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

National University Heart Centre Singapore

PULSE

ISSUE 45 | JULY 2025
WWW.NUHCS.COM.SG

COVER STORY

The Journey of Recovery: One Step at a Time

Scan here for an e-copy of Pulse!
TAKE ME HOME!

MDDI (P) 015/11/2024. All information is correct at time of print.

THE TEAM

Editorial Directors
Prof Tan Huay Cheem
Adj Prof Poh Kian Keong

Editors
Ms Belinda Chea
Ms Mindy Neo

Publications & Abstracts
Ms Belinda Chea
Ms Lin Xiao Yun
Ms Tan Sze Hwee

Publishing Agency
Triomine Pte Ltd

nuhcs@nuhs.edu.sg
www.nuhcs.com.sg
www.youtube.com/NUHCS
www.facebook.com/NUHCS
@nuhcsofficial
X.com/NUHCS
www.linkedin.com/company/nuhcs/

Pulse is a biannual publication by the **National University Heart Centre, Singapore (NUHCS).**

NUHCS spans across four locations:

NUHCS at National University Hospital (NUH) - Main Operations
National University Hospital, 5 Lower Kent Ridge Road, S(119074)

NUHCS @ Ng Teng Fong General Hospital (NTFGH)
Ng Teng Fong General Hospital, 1 Jurong East Street 21, S(609606)

NUHCS @ Alexandra Hospital (AH)
Alexandra Hospital, 378 Alexandra Road, S(159964)

NUHCS @ Jurong Medical Centre (JMC)
60 Jurong West Central 3, S(648346)

Opening Hours:
8.30am to 5.30pm (Mondays to Fridays), closed on Weekends & Public Holidays.

Appointments:
Call **6908 2222** or email:
appointment@nuhs.edu.sg

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 @ Alexandra Hospital

National University Heart Centre, Singapore (NUHCS) at National University Hospital - Main Operations

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,

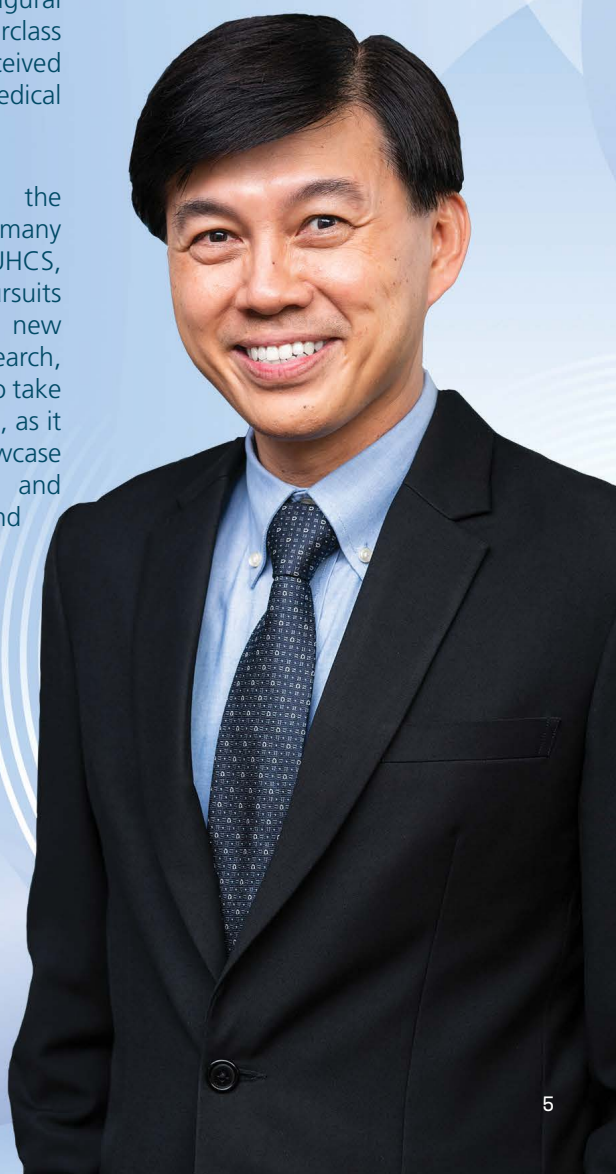
As we present this latest issue of the PULSE newsletter, it is a timely reminder that this newsletter has served as an important communication platform for the Centre with the wider Singapore medical community for the past 24 years. At the heart of the NUHCS mission lies the national commitment to elevate the standard of cardiovascular practice, introduce advanced therapies, develop innovative solutions, and institute a new model of care for cardiovascular medicine. Every issue of PULSE therefore allows us to share our experiences, clinical advancements and research progress with fellow healthcare professionals, in the hope of fostering collaboration and mutual learning in service of better patient care.

In this issue, we highlight the growing role of cardiac intensive care and rehabilitation in managing critically ill patients with advanced heart failure and cardiogenic shock. The deployment of extracorporeal membrane oxygenation in awake patients has enabled our team to stabilise patients in extremis, creating critical windows of opportunity for recovery. These advances exemplify cutting edge technology, combined clinical expertise and coordinated multidisciplinary care. An inaugural Cardiac Critical Care Masterclass organised by NUHCS was received enthusiastically by the medical community.

We continue to celebrate the accomplishments of the many talented individuals in NUHCS, whom in their respective pursuits of excellence, have set new benchmarks in clinical care, research, and education. We invite you to take time to enjoy reading this issue, as it has always been a joy to showcase and celebrate the dedication and tireless commitment of each and every member of NUHCS.

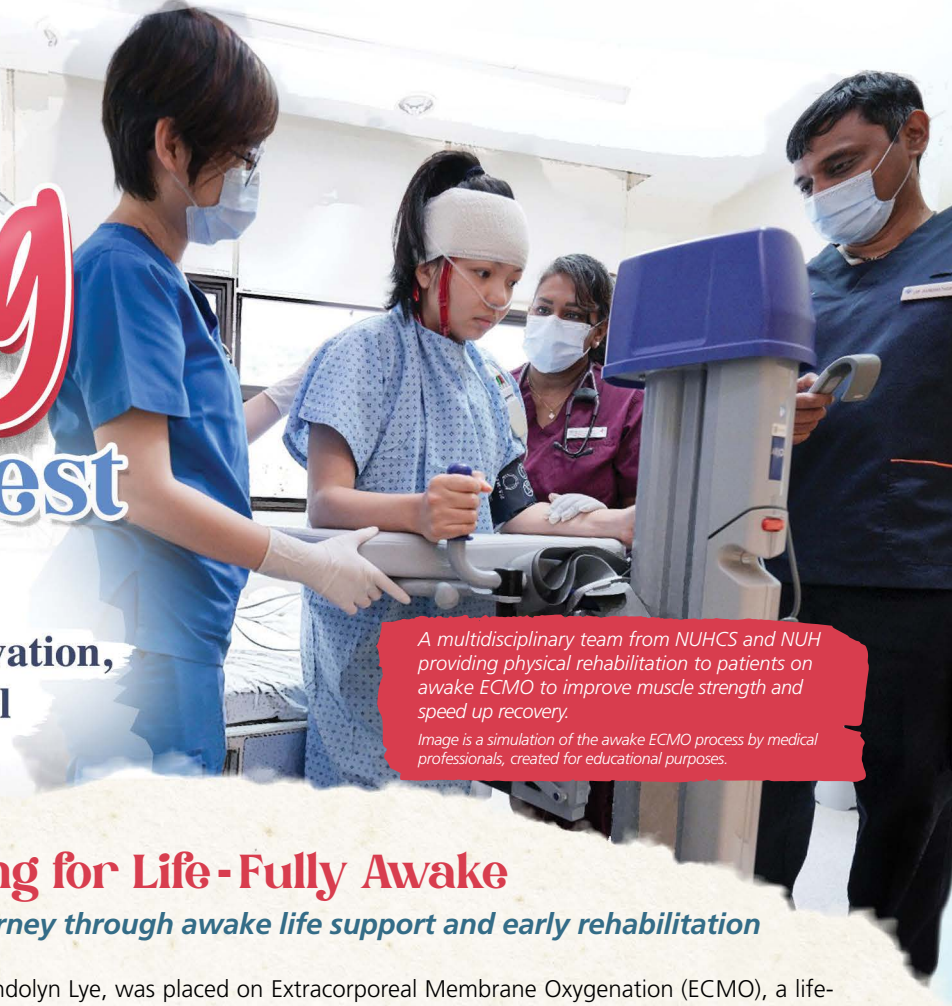
Tan Huay Cheem

Prof Tan Huay Cheem
Senior Advisor, NUHCS



Saving the Sickest Patients

Stories of Strength, Innovation, and the Fight for Survival



A multidisciplinary team from NUHCS and NUH providing physical rehabilitation to patients on awake ECMO to improve muscle strength and speed up recovery.

Image is a simulation of the awake ECMO process by medical professionals, created for educational purposes.

Fighting for Life - Fully Awake

A 22-year-old's powerful journey through awake life support and early rehabilitation

When 22-year-old nursing student, Gwendolyn Lye, was placed on Extracorporeal Membrane Oxygenation (ECMO), a life-support machine for heart failure, she was not just fighting for her life – she was doing so while awake.

Most patients on ECMO are placed in medically induced comas for days. However, Gwendolyn's heart was too weak to withstand general anaesthesia, so the team at the Cardiothoracic Intensive Care Unit (CTICU) at NUHCS stepped in with an uncommon but promising approach – Awake ECMO: **a form of life support where patients remain conscious and actively engage in physical rehabilitation to aid in their recovery.**

In an ICU environment where being unconscious is the norm, Gwendolyn remained conscious, receiving gentle, targeted physiotherapy from the very beginning. CTICU nurses and physiotherapists worked closely with her, initiating gentle exercise sessions which included assisted stretching and mobility drills to prevent rapid loss of muscle mass as a result of prolonged inactivity in an ICU setting. Research has shown that early physical rehabilitation in ICU patients can alleviate or prevent weakness syndromes, improve muscle strength, as well as decrease the duration of mechanical ventilation and length of ICU and hospital stay. These early interventions paid off – Gwendolyn was able to come off her life support in just four days, half the usual duration for a patient on traditional ECMO.

> ***"We have come to a stage where we do not use sedation at all. This helps the patients and caregivers in a big way. They are able to partake in the rehabilitation process within a few days. It enhances their recovery, and they leave the ICU much earlier."***
>
> *– Adj A/Prof Ramanathan K.R., Senior Consultant, Division of CTICU, Department of CTVS, NUHCS*

> ***"By assisting patients with targeted movements while on awake ECMO, we help them return to function sooner which shortens their recovery time."***
>
> *- Dr Geetha Kayambu, Principal Physiotherapist and Lead in Physiotherapy Research, Department of Rehabilitation, National University Hospital (NUH)*

Today, Gwendolyn is back in nursing school and has also resumed hiking – something she has always loved. Her journey is a testament to not only her strength, but to the impact of her multidisciplinary care team and the potential of awake ECMO in supporting survival and a faster, more complete recovery.

> ***"I am thankful that the medical team decided on awake ECMO as I knew how intubation could possibly lead to a longer recovery process instead."***
>
> *– Gwendolyn Lye*

Placed on Life Support. Lost a Limb. Today, Dancing Again.

Dancing has always been the passion of Nathan Tan*. However, after a severe case of pneumonia[1], the 30-year-old had to be placed in an induced coma and on extracorporeal life support. More devastating news followed - Nathan's fingers and right leg below the knee would have to be amputated after his infection had caused gangrene[2].

After awaking from life support to such life-altering news, Nathan feared such a loss would not just be physical, but existential, as he may never be able to dance again.

However, the team at NUHCS and NUH saw more than just a critically ill patient; they saw someone fighting for his identity. Physiotherapists began bedside rehabilitation while Nathan was still in the ICU, using cycle ergometry to build strength. They later incorporated **personalised dance-inspired movements into his rehabilitation exercises**, acknowledging how central dance was to his recovery. Their encouragement played a pivotal role in helping him regain confidence and eventually return to the art form he loves.

> ***Taking a shower and eating suddenly became very difficult. Thanks to the medical team and social workers working together, they helped me adapt and restore my daily routine.***
>
> *- Nathan Tan*

With Nathan's strong willpower and support from his rehabilitation team, he has not only returned to work, but has also returned to dancing. He continued physiotherapy at Alexandra Hospital for six more months. In February 2024 – less than a year after losing his leg – Nathan danced again.

Nathan catching up with the medical team who saved him

1. **Pneumonia** is lung inflammation caused by bacterial or viral infection, in which the air sacs fill with pus and may become solid.
2. **Gangrene** is the death of body tissue due to a lack of blood flow or a serious bacterial infection.

Against all odds, Nathan dances again – a powerful showcase of resilience and hope

*Not his real name.

Meet some of the people who Care for the sickest hearts

"When we meet patients or parents of critically ill young children at major crossroads in their lives, crossroads inevitably overcast with sorrow and uncertainty, we have an opportunity to make a unique connection with them, one not found through any other means in life."

- Adj Prof Graeme MacLaren,
Head of Division of Cardiothoracic ICU, Department of CTVS, NUHCS

"As a cardiac intensivist, caring for the sickest patients in the ICU is both a profound privilege and an immense challenge. It is like standing at the edge of life and death, where every decision carries the weight of hope and uncertainty. It is exhausting yet exhilarating and you feel the adrenaline rush, the quiet pride of stabilising a crashing patient, and the humbling reality of human fragility."

- Dr Anand Ambhore,
Clinical Director of the Coronary Care Unit, NUHCS

"To provide care for high risk patients in a critical care setting can be dynamic but very rewarding - where constant teamwork, quick clinical decisions and clear communication is not just important for the care of the patient, but also towards supporting the loved ones of the patient."

- Nur Aisyah Binte Hisyam,
Staff Nurse, Coronary Care Unit, NUHCS

"Working in the CTICU means caring for the most critically ill patients. Many depend on ECMO – a vital lifeline that gives their bodies the time and support needed to rest and heal. But ECMO is more than just a machine; it symbolises hope. For families, it offers precious time, renewed possibility, and the belief that recovery may still be within reach."

- Goh Si Guim,
Head of Perfusionist, Department of CTVS, NUHCS

"Being in a high-stakes environment like the Cardiothoracic ICU means having a front-row seat to resilience – where caring for the sickest patients challenges you to think sharper, care even deeper, grow constantly, and do it all as a part of an unshakable team."

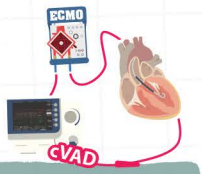
- Chan Beng Kee Timothy,
Senior Staff Nurse, CTICU, NUHCS

– A/Prof James Yip,
Executive Director, NUHCS

NUHCS will continue to lead innovation in the care of critically ill heart patients by focusing on three key areas. First, improving outcomes even before patients arrive at the hospital – through early detection of out-of-hospital cardiac arrests, reducing emergency response times, and expanding training in CPR and AED[3] use. Second, optimising and preserving organ function – especially of the heart, brain, and kidneys – through the judicious use of advanced support systems such as ECMO and cVADs. Third, maximising quality of life after critical illness, enabling patients to return to active, meaningful lives in the community through comprehensive cardiac rehabilitation.

Looking ahead, a bold and meaningful goal for NUHCS is to delay the onset of critical illness by addressing the root causes of cardiovascular disease much earlier in life – ultimately enhancing the health span of our population.

Life-Saving Devices and How They Work



ECMO

Extracorporeal Membrane Oxygenation (ECMO) is an artificial heart and/or lung machine that supports the body when a person's heart and/or lungs are too sick to carry out their normal functions.

ECMO does not treat the disease but allows the heart and/or lungs to rest and recover. It also enables necessary treatments and investigations to be carried out while providing vital organ support.

How it works:

ECMO continuously pumps blood out of the body and passes it through an artificial lung (also known as an oxygenator), which provides oxygen and removes carbon dioxide. This oxygenated blood is then pumped back into the body.

cVAD

Catheter-based left Ventricular Assist Device (cVAD) are small mechanical pumps that temporarily replace a patient's heart function. These devices are used in patients who remain critically ill despite the initiation of medications to improve heart pumping function.

How it works:

The cVAD is inserted into the heart's left ventricle through a small incision in the groin. Once in place, it monitors how well the heart is pumping blood. If the heart begins to struggle during the procedure, a small motor inside the pump kicks in to help by moving blood from the left ventricle into the body's main artery (the aorta), ensuring continued circulation throughout the body. This support is vital for patients whose hearts are too weak to maintain adequate blood flow on their own. The pump helps "top up" the heart's output, keeping the patient stable and ensuring their body gets the blood flow it needs.

ECPELLA

ECPELLA is a treatment for cardiogenic shock that simultaneously integrates the ECMO and cVAD. 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. Their expertise once gave Kang Zi Ying, a polytechnic student, a second chance at life. Read more about her inspirational story in ***Pulse Issue 42***!

