3. **AED:** Automated external defibrillator

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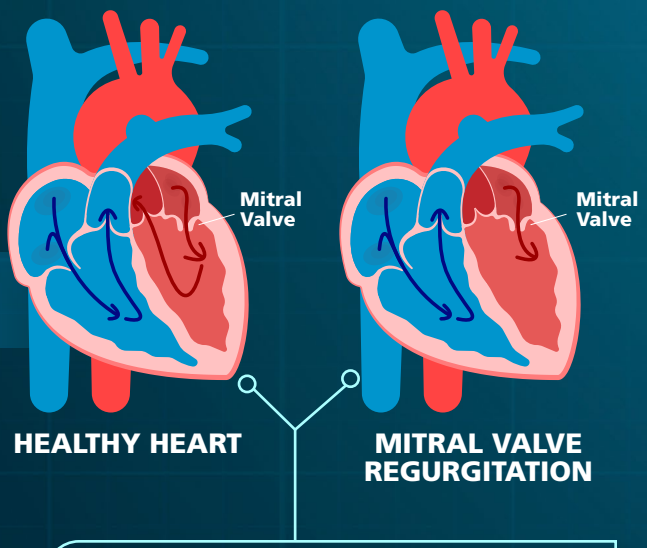
NUHCS PULSE Editorial

A NEW PATHWAY IN MITRAL VALVE HEART SURGERY

IMPROVED CONTROL FOR SURGEONS, BETTER SURGERY OUTCOMES FOR PATIENTS



Commonly known as "leaking heart valve", mitral valve regurgitation[1] is the most common form of heart valve disease where patients experience a backward leaking of blood in their heart, which can result in complications over time, such as atrial fibrillation[2] and heart failure.

Acting as "doors" that direct the one-way blood flow from the heart to the rest of the body, mitral valves play a crucial role by opening and closing with every heartbeat, to prevent blood from flowing the wrong way.

While it is better for mitral valves to be repaired rather than replaced to avoid possible complications such as infection or clotting, traditional techniques used in current valve repair surgeries require substantial experience on the surgeon's part to decide on the positioning, length, and the number of cords required during the procedure. This means an increased level of technical complexity and a steeper learning curve for less experienced surgeons, and may result in varying surgical results for patients.

Driven to deliver more intuitive techniques and consistent patient outcomes, Prof Theodoros Kofidis, Head and Senior Consultant, Department of Cardiac, Thoracic and Vascular Surgery (CTVS), NUHCS, has crafted a new set of 12 mitral valve techniques improving on current established procedures, with inspiration from Roman architecture. Termed "The Singapore Correction", the techniques allow for better surgical control through simplifying current procedures, to achieve more uniformity in patient results each time.

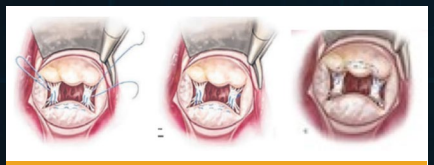


Figure illustration of the "Roman Arch" technique.

In the world of cardiac surgery where precision is paramount, equipping surgeons with greater confidence in the operative procedure helps to unlock the possibility of salvaging the use of the heart's original mitral valve rather than replacing it. To this end, the "Roman Arch" technique enables the surgeon to position the suture by using the heart's own papillary muscle tips as a guide, which reduces the risk of surgical errors. Like a sturdy bridge connecting the damaged valve to both papillary muscles, the "Roman Arch" allows the valve repair to be done using just a single running suture. This not only simplifies the procedure for the surgeon, but also reduces the risk of complications for patients.

> "The new surgical techniques for mitral valve repair allow for more standardised outcomes in patients…so more (patients) get to keep their valves, rather than have them replaced and live with the risk of related complications."
>
> **Prof Theodoros Kofidis**
> Head and Senior Consultant,
> Department of Cardiac, Thoracic and Vascular Surgery (CTVS), NUHCS

Applied by the Department of CTVS at NUHCS, the techniques have since been used in the surgeries of 10 patients with good outcomes, and have been adopted by international hospitals such as those in Italy and Greece.

Enhancing patient safety and potentially life-changing outcomes in cardiac surgery set-ups, this innovation unlocks a new chapter in mitral valve treatment – one of the most common heart surgeries performed today.

Prof Theodoros Kofidis performing cardiac surgery

Scan to read Lianhe Zaobao article

(Note: article is in Mandarin)

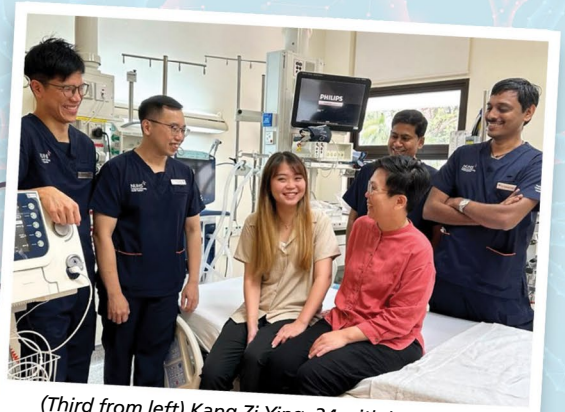
1 **Mitral valve regurgitation:**
A common heart valve condition characterised by a backflow of blood in the left ventricle (lower chamber) of the heart when the mitral valve does not close completely

2 **Atrial Fibrillation:**
Condition where the heart beats irregularly, increasing the risk of stroke, heart failure and/or other complications

ARTICLE BY
NUHCS PULSE Editorial

Fighting for Life During Sudden Heart Failure

Introducing the new Lifesaving Cardiogenic Shock Treatment Approach



(Third from left) Kang Zi Ying, 24 with her mother Mdm Yau Mei Fun, and the team of doctors in charge of her care: (from left) Dr Christopher Koo, Consultant and Asst Prof Lin Weiqin, Senior Consultant, Department of Cardiology, with Dr Senthil Kumar Subbian, Consultant, and Adj A/Prof Ramanathan K.R., Senior Consultant, Department of CTVS, NUHCS.

In the prime of her youth, Kang Zi Ying, a polytechnic student, never anticipated that a heart condition could leave her fighting for her life. Despite having no history of heart problems, she suddenly found herself in the grip of a condition known as "Cardiogenic Shock", a harrowing situation where only 10% of her heart functioned at one point. Nausea, dizziness and chest pain were the common symptoms that led to this unexpected battle.

Seeking help at the National University Hospital (NUH)'s Emergency Department, much of what happened next was a blur for the 24-year-old, who only recalled feeling unwell and passing out after an operation. Unfortunately, Zi Ying's condition deteriorated rapidly after her admission, with her heart facing an incapacity to function and efficiently pump blood to meet her body's needs.

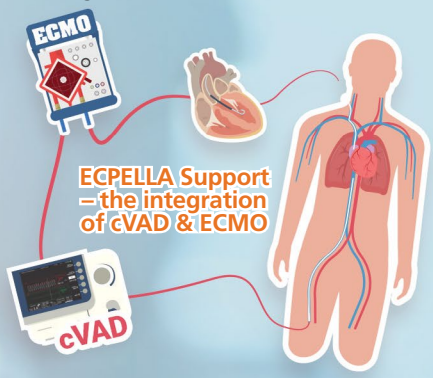
Due to her life-threatening condition, the National University Heart Centre, Singapore (NUHCS) cardiogenic shock team stepped in to save Zi Ying by deploying a new treatment strategy known as the "ECPELLA" support. This approach simultaneously integrates the Extracorporeal Membrane Oxygenation (ECMO)[1] Circuit and Catheter-based left Ventricular Assist Device (cVAD)[2] to maximise her chances of recovery.

The ECMO device took over her heart and lung functions, ensuring sufficient blood circulation in the body, while the cVAD allowed blood from the heart's left chambers to flow out of the body, thus reducing cardiovascular burden and preventing further complications.

As a national specialty centre, NUHCS is the only public institution in Singapore equipped with a multidisciplinary team of cardiogenic shock specialists trained to provide this lifesaving "ECPELLA" support.