How it works:

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

CTICU Fellowship Programme at NUHCS

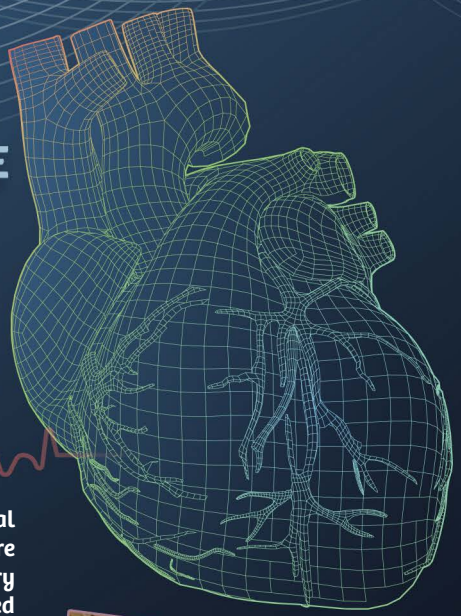
Keen to learn what it takes to be a part of this multidisciplinary critical care team? Hear from our Intensivists[4] and global fellows[5] who have trained with us, as they share how they empower one another in their combined mission to make a meaningful difference in the lives of cardiac critical care patients.

3. An **AED**, or Automated External Defibrillator, is a portable electronic device used to treat sudden cardiac arrest.
4. An **intensivist** is a medical doctor specialising in the care of critically ill patients in intensive care units (ICUs).
5. **The National University Hospital Global Fellows Alliance** provides clinical fellows and clinicians who had trained in the hospital with networking opportunities, knowledge sharing and extensive resources to professional development and mentoring programmes.

ARTICLE BY
NUHCS PULSE Editorial

ADVANCING EXPERTISE IN CARDIAC INTENSIVE CARE

Insights from the NUHCS Cardiac Critical Care Masterclass



The inaugural National University Heart Centre, Singapore (NUHCS) Cardiac Critical Care Masterclass held on 4–5 April 2025 brought together over 240 healthcare professionals for two days of intensive learning, hands-on training, and interdisciplinary collaboration. Attendees included specialists, intensivists, critical care nurses, allied health professionals, and medical officers, all with a shared goal: to elevate the standard of care for critically ill cardiac patients.

Led by Course Director Dr Anand Ambhore, Director, Coronary Care Unit, NUHCS, and Scientific Programme Chairman, Dr Lin Weiqin, Clinical Director, Heart Failure and Cardiomyopathy Programme, Department of Cardiology, NUHCS, the two-day masterclass delivered an immersive and impactful learning experience. Each session skillfully integrated clinical theory with practical, hands-on training and vibrant interdisciplinary dialogue. Participants left not only with deeper knowledge, but also the confidence and tools to apply it in delivering life-saving care on the ground.

Session 1: Cardiac Emergencies

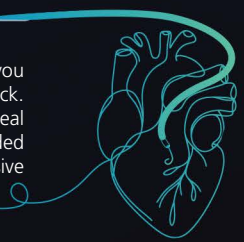
The masterclass started with an intensive exploration of the most critical cardiac emergencies. This session armed participants with the skills and strategies to tackle high-risk cases including percutaneous coronary interventions[1], life-threatening arrhythmias, pulmonary embolism[2], and mechanical complications following acute myocardial infarction[3]. Through real-world case scenarios and interactive discussions, participants honed their critical decision-making abilities required to act swiftly and effectively during cardiac emergencies — setting a strong foundation for the rest of the programme.

Session 2: Cardiogenic Shock

Following up on the knowledge of cardiac emergencies, Session 2 delved into cardiogenic shock: a serious condition where the heart fails to pump enough blood to the body, which can be fatal. This session focused on the classification, diagnosis, and management of this life-threatening condition. Participants gained insights into the latest treatment approaches, ranging from non-invasive tools to advanced haemodynamic monitoring techniques. Their key takeaway? Early intervention is critical. With the tools shared in this session, participants are now better equipped to diagnose with precision and respond more swiftly in critical situations.

Session 3: Mechanical Circulatory Support (MCS)

Imagine being at the bedside of a patient in severe shock, their heart struggling to keep up with the body's demands. How can you help? In this session, experts offered essential guidance on selecting the right medical device for patients with cardiogenic shock. This provided participants with valuable insights into navigating advanced technologies such as Veno-Arterial Extracorporeal Membrane Oxygenation (VA-ECMO) and Catheter-based Ventricular Assist Devices (cVADs). Additionally, the session provided tips on using echocardiography to monitor and manage patients on MCS — a skill increasingly vital in today's cardiac Intensive Care Units (ICUs).



Session 4: Multi-System Management in the Coronary Care Unit (CCU) (Part 1)

Acute cardiac conditions often lead to multi-organ complications, which require a broader approach to care beyond sole attention to the heart. Hence, this session discussed the interconnectedness of the body and the challenges of managing these complex conditions, including the ethics of medical futility and the challenge of managing difficult airways. Attendees also got to explore critical care nephrology and the nutritional needs of cardiac patients, offering them a holistic view of care within the CCU. This session emphasised that in critical care, collaboration across multiple disciplines is the key to better patient outcomes.

Hands-On Sessions

The Hands-On Sessions at the NUHCS Cardiac Critical Care Masterclass equipped participants with the confidence to act swiftly during cardiac emergencies, bringing practical skills to the forefront. Attendees engaged in immersive, small-group training focused on cVAD troubleshooting and VA-ECMO priming. The sessions offered an in-depth showcase of the key equipment and techniques used in cardiac critical care, providing participants with valuable insight into their function and application.

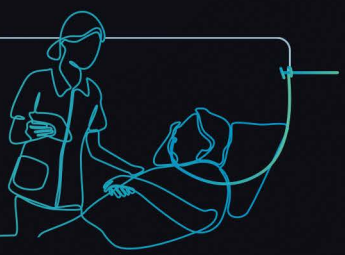
Session 5: Cardiac Arrest

A session that focused on one of the most catastrophic cardiac crises – cardiac arrest. Participants explored the realities of out-of-hospital cardiac arrests[4] in Singapore, alongside current practices in post-resuscitation care encompassing targeted temperature management, neuromonitoring and neuroprognostication[5]. With the spotlight on the evolving role of Extracorporeal Cardiopulmonary Resuscitation (E-CPR), this session covered cutting-edge techniques that rapidly reshapes the future of cardiac arrest.

Session 6: Multi-Disciplinary Management in the CCU (Part 2)

Building on the previous session, this follow-up session deepened the focus on the multi-disciplinary framework with a focus on coagulation and bleeding disorders[6], antibiotic stewardship in the cardiothoracic ICU, and drug dosing in extracorporeal circuits - all critical elements in the recovery of critically ill patients. The session also addressed the role of early mobilisation in cardiac intensive care, highlighting how integrated care can support faster recovery and reduce complications, and reinforcing the need for strong interconnected coordination in the CCU.

Nursing Breakout Session



This dedicated session allowed NUHCS nurses to come together to share on the vital contributions of nurses in the management of critically ill cardiac patients. This session offered an in-depth look into nurse-led spontaneous breathing trials and extubations, key nursing considerations in managing patients on VA-ECMO, and providing specialised care for those supported by cVAD. This session also addressed the compassionate removal of mechanical ventilation in cardiac intensive care, underscoring the central role of nurses in both life-sustaining interventions and dignified end-of-life care.

Session 7: End-of-Life Care and Organ Donation

The final session addressed the vital aspects of end-of-life care and the profound decision-making dilemmas around organ donation. Key speakers across coronary care, palliative care, anaesthesia and medical social work specialties concluded this masterclass with discussions on end-of-life and bereavement services. Sharing valuable information on brain death assessments and the ethical complexities of organ procurement - alongside practical approaches to support families through these emotionally charged decisions - participants ultimately learnt tips on promoting dignity in death and saving lives through organ donation. Crucially, participants developed a deeper appreciation of the compassion needed when making these difficult decisions.

Through a blend of case discussions, evidence-based guidelines, and hands-on demonstrations, this masterclass was an exceptional avenue for medical professionals to enhance their capacity in delivering exemplary care in high stakes emergencies – all in making a significant impact to the lives of cardiac critical care patients. Stay tuned for upcoming masterclass sessions as we continue to shape the future of cardiac care!

---

1. **Percutaneous Coronary Intervention (PCI)** is a non-surgical, invasive procedure with a goal to relieve the narrowing or occlusion of the coronary artery.
2. **A Pulmonary Embolism (PE)** is a blood clot that blocks and stops blood flow to an artery in the lung.
3. **Acute myocardial infarction**, also known as a heart attack, occurs when blood flow to the heart muscle is abruptly cut off, causing tissue damage.
4. **Out-of-Hospital Cardiac Arrests, or OHCA**, are the loss of cardiac function outside of a hospital setting. Cardiac arrest is the result of the heart suddenly and unexpectedly stopping. It is unpredictable and a time-sensitive medical emergency.
5. **Neuroprognostication** is the prediction of recovery from disorders of consciousness caused by severe brain injury.
6. **Coagulation and bleeding disorders** are conditions that affect the blood's clotting activities.

ARTICLE BY
NUHCS PULSE Editorial

Small Gifts, Big Hearts 2024

Spreading warmth from the heart with handmade crochets

On 6 December 2024, the National University Heart Centre, Singapore (NUHCS) hosted a heartwarming fundraising event that brought together compassionate individuals in support of a meaningful cause. In appreciation of their generosity, donors who made in-person donations received a special handmade token – a crocheted pouch or keychain, meticulously crafted with love by the dedicated staff of NUHCS' Electrophysiology[1] and Medical Technologist[2] teams. These are the same professionals who work behind the scenes to care for patients with heart rhythm conditions - using precision and technology to keep hearts beating strong.

This time, they have placed that same dedication beyond their frontline duties into every loop and stitch, to raise funds for the same financially disadvantaged patients that they care for.

The intricate details in every handcrafted piece reflected the passion and commitment behind this inspiring initiative. Believing that every act of kindness, no matter how small, can spark real change, the NUHCS team showed how compassion can be expressed in different forms, each with a personal and heartfelt touch.

The event was an overwhelming success, raising over $10,000 in donations, with all handmade crochet items fully redeemed. More than just a fundraiser, *Small Gifts, Big Hearts 2024* was a celebration of community, connection, and creativity – bringing people together to weave a shared tapestry of love, hope, and healing. Stay tuned for the next fundraising event coming to you in November 2025! Let's continue to craft kindness and make every heartbeat count.

"A small gesture can spark a great change. This belief drives our dedicated team of doctors, nurses, medical technicians, secretaries, & volunteers. This year, we are back with handmade crocheted gifts, crafted with love, to raise funds for our financially disadvantaged heart patients. Let's spread joy & hope to those who need it most!"

- Jessica Gan, Senior Case Management Officer, NUHCS, on behalf of the EP team

"Make a meaningful difference in the lives of our patients in need. Support the NUHCS Heart Fund today and bring hope, care, and healing to those who need it most!"

- Dr Yeo Wee Tiong, Clinical Director of Cardiac Electrophysiology (EP) & Pacing, Dept. of Cardiology, NUHCS

"The crocheted pouches and keychains, each handcrafted with care, represent hours of dedication from our team. Through our efforts, we aim to raise funds to support heart health and make a meaningful impact on lives."

- Too Pei Ni, Principal Medical Technologist, NUHCS, on behalf of the EP clinical team

About the NUHCS Heart Fund

A sub-fund of the NUHS Fund, the NUHCS Heart Fund was established to assist financially disadvantaged patients in their journey towards better heart health. 82% of applications[3] to the NUHCS Heart Fund came from the community's lowest 20% per capita income group, emphasising the need for financial support.

The generosity of donors to the NUHCS Heart Fund provides renewed hope to financially disadvantaged patients. With 100% of every donation going directly towards supporting the healthcare needs of our NUHCS financially disadvantaged patients, every donation matters to empower patients in rebuilding a healthier, better tomorrow!

Mdm Ina, a beneficiary of the NUHCS Heart Fund, shares her story of resilience and hope – thanks to the affirmative strength of kinship and timely support from donors:

KEEN TO MAKE A *Difference?*

Scan the QR code to make a donation!

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

For further queries, please contact **nuhcs@nuhs.edu.sg**

1. **Electrophysiology:** Examining the electrical activity of the heart, including the conduction system and rhythm.
2. **Medical technologist:** A healthcare professional who performs laboratory tests and procedures to assist in diagnosing and treating diseases. They analyze bodily fluids, tissues, and operate laboratory equipment to provide doctors with the information needed for accurate diagnoses.
3. Data as of Apr 2023 - Mar 2024 Donor Report.

ARTICLE BY
NUHCS PULSE Editorial

SPEARHEADING CARDIOVASCULAR RESEARCH AT ACC25

NUHCS brings research and innovation to the global stage

From bold ideas to practice-changing insights, the American College of Cardiology 74th Annual Scientific Session (ACC25), held from 29 to 31 March 2025 in Chicago, brought the international cardiology community together for three dynamic days of discovery and collaboration. With over 200 live sessions and seven late-breaking clinical trials, the event was a showcase of the latest innovation driving the next chapter of heart care.

◀ *NUHCS delegates at the conference*

American College of Cardiology (ACC)

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

This year's programme featured studies that challenged conventional practices, offered new therapeutic possibilities, and deepened the understanding of complex cardiovascular conditions. For NUHCS, it was not only a stage for knowledge exchange, but a proud opportunity to represent Singapore on the global stage.

Building on this spirit of international collaboration and innovation, seven pivotal clinical trials took centre stage — each contributing valuable insights with the potential to transform cardiovascular care worldwide.

CLINICAL TRIALS AND HIGHLIGHTS

STRIDE Trial

Originally used to treat diabetes, *Semaglutide* is now showing promise in another area. The STRIDE trial found that this medication helped improved the quality of life in people with peripheral arterial disease[1] and diabetes mellitus[2], enabling longer walking distances with less pain. Patients also reported feeling better overall – pointing to a promising new strategy for managing leg pain and mobility issues because of poor circulation.

API-CAT Trial

Preventing blood clots in cancer patients is essential, but treatment options may be limited by factors such as body weight or organ function. The API-CAT trial showed that a reduced dose of *Apixaban*, a common blood thinner, was just as effective as the standard dose in preventing venous thromboembolism[3] – offering a more tailored and tolerable approach to treatment.

ADVANCE HTN Trial

A potential new medication for resistant hypertension, *Lorundrostat* showed effectiveness in lowering systolic blood pressure in patients with treatment-resistant hypertension. After 12 weeks, patients saw significant improvements, suggesting this to be an effective new option for treating uncontrolled hypertension cases.

FRESH-UP Trial

For years, heart failure patients have often been told to limit their fluid intake each day. However, the FRESH-UP trial revealed that this approach did not provide clinical benefits in stable outpatients - prompting a re-evaluation of individualised fluid management strategies that may be more effective in future care of our patients.

DAPA-TAVI Trial

Transcatheter Aortic Valve Implantation (TAVI) – a minimally invasive procedure to replace damaged heart valves – still come with its risks for patients. The DAPA-TAVI trial found that the addition of a medication, *Dapagliflozin*, led to improved survival and reduced hospitalisation rates for heart failure, improving the quality of life after TAVI for many patients.

BHF-PROTECT TAVI Trial

When doctors replace a heart valve with the TAVI procedure, there is a risk of a stroke incidence. The Cerebral Embolic Protection (CEP) device has been developed to catch tiny debris that might cause a stroke during the procedure. However, the BHF-PROTECT TAVI trial found that using these devices did not reduce the chance of stroke in the first 72 hours after the procedure — igniting discussions on how to better enhance patient safety during and after TAVI.

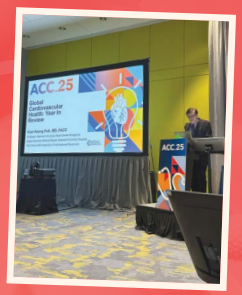
WARRIOR Trial

Addressing gaps in women's heart health, the WARRIOR trial found that intensive medical therapy did not significantly reduce adverse cardiovascular events for women with Ischemia with No Obstructive Coronary Artery Disease (INOCA) – a condition where blood flow to the heart is reduced despite their arteries appearing normal. This underscores the complexity of cardiovascular disease in women with INOCA and the urgent need for more tailored diagnostics and treatments.

Representing NUHCS on the Global Stage

Representing NUHCS at ACC25 was a 10-member team, led by Adj Prof Poh Kian Keong, Research Director, Department of Cardiology, NUHCS, and Adj A/Prof William Kong, Senior Consultant, Department of Cardiology, NUHCS. The team presented eight research abstracts co-authored by 34 NUHCS professionals, covering a range of crucial cardiology topics from valvular heart diseases to sudden cardiac death — reinforcing Singapore's growing influence in cardiovascular research.

One of the key moments for NUHCS was when Prof Ronald Lee, Senior Consultant, Department of Cardiology, NUHCS, was awarded the **2024 William W. Parmley Young Author Achievement Award.** His research paper titled, "Mandibular Advancement vs CPAP for Blood Pressure Reduction in Patients with Obstructive Sleep Apnoea", was selected for its academic rigour and impact - a recognition not only to his research but also to his leadership in mentoring the next generation of clinician-scientists.