Due to the complexity of deploying both ECMO and cVAD approaches simultaneously, the team comprises of experts from across 10 disciplines, including cardiologists, cardiothoracic surgeons, intensive care doctors and critical care nurses, all working closely together.

Asst Prof Lin Weiqin, Clinical Director of the Heart Failure Programme and Senior Consultant, Department of Cardiology, NUHCS, explains that for patients below the age of 40, acute infection of the heart (myocarditis) is usually the cause of cardiogenic shock. This inflammation may result from the common cough or cold, which can trigger an allergic reaction from the body's immune system, potentially leading to heart failure.



While distraught, Mdm Yau Mei Fun trusted NUHCS' experts to employ the most suitable treatment approach to increase her daughter's chance of survival.

After spending 22 days in the hospital, Zi Ying was finally discharged, well on her way to recovery. She has to continue her medications and follow-up regularly with her doctors at NUHCS, while working steadily towards a full recovery.

It is worth noting that a majority of patients affected by myocarditis experience mild symptoms. However, only a very small percentage, estimated at less than 10 young patients a year, will go on to develop fulminant myocarditis[3], as shared by Asst Prof Lin. Nevertheless, it is important to seek medical help if you experience symptoms such as unexplained chest pain and shortness of breath.

Formed in 2020, the multidisciplinary cardiogenic shock team at NUHCS continues to keep updated with the latest mechanical circulatory support devices for life-saving patient care. Their dedication and expertise continue to offer hope and second chances at life for individuals like Zi Ying.

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NUHCS PULSE Editorial

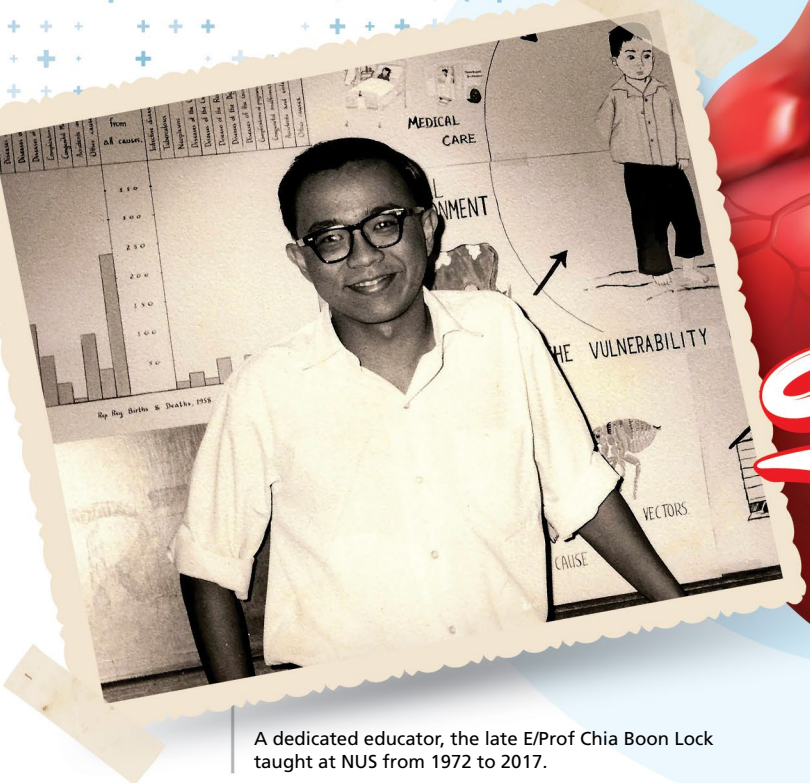
1. **ECMO**: A life support machine that takes over the heart and lung functions. ECMO is a life-sustaining treatment where patients need to be monitored and cared for by a specialist team in intensive care round the clock.
2. **cVAD:** A short-term mechanical circulatory support (MCS) device which helps pump blood from the lower chambers of the heart to the rest of the body.
3. **Fulminant Myocarditis:** Severe acute myocarditis or acute inflammation of the heart muscles, which can result in sudden weakening of the heart pumping function and/or disturbances in the heart's electrical conduction system.

Read more on her inspiring story:

SCAN TO READ AsiaOne article

SCAN TO WATCH 8world news video

SCAN TO READ Tamil Murasu article



A dedicated educator, the late E/Prof Chia Boon Lock taught at NUS from 1972 to 2017.

KEEPING Hearts BEATING

with the Chia Boon Lock Memorial Fund

Grooming doctors of the future through providing financial aid to medical students

Known as Singapore's "Father of Cardiology", the late Emeritus Professor Chia Boon Lock was an inspirational educator, mentor and teacher fondly remembered for his engaging teaching style, and is a respected clinician admired for his pioneering work in the medical field.

E/Prof. Chia contributed to building the foundation of NUHCS by serving as the Chief of Cardiac Department at National University Hospital (NUH) from 1996 to 1999. Having impacted many cohorts of doctors and cardiologists with his larger-than-life personality and vivid lectures over decades of teaching and mentorship, he has been a tireless proponent of education for doctors in Singapore.

E/Prof. Chia was the first cardiologist in Singapore to introduce 24-hour ambulatory blood pressure monitoring as a diagnostic test for heart patients. He was also one of the first in Singapore to introduce echocardiography, one of the most versatile and commonly used imaging tests today.

E/Prof. Chia's passion and legacy lives on through the Chia Boon Lock Memorial Fund, which was established in 2018 by his peers, colleagues and ex-students to honour him, and to advocate for the principles he holds close to his heart.

EDUCATION IS A GIFT

The Chia Boon Lock Memorial Fund was inaugurated in the academic year 2020/2021 and aims to assist full-time medical undergraduates at the NUS Yong Loo Lin School of Medicine, with hopes that every deserving student is allowed to attain the best possible education and training, despite their financial circumstances. A secondary but no less vital objective is in the advancement of medical research that will help to boost care and health outcomes, along with shaping future generations of doctors.

The late E/Prof Chia also lent his expertise across years of public service.

Coming from a family of 4, I have always wanted to become a doctor, more so after the diagnosis of my mother's condition back in 2020. As a doctor in future, I hope to be able to treat people and help to alleviate their pain.

- Chia Boon Lock Memorial Fund Beneficiary and Year 3 Medical Student, Ms. Chua Pei Xuan

Pei Xuan is a Year 3 medical student at the Yong Loo Lin School of Medicine who speaks passionately about her journey in medicine, and led the Project iRemember dementia screening initiative last year. She sees it as an avenue to connect with elderly in need of medical help, and is thankful that the experience gives her a ground-level understanding of the escalating condition in the local healthcare landscape, given Singapore's looming silver tsunami.

"Being awarded this bursary means a lot to me as it allows me to focus on my education…empowering me to push myself to do my best in school without worrying about finances," said Pei Xuan, who hopes to pay it forward.

As we navigate Singapore's changing healthcare landscape, the growth of the Chia Boon Lock Memorial Fund will empower the next generation of doctors to pick up relevant clinical and surgical skills, and lead and serve with compassion and integrity.

If you wish to build on the good work of visionaries like E/Prof. Chia, help financially-needy students stay on track to complete their education in medicine, and shape the future of quality, patient-centred care, you can make a donation and be a part of the change.

Scan the QR code to make a donation

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NUHCS PULSE Editorial

A SAFER, BETTER APPROACH FOR Heart Rhythm Disorder

A novel & safe treatment technique, Pulsed Field Ablation (PFA) treats Atrial Fibrillation without causing collateral damage to the body

Did you know that those with Atrial Fibrillation (AF) are five times more likely to suffer from a stroke? Affecting approximately 1 in 100 people, AF is the most common heart rhythm disorder in the world and afflicts 2.6% of men and 0.6% of women here – a number that is set to rise dramatically given Singapore's ageing population. If left untreated, it can trigger serious complications including stroke, heart failure and even death.

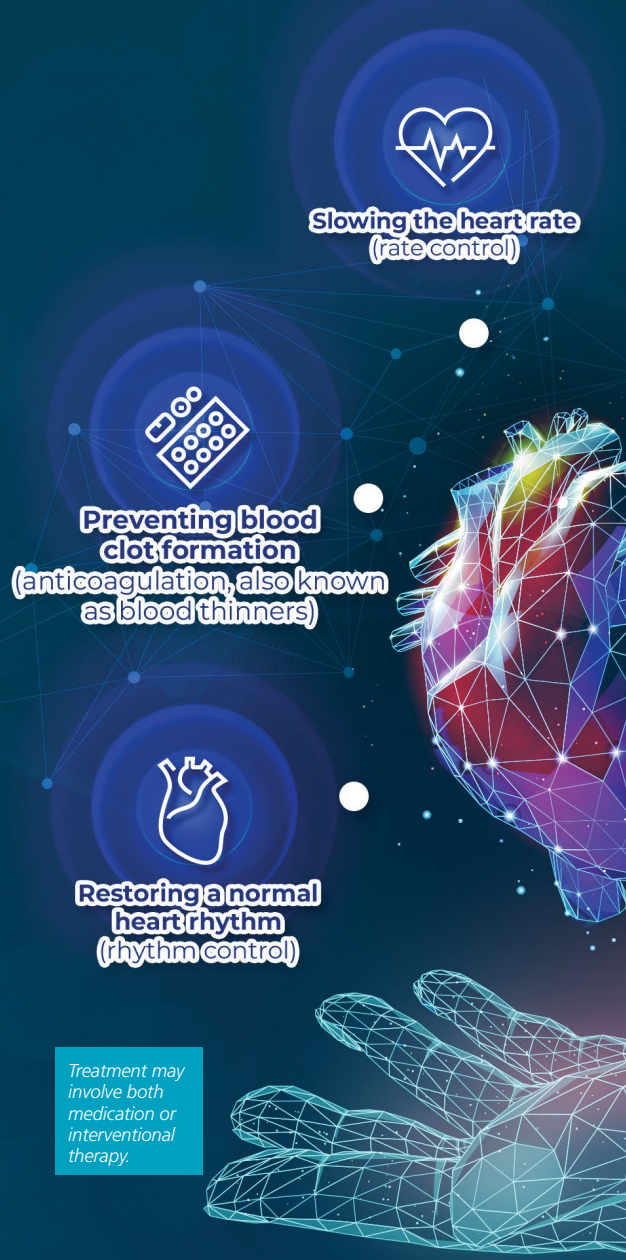
Known as AFib or AF in short, possible symptoms include breathlessness or heart-racing palpitations caused by rapid and irregular heartbeats, which may go up to 300-600 beats per minute. Prevalence of the condition increases with age, while family history, genetics, lifestyle, and underlying medical conditions all play a role in heightening one's risk of the condition.

Managing Atrial Fibrillation (AF)

Generally, managing AF involves three pathways: slowing the heart rate, restoring a normal heart rhythm, and preventing blood clot formation. Usually diagnosed with an Electrocardiogram (ECG)[1], doctors use cardiac ablation - a thermal-based method involving the use of heat (Radiofrequency Ablation, or 'RFA') or cold (Cryoablation) - to intentionally create scarring and stop the heart from conducting disorganised electrical signals.

There are about 4,000 to 6,000 patients each year who seek treatment for AF. However, cardiac ablation as the standard approach for AF is not without its own complications, as it may bring about collateral damage to nearby structures, tissues and organs.

"Thermal-based ablation can cause injury to the pulmonary veins of the heart, breathing (phrenic) nerves, or vagal nerves," explains Adj A/Prof Seow Swee Chong, Director of Cardiac Electrophysiology and Pacing and Senior Consultant, Department of Cardiology, NUHCS. In rare instances, it can even result in injury to the oesophagus (food pipe) - a serious complication that can cause stroke or even death, he adds.



Treatment may involve both medication or interventional therapy.

Unlocking A New Chapter in AF Treatment: Safer & More Efficient

Leading an active lifestyle since young, 46-year-old Zhang Feng started experiencing intermittent episodes of palpitations that increased in duration over the past five years, to the point where it took more than 30 minutes for his heart rate to return to normal after an exercise session. Finding it unusual that he had difficulty breathing while engaged in simple activities such as climbing a staircase or doing housework, Mr Zhang had an ECG performed last year and was diagnosed with AF.

During the initial phase, medication was prescribed to control his heart rate, while Mr Zhang started exploring alternatives as he did not want to rely on lifelong medication for his condition and was also keen to return to his usual exercise routine.

After close consultation sessions with Adj A/Prof Seow on his treatment options, Mr Zhang became the first patient at NUHCS to receive Pulsed Field Ablation (PFA) through a procedure in January this year. Already used in Europe, Australia and the United States, this approach utilises a series of non-thermal, ultra-short electrical pulses to achieve ablation and correct abnormal heart rhythm disorders. Undertaken by Adj A/Prof Seow and the team of specialists at NUHCS, the centre is among the first in Singapore to treat AF patients with this new PFA approach.

Breathless No More: A Second Lease on Life

"As PFA is highly specific and allows for the electrical field to be tuned such that it only affects selected tissues, this new treatment option is a safer and more efficient procedure than thermal-based methods. Additionally, it has shown similarly successful outcomes across multiple studies," explains Adj A/Prof Seow.

> **"This means that the chance of collateral damage to surrounding blood vessels, nerves and the food pipe is greatly reduced from 3% to 0%, making PFA a much safer procedure for patients…without compromising on the efficacy of treatment."**
>
> *Adj A/Prof Seow Swee-Chong, Director of Cardiac Electrophysiology and Pacing and Senior Consultant, Department of Cardiology, NUHCS*

No longer experiencing palpitations and related symptoms of breathlessness, Mr Zhang has since been given the go-ahead by his doctor to resume regular exercises. While he continues to monitor his heart health with help from the specialist team at NUHCS, he is glad to have made a recovery and is back on track to lead an active lifestyle. "It's a huge relief to have this treated, and I'm thankful to be able to have my life almost back to normal again," he said.

A 3D electroanatomic map of the ablation site

Mr Zhang discusses his treatment options with Adj A/Prof Seow.

WATCH the feature on Channel NewsAsia here

1. **Electrocardiogram (ECG):** A non-invasive test that measures electrical activity of heartbeats. The two common types are the resting 12-lead ECG and the Exercise Stress ECG.

ARTICLE BY
NUHCS PULSE Editorial

GETTING YOUR HEALTH BACK ON TRACK AFTER A HEART ATTACK

ACUTE MYOCARDIAL INFARCTION: ALLIED HEALTH-ORIENTED, PATIENT-CENTRED TECHNOLOGY-ENABLED (AMI-HOPE) PROGRAMME

SINGAPORE HAS ONE OF THE HIGHEST 30-DAY ALL-CAUSE MORTALITY RATES[1] AMONG HIGH-INCOME OECD[2] NATIONS – WITH 1 IN 220 RESIDENTS PROJECTED TO HAVE A HEART ATTACK BY 2030.

The days following a heart attack can be a scary, lonely journey for many patients, who may face an overwhelming range of emotions, such as confusion or worries and anxieties regarding their condition. They may also experience side effects from the medication they take.

In patients with Acute Myocardial Infarction (AMI), or more commonly known as heart attack, the early post-discharge is crucial for monitoring complications and adjusting medications to expedite heart muscle recovery. Although early post-discharge reviews are ideal, there are instances where the first follow-up appointment date may not be scheduled on time, due to lack of available slots or other unforeseen delays.