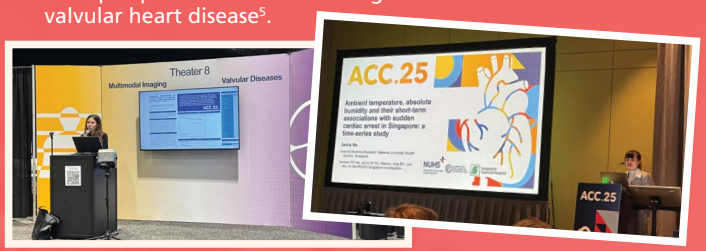


Adj Prof Poh Kian Keong, Research Director, Department of Cardiology, NUHCS, presenting on the review of global cardiovascular health

Young Voices Making Big Impacts

Dr Jamie Ho, a second-year Internal Medicine Resident, NUHS, stood out with her thought-provoking study on environmental determinants of cardiac risk in a tropical urban setting like Singapore. Her research, titled "Ambient temperature, absolute humidity and their short-term associations with sudden cardiac arrest in Singapore: a time-series study" was featured in a global session on cardiovascular health trends and climate, spotlighting the intersection of environmental and heart health.

Dr Elinor Tan, Senior Resident, Department of Cardiology, NUHCS, shared insights on how elevated right-sided heart pressures could help predict outcomes in patients with aortic regurgitation[4]. Findings from her study, titled "Prognostic implications of elevated RSVP in moderate to severe aortic regurgitation" add new perspective to the evolving field of risk stratification in valvular heart disease[5].



(left) Dr Elinor Tan, Senior Resident, Department of Cardiology, NUHCS, and (right) Dr Jamie Ho, Junior Resident, NUHS, delivering their oral presentation

More Than a Conference, but a Global Movement

Beyond the scientific presentations and interactive clinical sessions, ACC25 provided a rich platform for the exchange of ideas, meaningful networking with like-minded professionals, and cross-border collaboration with one shared purpose: **to push the boundaries of cardiovascular care**.

NUHCS' participation reflects its ongoing commitment to academic research, excellence, mentorship, and collaborative innovation. By contributing to global conferences like ACC25, the institute strives to strengthen its international footprint in cardiovascular research, not just in Singapore, but around the world.

References:

1. **Peripheral arterial disease** – Condition where narrowed arteries reduce blood flow to the limbs, causing leg pain when walking.
2. **Diabetes mellitus** – Long-term condition where the body struggles to regulate blood sugar levels.
3. **Venous thromboembolism** – Condition involving blood clots in the veins, which can travel to the lungs and disrupt blood flow and heart function.
4. **Aortic regurgitation** – A heart valve condition where blood leaks backward from the aorta back into the rest of the body.
5. **Valvular heart disease** – A condition where one or more of the heart's four valves (aortic, mitral, tricuspid, and pulmonary) do not function properly.
6. **Ischemic heart disease** – Also known as coronary artery disease, this condition occurs when the heart's blood supply is reduced, often causing chest pain or heart attacks.

ARTICLE BY

Dr Aloysius Leow
Junior Resident,
Internal Medicine, NUHS

Dr Aloysius Leow is a third-year Internal Medicine Junior Resident in NUHS. He has a strong interest in epidemiology/statistical analysis, cardiovascular health, and multidisciplinary research pertaining to Neurocardiology.

ARTICLE BY

Dr Audrey Zhang
Junior Resident, Internal Medicine, NUHS

Dr Audrey Zhang is a third-year Internal Medicine Junior Resident in NUHS. She has a strong interest in cardiovascular research with publications in ischemic heart disease[6], cardiometabolic health and valvular heart disease.

Stronger Together: 7 Years of Caring Hearts Support Group (CHSG)

About CHSG

A volunteer initiative *by* patients *for* patients at NUHCS, this support group was launched with the vision to build an inspiring and caring heart patient support group that stays connected and supports fellow cardiac patients and the community through each other's journey to remain heart healthy.

CHSG members unite for the 2024 Christmas carolling sessions at the National University Heart Centre, Singapore (NUHCS), where festive cheer was spread to both patients and fellow members alike, ending 2024 on a high note and approaching 2025 with optimism.

Find out more about CHSG!

Membership is open to heart patients who have completed the Basic Cardiac Rehabilitation Programme at NUHCS. For more information about CHSG or to join CHSG, please contact Magdalene Chia, Programme Volunteer Lead, at mchia@kucinta.com.

A Strong Start to 2025

We began the year on an inspiring note. In January, as CHSG's Programme Volunteer Lead, I completed my second module in Health Coaching at the National University of Singapore (NUS)'s Yong Loo Lin School of Medicine, after six months of in-depth practical skills training. Now a Certified Health Coach, I bring deeper knowledge to empower CHSG members on their heart health journey with greater confidence and support.

Celebrating 7 Years of Care and Friendship

2025's celebration was more than just a joyful gathering. It was a moment of reflection on CHSG's evolving role within the healthcare system, and the deep impact it continues to make on the lives of its members.

One of the most heartfelt moments of the celebration was when the CHSG members stood together and proudly took a collective pledge - reaffirming their dedication to continuous growth, patient education, and close collaboration with the healthcare system to provide a holistic and compassionate support in the patient care journey.

A Community for All Ages

The 7th anniversary celebration also shone a light on CHSG's strength – its community. From newborns to the group's most senior member, 101-year-old Mdm Sharada Chellam, CHSG is truly a multigenerational support system. Mdm Chellam, with her lifetime of wisdom, shares a simple yet profound philosophy for life, which members have embraced as a source of daily encouragement:

Life Is As Simple As "ABCDE"

- **A** Accept, Adapt, and Adjust - no matter the situation
- **B** Believe in yourself and find Balance – in emotions, food, and activity
- **C** Never Complain, Compete, Compare – seek comfort in contentment
- **D** Determination, Dedication, Discipline – this will keep you on your path
- **E** Exercise – the key to lifelong good health

These guiding principles have become a daily motivation for many CHSG members, inspiring them to live healthier, happier lives by accepting, adapting and adjusting to all changes that life may bring.

Championing Heart Health Through Movement

With seven years of expertise in heart health under our belt, CHSG continues to champion the importance of exercise in cardiovascular wellness. At the 7th anniversary celebration, A/Prof James Yip, Executive Director, NUHCS, together with Prof Tan Huay Cheem, Senior Advisor, NUHCS, Dr Yeo Tee Joo, Director of Cardiac Rehabilitation Unit, Department of Cardiology, NUHCS, Mr Qamaruzaman, Principal Physiotherapist, NUHCS, and I introduced a new initiative: specially designed NUHCS-CHSG TheraBands to encourage safe and effective home-based exercise.

During the festivities, Dr Yeo and Mr Qamaruzaman, also demonstrated a series of simple exercises utilising the TheraBands, highlighting the importance of regular movement in maintaining heart health.

Scan the QR code to watch the exercise routine:

The celebration concluded with a joyful cake-cutting ceremony, followed by a heartfelt toast to many more years of friendship, resilience, and good health.

"CHSG's strength lies in its unity – a vibrant community of diverse ethnicities and cultures, bound by a shared commitment to lead heart-healthy lives. As it celebrates seven years of meaningful support and friendship, the group continues to uphold its mission of bringing positive change to the lives of heart patients and the community with its motto - "Caring Begins With Me".

As CHSG looks forward to brighter days ahead in 2025, it remains dedicated to strengthening its efforts and actions guided by its core principle — **"Let All That We Do, Be Done in Love"**."

ARTICLE BY
Magdalene Chia
Programme Volunteer Lead,
Caring Hearts Support Group (CHSG)

Shining the Light on Women's Heart Health

Uncovering hidden heart disease risks in women

Did you know that 1 in 3 heart attack victims are women?

Traditionally perceived as a men's disease, Cardiovascular Disease (CVD)[1] is, however, the **leading cause of death** among women[2]. Despite its alarming prevalence, many females are unaware of or diminishing the life-threatening risks of CVD, highlighting the urgent need for greater public education and advocacy around women's heart health.

The Subtle Symptoms Women Shouldn't Ignore

On a recent CAPITAL 958 Mandarin radio show, Dr Sim Hui Wen, Consultant, Department of Cardiology, NUHCS, spotlighted on the less obvious heart attack symptoms experienced by women - including fatigue and unusual upper body pain - which often leads to them being downplayed, or even mistaken as symptoms of stress, ageing or flu.

Scan to read this Channel NewsAsia article to **discover surprising women's health facts you might not know!**

In another 987 FM English radio show, Dr Jeanne Ong, Consultant, Division of Cardiology, Dept. of Medicine, NUHCS @ Ng Teng Fong General Hospital (NTFGH), dived into the recent fitness bandwagon of Hyrox and spin classes, where she weighed in on the cardiovascular benefits of High-Intensity Interval Training (HIIT) compared to more moderate forms of exercise such as Pilates or yoga.

Her advice? "Any exercise is good exercise". Choose activities you enjoy and stick with it – it is consistency that counts.

While working out has become increasingly popular, particularly among Generation-Zs and millennials, many of them rely on pre- and post-workout caffeinated drinks for a boost. Although caffeine may help with energy and focus, Dr Jeanne cautions that some individuals may experience faster heart rates and heart palpitations, and she emphasises on consuming such beverages in moderation.

Recommended weekly activities levels:

Moderate intensity workouts:
30 mins per day
(5 times a week)

High intensity workouts:
15 mins per day
(5 times a week)

Heart Health showdown: HIIT vs Pilates – Who wins? Tune in to the 987 FM podcast to find out!

Her Heart Matters Too

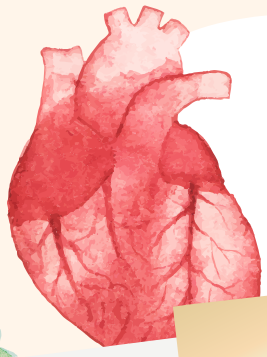
Many women are caregivers – whether for children, ageing parents, or both. But while caring for others, they often neglect their own health, placing themselves at greater risk of stress-related cardiovascular issues.

One such woman kept going... until she couldn't. Watch on to find out why.

Protecting Women's Hearts Through Different Life Stages

Pregnancy is one of the most joyful and transformative phases in a woman's life – but it's also a time when the heart is under significant strain. To support both the mother and baby, the heart must pump **up to 50% more blood** than usual.

The journey of motherhood can also come with emotional challenges, such as pre- and post-natal depression. These challenges can affect the mother's emotional wellbeing, which can in turn affect her physical heart health. This highlights the connection between physical and emotional health.



Women with depression have up to 1.6x heart disease risk!

An example of such mind-heart connections is the Broken Heart Syndrome (also known as Takotsubo Cardiomyopathy), a real and serious medical condition triggered by intense emotional stress, which mimics the symptoms of a heart attack.

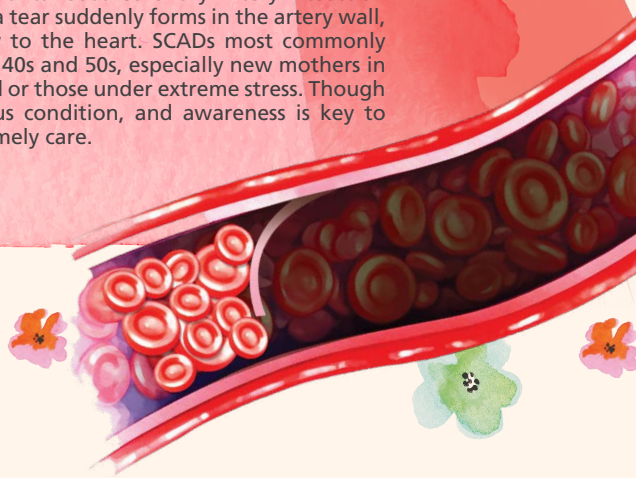
Over time, unaddressed emotional strain can significantly increase cardiovascular risk, making it crucial to recognise and manage both the psychological and physical aspects of heart health.

SMALL STEPS, BIG IMPACT!
Make healthier lifestyle choices & seek support:

• Move more • Manage stress • Call a friend

Sudden tear in the heart's walls

While most heart attacks are caused by artery blockages, another condition - Spontaneous Coronary Artery Dissection (SCAD) - occurs when a tear suddenly forms in the artery wall, restricting blood flow to the heart. SCADs most commonly affect women in their 40s and 50s, especially new mothers in the postpartum period or those under extreme stress. Though rare, SCAD is a serious condition, and awareness is key to early detection and timely care.



Symptoms of SCAD to watch out for:

Chest pain or tightness

Shortness of breath

Nausea or dizziness

Unusual pain in arms, jaw or back

Understanding how women experience heart disease differently is the first step toward protection and prevention. Whether it is recognising subtle symptoms, managing stress, or building healthy habits, every woman deserves to be equipped with the knowledge to care for her heart.

Follow NUHCS on social media for more lesser-known heart facts and practical tips to support the heart health of the women we love – our mothers, daughters, sisters, and friends.

@NUHCS | @nuhcsofficial | @nuhcs

ARTICLE BY
NUHCS PULSE Editorial

References:
1. Cardiovascular diseases (CVDs) are a group of disorders of the heart and blood vessels, including heart attacks and strokes.
2. https://nuhsplus.edu.sg/article/heart-disease-is-the-number-one-killer-among-women

A student's mission to heal through research

with support from the Chia Boon Lock Memorial Fund

Chia Boon Lock Memorial Fund was established in 2018 to honour Emeritus Professor Chia Boon Lock, and to perpetuate his passionately held beliefs about the practice of medicine and the education of Singapore's doctors.

Widely regarded as Singapore's "Father of Cardiology", E/Prof. Chia 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 field. Being the first cardiologist to introduce 24-hour 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.

Officially launched in the 2020/2021 academic year, this bursary offers financial assistance to 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 boost care and health outcomes, along with shaping future generations of doctors.

"I am incredibly honoured to have been awarded the Chia Boon Lock Memorial Fund, a recognition that deeply affirms my commitment to cardiovascular research and public health. As a medical undergraduate at the Yong Loo Lin School of Medicine, National University of Singapore (NUS), this award is not just a personal milestone — it represents a shared vision of using medicine and data to shape a healthier future.

My journey in research stems from a simple but powerful belief: that every dataset carries a human story. The ability to transform raw numbers into insights that can improve patient care is what drives me. To me, research is not merely an academic exercise; it is a way to safeguard the lives and well-being of people we may never meet, but whom we serve through science and foresight.

A Vision for Healthier Futures

I dedicated my project, ***The Global Syndemic of Modifiable Cardiovascular Risk Factors***, to exploring the shifting trends in five major culprits of heart disease — diabetes, hypertension, high cholesterol, obesity, and smoking. By projecting these trends to 2050, I aimed to illuminate the evolving burden of cardiovascular risk across different populations and age groups.

As global populations age, we are seeing a rapid increase in chronic conditions such as diabetes and hypertension among the elderly. At the same time, worrying patterns are emerging among youth, especially the growing prevalence of obesity, driven by sedentary lifestyles and unhealthy diets. These trends, if left

unaddressed, could accelerate early-onset heart disease, overburden healthcare systems, and compromise quality of life for millions.

From Data to Change

Identifying the problem is only the beginning. My research is about using insight to drive action. By examining data across regions, age groups, and socio-economic contexts, I sought to help shift the focus of heart health from reactive treatment to proactive prevention. A key takeaway from this study is that we cannot afford a one-size-fits-all approach — prevention strategies must be tailored to the diverse populations they are intended to serve.

The findings support targeted interventions, such as improving hypertension screening among the elderly, addressing youth obesity early on, and allocating healthcare resources more strategically in low- and middle-income countries. We also need bold, system-wide measures — such as implementing sugar taxes, introducing front-of-pack nutritional labelling, and launching large-scale public health campaigns. With better foresight, we can ensure that healthcare systems are not only prepared, but also equitable in their response.

Ultimately, this research is more than a paper; it is a roadmap for smarter, more inclusive health policy. That said, I believe policy change alone is not sufficient. Long-term impact depends on a collective effort — one that includes healthcare institutions, governments, public education, and individual commitment. Forecasting health risk is not about accepting a bleak future, it is about creating opportunities to act earlier, respond more effectively, and help more people live longer, healthier lives.

At the 35th Annual Scientific Meeting of the Singapore Cardiac Society (SCS), I explored the latest advancements in cardiovascular health alongside 500 healthcare professionals, researchers, and experts.

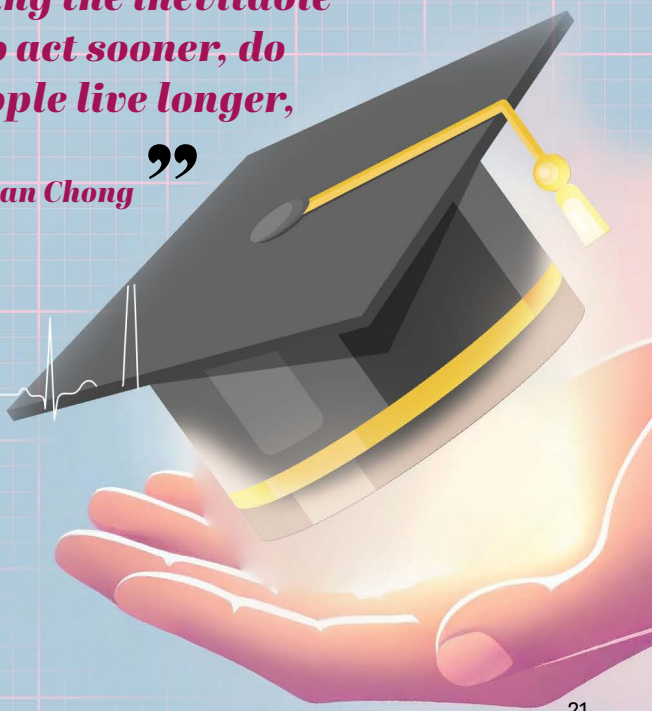
Carrying a Legacy Forward

Receiving the Chia Boon Lock Memorial Fund is both a privilege and a call to action. I am proud to stand alongside fellow recipients who share the mission of advancing medicine not only through knowledge, but through compassion and real-world impact.