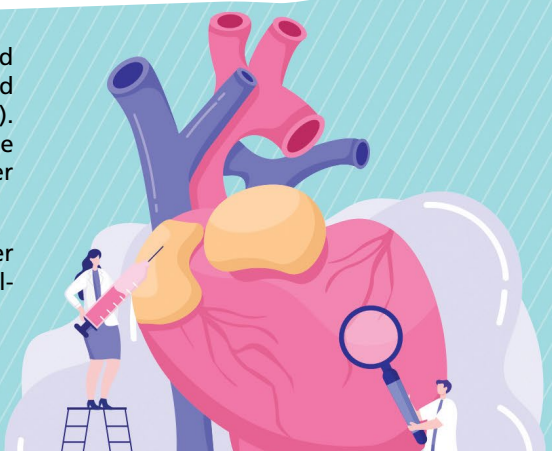
Despite the recognition that the path to a healthier heart extends beyond the hospital, cardiac rehabilitation[3] participation rates remain low at 15%, indicating a need for improved patient engagement during their transition to primary care[4].

AMI-hope

Unlocking a personalised care journey during a critical time of heart muscle recovery, the AMI-HOPE initiative seeks to ultimately reduce mortality, rehospitalisation rates and length-of-stay for post-AMI patients.

To allow earlier medical reviews for patients, NUHCS is taking the lead in a nationwide programme named **A**cute **M**yocardial **I**nfarction: Allied **H**ealth-**O**riented, **P**atient-centred and Technology-**E**nabled (AMI-HOPE). This 12-month subsidised heart attack recovery programme combines the power of digital health and the human touch to help patients recover faster.

Streamlining a patient-centred journey, AMI-HOPE facilitates a smoother transition to primary care, and ensures close monitoring of patients' well-being during the critical phase of heart muscle recovery.



Redesigning the Care Pathway with Digital Technology

Using the dedicated Health Discovery Plus (HD+) mobile application, patients are nudged to take their Blood Pressure (BP) and Heart Rate (HR) readings as directed. These collected data are shared with allied health professionals sited in primary care settings, such as polyclinic pharmacists, who can promptly reach out to patients within a week of discharge, effectively reducing their uncertainties during the recovery process.

Digitally empower patients to practise self-care through exercise, diet and medications

Leverage on pharmacist capabilities & telecollaboration to drive personalised treatment goals and reduce reliance on face-to-face visits with a specialist doctor at a hospital

Enhance the skills of primary care teams to manage patients better and earlier

To ensure timely follow-up for patients of the AMI-Hope programme, pharmacist clinicians will review the patient's progress and offer outpatient[5] follow-up care between doctor appointments. With their expertise, they are also able to adjust patient medications and order follow-up tests when necessary. At the same time, patients will receive alerts for abnormal readings, and access practical tips on managing their diet, wellness and lifestyle through the HD+ mobile application. This empowers post-heart attack patients to take greater ownership of their self-care in a non-intrusive way.

By leveraging on technology and involving pharmacist clinicians with doctors in the care protocols, the AMI-HOPE model is poised to deliver more attentive care and mitigate potential delays in post-discharge follow-ups – leading to improved health outcomes, and ultimately save more lives through unlocking enhanced synergies in care.

> **Technology has eliminated many barriers posed by traditional care models. Highly trained pharmacists enabled by technology will have continuous patient management instead of infrequent episodic care from over-extended doctors.**
>
> *A/Prof Mark Chan,*
> *Deputy Executive Director,*
> *NUHCS*

1. **Mortality Rate:** The number of deaths from a particular cause or during a particular period of time in a specific population
2. **OECD:** Organisation for Economic Cooperation and Development
3. **Cardiac Rehabilitation:** A multi-disciplinary programme which assists patients with cardiac disease to reintegrate into the community and regain their quality of life as much as possible, while reducing the risk of relapse
4. **Primary Care:** First line of care in the community providing holistic & personalised care for the patients of different age groups
5. **Outpatient:** Treatment, procedure or consultation at or outside a hospital without overnight stay

ARTICLE BY

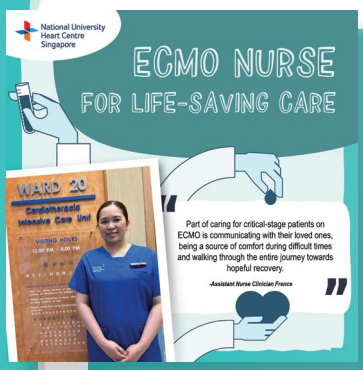
A/Prof Mark Chan
Deputy Executive Director and Senior Consultant, NUHCS

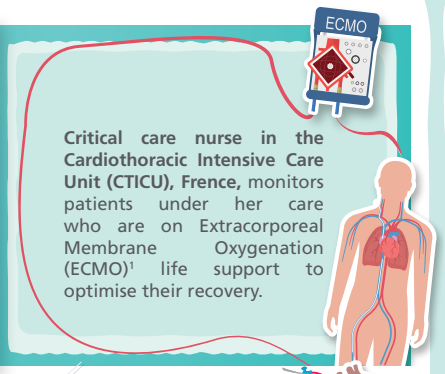
A/Prof Chan is an interventional cardiologist at the NUHCS. He is also Co-Director, Cardiovascular Summit Research Programme at the National University Health System (NUHS) and the CArdiovascular DiseasE National Collaborative Enterprise (CADENCE). As a National Medical Research Council-awarded Clinician Scientist-Senior Investigator, he leads translational research in heart attacks at the Cardiovascular Research Institute (CVRI).

Nursing: More Than You Think

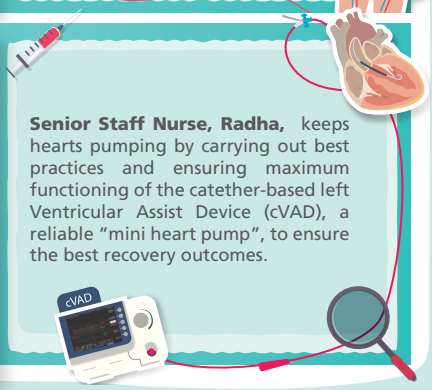
Did You Know? Nurses are empowered to pursue various professional tracks according to their aspirations, to enable them to advance clinical practice, transform care and shape the future of nursing. Take a peek into how our specialised nurses are transforming patient care through their respective fulfilling paths!

Critical Care in Nursing





Critical care nurse in the Cardiothoracic Intensive Care Unit (CTICU), Frence, monitors patients under her care who are on Extracorporeal Membrane Oxygenation (ECMO)[1] life support to optimise their recovery.



Senior Staff Nurse, Radha, keeps hearts pumping by carrying out best practices and ensuring maximum functioning of the catether-based left Ventricular Assist Device (cVAD), a reliable "mini heart pump", to ensure the best recovery outcomes.

Caring Around-the-Clock with On-call Roles in Nursing

Scan for a behind-the-scenes look at how NUHCS nurses at the Angiography Centre work in unison to gear up for emergency calls involving patients with life-threatening heart attacks.

Clinical Research in Nursing

An inquisitive mind and a passion for problem-solving inspired **Senior Staff Nurse, Ellene,** to embark on the Research and Evidence-Based Practice (EBP) journey, where she engages in continuous research to advance patient practice and healthcare outcomes, backed by robust evidence and critical decision-making.

Breaking Gender Stereotypes in Nursing

Former ITE student-turned-**Senior Staff Nurse, Suresh,** took a leap of faith to join nursing. Going on to obtain a Bachelor's Degree in Nursing, he found confidence and meaning in the quality of care he provides to the patients.

Advanced Practice Nurses (APNs)

Going beyond traditional nurses' roles, APNs are trained with enhanced skills and knowledge to fulfil selected medical roles that are conventionally done by doctors, such as managing patients with common medical diseases including chronic illnesses, in collaboration with other healthcare professionals.

Did you know that APNs can now prescribe medications to patients? Scan to find out more from APN, Juvena.

1. **ECMO**: A life support machine that takes over the heart and lung functions. ECMO is a life-sustaining treatment where patients need to be monitored and cared for by a specialist team in intensive care round the clock.

ARTICLE BY
NUHCS PULSE Editorial

Nurses' Merit Award 2023
Celebrating Nurses as the Heart of Healthcare

In 1976, the Ministry of Health (MOH) introduced an esteemed award to celebrate the outstanding contributions and unwavering dedication of nurses in fostering and enhancing patient well-being. This year, the MOH Nurses' Merit Award recognised Pan Ning, a Nurse Clinician at NUHCS, for her exceptional service. This distinguished honour was bestowed upon her in commendation of her noteworthy dedication, that consistently exceeded the call of duty. Pan Ning exemplifies the core values of compassionate nursing, demonstrating her care not only to patients but also to her fellow colleagues.

With a benevolent spirit as her guiding force, Pan Ning approaches her daily work with unwavering compassion. She takes a proactive approach by actively engaging both the patient and their caregiver(s) in the care planning process. Her patient-centered warmth has garnered numerous accolades and affirmations through various channels, including emails, appreciation cards and the electronic feedback system. These endorsements further solidify the justification behind her well-deserved nomination for the Nurses' Merit Award.

As a nurse clinician, Pan Ning consistently upholds and improves the standards of nursing practices and patient care. She diligently stays current with the latest nursing and clinical practices by regularly reviewing protocols and guidelines, ensuring that Coronary Care Unit (CCU) nurses have readily accessible and accurate references. Pan Ning's deep commitment extends to nurturing and empowering her colleagues, as she provides coaching and equips them with the essential resources and skills for effective care. Her passion is evident in her efforts to facilitate and instruct fellow nurses, both through clinical supervision and classroom instruction.

Additionally, Pan Ning plays a pivotal role in supporting the Critical Care Nursing Course (CCNC) by actively participating in the teaching of crucial topics like Pulmonary Artery Catheterisation. Beyond her regular work duties, Pan Ning goes the extra mile by volunteering in the Singapore Nursing Christian Fellowship (SNCF) where she engages in teaching and sharing sessions, offering her expertise to fellow nurses in Singapore and exemplifying her commitment to the broader nursing community.

Devoted to share her knowledge and skillsets with fellow nurses, Pan Ning puts in time and effort to sharpen her different competencies to enhance her coaching capabilities. As a notable example, she honed her video-making skills to create clearer and more effective demonstrations on nursing procedures such as, cleaning the central venous access to prevent Central Line-Associated Blood Stream Infection (CLABSI). Besides this, Pan Ning also contributes to the electronic learning portal. She creates and uploads quizzes in learning resources designed to better assist nurses in mastering unit-specific procedures. Her proactive involvement in the development of these resources ensures that her colleagues have access to the best tools for ongoing professional development and excellence in patient care.

Driven by a strong desire to give back to the community, Pan Ning is highly esteemed by both her patients and colleagues through her exemplary holistic care in and outside of her working environment. The Nurses' Merit Award serves as a testament to her outstanding commitment in nursing, and NUHCS takes immense pride in celebrating Pan Ning's well-deserved recognition for her exemplary ethics and wholehearted dedication.

"I believe it was my calling to be a nurse and I am very grateful to NUHCS for giving me opportunities to learn and grow."

– Pan Ning, Nurse Clinician,
Nurses' Merit Award Recipient 2023

ARTICLE BY
NUHCS PULSE Editorial

REFLECTIONS ON THE NURSING JOURNEY

We caught up with two Advanced Practice Nurses (APNs) to learn more about their journeys of growth.

As registered nurses equipped with a wide knowledge base and specialised clinical skills, Advanced Practice Nurses (APNs) take on an expanded role in nursing by administering therapies, ordering basic tests & anticipating and managing complex situations. Tapping on their advanced training and skill sets, they work hand-in-hand with other healthcare professionals to provide specialty care through making diagnoses and even initiating care plans.

In this heart-to-heart interview, NUHCS PULSE Editorial speaks to APNs Li Yao and Christina, Advanced Practice Nurses in Cardiac, Thoracic and Vascular Surgery (CTVS) and Cardiology respectively, who share more on their insights and perspectives, and the challenges they face.

> **"As an APN, I juggle direct patient care with education, research, leadership, and management. It can be daunting at times. However, I am inspired to face these challenges with joy."**
>
> – Li Yao, Nurse Clinician, Ward 64, NUHCS

Q: What are the roles of an APN, beyond that of traditional nursing responsibilities?

Li Yao: APNs encompass diverse specialty areas. As nursing experts in our respective fields, we are credentialed and trained not just in the knowledge base, but also equipped with the assessment, judgment, decision-making and other skills needed to enhance patient care at an advanced level.

Currently, I work closely with cardiac surgeons to run an APN-led outpatient[1] clinic, located at the NUHCS Heart Clinic, for patients who have undergone heart surgeries.

Besides timely review of patients to pre-empt issues that might occur during recovery, I conduct in-depth exploration into factors affecting how well patients adhere to their prescribed medications, as well as the positive lifestyle habits they can be encouraged to adopt. I enjoy interacting with patients and helping them learn more about their condition, so they can manage it better.

Q: What are some of the challenges you face in your role?

Li Yao: As an APN, I juggle direct patient care with education, research, leadership, and management. With so many different roles, it can be daunting at times. However, I am inspired to face these challenges positively, as I believe that I can make a significant impact to patients' health and well-being through specialised care.

Q: Any reflections on your nursing journey or memorable experiences you wish to highlight?

Li Yao: I was called to assist a patient who had turned cold and clammy prior to a routine chest-tube removal procedure. The 47-year-old patient had undergone a heart (mitral) valve replacement, was aphasic[2] and could not move the right side of his body (hemiparesis). Thanks to our nurses' sharp observation and clinical assessment, the patient underwent the appropriate diagnostic scans timely, followed by a successful thrombectomy[3]. He was able to speak and move the right side of his body, avoiding catastrophic consequences. I felt an immense sense of satisfaction, and found great meaning in my role at that moment!

Q: What are some of the qualities an APN should have? Any words for nursing peers keen to pursue the APN route?

Li Yao: Nursing is a calling and a work of heart. In addition, to be an APN, you need the drive and passion to drive care. Given Singapore's ageing population and the growing complexity of healthcare needs, I believe that APNs can help address these by providing specialised care and bridging the gaps in healthcare system and services.

> **More than providing direct patient care, (my) role involves sharing what I have learnt with the aim of enhancing quality of care & nursing standards in the next generation of nurses.**
>
> – Chong Wooi Fuon Christina, Nurse Clinician, Ward 63, NUHCS

Q: How do APNs help to improve the overall framework of care?

Christina: Cardiology APNs work alongside in consultation and collaboration with the Inpatient Cardiology Team, Nurses and Allied Healthcare Professionals to provide comprehensive care to patients with complex health needs, who require care of both extended medical functions and nursing-focused management.

We work towards improving workflow efficiencies, ensuring early review & follow-up of patients. This is all done with the aim to decrease the need for hospitalisation, unplanned readmissions and reduce waiting time.

For instance, our APN-led Cardiac Stress Test Clinic provides patients who are admitted into the Emergency Department with chest pains - and who only require early cardiac evaluation without hospitalisation - to have an early review of their condition by our team of APNs. This thus reduces unnecessary admissions and reduction in waiting time in having these patients' condition attended to.

Furthermore, our APN-led Post-Discharge Clinic enables eligible patients discharged from the Cardiology unit to be reviewed by APNs early (within 2-4 weeks post discharge) to evaluate symptoms, test results, assess for therapeutic and adverse outcomes as well as titration of drug therapeutics.

Ultimately, through these improved workflows that allow urgent patient needs to be met more efficiently, we hope to improve the standards of nursing care with better patient outcomes.

Q: What are some of the challenges you face in your role?

Christina: The need to be able to multitask efficiently, in addition to managing patients with various complex healthcare needs.

The ever-changing landscape of healthcare has spurred the need for me to keep enhancing my knowledge and skills. Thanks to the continuous support from my Nursing & Clinical Supervisors, various Cardiologists/Doctors, Nurses, and Allied Health Professionals, my APN journey has truly been a fruitful and meaningful experience by far!

Q: What are some of the qualities an APN should have? Any words for nursing peers keen to pursue the APN route?