Through this opportunity, I remain committed to contributing to a future where our health systems are inclusive, resilient, and forward-looking.

> ***"Forecasting risk isn't about predicting the inevitable — it's about finding opportunities to act sooner, do better, and ultimately help more people live longer, healthier lives."***
> ***- Chia Boon Lock Memorial Fund Beneficiary, Bryan Chong***

Scan the QR code below to find out more about the Chia Boon Lock Memorial Fund:



ARTICLE BY

Bryan Chong
Medical Student, Yong Loo Lin School of Medicine

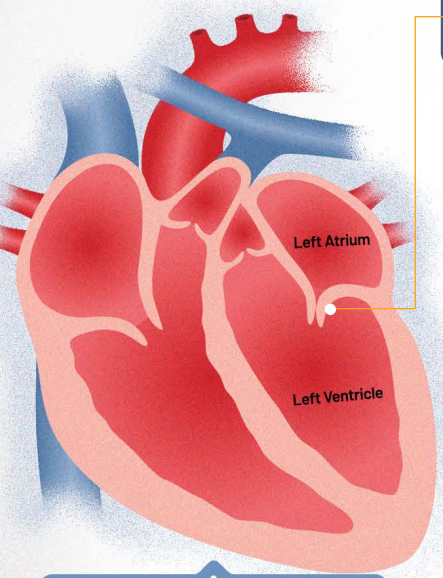
Bryan is currently a junior doctor with a keen interest in cardiometabolic health.

The Leaking Heart Valve: Advancements in Treatment

A **new** lease on life through *less invasive transcatheter* heart valve repair

Feeling unusually breathless or constantly fatigued? It might be more than just stress. These symptoms could be signs of Mitral Valve Regurgitation (MR) - a heart condition where blood leaks backwards in the heart, making it harder to circulate blood and, if left untreated, could potentially lead to heart failure. The good news? Less invasive treatments are available to improve this condition, especially for patients who are not suitable candidates for an open-heart surgery.

Mitral valve *acts as a door that connects the heart's left atrium and left ventricle.*

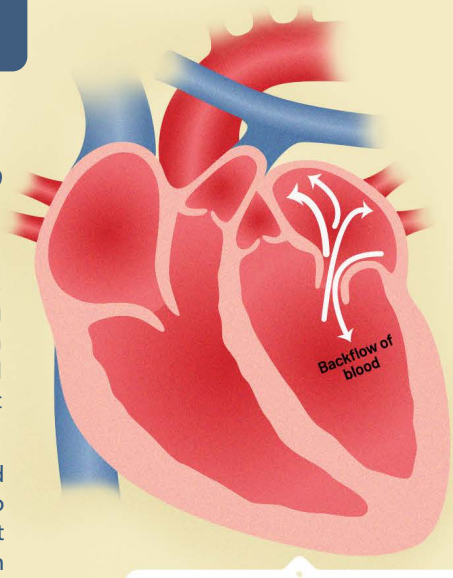


Typical Heart

What is Mitral Valve Regurgitation?

Marked by symptoms of fatigue, palpitations, shortness of breath during exercise or even at rest, MR happens when the mitral valve - which controls blood flow from the left atrium into the left ventricle - is unable to close properly.

The improper closure causes backward flow (leaking) of blood, leading to dilation of the heart chambers. If left untreated, MR can eventually result in heart failure.



Mitral Valve Prolapse[2] with Regurgitation

Who is at risk?

MR can affect anyone, but certain groups are more vulnerable:

1. Elderly individuals with heart conditions such as Atrial Fibrillation (AF)[1], which can enlarge the heart chambers.
2. Those born with an abnormal mitral valve shape, most commonly known as mitral valve prolapse.
3. People who had a heart attack, which can weaken the heart function, and enlargement of the heart chambers.
4. Elderly with degenerative[3] or calcified[4] (calcium buildup) mitral valves.

How is MR Diagnosed?

While some heart problems share similar symptoms, patients with severe MR typically have a distinctive heart murmur. Diagnosis is typically confirmed using:

- **Transthoracic Echocardiogram (TTE) – a painless ultrasound scan of the heart**
- **Blood tests**
- **Transoesophageal Echocardiogram (TEE) – for more detailed imaging**

Treatment for MR: A Non-invasive Approach

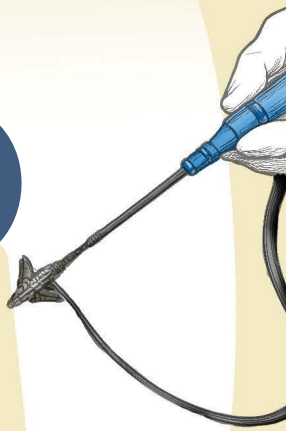
A damaged mitral valve can either be repaired or replaced, depending on the severity of the condition. Traditionally, severe mitral regurgitation was treated through an open-heart surgery. Now, a less invasive alternative is available, the Transcatheter Edge-to-Edge Repair (TEER) treatment procedure, which uses a MitraClip or PASCAL clip implant device inserted through a catheter via the groin.

TEER, typically taking two hours, uses implant devices to repair and restore normal blood flow. Expanding the pathway of treatment options for patients with complex heart conditions, the TEER approach enables precise treatment of mitral valve regurgitation through a less invasive method compared to traditional open-heart surgery.

In early 2025, the National University Heart Centre, Singapore (NUHCS) became one of the first in the region to offer a next-generation TEER treatment using the PASCAL device. This approach improves precision for clinicians, potentially leading to better patient outcomes.

Benefits for the Patient:

- **Lower surgical risks**
- **Faster recovery time**
- **A less invasive approach for high-risk patients**



Living with Severe Mitral Regurgitation

As the population ages, mitral regurgitation is becoming increasingly prevalent. Fortunately, advanced devices such as the PASCAL TEER system and MitraClip are paving the way for safer, more effective treatments. These innovations not only address current challenges in heart valve disease but also signal a shift towards more personalised and less invasive cardiac care for patients.

At NUHCS, the future of heart health is progressing steadily – with every valve repair offering patients renewed strength, resilience, and a better quality of life.

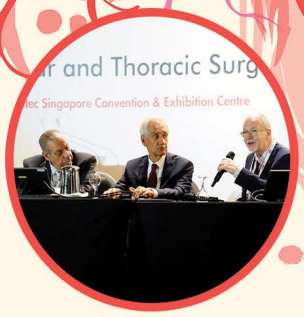
PASCAL TEER procedure co-led by Dr Ivandito Kuntjoro, Director of Structural Heart Programme, Dept. of Cardiology, NUHCS. NUHCS was one of the first regional centres to offer this PASCAL TEER procedure.

1. **Atrial Fibrillation (AF)** – Fast and disorganised contraction of the heart's top chambers, leading to an irregular heartbeat
2. **Mitral valve prolapse** – The most common form of heart valve disease where the mitral valve does not close properly
3. **Degenerative mitral valves** – Gaps in portions of the valve prevent it from closing properly
4. **Calcification mitral valves** – Calcium deposits around the valve cause narrowing of structures supporting the flaps

ARTICLE BY
NUHCS PULSE Editorial

ASCVTS 2025

Bridging Expertise Across Borders



The 33rd Annual Meeting of the Asian Society for Cardiovascular and Thoracic Surgery (ASCVTS 2025), led by Congress President, Prof Theodoros Kofidis, took place from 14th –17th May 2025 at Suntec Singapore Convention & Exhibition Centre.

NUHCS is honoured to be on the global stage with its team of medical professionals contributing across multiple educational tracks - including adult cardiac, congenital cardiac, thoracic, critical care and nursing specialties - to lead and participate in various symposiums, hands-on workshops, and panel discussions.

Under the theme of "Progress, Innovation and Fellowship", ASCVTS 2025 aimed to provide a dynamic platform for surgical specialists to share innovative ideas, update clinical knowledge, and explore emerging trends and controversies in the field. With participation from more than 1000 healthcare professionals from over 50 countries, the conference fostered meaningful exchange across academia, clinical practice, and technology.

The Asian Society for Cardiovascular and Thoracic Surgery (ASCVTS) is a professional organisation for surgeons, researchers and healthcare professionals involved in cardiovascular and thoracic surgery, with a focus on the Asian region. With annual meetings held every year at selected countries, the ASCVTS brings together experts to network, share advancements, and shape the future of the field.

1000+ Attendees

>50 Countries

212 Invited Speakers

38 Symposiums

7 Workshops

4 Joint Society Sessions

111 Oral Presenters

140 Poster Presenters

6 Awards

4 Sponsors

33 Exhibiting Companies

4 Social Functions

Fostering Collaboration and Shaping the Future

NUHCS also introduced a brand-new Perfusion Crisis Simulation workshop, led by its team of perfusionists – specialists who operate the heart-lung machine during surgery. Through realistic simulations of emergency situations in the operating room, participants practised making quick decisions, working as a team, and staying calm under pressure.

ASCVTS 2025 provided an invaluable platform for knowledge exchange and a hub for both regional and global networking. The bonds and friendship forged during the congress pave the way for future collaborations, ultimately contributing to improved patient outcomes.

As one of Singapore's national centres for tertiary care, NUHCS is proud to be at the forefront of cardiovascular and thoracic surgery – shaping the future of medicine and driving transformative outcomes for patients across the region.

Pre-Congress Workshops

A significant highlight was the array of pre-congress workshops on 14th May, designed to provide hands-on training in advanced surgical techniques.

Among these, the Minimally Invasive Cardiac Surgery (MICS) Endoscopic Mitral Repair workshops, led by Prof Filip Casselman, Dr Nuttapon Arayawudhikul and Dr Chang Guohao, Scientific Chair of ASCVTS and Consultant, Department of Cardiac, Thoracic and Vascular Surgery (CTVS), NUHCS, provided hands-on training in endoscopic mitral valve repair[1] techniques using state-of-the-art simulators. This environment of dry and wet lab simulation is designed to facilitate and transition surgeons from 'textbook' to 'bedside'.

The Aortic workshops led by Adj A/Prof Sorokin Vitaly, Head of Division of Adult Cardiac Surgery, Department of CTVS, NUHCS, attracted numerous participants to an immersive session. The workshop provided information on the latest treatments for disease of the body's main artery – the aorta – and offered cutting-edge, hands-on experience in advanced aortic surgery techniques, including frozen elephant trunk deployment[2].

1. **Mitral valve repair** is a surgical procedure that treats conditions related to the mitral valve - the "door" that connects the heart's left atrium and left ventricle.
2. **The frozen elephant trunk deployment** is a hybrid surgical technique used to treat complex aortic arch pathology in a single operation. The word "frozen" refers to the fact that the stent graft (or "trunk") is implanted and "frozen" in place during the arch replacement, acting as a foundation for potential future endovascular procedures.

ARTICLE BY

Dr Chang Guohao
Consultant, Department of CTVS, NUHCS

Dr Chang Guohao is a Consultant Cardiothoracic Surgeon in the Division of Adult Cardiac Surgery, Department of Cardiac, Thoracic and Vascular Surgery (CTVS) at the National University Heart Centre, Singapore (NUHCS). He is fellowship-trained in Minimally Invasive Cardiac Surgery and Transcatheter procedures for the treatment of valvular heart diseases at Ospedale San Raffaele, Milano, Italy. Dr Chang's interests lie in all aspects of adult cardiac surgery including minimally invasive cardiac surgery for valvular heart disease, coronary artery disease and left atrial tumors and atrial septal defects, and Extracorporeal life support. In ASCVTS 2025, Dr Chang is the Scientific Committee Chair and concurrent domain lead for Adult Cardiac Surgery.

LEARNING Abroad, IMPACT AT HOME

Inside the scholarship journey of NUHCS Medical Technologists

Committed to nurturing the next generation of healthcare professionals and in pursuit of knowledge sharing, the National University Heart Centre, Singapore (NUHCS) facilitates medical technologists[1] to embark on specialised scholarships, which further develops their potential in the clinical, educational, and research aspects of the profession.

In this feature, the *PULSE* Editorial team speaks with three medical technologists from NUHCS, as they reflect on their journeys of pursuing overseas education through the scholarship programmes that have strengthened their dedication to transform cardiovascular diagnostics and patient care.

In 2018, I joined Alexandra Hospital (AH) as its first cardiac medical technologist[2], helping to co-develop its cardiac services. Recognising the need for advanced knowledge to build a future-ready lab, I pursued a Master's degree in Medical Ultrasound (Echocardiography[3]) at Imperial College London through the Formal Qualification Scheme (FQS) scholarship — becoming the first in my department to do so.

This milestone came with a deep sense of responsibility. At Imperial, I was mentored by world-renowned experts such as Professor Petros Nihoyannopoulos, former President of both the British Society of Echocardiography and the European Association of Echocardiography, and Shaun Robinson, Vice-President of the British Society of Echocardiography. Their guidance profoundly shaped my clinical expertise in advanced cardiac imaging.

My clinical rotations in the United Kingdom (UK) exposed me to rare, complex cases that strengthened my diagnostic skills and inspired innovations for NUHCS.

Graduating with Honours (Distinction) and receiving the Dean's Prize was an honour, but the true reward lies in the vision it sparked — to raise the standards of cardiac diagnostics and contribute meaningfully to the future of cardiovascular care in Singapore.

Cherlyn on the job

Cherlyn at her Master's graduation

Cherlyn Ng

Senior Medical Technologist, NUHCS @ AH

More than two decades ago, my journey into vascular sonography[4] began with a non-healthcare degree. Through the years, my passion for vascular sonography deepened.

As part of multi-disciplinary vascular team, providing highly accurate vascular diagnostics is crucial to improve patient outcome and this can only be achieved through structured training of vascular technologists.

My pursuit for professional excellence started from becoming a Registered Vascular Technologist (RVT) followed by a formal degree in Vascular Technology, culminating in a Master of Science in Medical Ultrasound (Vascular) from Imperial College London.

During my clinical attachment with the UK's National Health Service, I encountered complex cases and innovative practices that enriched my perspective. A highlight was attending the Charing Cross Symposium, where insights were exchanged with vascular experts from around the world - an experience that broadened my understanding of diagnostics and multidisciplinary care.

Returning to Singapore, I felt a strong responsibility to share this knowledge. I continued to teach as an adjunct faculty at the Singapore Institute of Technology and am now in the process of developing a certification programme for aspiring vascular technologists. To foster collaboration and support among peers, I volunteered to chair a Community of Practice for Sonographers — an initiative aimed at providing a comprehensive career progression pathway and shared learning, to elevate the profile of our profession.

Vascular sonography is a dynamic and rewarding field that plays a crucial role in modern healthcare. I encourage individuals from diverse backgrounds to explore this fulfilling career path and contribute to the advancement of vascular diagnostics in Singapore.

Julie receiving the Dean's Award plaque

> ***"By joining this profession, you can make a significant impact on patient care and help shape the future of medical imaging technology. – Julie Low"***

Julie with her classmates

Julie at the Charing Cross Symposium

Julie Low
Principal Medical Technologist,
NUHCS @ National University Hospital (NUH)

Echocardiography has always fascinated me — it is one of the most powerful and non-invasive tools we have to understand the heart's function. Yet for me, it was never just about the technology, but about the impact it can have on patients.

When I decided to pursue a Master's degree in Clinical Ultrasound (Echocardiography) through the University of Melbourne's remote programme, it was the ideal way to advance my skills without having to leave my family in Singapore.

This flexible structure allowed me to remain with my family while furthering my education, giving me the best of both worlds. The curriculum covered advanced imaging techniques such as 3D and strain imaging, which are transforming the way we evaluate cardiac function. These tools have enabled me to deliver more accurate, high-quality scans that directly enhance diagnostic confidence and patient outcomes.

Beyond technology, the programme reshaped how I approach each scan—with precision, purpose, and a deeper clinical perspective. It reinforced my belief that ongoing learning is key to raising the standard of care.

I hope my journey encourages fellow cardiac medical technologists to invest in their growth and embrace new ways of improving patient care, all while staying rooted in the lives and communities they serve.

Jolie on the job

Jolie Pang
Medical Technologist, NUHCS @ NUH

References:
1. **Medical technologists** – healthcare professionals who perform laboratory tests to aid in the diagnosis, treatment, and monitoring of diseases.
2. **Cardiac medical technologists** – healthcare professionals who use specialised equipment like echocardiogram and electrocardiogram machines, to assist clinicians in diagnosing cardiovascular conditions.
3. **Echocardiography** – a non-invasive ultrasound test to visualise the heart's structures, for diagnosing issues such as enlargement of the heart, structural abnormalities, blood clots, etc.
4. **Vascular sonography** – a non-invasive imaging technique that uses high-frequency sound waves to visualise and assess blood flow and the structure of blood vessels, primarily arteries and veins. It helps doctors diagnose and monitor various vascular conditions.