Christina: I would say having the right attitude, aptitude, good clinical reasoning skills as well as the thirst to improve oneself and others. Equally important is the forging of good interpersonal and interprofessional relationships for effective teamwork and collaboration with healthcare colleagues across various departments!

1. **Outpatient:** Patient who receives treatment without being hospitalised
2. **Aphasic:** Of a language disorder caused by damage to areas of the brain
3. **Thrombectomy:** A type of surgery to remove blood clot inside an artery or vein

ARTICLE BY
NUHCS PULSE Editorial

OBESITY WILL BECOME THE LEADING CAUSE OF RISK FOR HEART DISEASE BY 2050

RESEARCH BY NUHCS CARDIOLOGISTS UNVEILS FUTURE STATISTICS ON OBESITY-RELATED MORTALITY

AMI, or more commonly known as heart attack, occurs when blood is unable to flow to a section of the heart muscle due to a blockage in a coronary artery. The blockage, usually in the form of a blood clot, deprives the heart muscle of oxygen and nutrients, causing severe damage to the affected heart tissue, and is often life-threatening.

To project the prevalence of Type 2 Diabetes Mellitus (T2DM), hypertension, hyperlipidemia (or high cholesterol), obesity and smoking, among AMI-incident and AMI-related mortality for 2025 to 2050, Dr Nicholas Chew from the Cardiovascular-Metabolic Disease Translational Research Programme (CVMD TRP) at the Yong Loo Lin School of Medicine (NUS Medicine) and Department of Cardiology, NUHCS, led a study using data from the Singapore Myocardial Infarction Registry (SMIR) from January 2007 to December 2018, focusing on age group, gender and ethnicity.

With the current sedentary lifestyle and silent obesity epidemic, obesity surpasses hypertension and hyperlipidemia by almost ten times (880%) as a risk factor. By 2050, out of every 100,000 who may have a heart attack, 3,764 will be overweight or obese, compared to 384 per 100,000 in 2025. This concerning increase will disproportionately affect overweight or obese females, with more than 13 times (1,204.7%) increase in heart attack cases by 2050. A huge increase in the incidence of heart attacks is also projected among Malays, with an expected twelve-fold (1,191.9%) increase per 100,000 population of obesity-related heart attacks, between 2025 and 2050.

Obesity will contribute to an alarming four-fold (294.7%) increase in AMI-related deaths, while mortality rates associated with other risk factors like T2DM, hypertension, and smoking are expected to decline. The most substantial increase in AMI-related mortality will occur among Malays, with a five-fold (419.3%) rise, followed by a three and a half times (253.5%) increase among Indians.

GOOD NEWS

Research suggests that the projected increase in AMI cases can be halted with early detection and treatment of **unrecognised diseases in high-risk groups including diabetes or high cholesterol, thus reducing metabolic risks.** Implementing nationwide programmes focused on improving heart health can also potentially reduce obesity-related deaths.

Dr Nicholas Chew emphasises on the need to steer away from a 'one-size-fits-all' approach to address the specific challenges faced by different groups at risk of the onset of a heart attack and mortality. For instance, younger and middle-aged individuals are more prone to obesity-related mortality, while older populations are more prone to increased metabolic diseases mortality due to hypertension and hyperlipidemia, thus, highlighting the importance of tailored interventions for different age groups.

A/Prof Mark Chan, Deputy Executive Director, NUHCS, notes that while many European and U.S. studies have explored the cardiovascular disease burden in general populations, few studies have projected trends of metabolic diseases. These identified trends reflect larger, emerging trends worldwide, due to Singapore's rapid socio-economic development and its multi-ethnic and ageing population. The population-based analysis in this study offers valuable insights that can potentially guide future global responses to cardiovascular-metabolic diseases.

ARTICLE BY

Dr Nicholas Chew
Senior Resident,
Department of Cardiology, NUHCS

Dr Chew is currently a cardiology senior resident, having joined the senior residency programme at NUHCS in 2020. While embarking on a new journey in his specialist training, he hopes to contribute in the areas of research and education in cardiology.

ANALYSING E-CPR IN CARDIAC ARREST PATIENTS

WHERE TIME AND EXPERIENCE ARE OF THE ESSENCE

Cardiac arrest is a life-threatening condition where the heart stops beating due to a lack of oxygenated blood supply to the heart and brain, necessitating immediate treatment to prevent complications. Statistics show survival rates for out-of-hospital cardiac arrest patients are less than 10%, while in-hospital cases range between 15% to 25%.

Conventional Cardiopulmonary Resuscitation (C-CPR) is the standard method for reviving the heart, involving chest compressions, defibrillation, and medications. However, recent research has explored Extracorporeal Cardiopulmonary Resuscitation (E-CPR), which aims to maintain blood circulation while the heart is being revived. E-CPR involves redirecting blood from the body through a heart-lung machine, which removes carbon dioxide and pumps oxygenated blood back to the brain and other vital organs of the body. Nevertheless, it's important to note that this procedure is time-consuming and resource-intensive, and several overseas studies comparing E-CPR to C-CPR have yielded mixed results, with major bleeding being a common side effect of E-CPR.

NUHCS researchers conducted a systematic review[2] and meta-analysis[3] using data from 11 high-quality studies published within the last 20 years, to compare the clinical outcomes of cardiac arrest patients who received E-CPR versus C-CPR.

According to research, the mortality rate[4] of patients who've received CCPR was 80.7% while those who underwent ECPR is 75.1%, which is two-thirds lower than that of CCPR despite its seemingly small percentage difference. Moreover, a quarter of ECPR patients experienced good brain recovery, as compared to CCPR patients which only 13% saw such results, and survival rate among ECPR patients after hospital discharge were analysed to be higher.

While E-CPR was associated with lower mortality rates for in-hospital cardiac arrests, this was not observed for out-of-hospital cases. Researchers attributed this difference to longer transport time of emergency medical services, resulting in further organ damage that affects treatment efficacy. This does not imply that E-CPR is ineffective in out-of-hospital cases, but it calls for further exploration of methods that can enhance survival rates, such as streamlining emergency services. Analysis shows hospitals with more experiences performing E-CPR procedures achieve better outcome, indicating the importance of rigorous training and extensive experience in realising E-CPR's life-saving potential.

The research findings encourage the implementation of E-CPR for in-hospital cardiac arrests, highlighting the vital role of clinicians and policymakers in devising cardiac arrest treatment protocols. This especially pertains to employing E-CPR as the primary approach over C-CPR, and considering factors that can improve E-CPR survival rates.

While E-CPR has the potential to improve cardiac arrest survival rates, this study emphasises the need for further research to build sustainable systems that efficiently evaluate patients' eligibility for E-CPR, and optimising the healthcare system to implement E-CPR effectively, maximising patient outcomes and resource efficiency.

E-CPR IN CARDIAC ARREST PATIENTS

A SYSTEMATIC REVIEW AND META-ANALYSIS[1]

TIME-DEPENDENT EFFECTS
May explain worse outcomes for out-of-hospital patients after E-CPR

TRAINING IS KEY
To optimise lifesaving potential of E-CPR

MORE RESEARCH NEEDED
For resource-effective, sustainable E-CPR approach in out-of-hospital arrests

ARTICLE BY

Adj A/Prof Kollengode Ramanathan
Senior Consultant,
Division of Cardiac Thoracic ICU,
Department of Cardiac, Thoracic, and Vascular Surgery (CTVS), NUHCS

Adj A/Prof Ramanathan is an Adult Cardiac Intensivist in the Cardiothoracic Intensive Care Unit (CTICU) specialising in management of critically ill cardiac patients and mechanical cardiac support in the ICU. He is also the Programme Director for the ICU Fellowship and the research lead for CTICU.

Dr Ryan Ruiyang Ling
Dean's Fellow, Yong Loo Lin School of Medicine
National University of Singapore (NUS)

Ryan is a house officer at Ng Teng Fong General Hospital, interested in fields of anaesthesiology and intensive care medicine, with keenness in perioperative medicine for cardiac surgery, extracorporeal membrane oxygenation, and cardiac arrest.