ARTICLE BY
NUHCS PULSE Editorial

New Heart, Same Mission

An interview with the new Head of Cardiology for NUHCS @ Ng Teng Fong General Hospital (NTFGH)

At the heart of healthcare, leadership is not just about managing departments – it is about shaping lives. Dr Anand Ambhore, Head, Division of Cardiology, Department of Medicine, National University Heart Centre, Singapore (NUHCS) @ Ng Teng Fong General Hospital (NTFGH), embodies this philosophy.

A passionate clinician, educator and leader, Dr Anand has dedicated his career to advancing cardiovascular care. Now, with his wealth of expertise and his forward-looking vision, he is taking the reins of cardiology at NTFGH, guiding the team through the evolving landscape of heart care in Singapore.

In this issue, *PULSE* speaks with Dr Anand as he shared more about his experience and what he hopes to achieve in the next few years.

PULSE: What are your top priorities in your role as Head of Cardiology, NUHCS @ NTFGH?

My priorities will revolve around improving patient and staff satisfaction, while strengthening our future capabilities through clinical research and education.

Key goals include fostering a supportive work culture through open communication and shared visions, delivering exceptional patient care through streamlined workflows and a motivated team with close primary care partnerships, driving research to expand NUHCS' vision, and cultivating a collaborative culture. By integrating research into practice and fostering a culture of continuous learning, we ensure our team stays aligned in values and practices to deliver the best possible outcomes for patients.

PULSE: What is your vision for the Division of Cardiology at NTFGH for the next five years?

In the next years, I envision the cardiology division at NTFGH providing exceptional cardiac care in western Singapore, recognised for its patient-centered approach and innovative treatments. We aim to strengthen our collaboration with NUHCS at National University Hospital (NUH) through a "Hub-and-Spoke" model for key programmes, such as aortic disease, cardiogenic shock and complex electrophysiological conditions.

A robust system should be built for early detection and prevention of heart disease, working closely with primary care providers and leveraging technologies including telemedicine and wearable devices for remote patient monitoring. NUHCS @ NTFGH will also evolve into a hub for clinical research and education, supporting NUHCS' broader vision of "a healthy community, shaping medicine and transforming care." Beyond the introduction of new tools and initiatives, I envision a multidisciplinary team that collaborates seamlessly with other sub-specialties to provide holistic care, ensuring that NUHCS @ NTFGH sets a benchmark for cardiac health excellence in the region.

PULSE: Are there any immediate gaps you hope to address?

- **Patient education on cardiac diseases and preventive care**
  We aim to launch community outreach programmes to raise awareness about cardiac health, delving into cardiovascular diseases including heart failure and coronary atherosclerosis.
- **Adopting new technologies**
  Training staff to use advanced imaging and advanced telemonitoring[1] to effectively manage cardiac conditions.
- **Optimising resource utilisation**
  Refining resource allocation to allow faster access to urgent cardiac care, ensuring timely interventions and reducing hospital readmissions through close collaboration across departments and nurse-led clinical services.

Dr Anand Ambhore, Head, Division of Cardiology, Department of Medicine, NUHCS @ NTFGH

PULSE: What inspired you to specialise in cardiology, and how has your passion evolved over the years?

Early in my career as an Internist[2] in the 2000s, I was captivated by the complexity of the cardiovascular system. Managing critical conditions such as acute myocardial infarction[3] was challenging, but deeply fulfilling. Over the years, I have seen remarkable improvements in cardiac and critical care. We have gone from basic treatments to more structured ways of handling serious conditions, along with major advances in respiratory support, kidney treatments, emergency care during cardiac arrest, and helping the heart recover using high-tech support systems.

These developments have only deepened my passion—not just in treating patients, but also for driving research and innovation to continually elevate cardiac care for future generations.

PULSE: What are the most promising developments in cardiac treatment on the horizon?

Several emerging developments are set to reshape cardiac treatment, including refining Mechanical Circulatory Support (MCS) with microaxial pumps[4] and the promise of regenerative therapies, such as stem cell treatment, to repair damaged heart tissue.

Minimally invasive procedures, such as Transcatheter Aortic Valve Replacement (TAVR)[5], continue to broaden treatment options for intermediate and higher risk patients. Meanwhile, wearable technology and remote monitoring of vital signs are enabling real-time tracking of heart health, allowing for early interventions. The growing field of precision medicine using genetic profiling, holds immense potential for more effective, highly individualised therapies, while augmented and virtual reality enhances training, diagnostics, and precise operations.

PULSE: How do you balance advanced treatments with preventive care in cardiology?

Striking the right balance requires a dual-focus approach. While it is essential to invest in advanced therapies for managing acute and complex conditions, preventive care remains key to reducing the overall burden of heart disease, including coronary artery disease and heart failure.

Public health campaigns, regular screenings, and lifestyle intervention programmes should be prioritised to detect risks early. By integrating data from preventive efforts, including wearable devices and community health checks, we can proactively identify at-risk individuals and ensure they benefit from timely preventive strategies and cutting-edge treatments when necessary.

PULSE: What are some common misconceptions about heart health?

Here are some misconceptions I often hear from my patients:

"Cardiac diseases only affect older adults; I'm too young to have heart disease."
In reality, heart disease can impact people of all ages, especially with increasing risk of obesity and stress in younger populations.

"I'm lean, so I don't need to worry about high cholesterol."
Hyperlipidemia[6], including familial hypercholesterolemia, can be seen in people of all body shapes and sizes.

"Heart disease is inevitable if it runs in the family."
While genetics matter, lifestyle choices including balanced diet, regular exercise, and avoiding smoking can greatly reduce risks.

"Chest pain is the only sign of coronary artery disease."
Symptoms including fatigue, shortness of breath, or even jaw pain, especially in women, can signal a problem and should not be overlooked.

PULSE: What is the most memorable patient experience you have had?

A long-term patient with recurrent cardiac arrhythmias[7] once asked if I could treat his latest abnormal rhythm flare within a month – just in time for his 50th postgraduate college reunion in India. Knowing how much it meant for him to reconnect with his friends, my electrophysiology colleagues and I worked together, to make it happen.

When he returned to my clinic beaming with joy and gratitude, it reminded me that beyond the diagnoses and treatments are people with dreams, relationships, and moments that matter. This experience reaffirmed our commitment at NUHCS to provide care that is not just clinically excellent, but also deeply human.

Reference:
1. ***Telemonitoring*** *is the practice of using technology to remotely monitor patients' health and vital signs from a distance, typically in their own homes.*
2. *An* ***internist*** *is a doctor who has special training in internal medicine, and who works with adult patients to prevent, diagnose, and treat diseases without using surgery.*
3. ***Acute myocardial infarction****, also known as a heart attack, occurs when blood flow to the heart muscle is abruptly cut off, causing tissue damage.*
4. *A* ***microaxial pump*** *is a percutaneous mechanical circulatory support (MCS) device used to assist the heart's pumping function.*
5. ***Transcatheter Aortic Valve Replacement (TAVR)*** *is a minimally invasive procedure used to treat severe aortic stenosis, a condition where the aortic valve narrows, restricting blood flow.*
6. ***Hyperlipidemia*** *is an abnormally high concentration of fats or lipids in the blood.*
7. *An* ***arrhythmia*** *is a disruption to the electrical system that normally keeps your heart's upper chambers (atria) and lower chambers (ventricles) beating in a steady, coordinated rhythm. Repeated episodes of heart rhythm disturbances are called "recurrent arrhythmia."*

ARTICLE BY
NUHCS PULSE Editorial

SINGAPORE HEALTH QUALITY SERVICE AWARDS 2025: *Honouring* THE HEART OF HEALTHCARE

The Singapore Health Quality Service Awards (SHQSA) was established in 2011 as Singapore's first dedicated platform aimed at honouring outstanding healthcare professionals from across the healthcare sector, who have delivered quality care and excellent patient experience.

Held on 13 February 2025, this year's ceremony was graced by Guest-of-Honour, President Tharman Shanmugaratnam, with a total of 4,752 awards presented to individuals from 45 healthcare institutions and organisations.

SHAPING NUHCS INTO A NATIONAL HEART CENTRE THROUGH EXEMPLARY LEADERSHIP

Among the 14 individuals conferred the prestigious **Superstar Award**, the highest accolade under the "Exemplar Leaders – Clinician" category was awarded to Prof Tan Huay Cheem, Senior Advisor, National University Heart Centre, Singapore (NUHCS).

This award is a testament of Prof Tan's exemplary leadership and unwavering commitment towards advancing the field of cardiology across clinical care, research, and education. As the inaugural Director of NUHCS, Prof Tan played an instrumental role in transforming the institution into a world-class academic national heart centre, known for managing complex and high-risk cardiovascular conditions.

Under Prof Tan's leadership, NUHCS has achieved several landmark improvements in patient outcomes. One key milestone is the reduction in door-to-balloon time[1] – a critical indicator in emergency cardiac care - from 110 minutes in 2017 to just 45 minutes in 2023, far exceeding international standards.

His commitment to optimising care delivery also led to the development of the Western ST-Elevation Myocardial Infarction (STEMI) Network in 2015. This initiative ensures that all heart attack patients in western Singapore are rapidly referred to NUHCS for timely and effective treatment, with advanced resources available to manage severe cardiac conditions. The Western STEMI Network has since substantially improved patient outcomes and survival rates, bringing hope to heart patients and enhancing the global recognition of NUHCS.

Recognising that healthcare excellence stems from a solid foundation of clinical competence, Prof Tan also championed structured training programmes to better equip the next generation of healthcare professionals. Junior doctors receive specialised training across various cardiology subspecialties, while nurses and allied health professionals are empowered with advanced clinical skills, enabling them to provide high-quality, holistic care to every patient.

Prof Tan Huay Cheem
Senior Advisor & Senior Consultant, NUHCS

INSPIRING THE NEXT GENERATION

As a veteran in the field of cardiology, Prof Tan continues to serve as a mentor and role model, inspiring the next generation of heart doctors with his passion, humility, and drive for excellence. Together, his leadership and the team's collective spirit continue to elevate the standard of cardiovascular care – not just at NUHCS, but across Singapore's healthcare landscape.

MAKING A DIFFERENCE TOGETHER

Alongside Prof Tan's recognition, NUHCS also celebrated the achievements of four other outstanding team members who were honoured with Silver Awards for their unwavering commitment towards patient care:

SILVER AWARD

— **Adj A/Prof Chai Ping**
Head & Senior Consultant,
Department of Cardiology,
NUHCS

Chin Chew Hoon —
Service Team Leader,
NUHCS

— **Conny Lim**
Service Team Leader,
NUHCS

Joyce Tee Pei Wei —
Service Team Leader,
NUHCS

> **THESE ACCOMPLISHMENTS ARE NOT THE RESULT OF JUST ONE PERSON, BUT FROM THE COLLECTIVE EFFORT OF PEOPLE WHO ARE DEDICATED TO GIVING SINGAPOREANS THE BEST PUBLIC CARE IN THE WORLD.**
>
> **- PROF TAN HUAY CHEEM**

Reference:

1. **Door-to-balloon time: Time between the arrival of a heart attack patient at the hospital and treatment performed to open up the blocked artery.**

ARTICLE BY
NUHCS PULSE Editorial

One Lifesaving Moment, A Decade of Gratitude

The lifelong bond between a cardiac arrest survivor and his care team

Honouring Amy with the NUHCS Inspirational Caregiver Award at the 10th anniversary of Markus' survival

Markus and Amy visiting the NUHCS team through the years from 2015 to 2025.

To be pulled back from the edge is to be reminded how fragile and precious life is. Markus was given a second lease on life when he was resuscitated from a cardiac arrest ten years ago, thanks to the timely intervention from his wife and the medical team at the National University Heart Centre, Singapore (NUHCS).

Markus, who was from Switzerland but was based in Singapore for work 10 years ago, experienced a sudden cardiac arrest and passed out without warning. Recalling the harrowing experience, his wife, Amy, shared on how she had to grapple with both the shock and anguish even as she instinctively responded to Markus' cardiac arrest by performing Cardiopulmonary Resuscitation (CPR) - a timely skill which she picked up just months earlier.

Emergency responders who arrived shortly after promptly administered two defibrillator shocks on Markus before rushing him to the nearest hospital's emergency department, where he was attended to by A/Prof Mark Chan, Deputy Executive Director and Senior Consultant, NUHCS, the interventionist[1] on duty.

Quickly recognising the circumstances of the cardiac arrest, A/Prof Mark led his team to work on bringing Markus out of the critical situation.

Despite having been resuscitated from his cardiac arrest, Markus entered a 17-day coma, during which Amy kept vigil over him, along with the relentless care of the NUHCS Coronary Care Unit (CCU)'s nurses and medical team.

When Markus finally awoke, it was to the quiet realisation that he had been given a second chance at life. Not only was Markus' life saved, but him and Amy were given another opportunity to continue a future together – one which now held renewed significance, in light of his unexpected health crisis.

Living differently, fully, and more gratefully

While they eventually returned to Switzerland, Markus and Amy began a tradition of travelling all the way back to Singapore to visit the team at NUHCS every year - driven by the deep gratitude they harbour for the medical team who cared for Markus, whom they regard as "extended family" that have played a pivotal role in his recovery journey. Hearts welling up with emotion, both sides reconnect annually with hugs and embraces, cherishing the bond of deep friendship which has blossomed over the years.

> *"Coming back (to NUHCS) was, and still is today, like coming back to a second home."*
> *– Markus, cardiac arrest survivor who shares a decade-long friendship with NUHCS*

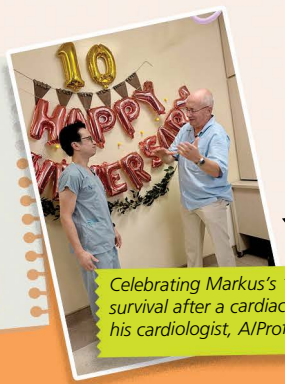
Their most recent visit to NUHCS was to be exceptionally memorable, as the NUHCS team had specially prepared a small gathering to commemorate the 10th anniversary of Markus' recovery from cardiac arrest.

At this heartfelt reunion, Amy was also presented with the **NUHCS Inspirational Caregiver Award**, an accolade given to individuals or caregivers who played a key role in contributing to survival rates during life-threatening events, especially in out-of-hospital cardiac arrest incidences.

Being the first to initiate CPR on the then unconscious Markus – a noteworthy act that greatly shaped the favourable outcomes of Markus' recovery – Amy was honoured for her decisive thinking and courage in such critical life-and-death scenarios.

For the couple, their story is more than one of recovery, but an uplifting chapter of enduring gratitude, resilience, and powerful human connection – a testament to the frontline team's commitment as they strive to care with empathy and serve with excellence in their invaluable daily work.

Watch Markus and Amy's story here:



Celebrating Markus's 10th year of survival after a cardiac arrest with his cardiologist, A/Prof Mark.

Honouring ten years of recovery with Juvena Gan, the nurse who cared for Markus.

Reference:

1. **Interventionist** - A medical specialist who focuses on diagnosing and treating heart conditions using minimally invasive procedures.

ARTICLE BY
NUHCS PULSE Editorial

EDITING OUT A SILENT THREAT.

NUHCS leads the Singapore arm of the world's first gene editing trial in adult cardiology, targeting the root cause of ATTR-CM

In a bold stride toward tackling a rare but life-threatening heart condition, Asst Prof Lin Weiqin, Clinical Director of Heart Failure and Cardiomyopathy Programme, Department of Cardiology, NUHCS, is leading the Singapore arm of the international MAGNITUDE trial – a global study exploring the potential of gene editing to treat Transthyretin Amyloid Cardiomyopathy (ATTR-CM). If successful, this initiative will be the first DNA altering treatment used in the field of adult cardiology.

Understanding ATTR-CM

ATTR-CM is a progressive condition caused by accumulation of misfolded transthyretin proteins in the heart and other organs. Due to the accumulation of protein, the heart's walls become thick and rigid, preventing the heart from efficiently pumping blood to the rest of the body. These proteins disrupt normal function and lead to symptoms such as numbness, fatigue and dizziness. If not diagnosed and treated promptly, ATTR-CM can lead to heart failure. The condition may arise due to a genetic mutation or as part of the natural ageing process.

Unfortunately, there is currently no cure for this debilitating illness.

The disease affects an estimated 150 people in Singapore, but numbers could be more as symptoms – including stiffness of limbs and fatigue – are often dismissed as part of the ageing process or attributed to other medical conditions.

For patients like Mr Chua Ah Hai, who was diagnosed with ATTR-CM while receiving treatment after a car accident ten years ago, this disease has significantly impacted his quality of life. Despite ongoing medication, his symptoms continue to worsen. The once active 62-year-old can now no longer walk due to the stiffening of his hands and legs by the disease, leading to repeated hospitalisations and increasing disability.

However, through this new clinical trial, a glimmer of hope has emerged – not just for him, but also for others facing the same struggle.

From left: Asst Prof Lin Weiqin, Clinical Director of Heart Failure and Cardiomyopathy Programme, Department of Cardiology, NUHCS; Mr Chua Ah Hai; Dr Kay Ng, Senior Consultant, Division of Neurology, Department of Medicine, National University Hospital; Nur Faezah Binte Md Fadzillah, Clinical Research Coordinator, NUHCS

A Global First in Adult Cardiology

The **MAGNITUDE study** – led locally by Asst Prof Lin – investigates a single-dose gene editing therapy called Nexiguran Ziclumeran (NEX-z), also known as NTLA-2001, designed to alter the patient's DNA and reduce production of the harmful transthyretin protein at its source.

Although full results may take two to three years, early findings have shown promising results with consistent, rapid, and sustained reductions in abnormal protein levels, with minimal side effects – pointing toward a safer, more effective treatment option for those with ATTR-CM.

Pioneering with Purpose

Through this initiative, NUHCS is not only reaffirming its leadership in cardiovascular care but also bringing new, potentially life-changing treatments closer to home for patients within Asia. By advancing science with compassion, discoveries can be translated into real, tangible hope for patients, caregivers, and families affected by rare diseases like ATTR-CM.

> **"If this trial is successful, gene editing therapy will be the first DNA altering treatment used in adult cardiology and offers new hope to patients living with ATTR-CM."**
>
> - Asst Prof Lin Weiqin
> *Clinical Director of Heart Failure and Cardiomyopathy Programme, Department of Cardiology, NUHCS*

Scan to read how science is reshaping the fight against ATTR-CM in this The Straits Times article:

ARTICLE BY
NUHCS PULSE Editorial

Making A *Meaningful Difference* to Clinical Research

CONTRIBUTOR AWARD FOR CLINICAL RESEARCH COORDINATORS (CDCA-CRC)

Presented by the Singapore Clinical Research Institute (SCRI), this distinguished award honours outstanding CRCs who underpin Singapore's clinical research ecosystem, and uphold the quality of clinical research with their passion and professionalism.

Meet Jolene Leong, Senior Clinical Research Coordinator (CRC), Department of Cardiology, National University Heart Centre, Singapore (NUHCS). As the 2024 recipient of the Distinguished Contributor Award for Clinical Research Coordinators (CDCA-CRC), she shares more on how she finds fulfilment in the dynamic world of clinical trial research!

PULSE How does it feel to be recognised for your work in clinical research?

Jolene: I am honoured and deeply grateful to receive this award. It means a lot to be acknowledged for doing what I love – supporting patients through their recovery and providing them with the best possible experience during clinical trials.

PULSE What inspired your journey into clinical research?

Jolene: My journey into this exciting field started when I took on an internship at the National Cancer Centre Singapore in 2018. During my internship, I witnessed the real-world translation of potential treatments, which I learnt about back in school, and saw up close the impact it had on the lives of the patients. This inspired me to explore a career in clinical research. I have been fortunate to grow my career at NUHCS, surrounded by mentors, colleagues, and investigators who have shaped and supported my development along the way.

PULSE What are some challenges you face as a CRC, and how do you overcome them?

Jolene: One of the greatest challenges is managing the expectations and emotions of clinical trial participants, especially when outcomes don't go as hoped. While trials are designed to minimise risks, uncertainties remain. When patients experience setbacks, it is important to respond with empathy, validate their feelings, and provide reassurance and support. Balancing scientific objectives with patient care is a delicate but vital part of the job.

PULSE Any advice for aspiring CRCs?

Jolene: Always remember that no question is too small, and no one is above learning! There might be moments when you feel doubtful, or wonder if you made the right decision, but it is important to take courage and believe in yourself. Think back on your reasons for taking up this role to keep your passion and purpose alive, which will help you push forward through the difficult moments.

PULSE What do you find most fulfilling in your work?

Jolene: Beyond seeing how research contributes to better patient care, what I value most is the human connection – working alongside clinical teams and learning from different perspectives. We constantly improve workflows and trial protocols to deliver better patient care.

And of course, the interactions with patients. Building trust, hearing their stories, and being there through their treatment journey is incredibly meaningful! These moments ground me and motivate me to continuously improve, not just for them, but for the future patients.

PULSE Looking ahead, what's next in your career aspirations?

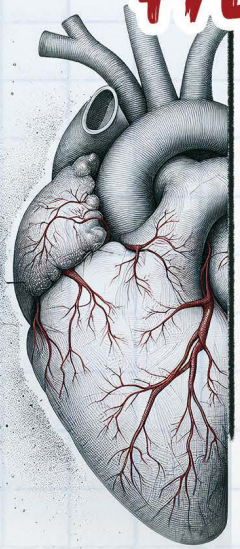
Jolene: Besides asking and finding the answers to more clinical questions through research, I hope to inspire, nurture and develop new pipelines of young and future research coordinators. Bridging gaps between clinical care and research is a goal I strongly believe in – doing so will help enhance the overall patient experience and better pave the way ahead in optimising patient care!

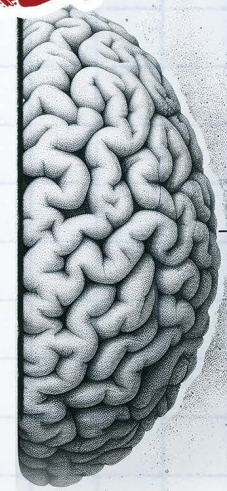
(Left) Jolene with the team that supported her during her research journey. (Right) Honoured with the Distinguished Contributor Award 2024 for Clinical Research Coordinators.

Scan the QR code to discover how clinical research improves the quality of patient care!

ARTICLE BY
NUHCS PULSE Editorial

HEART ATTACK & STROKE: CAN BOTH OCCUR TOGETHER?





Cardiocerebral Infarction (CCI) is a rare but severe condition where an ischemic stroke and a myocardial infarction, also known as heart attack, occur at the same time or in rapid succession. Although strokes and heart attacks are common medical emergencies on their own, the possible simultaneous occurrence of both is often overlooked, despite the life-threatening consequences.

To better understand and address this dangerous overlap, a multidisciplinary team led by Dr Sia Ching Hui, Consultant, Department of Cardiology, NUHCS, involving cardiologists from NUHCS and neurologists from the National University Hospital - in collaboration with statutory boards such as Health Promotion Board and National Registry of Disease Office, and medical centres including Khoo Teck Puat Hospital, Singapore General Hospital, National Neuroscience Institute, Tan Tock Seng Hospital and National Heart Centre Singapore - embarked on a research study for improved CCI patient outcomes.

A Closer Look into the Heart-Brain Connection

Strokes and heart attacks together account for a quarter of global deaths[1]. Evidence shows a bidirectional association between the two, where the occurrence of one increases the risk of the other[2,3]. While previous case reports and series suggest CCI is associated with poorer patient outcomes including prolonged dependence on life-support systems, increased hospital stays and readmissions, and higher mortality[4], its incidence and clinical impact remain neglected due to limited large-scale studies. To bridge this gap, the team used information from Singapore's two largest population-based registries to research on the incidence, treatment, and outcomes of patients with CCI.

An analysis was conducted on 120,531 patients who experienced an ischemic stroke, heart attack, or both between 2007 and 2018. Findings showed patients with CCI were more likely to have Atrial Fibrillation[5] - suggesting possible cardioembolic causes[6] - and faced worse outcomes, including all-cause mortality and cardiovascular mortality, compared to those with stroke or heart attack alone.

	Synchronous CCI *Stroke and heart attack occur simultaneously in 24 hours*	**Metachronous CCI** *Stroke and heart attack occur within a week of each other*
Cases Identified in Singapore (2007-2018)	625	996
Fatality Rate Within A Year	**Total:** 56.3% **Heart attack alone:** 29.9% **Stroke alone:** 15.4%	**Heart attack before ischemic stroke:** 50.7% **Ischemic stroke before heart attack:** 59.4%

The research findings revealed that around 1 in every 200 ischemic stroke and/or heart attack cases are synchronous CCI that occurs at the same time or consecutively. These patients have a two to four times higher risk of mortality compared to those experiencing either condition alone. With greater availability of digital medical records and advancements like artificial intelligence, effective adoption of these tools and further clinical research is required to enable more rapid advancements to manage such understudied conditions.

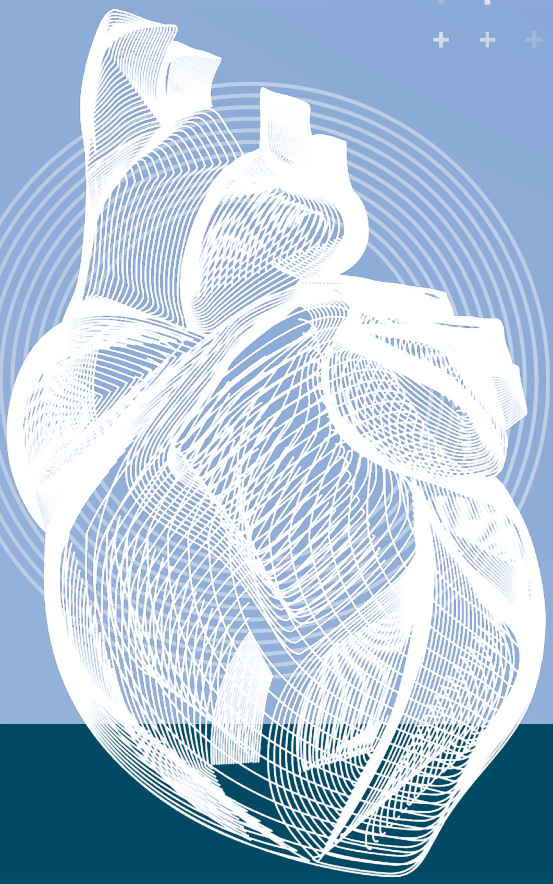
This study was first presented at the Singapore Cardiac Society Annual Scientific Meeting 2023, where it was awarded the Best Paper for Free Paper Session 1. In 2024, the full manuscript was later published in *Stroke*[7] – the world's leading peer-reviewed journal in cerebrovascular disease investigation. This study was also featured in *Blogging Stroke*[8] – the official blog of the American Heart Association's Stroke Council. These milestones make this collaborative project extremely fulfilling in not only deepening clinical understanding but also raising awareness on the impact of this rare but lethal condition.

References:
1. Organization WH. Cardiovascular diseases (CVDs). *https://who.int/news-room/fact-sheets/detail/cardiovascular-diseases-(cvds)#:~:text=Cardiovascular%20diseases%20(CVDs)%20are%20the,-%20and%20middle-income%20countries.* 2021. Accessed 6 May.
2. Witt BJ, Ballman KV, Brown RD, Jr., Meverden RA, Jacobsen SJ, Roger VL. The incidence of stroke after myocardial infarction: a meta-analysis. *Am J Med*. 2006;119:354.e351-359. doi: 10.1016/j.amjmed.2005.10.058
3. Boulanger M, Béjot Y, Rothwell PM, Touzé E. Long-Term Risk of Myocardial Infarction Compared to Recurrent Stroke After Transient Ischemic Attack and Ischemic Stroke: Systematic Review and Meta-Analysis. *J Am Heart Assoc*. 2018;7. doi: 10.1161/jaha.117.007267
4. Ng TP, Wong C, Leong ELE, Tan BY, Chan MY-Y, Yeo LL, Yeo T-C, Wong RC, Leow AS, Ho JS-Y, et al. Simultaneous cardio-cerebral infarction: a meta-analysis. *QJM: An International Journal of Medicine. 2021*. doi: 10.1093/qjmed/hcab158
5. Atrial fibrillation – heart rhythm disorder where the heart beats in an irregular or rapid way
6. Cardioembolic causes – Blood clots that form in the heart and travel to the brain, causing a stroke
7. Ho JS-Y, Zheng H, Tan BY-Q, Ho AF-W, Foo D, Foo L-L, Lim PZ-Y, Liew BW, Ahmad A, Chan BPL, et al. Incidence and Outcomes of Cardiocerebral Infarction: A Cohort Study of 2 National Population-Based Registries. Stroke. 2024;55:2221-2230. doi: 10.1161/STROKEAHA.123.044530
8. Hosking A. Exploring Simultaneous Stroke and Heart Attack in a National Dataset. *Blogging Stroke*. 2024. doi: 10.1161/blog.20241204.989386

ARTICLE BY

Dr Jamie Ho
Junior Resident, NUHS

Dr Jamie Ho is a second-year Internal Medicine junior resident in NUHS. She is an Associate Chief Resident in the Internal Medicine Residency, and has a strong interest in cardiovascular research, having published articles on acute coronary syndrome, cardiomyopathies, valvular heart diseases and public health.



GUARDING AGAINST HIDDEN CORONARY HEART DISEASE IN "LOW-RISK" INDIVIDUALS

SG-GUARD study uncovers hidden dangers behind silent heart disease

Coronary Artery Disease (CAD) is one of the leading causes of disability and death worldwide. In Singapore, CAD accounts for one in five deaths – making it the second leading cause of mortality locally. With heart attack cases **projected to triple in the next 25 years**, the urgency to detect and prevent heart disease before it strikes has never been more critical.

An especially worrying trend is that many people are living with early signs of CAD **unknowingly**. These individuals feel fine, have no symptoms, and may even be classified as "low-risk". However, low risk does not mean no risk.

A hidden threat in "healthy" people

Did you know that nearly one in 10 Singaporeans who have suffered a heart attack do not have typical risk factors?

A local study initiated in 2022 by a team from the National University of Singapore (NUS), National University Hospital (NUH) and National University Heart Centre, Singapore (NUHCS) has found that a growing proportion of heart attack cases had no known cardiovascular risk factors such as diabetes, high blood pressure, high cholesterol, or active smoking.

Dr Nicholas Chew (from left), Associate Consultant, Dept. of Cardiology, NUHCS, with Mr Zhao Chun (second from left), Prof Tan Huay Cheem, Senior Advisor, NUHCS, and Adj A/Prof Loh Poay Huan, Director of Acute Coronary Syndrome Programme, Dept. of Cardiology, NUHCS.
© Image credits: Lianhe Zaobao

When the unexpected happens

One such example is Mr Zhao Chun, a 34-year-old who had no family history of heart disease and never smoked. Despite his active lifestyle, Mr Zhao Chun suffered a heart attack after experiencing symptoms of breathing difficulties, cold sweat, and worsening back pains.

His case, among many others, underscores the core message of the SG-GUARD study: heart disease does not always look like what we expect.

Scan to read more in articles featured on:

The Straits Times

Lianhe Zaobao (Article is in Mandarin)

Shedding light on the void in our understanding of cardiovascular disease

The Western Acute Coronary Syndrome (ACS) network study examined data from 8,680 heart attack patients between January 2011 and March 2021. This study revealed that the low-risk population without standard risk factors had a higher chance of fatal outcomes, compared to those who had a history of related conditions.

Principal investigator Dr Nicholas Chew, Associate Consultant, Department of Cardiology, NUHCS, highlighted the importance of early detection and cautioned for symptoms of chest pain not to be ignored, even in those without risk factors. He urged clinicians to raise their guard when seeing patients without such risk factors, but display symptoms suggestive of cardiovascular diseases.

Recognised for advancing the understanding of CAD within the community and amongst professionals, while championing future research efforts and the practice of clinical medicine for cardiovascular health, Dr Nicholas Chew was honoured with the prestigious **National Medical Research Council (NMRC) Transition Award 2025.**

About the NMRC Transition Award

The National Medical Research Council (NMRC) presents awards to outstanding clinician scientists and researchers annually for contributing to better health outcomes.
The Transition Award (TA) aims to provide support for young, budding clinician scientists who have just completed their formal research training, to build up their capability in research.

Shaping the future of heart disease prevention

With the aim to guard against hidden coronary heart disease risks in the local population, the SG-GUARD study was implemented to debunk the common perception that coronary artery disease is an unlikely health concern for those without conventional risk factors.

Identifying hidden risk factors in individuals without Standard Modifiable Risk Factors[1]

Almost
1 in 10 heart attack patients have no standard risk factors

This "low-risk" group was found to have:

105% chance of stroke

80% risk of death following a heart attack

To examine the presence of CAD in low-risk individuals, the SG-GUARD study aims to identify hidden risk factors in people aged 30 to 55 years old with no known heart disease risks.

Participants will undergo a range of advanced diagnostic tests such as:

- CT Coronary Angiogram and ultrasound
- Liver ultrasound
- Urine and blood tests
- Heart health assessments

This study takes a holistic approach to evaluate the health condition of participants. Its goal is to empower people with knowledge, encourage proactive screening, and reduce preventable deaths caused by silent heart disease.

After all, heart disease doesn't always come with a warning. In the fight against it, awareness is always the first line of defence.

Scan to register your interest to take part in the study

ARTICLE BY
Dr Nicholas Chew
Associate Consultant, Department of Cardiology, NUHCS

Dr Chew is the Principal Investigator of several studies that uncover hidden risk factors of heart attack. The recipient of Young Investigator Awards at both regional and international conferences, Dr Chew has published more than 100 peer-reviewed articles, and also serves on the editorial boards of several internationally recognised journals.