Mr Low Jer Wei Christopher
Medical Student, Yong Loo Lin School of Medicine
National University of Singapore (NUS)

Christopher is a final-year undergraduate medical student in the Yong Loo Lin School of Medicine, Class of 2024. His research interests lie in the field of cardiac critical care and intensive care medicine.

1. Low CJW, Ramanathan K, Ling RR et al.Extracorporeal cardiopulmonary resuscitation versus conventional cardiopulmonary resuscitation in adults with cardiac arrest: a comparative meta-analysis and trial sequential analysis. Lancet Respir Med. 2023; https://doi.org/10.1016/S2213-2600(23)00137-6
2. Systematic review: Structured approach to gather, assess and draw meaningful conclusions from research data.
3. Meta-analysis: A statistical research technique to combine and analyse the results of multiple studies.
4. Mortality rate: A measure of the number of deaths within a population over a defined period.

YOUNG INVESTIGATOR AWARD:

UNLOCKING NEW INSIGHTS IN CARDIOVASCULAR APPROACHES

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

> ***This is the first medical research conference that I took part in since resuming clinical work after National Service, where I was able to showcase the fruits of our research labour and even received an award recognition; it made this experience much more memorable.***
>
> ***Dr Aloysius Leow***
> *Resident, Dept of Medicine, NUH*

The Singapore Cardiac Society (SCS) Annual Scientific Meeting (ASM) 2023 was held from 24 to 26 March 2023 to mark the 50th Anniversary of SCS, and the event brought together cardiology medical professionals from around the region to share about the latest topic updates and present on the latest research findings to facilitate the exchange of ideas in the field.

With the support of the Department of Cardiology at NUHCS, Dr Aloysius Leow presented two abstracts for the Young Investigator Award (YIA) competition, and another abstract as a free paper oral presentation, with the abstract titled "Meta-Analysis[1] of Cardiac Imaging Modalities for the Diagnosis of Left Ventricular Thrombus[2] following Acute Myocardial Infarction[3]" clinching the 1st prize amongst five other high-quality research abstracts.

The objective of this study was to conduct a systematic review and meta-analysis of the current literature on the various diagnostic modalities[4] used to detect Left Ventricular Thrombus (LVT) in post-Acute Myocardial Infarction (AMI) – a common cardiac complication that can lead to potentially disastrous morbidity and mortality from systemic embolism[5]. While Transthoracic Echocardiogram (TTE) appears to be the imaging modality of choice for routine post-AMI review in most hospitals – given its ubiquity, cost-effectiveness, and good safety profile – this study found that TTE may suffer from poorer sensitivity as compared to the gold standard of Cardiac Magnetic Resonance (CMR) imaging.

Through this largely exploratory study, the research team hopes that clinicians would be prompted to consider a risk stratification[6] approach when deciding on the diagnostic modality for LVT detection in post-AMI patients, or for further studies with larger cohorts that can validate findings to be performed.

Presenting this study on behalf of his co-first author, Dr Christopher Low from National University of Singapore (NUS) Medicine, who also invaluably contributed to the research, and under the guidance of his mentors – Dr Sia Ching Hui, Consultant, Department of Cardiology, NUHCS, Dr Benjamin Tan, Consultant, Division of Neurology, Department of Medicine, NUH, and Dr Leonard Yeo, Senior Consultant, Division of Neurology, Department of Medicine, NUH, this opportunity allowed Dr Leow to delve into his areas of interest and further expand on his achievements as a resident.

1. **Meta-analysis -** A statistical research technique to combine and analyse the results of multiple studies.
2. **Left Ventricular Thrombus -** A complication of Acute Myocardial Infarction (AMI), or heart attack, that forms a blood clot within the left heart ventricle.
3. **Acute Myocardial Infarction (AMI) -** Also known as a heart attack, where one or more of the coronary arteries that supplies oxygen to the heart, becomes severely narrowed or blocked.
4. **Diagnostic modalities -** Tests conducted to establish or eliminate the cause of an individual's condition, disease and/or discomfort.
5. **Systemic embolism -** When a blood clot, or other foreign bodily material detaches and travels through the bloodstream, which can block blood vessels and obstruct blood flow.
6. **Risk stratification -** The process of categorising patients into different risk groups to identify individuals at higher risk to allocate resources more effectively.

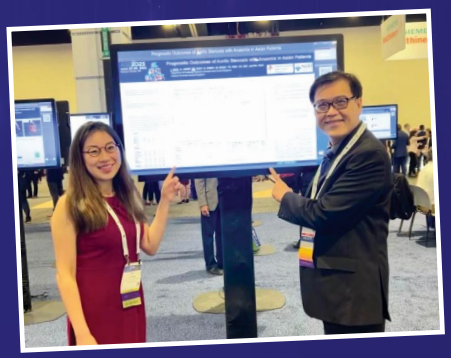
ARTICLE BY

Dr Aloysius Leow Sheng Ting

2nd year NUH Internal Medicine resident with a developing interest in cross-disciplinary clinical research pertaining to Cardiology and Stroke Neurology.

AMERICAN SOCIETY ECHOCARDIOGRAPHY – TOP INVESTIGATOR PRIZE

ANALYSING THE IMPACT OF ANEMIA ON AORTIC STENOSIS



A research study led by a team of medical experts from NUHCS has clinched the American Society of Echocardiography (ASE) Top Investigator Prize 2023, along with a travel grant award, at its annual scientific conference held in National Harbour, United States of America (USA) from 23 – 26 June 2023. Helmed by Adj Prof Poh Kian Keong, Senior Consultant, Department of Cardiology, NUHCS, and presented by Dr Joy Ong, Senior Resident, Department of Cardiology, NUHCS, this is the first Asian study of its kind to evaluate the outcomes of anemia on differing grades of Aortic Stenosis (AS)[1].

Globally, AS is the most common left-sided native valvular heart disease. It is especially prevalent among the older population - 82% of cases are attributed to ageing or calcium buildup. Symptoms include chest pain, breathlessness, dizziness or faints.

Anemia[2] is a condition reported to be highly prevalent among South Asians due to hereditary conditions, chronic endemic infections[3], deep-rooted cultural practices, and socioeconomic circumstances. Women are also found to be more likely to be affected as they undergo physiological changes such as preservation of uterine[4] health and pregnancy. Anemia in heart disease is also associated with accompanying conditions such as diabetes mellitus, chronic kidney disease, peripheral vascular disease[5], and myocardial infarction[6].

Anemia is present in one out of every three people with AS, and may occur in a bidirectional relationship, which complicates symptoms, worsen outcomes and hinders the possible treatment options. This occurs via several mechanisms – notably the Type 2A von Willebrand syndrome[7] in the eponymous Heyde's Syndrome, comprising a triad of AS, acquired coagulopathy, and anemia resulting from gastrointestinal angiodysplasia[8].

The study revealed anemia as a major indicator of worse outcomes for patients with existing AS. Anemia is independently associated with heightened symptom severity, increased cardiovascular hospitalisations, higher all-cause mortality rates[9], and adverse composite cardiovascular outcomes among Asian AS patients; with more severe degrees of anemia leading to worse outcomes. Surgical treatment options for aortic valves[10] such as Transcatheter Aortic Valve Replacement (TAVR) and Surgical Aortic Valve Replacement (SAVR) interventions show improvement in overall survival rates compared to conservative therapy alone.

American Society of Echocardiography (ASE)

Founded in 1975, American Society of Echocardiography (ASE) is the largest global organisation for professionals with an interest in echocardiography, to advance cardiovascular ultrasound imaging and improve lives through excellence in education, research, innovation, advocacy and service to the profession and the public.