Reference:
1. Standard Modifiable Risk Factors – Common health risks which are changeable or controllable to lower risks of diseases, such as smoking, unhealthy diet, high blood pressure and high cholesterol.

Congratulations

DOCTORS' PROMOTIONS AT NUHCS

Dr Jeanette Ting

Senior Consultant,
Division of Cardiology,
Department of Medicine,
NUHCS @ Alexandra Hospital

Dr Rodney Soh

Associate Consultant,
Division of Cardiology,
Department of Medicine,
NUHCS @ Ng Teng Fong
General Hospital (NTFGH)

Dr Hari Kumar Sampath

Associate Consultant,
Division of Thoracic Surgery,
Department of Cardiac,
Thoracic and Vascular Surgery
(CTVS), NUHCS

Dr Tony Li

Associate Consultant,
Division of Cardiology,
Department of Medicine,
NUHCS @ NTFGH

Dr Reuban D'cruz

Associate Consultant,
Division of Vascular Surgery,
Department of CTVS,
NUHCS

Dr Wesley Yeung

Associate Consultant,
Division of Cardiology,
Department of Medicine,
NUHCS @ NTFGH

Congratulations
Awards & Accolades

The National University Health System (NUHS) Tribute Awards is the most prestigious honour awarded by NUHS to recognise staff who have made outstanding contributions to patient care, research or education in the academic health system. NUHS honours these healthcare professionals and administrators for the difference they make to the institute and Singapore's healthcare landscape, and their role in shaping medicine and transforming care.

RESEARCH EXCELLENCE AWARD

This award honours Clinicians, Allied Health Professionals or Nurses who are the drivers of change, and have significantly contributed to research projects or initiatives to elevate patient-centred services.

A/Prof Mark Chan Yan Yee
Deputy Executive Director, NUHCS

EXCELLENCE AWARD

This award recognises individuals who have significantly contributed towards NUHS' clinical, research and education missions with major impact, leading to improved standards of care, exceptional professional healthcare education and/or outstanding health research.

Adj Prof Graeme MacLaren
Head, Division of Cardiothoracic Intensive Care Unit (CTICU), Department of Cardiac, Thoracic and Vascular Surgery (CTVS), NUHCS

YOUNG ACHIEVER AWARD

This award recognises young NUHS staff who have demonstrated excellence in their professional fields, shown instances of promising leadership skills, and are exemplary role models for those around them.

Adj Asst Prof Raj Kumar Menon
Senior Consultant, Division of Vascular Surgery, Department of CTVS, NUHCS

New Appointments

Adj A/Prof Sorokin A. Vitaly
Head, Division of Adult Cardiac Surgery, Department of CTVS, NUHCS

Adj A/Prof Ramanathan K.R.
Group Research Director, Department of CTVS, NUHCS

Dr Kristine Teoh
Informatics Director, Department of CTVS, NUHCS

Dr Robin Cherian
Programme Director, Cardiology Senior Residency, NUHS

Dr Yeo Wee Tiong
Clinical Director, Cardiac Electrophysiology and Pacing, NUHCS

Dr Gavin Ng
Clinical Director, Interventional Cardiology and Angiography Centre, NUHCS

Dr Sim Hui Wen
Director, Cardiovascular Catheterisation Laboratory, NUHCS @ Ng Teng Fong General Hospital

Ms. Nyeo Hui Qing
Assistant Director of Nursing (Clinical), NUHCS

PUBLICATIONS

A deep-learning retinal aging biomarker for cognitive decline and incident dementia. Alzheimers Dement. 2025 Mar;21(3):e14601. Sim MA, Tham YC, Nusinovici S, Quek TC, Yu M, Xue CC, Chee ML, Peng QS, **Tan ESJ, Chan SP,** Cai Y, Chong EJY, Tan BY, Venketasubramanian N, Hilal S, Lai MKP, Choi H, Richards AM, Cheng CY, Chen CLH.

A multivariate and retrospective analysis of the impact of intra-aortic balloon counterpulsation in Open-Heart surgery. Sci Rep. 2024 Nov 28;14(1):29534. Sharma S, Nah JH, Siddarth V, Lai H, Liang S, Ong ZX, Wu D, **Luo HD, Chang G, Kang GS,** Kofidis T, Sazzad F.

A Multi-Center Prospective Study on the Healing of Neuro-Ischemic Ulcers in Singapore: A Prospective Cohort Study. Health Sci Rep. 2025 Jan 24;8(1):e70332. Meng L, Bishnoi P, Lo ZJ, Yong E, Chong TT, Carmody D, **Dharmaraj RB,** Ng YZ, Harding K, **Ho P.**

A sex-disaggregated analysis of the prognostic value of lean type 2 diabetes mellitus in the adult population with acute myocardial infarction. Cardiovasc Diabetol. 2025 Feb 7;24(1):59. Kong G, Koh J, Chia J, Neo B, Chen Y, Cao G, Chong B, Muthiah M, **Sim HW, Ng G, Koo CY,** Khoo CM, **Chan MY, Loh PH, Chew NWS.**

A systematic review and meta-analysis of total endovascular versus hybrid repair for the treatment of thoracoabdominal aortic aneurysms. J Vasc Surg. 2023 Dec 6:S0741-5214(23)02305-4. Chan XW, Masuda Y, Mtl Choong A, **Ng JJ.**

Accounting for extent of non-compliance when estimating treatment effects on an ordinal outcome in randomized clinical trials. BMC Med Res Methodol. 2025 Feb 25;25(1):52 Zhu J, Li J, Richards AM, **Chan MY,** Tai BC.

Age-specific prognosis of acute and steady minor elevations in cardiac troponin among non-acute myocardial infarction inpatients: a large real-world cohort study. Heart. 2025 Jan 16:heartjnl-2024-325079. [Epub ahead of print]. Sun P, Liu WN, Qian X, Zhang Z, Liu H, A G, Liu Y, Fonarow G, **Foo R, Chan MY,** Wang L, Li Y, Yang Q, Zhou X.

Anti-diabetic effects of GLP-1 receptor agonists on obese and overweight patients across diabetes status, administration routes, treatment duration and baseline characteristics: A systematic review. Diabetes Obes Metab. 2025 Apr;27(4):1648-1659 Wong HJ, Lin NHY, Teo YH, Yeo BSY, Toh KZX, Teo YN, **Chan MY,** Yeo LLL, **Poh KK, Kong WKF,** Eng PC, Tan BYQ, **Dalakoti M, Sia CH.**

Asian Pacific Society of Cardiology Position Statement on the Use of Transcatheter Aortic Valve Implantation in the Management of Aortic Stenosis. JACC Asia. 2024 Nov 1;4(12):885-897. Yap J, Hayashida K, Lee MKY, Stub D, **Hon JKF,** Ho KW, Lo S, Seth A, Kim HS, Wongpraparut N, Nguyen QN, Dy TC, Chandavimol M, Ewe SH, Yin WH, Lee YT, Tay EL, Poon K, Chen M, Chui A, Lam SC, Rao RS, Izumo M, Nair R, Tang GH, Tabata M, Yahaya SA, Sin KY, Park DW, Wang J, Chieh JTW.

Asundexian versus Apixaban in Patients with Atrial Fibrillation. N Engl J Med. 2025 Jan 2;392(1):23-32. 2024 Sep 1. Piccini JP, Patel MR, Steffel J, Ferdinand K, Van Gelder IC, Russo AM, Ma CS, Goodman SG, Oldgren J, Hammett C, Lopes RD, Akao M, De Caterina R, Kirchhof P, Gorog DA, Hemels M, Rienstra M, Jones WS, Harrington J, Lip GYH, Ellis SJ, Rockhold FW, Neumann C, Alexander JH, Viethen T, Hung J, Coppolecchia R, Mundl H, Caso V; **OCEANIC-AF Steering Committee and Investigators.**

Biomarker-Guided Antibiotic Discontinuation in Adults Critically Ill with Sepsis: Harnessing Network Meta-Analysis to Guide Clinical Therapy. Crit Care Med. 2024 Oct 1;52(10):1658-1660. Ling RR, Somani J, **Ramanathan K.**

Cannulation Strategies for Extracorporeal Membrane Oxygenation in Children with Refractory Septic Shock. Pediatr Crit Care Med. 2025 Feb 10. [Epub ahead of print]. **MacLaren G.**

Cardiogenic shock in the setting of acute myocardial infarction: Still a difficult entity to treat. Int J Cardiol. 2025 Feb 15:421:132886. **Sia CH,** Ho AFW.

Cardiovascular-Liver-Metabolic Health: Recommendations in Screening, Diagnosis, and Management of Metabolic Dysfunction-Associated Steatotic Liver Disease in Cardiovascular Disease via Modified Delphi Approach. Circulation. 2025 Jan 7;151(1):98-119. **Chew NWS,** Mehta A, Goh RSJ, **Zhang A,** Chen Y, Chong B, Chew HSJ, Shabbir A, Brown A, Dimitriadis GK, Huang DQ, **Foo R,** le Roux CW, Figtree GA, Fudim M, Pandey A, Mamas MA, Hausenloy DJ, Richards AM, Nicholls SJ, **Chan MY,** Muthiah MD, Sanyal A, Sperling LS.

Cardiovascular-obstetric state-of-the-art review: pulmonary hypertension in pregnancy. Singapore Med J. 2025 Mar 1;66(3):130-140. **Ong J,** Yap JJY, Choolani M, **Poh KK,** Dashraath P, **Low TT.**

Characterizing cardiac adipose tissue in post-acute myocardial infarction patients via CT imaging: a comparative cross-sectional study. Eur Heart J Cardiovasc Imaging. 2025 Jan 17:jeaf019. Wang X, Leng S, Adamson PD, Greer CE, Huang W, Lee HK, Loong YT, Raffiee NAS, **Sia CH,** Tan SY, Tan SH, Teo LLS, Wong SL, Yang X, Yew MS, Yong TH, Zhong L, Shaw LJ, **Chan MY,** Hausenloy DJ, Baskaran L.

Clinical phenotypes and outcomes of patients with left ventricular thrombus: an unsupervised cluster analysis. Hellenic J Cardiol. 2025 Jan-Feb:81:65-74. **Leow AST,** Goh FQ, Tan BYQ, Ho JSY, **Kong WKF, Foo R, Chan MY,** Yeo LLL, **Chai P,** Geru A, **Yeo TC, Chan SP,** Zhou X, Lip GYH, **Sia CH.**

Comparing Renin-Angiotensin-Aldosterone Blockade Regimens for Long-Term Chemotherapy-Related Cardiac Dysfunction: A Network Meta-Analysis. Cardiovasc Drugs Ther. 2023 Jun 14. Li J, Lee ARYB, Tariq A, Lau G, Yau CE, **Tan LL, Tyebally SM,** Lee MX, **Koo CY, Sia CH.**

Contemporary Incidence of Cognitive Impairment or Dementia in Patients Undergoing Coronary Artery Bypass Grafting: A Systematic Review and Meta-Analysis. Dement Geriatr Cogn Disord. 2025;54(1):52-66. 2024 Jul 24. Lo HZ, Wee CF, Low CE,

Teo YH, Teo YN, Yun CY, Syn NL, Tan BYQ, **Chai P,** Yeo LLL, **Yeo TC,** Chong YF, **Poh KK, Kong WKF, Wong RCC, Chan MY, Sia CH.**

Corticosteroid treatment in COVID-19 patients receiving extracorporeal membrane oxygenation: benefit from rational use - authors' reply. Ann Intensive Care. 2024 Oct 28;14(1):166. Ling RR, Brodie D, **MacLaren G, Ramanathan K.**

Cost-Effectiveness Analysis of Inclisiran for the Treatment of Primary Hypercholesterolemia or Mixed Dyslipidemia in Singapore. Value Health Reg Issues. 2025 Jan 15:101067. [Epub ahead of print]. Lim YL, Tan RS, **Poh KK,** Wang XJ.

Definitions of adverse events associated with extracorporeal membrane oxygenation in children: results of an international Delphi process from the ECMO-CENTRAL ARC. Lancet Child Adolesc Health. 2024 Oct;8(10):773-780. Alexander PMA, Di Nardo M, Combes A, Vogel AM, Antonini MV, Barrett N, Benedetti GM, Bettencourt A, Brodie D, Gómez-Gutiérrez R, Gorga SM, Hodgson C, Kapoor PM, Le J, **MacLaren G,** O'Neil ER, Ostermann M, Paden ML, Patel N, Rojas-Peña A, Said AS, Sperotto F, Willems A, Vercaemst L, Yoganathan AP, Lorts A, Del Nido PJ, Barbaro RP; Extracorporeal Life Support Organization (ELSO); International ECMO Network (ECMONet); Pediatric Acute Lung Injury and Sepsis Investigators (PALISI); Pediatric ECMO subgroup of PALISI and ELSO (PediECMO); European Society of Paediatric and Neonatal Intensive Care (ESPNIC); Australian and New Zealand Intensive Care Society Paediatric Study Group (ANZICS PSG); Intensive Care Society (ICS); Pediatric Cardiac Intensive Care Society (PCICS); Advanced Cardiac Therapies Improving Outcomes Network (ACTION); Children's Hospitals Neonatal Consortium (CHNC); American Pediatric Surgical Association (APSA); Society of Thoracic Surgeons (STS); Society of Critical Care Medicine (SCCM).

Dialysis nurses' knowledge, attitude, practices, and self-efficacy regarding vascular access care: A multicenter cross-sectional survey in Singapore. J Vasc Access. 2024 Feb 12:11297298241228816. Meng L, Tan P, Ali Khan B, Liao J, Lou L, Chen S, Teo BW, Guo W, **Ho P.**

Differentiation of the severity of rheumatic mitral stenosis using dimensionless index and its association with outcomes. Int J Cardiol Cardiovasc Risk Prev. 2025 Jan 7:24:200366. **Leow R, Li TYW,** Chan MW, **Kong WKF, Poh KK, Kuntjoro I, Sia CH, Yeo TC.**

Early β-Blocker Use and Clinical Outcomes in Acute Myocardial Injury: A Retrospective Cohort Study. Am J Med. 2025 Mar 6:S0002-9343(25)00140-8. [Epub ahead of print]. Li L, A G, Guo Y, Liu H, Li J, Jiang S, Zuo L, **Sia CH,** Zhou X, Sun P, Yang Q.

ECMO: more than just a bridge over troubled waters? Lancet Respir Med. 2024 Oct;12(10):756-758. Ling RR, **Ramanathan K,** Shekar K.

Effects of glucagon-like peptide-1 receptor agonists on blood pressure in overweight or obese patients: a meta-analysis of randomized controlled trials. J Hypertens. 2025 Feb 1;43(2):290-300 Wong HJ, Toh KZX, Teo YH, Teo YN, **Chan MY,** Yeo LLL, Eng PC, Tan BYQ, Zhou X, Yang Q, **Dalakoti M, Sia CH.**

Efficacy of GLP-1 Receptor Agonists on Weight Loss, BMI, and Waist Circumference for Patients With Obesity or Overweight: A Systematic Review, Meta-analysis, and Meta-regression of 47 Randomized Controlled Trials. Diabetes Care. 2025 Feb 1;48(2):292-300 Wong HJ, Sim B, Teo YH, Teo YN, **Chan MY,** Yeo LLL, Eng PC, Tan BYQ, Sattar N, **Dalakoti M, Sia CH.**

Epidemiology and outcomes of patients with tuberculosis requiring extracorporeal membrane oxygenation: An ELSO registry analysis. Intensive Crit Care Nurs. 2025 Feb;86:103841. Ait Hssain A, Vahedian-Azimi A, Schmidt M, Saif Ibrahim A, **Ramanathan K,** Fawzy Hassan I, Sahebkar A.

Evaluating the Appropriate Use Criteria for Coronary Revascularization in Stable Ischemic Heart Disease Using Randomized Data From the ISCHEMIA Trial. Circ Cardiovasc Qual Outcomes. 2025 Feb 26:e010849. Slater J, Maron DJ, Jones PG, Bangalore S, Reynolds HR, Fu Z, Stone GW, Kirby R, Hochman JS, Spertus JA; **ISCHEMIA Research Group.**

Exosome autoantibody biomarkers for detection of lung cancer. Mil Med Res. 2024 Nov 18;11(1):72. Thuya WL, Peyper JM, Myen TT, Anuar ND, Anwar A, Gudimella R, Rutt NH, Rosli NSM, Badri NH, Rahman TNA, Nurashirin R, Sethi G, **Tam JKC,** Wong AL, Soo R, Blackburn JM, Wang L, Goh BC.

Extracorporeal Life Support Organization 2024 Guideline for Early Rehabilitation or Mobilization of Adult Patients on Extracorporeal Membrane Oxygenation. ASAIO J. 2025 Mar 1;71(3):187-199. Ramsey S, Shehatta AL, **Ramanathan K,** Shekar K, Brodie D, Diaz R, Roberts A, Cruz S, Hodgson C, Zakhary B.

Fatal Acute Limb Ischemia Due to Catastrophic Late Endograft Infection and Adjacent Arterial Infection After Endovascular Aneurysm Repair - A Case Report. Vasc Health Risk Manag. 2024 Nov 1;20:469-477. Djajakusumah TM, Hapsari P, Dewayani BM, **Ho P,** Herman H, Lukman K, Lesmana R.

Frozen Elephant Trunk Technique to Minimize Circulatory Arrest and Aortic Cross-Clamp Time. Ann Thorac Surg Short Reports. 2025 Jan 9. [Epub ahead of print]. Sazzad F, Ahmed MU, **Sule JA,** Mohamed MH, Farid S, **Vitaly S.**

Global Prevalence of Myocardial Fibrosis among Individuals with Cardiometabolic Conditions: A Systematic Review and Meta-Analysis. Eur J Prev Cardiol. 2025 Feb 19:zwaf083. [Epub ahead of print]. Yeo TM, Chin WLC, Seah CWA, Cheng LJ, **Lin W, Dalakoti M, Foo R,** Wang W.

Guideline-directed Medical Therapy in Nonagenarians and Centenarians (≥ 90 Years Old) After First-onset Myocardial Infarction - a National Registry Study. Can J Cardiol. 2025 Jan 31:S0828-282X(25)00101-1. [Epub ahead of print]. Wong HJ, Toh KZX, Low CE, Yau CE, Teo YH, Teo YN, Ho VWT, Tan LF, **Chai P, Loh PH, Yip JWL,** Ho AF, Foo D, Chia PL, Lim PZ, Yeo KK, Chow W, Chong DTT, Hausenloy DJ, **Chan MY, Sia CH.**

Health Services Costs of Clinical Heart Failure with Reduced Ejection Fraction in Singapore. Value Health Reg Issues. 2025 Jan:45:101037. Senanayake S, Kularatna S, Lee ASY, Lee A, Lau YH, Hausenloy DJ, Yeo KK, **Chan MY, Wong RCC,** Loh SY, Sim KLD, Weien C, Graves N.

Hemostatic Outcome Definitions in Pediatric Extracorporeal Membrane Oxygenation: Challenges in Cohorts from Rotterdam (2019-2023) and Melbourne (2016-2022). Pediatr Crit Care Med. 2024 Dec 26. Drop J, Van Den Helm S, Letunica N, Wildschut E, de Hoog M, de Boode W, Barton R, Yaw HP, Newall F, Horton S, Chiletti R, Johansen A, Best D, McKittrick J, Butt W, d'Udekem Y, **MacLaren G,** Ignjatovic V, Attard C, van Ommen CH, Monagle P.

Highlights of the 2024 ELSO Consensus Guidelines on Neurological Monitoring and Management for Adult ECMO. ASAIO J. 2024 Dec 1;70(12):e165-e168. Cho SM, Antonini MV, **MacLaren G,** Zaaqoq AM, Lorusso R.

Impact of number of passes and futile reperfusion in basilar artery occlusion acute ischaemic stroke. Singapore Med J. 2025 Jan 3.doi: 10.4103/singaporemedj.SMJ-2023-255. [Epub ahead of print]. Siow I, Tan BY, Lee KS, Yap DWT, **Sia CH,** Gopinathan A, Yang C, Bhogal P, Lam E, Spooner O, Meyer L, Fiehler J, Papanagiotou P, Kastrup A, Alexandrou M, Kutschke S, Wu Q, Mpotsaris A, Maus V, Anderson T, Gontu V, Arnberg F, Lee TH, Chan BPL, Seet RC, Teoh HL, Sharma VK, Yeo LLL.

Institutional experience and outcomes in patients receiving extracorporeal CPR for out-of-hospital cardiac arrest: Knowledge comes, does wisdom linger? Resuscitation. 2025 Feb 21:110560. [Epub ahead of print]. Ling RR, **Lim SL, Ramanathan K.**

Long-term all-cause mortality of metabolic-dysfunction associated steatotic liver disease based on body weight phenotypes following acute myocardial infarction: A retrospective cohort study. Koh J, Mohamed A, Kong G, Wong E, Chen Y, Anand VV, Chong B, Chin YH, Wang JW, Khoo CM, **Chan SP,** Muthiah M, Dimitriadis GK, **Chan MY, Loh PH, Chew NWS.**

Longitudinal Outcomes of Patients with Aortic Stenosis Stratified by Sex: An Asian Perspective. J Cardiovasc Dev Dis. 2025 Jan 19;12(1):32. **Ong J, Leow AST,** Ng CY, **Loh PH,** Quek SC, **Kong WKF, Yeo TC, Sia CH, Poh KK.**

Low serum serotonin is associated with functional decline, mild behavioural impairment and brain atrophy in dementia-free subjects. Brain Commun. 2025 Jan 9;7(1):fcaf005. Sim MA, Liao Y, **Chan SP, Tan ESJ,** Kan CN, Chong JR, Chai YL, Venketasubramanian N, Tan BY, Hilal S, Xu X, Chen CLH, Lai MKP.

Magnetic augmentation through multi-gradient coupling enables direct and programmable profiling of circulating biomarkers. Nat Commun. 2024 Sep 27;15(1):8410. Chen Y, Zhang L, Wu X, Sun X, Sundah NR, Wong CY, Natalia A, **Tam JKC,** Lim DW, Chowbay B, Ang BT, Tang C, Loh TP, Shao H.

Management of cardiogenic shock: state-of-the-art. Intensive Care Med. 2024 Nov;50(11):1814-1829. Jung C, Bruno RR, Jumean M, Price S, Krychtiuk KA, **Ramanathan K,** Dankiewicz J, French J, Delmas C, Mendoza AA, Thiele H, Soussi S.

Mixed Reality (Holography)-Guided Minimally Invasive Cardiac Surgery-A Novel Comparative Feasibility Study. J Cardiovasc Dev Dis. 2025 Jan 27;12(2):49. **Aye WMM, Kiraly L, Kumar SS,** Kasivishvanaath A, Gao Y, Kofidis T.

Monitoring Hemostatic Function during Cardiac Surgery with Point-of-Care Viscoelastic Assays: A Narrative Review. Semin Thromb Hemost. 2025 Feb 12. [Epub ahead of print]. Ong BJA, See Tow HX, Fong ATW, Ling RR, Shekar K, **Teoh K,** Ti LK, **MacLaren G,** Fan BE, **Ramanathan K.**

Neurological monitoring and management for adult extracorporeal membrane oxygenation patients: Extracorporeal Life Support Organization consensus guidelines. Crit Care. 2024 Sep 6;28(1):296. Cho SM, Hwang J, Chiarini G, Amer M, Antonini MV, Barrett N, Belohlavek J, Brodie D, Dalton HJ, Diaz R, Elhazmi A, Tahsili-Fahadan P, Fanning J, Fraser J, Hoskote A, Jung JS, Lotz C, **MacLaren G,** Peek G, Polito A, Pudil J, Raman L, **Ramanathan K,** Dos Reis Miranda D, Rob D, Salazar Rojas L, Taccone FS, Whitman G, Zaaqoq AM, Lorusso R.

Neurological Monitoring and Management for Adult Extracorporeal Membrane Oxygenation Patients: Extracorporeal Life Support Organization Consensus Guidelines. ASAIO J. 2024 Dec 1;70(12):e169-e181. Cho SM, Hwang J, Chiarini G, Amer M, Antonini MV, Barrett N, Belohlavek J, Blatt JE, Brodie D, Dalton HJ, Diaz R, Elhazmi A, Tahsili-Fahadan P, Fanning J, Fraser J, Hoskote A, Jung JS, Lotz C, **MacLaren G,** Peek G, Polito A, Pudil J, Raman L, **Ramanathan K,** Dos Reis Miranda D, Rob D, Salazar Rojas L, Taccone FS, Whitman G, Zaaqoq AM, Lorusso R.

Novel Circulating Biomarkers in Aortic Valve Stenosis. Int J Mol Sci. 2025 Feb 22;26(5):1902. **Ong J,** Tan SML, Koh AS, **Kong WKF, Sia CH, Yeo TC,** Quek SC, **Poh KK.**

Patient-Reported Quality of Life Outcomes with Mandibular Advancement versus CPAP: Insights from the CRESCENT Trial. Sleep. 2025 Jan 31:zsaf022. [Epub ahead of print]. Colpani JT, Ou YH, Thakumar AV, Cheong CS, Loke W, **Sia CH,** Teo YH, **Chan SP,** Chin CW, Kojodjojo P, **Chan MY,** Cistulli PA, Luo N, **Lee CH.**

Plasma proteomics for cognitive decline and dementia-A Southeast Asian cohort study. Alzheimers Dement. 2025 Feb;21(2):e14577. Sim MA, Doecke JD, Liew OW, Wong LL, **Tan ESJ, Chan SP,** Chong JRF, Cai Y, Hilal S, Venketasubramanian N, Tan BY; Alzheimer's Disease Neuroimaging Initiative; Lai MKP, Choi H, Masters CL, Richards AM, Chen CLH.

Polymer-coated paclitaxel-eluting stents for the treatment of stenosed native arteriovenous fistulas: Long-term results from the ELUDIA study. J Vasc Access. 2023 Jun 21:11297298231174263. Katsanos K, **Ho P,** Tang TY, Vlachou E, Yap CJQ, Kitrou PM, Karnabatidis D.

Position paper on the physiology and nomenclature of dual circulation during venoarterial ECMO in adults. Intensive Care Med. 2024 Dec;50(12):1994-

2004. Badulak J, Abrams D, Luks AM, Zakhary B, Conrad SA, Bartlett R, **MacLaren G,** Vercaemst L, Lorusso R, Broman LM, Agerstrand C, Price S, Combes A, Peek G, Fan E, Shekar K, Fraser J, Brodie D; Extracorporeal Life Support Organization (ELSO).

Pulmonary hypertension in pregnancy: two sides to a coin. Singapore Med J. 2025 Mar 1;66(3):167-171 **Ong J,** Yap JJY, Dashraath P, **Low TT,** Choolani M, **Poh KK.**

Outcomes Following Vascular and Endovascular Procedures Performed During the First COVID-19 Pandemic Wave. EJVES Vasc Forum. 2024 Sep 19;62:64-71. Birmpili P, Benson RA, Gwilym B, Nandhra S, Al-Saadi N, Ambler GK, Blair R, Bosanquet D, Dattani N, Hitchman L, Hurndall K, Machin M, Onida S, Saratzis A, Shalhoub J, Shelmerdine L, Singh AA, **COVER Study Collaborative.**

Real-time estimated Sequential Organ Failure Assessment (SOFA) score with intervals: improved risk monitoring with estimated uncertainty in health condition for patients in intensive care units. Health Inf Sci Syst. 2024 Dec 31;13(1):12. He Y, Luo Q, Wang H, Zheng Z, **Luo HD, Ooi OC.**

Relationship Between Severity of Ischemia and Coronary Artery Disease for Different Stress Test Modalities in the ISCHEMIA Trial. Circ Cardiovasc Interv. 2024 Dec;17(12):e013743. Reynolds HR, Page CB, Shaw LJ, Berman DS, Chaitman BR, Picard MH, Kwong RY, Min JK, Leipsic J, Mancini GBJ, Budoff MJ, Hague CJ, Senior R, Szwed H, Bhargava B, Celutkiene J, Gadkari M, Bainey KR, Doerr R, Ramos RB, Ong P, Naik SR, Steg PG, Goetschalckx K, Chow BJW, Scherrer-Crosbie M, Phillips L, Mark DB, Spertus JA, Alexander KP, O'Brien SM, Boden WE, Bangalore S, Stone GW, Maron DJ, Hochman JS, **ISCHEMIA Research Group.**

Respiratory Support in COVID-19-Related Respiratory Failure: Lessons Learnt. Adv Exp Med Biol. 2024;1457:97-109. Ling RR, **Ramanathan K,** Subramaniam A, Shekar K.

Right Ventricular Injury Definition and Management in Veno-Venous Extracorporeal Membrane Oxygenation. ASAIO J. 2025 Jan 7. [Epub ahead of print]. Dugar SP, Sato R, Charlton M, Hasegawa D, Antonini MV, Nasa P, Yusuff H, Schultz MJ, Harnegie MP, **Ramanathan K,** Shekar K, Schmidt M, Zochios V, Duggal A; Protecting the Right Ventricle Network (PRORVnet).

Risk score for the prediction of arteriovenous fistula maturation. J Vasc Surg. 2025 Feb 25:S0741-5214(25)00345-3. [Epub ahead of print]. Meng L, Guo W, **Ho P.**

Sodium-Glucose Cotransporter-2 Inhibitors After Acute Myocardial Infarction: A Systematic Review and Meta-Analysis of Randomized Controlled Trials. Am J Cardiovasc Drugs. 2025 Jan;25(1):71-81. Lin NHY, Ho JSY, **Leow AST**, Teo YH, Yeo BSY, Zhang AAY, Goh FQ, **Yeo TC, Wong RCC, Chai P, Chan MY, Sia CH.**

Validation of a Prediction Model from Quantitative Coronary Angiography to Detect Ischaemic Lesions as Evaluated by Invasive Fractional Flow Reserve. Heart Lung Circ. 2025 Feb;34(2):125-134. Yang S, Leng S, Fam JM, **Low AF,** Tan RS, **Chai P,** Teo L, Chin CY, Allen JC, **Chan MY,** Yeo KK, Wong ASL, Wu Q, Lim ST, Zhong L.

ABSTRACTS

American College of Cardiology (ACC) 2024, Atlanta, USA, 6-8 April 2024

An Asian Perspective on Longitudinal Outcomes of Aortic Stenosis Stratified by Sex.
Ong J, Leow AST, Loh PH, Kong WKF, Yeo TC, Sia CH, Poh KK.

Regression of Infarct Scars in COMET-AMI (Concomitant Milrinone and Esmolol Treatment in Patients with Acute Myocardial Infarction) Pilot Randomised-Controlled Study.
Ong J, Loh PH, Chan SP, Teo L, Wong CY, Tan V, **Tan HC,** Huang MH, **Poh KK.**

European Society of Cardiology (ESC) Congress 2024, London, UK, 30 August-2 September 2024

Long-Term Mortality Outcomes of Southeast Asian Patients with Aortic Stenosis.
Ong J, Leow AST, Ching K, Goh F, **Chew NWS, Kong WKF, Yeo TC, Sia CH, Poh KK.**

Prognostic Impact of Lean Diabetes Mellitus on Aortic Stenosis.
Ong J, Leow AST, Kong WKF, Yeo TC, Sia CH, Poh KK.

5-Year VARC-3 Outcomes and Predictors of Mortality in an 10-year Asian TAVI Registry.
Ong J, Soh RYH, Chew NWS, Teo TW, Leow AST, Low TT, Yip JWL, Hon JKF, Tay E, **Kuntjoro I, Lim Y.**

35th Annual Extracorporeal Life Support Organization (ELSO) Conference, Detroit, USA, 29 September – 1 October 2024

Mechanical left ventricular unloading during extracorporeal cardiopulmonary resuscitation: a propensity score-matched analysis of the ELSO registry.
Ling R, Ying C, Shekar K, Brodie D, **MacLaren G, Ramanathan K**.

Prone positioning during venovenous ECMO for ARDS: an updated meta-analysis with trial sequential analysis.
Lim O, Ling R, Nair P, **MacLaren G, Ramanathan K**.

Temporal trends in venovenous ECMO utilization before and during the COVID-19 pandemic: an ELSO registry analysis.
Ling R, **Ramanathan K,** Chen Y, Barbaro R, Shekar K, Brodie D, **MacLaren G.**

American College of Cardiology (ACC) 2025, Chicago, USA, 29-31 March 2025

Clinical Characteristics and Longitudinal Outcomes of a 10-year Asian Transcatheter Aortic Valve Implantation Registry.
Ong J, Valerie Ramero, **Soh RYH, Chew NWS, Leow AST, Zhang A, Low TT, Yip JWL, Hon JKF,** Tay E, **Kuntjoro I, Lim Y.**

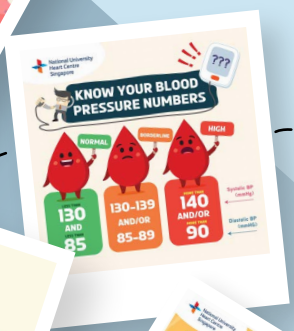
Longitudinal Characteristics and Outcomes of Normal-Flow Low-Gradient Aortic Stenosis in Asian Patients.
Ong J, Yeung W, Leow AST, Kong WKF, Yeo TC, Sia CH, Poh KK.

American College of Cardiology (ACC) Asia 2025 Together with Singapore Cardiac Society (SCS) 36th Annual Scientific Meeting, Singapore, 9 - 11 May 2025

Multimodality Imaging in the Assessment of MINOCA: Rare Case of Thromboembolism Originating from Accessory Mitral Valve Tissue.
Chan EZ, **Tung BWL, Chai P, Wong RCC, Kang GS,** Goh AXC, **Kong WKF, Sia CH.**

National University Heart Centre Singapore

Follow NUHCS Socials for the Latest Heart Health *Happenings*



FACEBOOK.COM/NUHCS

@NUHCS

@NUHCSOFFICIAL

LINKEDIN.COM/COMPANY/NUHCS

@NUHCS