1. **Aortic Stenosis** – A condition where the aortic valve narrows causing abnormal flow of oxygen-rich blood from the heart to the rest of the body.
2. **Anemia** – A condition of having insufficient red blood cells or hemoglobin to carry oxygen to the body's tissues
3. **Endemic infections** – Diseases consistently present in a particular region over an extended period.
4. **Uterine** – Anything relating to or affecting the uterus, a hollow muscular organ in the pelvis, also known as the womb.
5. **Peripheral vascular disease** – A condition where the blood vessels outside of the heart and brain, are narrowed or obstructed, resulting in reduced blood flow to the body's tissues and organs.
6. **Myocardial infarction** – A condition commonly known as a heart attack, where a part of the heart muscle has been damaged due to a lack of blood flow from a blockage in the heart's artery.
7. **Type 2A von Willebrand syndrome** – Von Willebrand disease (VWD) is a disorder in which the blood does not clot normally and Von Willebrand factor (VWF) is a protein that helps the blood clot. Type 2A syndrome occurs when the VWF is not the right size for the platelets to attach and form a proper clot.
8. **Gastrointestinal angiodysplasia** – A condition where abnormal blood vessels, known as angiodysplastic lesions, which are prone to bleeding, are found in the gastrointestinal tract.
9. **Mortality rates** – The measure of number of deaths in a particular population over a specified period.
10. **Surgical treatment options for aortic valves** – Procedural repairs or replacements of the aortic valve through traditional open-heart surgery or minimally invasive methods.

ARTICLE BY

Dr Joy Ong
Senior Resident, Department of Cardiology, NUHCS

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

Congratulations

ON THE WELL-DESERVED HONOURS

Our heartiest congratulations to Prof Tan Huay Cheem, Senior Advisor of National University Heart Centre, Singapore (NUHCS), for being conferred two national-level accolades!

The National Outstanding Clinician Award at the National Medical Excellence Awards 2023 (NMEA) recognises Prof Tan's selfless contributions to healthcare and outstanding leadership in elevating cardiology service in Singapore to world-class standards. The prestigious Public Administration Medal (Silver) – Pingat Pentadbiran Awam (Perak), applauds his dedication and significant contributions to cardiology, throughout an illustrious career spanning over 30 years in the healthcare sector.

NATIONAL OUTSTANDING CLINICIAN AWARD

Recognises individuals with at least 15 years of service in public or private healthcare establishments, with exceptional contributions to clinical work that advances the safety and quality of patient care.

PUBLIC ADMINISTRATION MEDAL (SILVER)

Conferred to those who have made special contributions of national significance over and above what is expected in their duties.

A distinguished clinician, Prof Tan is an active clinical researcher in cardiovascular care, with over 200 papers in international peer-reviewed journals to his name. A well-respected figure in the cardiology circle, he has helped shape knowledge exchange and cardiac practice in the region, flying the NUHCS flag high in important cardiology meetings.

With an unwavering commitment to advancing interventional cardiology clinical care and education, he continues to inspire the future generation of doctors and cardiologists with his clinical acumen, and qualities of dedication, kindness, and equanimity.

Professor Tan Huay Cheem
Senior Advisor of NUHCS

Congratulations

DOCTORS' PROMOTION AT NUHCS

Dr Lin Weiqin
Senior Consultant,
Department of Cardiology, NUHCS

Dr Perryn Ng
Consultant,
Department of Cardiology, NUHCS

Dr Sia Ching Hui
Consultant,
Department of Cardiology, NUHCS

Dr Alfred Yip
Associate Consultant,
Department of Cardiology, NUHCS

Dr Andie Hartanto Djohan
Associate Consultant,
Department of Cardiology, NUHCS

Dr Zan Ng Zhe Yan
Associate Consultant,
Department of Cardiology, NUHCS

ACADEMIC APPOINTMENTS WITH EFFECT FROM 1 APRIL 2023:

Adj Prof Graeme MacLaren
Senior Consultant,
Department of Cardiac, Thoracic and Vascular Surgery (CTVS), NUHCS

Adj A/Prof Low Ting Ting
Senior Consultant,
Department of Cardiology, NUHCS

Adj A/Prof Seow Swee Chong
Senior Consultant,
Department of Cardiology, NUHCS

Adj A/Prof Vitaly A. Sorokin
Senior Consultant,
Department of Cardiac, Thoracic and Vascular Surgery (CTVS), NUHCS

Adj A/Prof Wong Ching Chiew Raymond
Senior Consultant,
Department of Cardiology, NUHCS

MASTER CLINICIAN AWARDS 2023

The Master Clinician Award is conferred by NUHS to recognise clinicians who have contributed significantly towards elevating the quality of healthcare delivery through outstanding leadership and compassionate and skilled practice in their respective specialty fields.

Adj A/Prof Seow Swee Chong
Senior Consultant, Department of Cardiology, NUHCS

Adj A/Prof Vitaly A. Sorokin
Senior Consultant, Department of Cardiac, Thoracic and Vascular Surgery (CTVS), NUHCS

Adj A/Prof Wong Ching Chiew Raymond
Senior Consultant, Department of Cardiology, NUHCS

· NUS Appreciation for Clinical Educators ·

NUS Dean's Award for Teaching Excellence

Dr Sia Ching Hui
Consultant, Department of Cardiology, NUHCS

Dr Ng Jun Jie
Consultant, Department of Cardiac, Thoracic and Vascular Surgery (CTVS), NUHCS

· NUHS Educator's Day 2023 ·

NUHS Teaching Excellence Award (Medical)

Dr Isabel Ahmad
Consultant, Division of Cardiology, Department of Medicine, NUHCS @ Ng Teng Fong General Hospital

Dr Sia Ching Hui
Consultant, Department of Cardiology, NUHCS

Junior Doctor Teaching Award

Dr Joy Ong
Senior Resident, Department of Cardiology, NUHCS

Dr Teo Ting Wei
Senior Resident, Department of Cardiology, NUHCS

Dr Tony Li
Senior Resident, Department of Cardiology, NUHCS

NATIONAL DAY AWARDS 2023

Congratulations
TO ALL OUR AWARD WINNERS!

Established in 1962, the annual National Day Awards recognises various types of merit and service to the nation. Singaporeans and non-Singaporeans alike are honoured for outstanding contributions to the civil or military service, social and community work or excellent performance in their own field.

PUBLIC ADMINISTRATION MEDAL (SILVER)

Prof Tan Huay Cheem
Senior Advisor, *NUHCS*

LONG SERVICE MEDAL

A/Prof James Yip
Executive Director, *NUHCS*

Ms Pan Ning
Nurse Clinician I, *Ward 28, NUHCS*

Ms Ramasamy Nanmullai
Executive Secretary,
Dept. of Cardiology, NUHCS

NATIONAL MEDICAL RESEARCH COUNCIL (NMRC) AWARDS

The NMRC oversees the development and advancement of medical research in Singapore. It provides research funds to healthcare institutions, awards competitive research funds for individual projects and is responsible for the development of clinician-scientists through awards and fellowships.

CLINICIAN-SCIENTIST INDIVIDUAL RESEARCH GRANT (CS-IRG) AWARD

Research: Dissecting the role of Asparagine synthetase (ASNS) in the cardiomyocyte cellstate

Prof Roger Foo
Director, Cardiovascular Research Institute (CVRI), NUHCS, and Senior Consultant, Dept. of Cardiology, NUHCS

NMRC TRANSITION AWARD

Research: Thromboinflammation and Cerebral Dysfunction following Acute Myocardial Infarction (TICAMI) Study

Dr Sia Ching Hui
Consultant, Dept. of Cardiology, NUHCS

NMRC SENIOR CLINICIAN SCIENTIST AWARD

Research: Nanoparticle mediated complete synthesis of biological therapeutics

Dr Chester Drum
Senior Consultant, Dept. of Cardiology, NUHCS

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ABSTRACTS

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Adjuvant pembrolizumab impairs healing post lung resection. **Leow L.**

Do we have to use and freeze elephant trunk? **Sorokin V.**

UVATS surgical decortication is a safe and effective procedure in patients with diabetes mellitus. **Chen J.**

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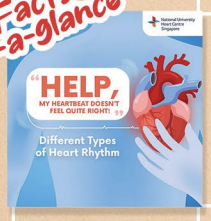

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