

A biannual publication
of the
**National University
Heart Centre, Singapore**

PULSE

www.nuhcs.com.sg

Issue
No.25
January - June 2015

Grab a
COMPLIMENTARY
copy now!



Celebrating the Work of Medical **TECHNOLOGISTS**



EVENT

I Carry Your Heart
with Me – A Dance
of Healing &
Rejuvenation

CLINICAL

A Healthy Mind,
A Healthier Heart



EDUCATION

Achieve a Fitter
Heart with Cardiac
Rehabilitation

RESEARCH

Meet Our New Batch
of NMRC Award
Winners 2015



COVER FEATURES

04 Celebrating the Work of Medical Technologists

NUHCS shows appreciation for our medical technologists, the unsung heroes that play a vital role in heart care.

08 I Carry Your Heart With Me

A celebration of love, art and nature. Relive the night of healing and rejuvenation at NUHCS Sculpture Garden.

20 A Healthy Mind, A Healthier Heart

Find out how NUHCS Psychiatry Service cares for the emotional wellbeing of our heart patients.

25 Achieve a Fitter Heart with Cardiac Rehabilitation

Follow Dr. Yeo Tee Joo's journey in Toronto, Canada, as he picked up the art of strengthening heart health through fitness.

28 NMRC Clinician Scientist Award – A/Prof. Ronald Lee

Perseverance paid off for A/Prof. Lee as his project on 'Sleep Study Guided Multidisciplinary Therapy for Patients Presenting with Acute Coronary Syndrome' was given due recognition.

IN THIS ISSUE

EVENT

03 / Reaching A Greater Goal: NUHCS Workplan Seminar 2015
Discover the plans and future goals of NUHCS as we strive towards becoming a leading centre in Asia.

12 / Mutual Empowerment For A Healthy Heart

Get to know the NUHCS Heart Support Group, as members come together to conquer heart disease.

15 / When Heart-Cancer Join Forces

Gain insights into the Arteriovenous Thrombosis Forum 2015, as the two National Centres of NUH joined hands.

16 / Singapore Cardiac Society 27th Annual Scientific Meeting

See how our NUHCS team participated with great fervour at the annual meeting.

18 / 10th Introductory Course in Interventional Cardiology

Created for cardiologists with little or no interventional cardiology experience, the 10th installment of the course saw our fruits of labour.

CLINICAL

14 / Sutureless Valves: Reshaping Aortic Valve Disease Treatments

Learn about the introduction of sutureless valves and how it advances surgical options in NUHCS.

18 / The Retrograde Approach to Coronary Artery Chronic Total Occlusions: A New Approach

Hear from the expert on the revolutionary approach that helps treat complex chronic total occlusion lesions.

19 / Percutaneous Pulmonary Thrombectomy

A minimally invasive procedure for treatment of life-threatening pulmonary embolism.

22 / Precious Gifts from the Heart

Make a difference with the Heart Fund, as it goes a long way in helping heart patients recover and lead fulfilling lives.

24 / Pushing the Envelope in Conventional CT Imaging

How does the next generation in Dual Source computed tomography enable advanced CT imaging?

RESEARCH

26 / MOH Healthcare Research Scholarship – Dr. Lim Shir Lynn

Dr. Lim talks about her award-winning research, which clinched two other grants.

ACCOLADES

30 / Spreading Warmth Beyond Nursing

NUHCS is proud to have two dedicated nurses who won the Healthcare Humanity Award for going beyond the call of duty.

32 / Guiding and Motivating as a Nurse Leader

Taking pride in her work, Ms. Doreen Chew achieved the Outstanding Nurse Leader award for guiding other nurses.

33 / New Colleagues and Promotions

34 / Happenings at NUHCS

38 / Abstracts & Publications

PULSE is a biannual publication by the National University Heart Centre, Singapore, 1E Kent Ridge Road, NUHS Tower Block, Level 9, Singapore 119228

Please address comments to nuhcs_pulse@nuhs.edu.sg

National University Heart Centre, Singapore

Edited and designed by:

cubiz

beeling.ng@cubiz.com.sg

MCI (P) 098/02/2015

Copyright © is held by the publishers. All rights reserved. Reproduction in whole or in parts without permission is strictly not allowed.

Opinions expressed in the NUHCS Pulse are solely those of the writers and are not necessarily endorsed by NUH, NUHS and their related companies. They are not responsible or liable in any way for the contents of the advertisements, articles, photographs or illustrations contained in this publication. Contents are not to be reproduced without the written permission of NUHCS.



A/Prof. Poh Kian Keong
Editor



Prof. Tan Huay Cheem
Advisor



EVENT

REACHING A GREATER GOAL: NUHCS Workplan Seminar 2015

What are some of the upcoming developments of the National University Heart Centre, Singapore (NUHCS) as we aim for bigger aspirations? Dr. Daniel Tan shares more about these talking points at the NUHCS Workplan 2015.

The annual NUHCS workplan provides a platform for all of us at NUHCS to share and align our work objectives towards a common goal. This year, Prof. Tan Huay Cheem gave his perspective of the key accomplishments in 2014. Notably, NUHCS initiated a new telehealth service, which leverages technology, to enable remote monitoring of the weight, blood pressure or pacemakers of our patients. Beyond this, our higher aspiration is to become a leading centre in Asia by 2020 through differentiating ourselves from the pack.

THE ROAD TO EXCELLENCE

We can best achieve this by developing an end-to-end programme for Heart Failure that looks at prevention strategies, hospital management and rehabilitation back to society. A/Prof. Yeo Tiong Cheng elaborated on how

Cardiology will support this aim by deepening its collaborations with primary care such as GPs and Polyclinics through providing direct access to diagnostic services, e.g. treadmill and 24hr Holter, so that primary care can enlarge its screening equipment to better detect and diagnose cardiac abnormalities. The focus will gradually shift to developing preventive cardiology as a new service that can integrate screening; diagnostics; data analytics and research; and education into a comprehensive

programme that can slow down the growing pool of cardiac patients.

EFFORTS AND PROGRAMMES

Prof. Arthur Mark Richards added how **Cardiovascular Research Institute's (CVRI) current programmes will fit into this larger picture by striving towards biomarker discovery that can serve as future predictors of disease.**

More needs to be done to validate the potential biomarkers CVRI has identified as useful surrogates and it is encouraging that both industry and funding agencies support this by awarding more grants. The latest collaborative grant for the Asian network for translational research and clinical Trials (ATTRACT) has garnered \$30 million in funding, which raised CVRI's portfolio grants to \$70 million and affirmed it as a growing key contributor in cardiovascular research.

A/Prof. Michael Caleb outlined **Department of Cardiac, Thoracic and Vascular Surgery's (CTVS) aims to become a unit of excellence and referral.** He quoted 'the former borderline surgical patient becomes the standard patient and the former un-doable

patient becomes the challenging patient' to summarise the evolution of NUHCS cardiothoracic surgery's capabilities. As a tertiary referral centre, one of our key strengths is combining the talents from both Cardiology and CTVS, thus giving us confidence to embark on more complex work such as the Left Ventricular Assist Device (LVAD) programme (LVAD is a mechanical pump implanted inside the chest to help a weak heart pump blood throughout the body). Department of CTVS will focus on examining its processes and evaluating some practices that can achieve good outcomes and contain cost at the same time.

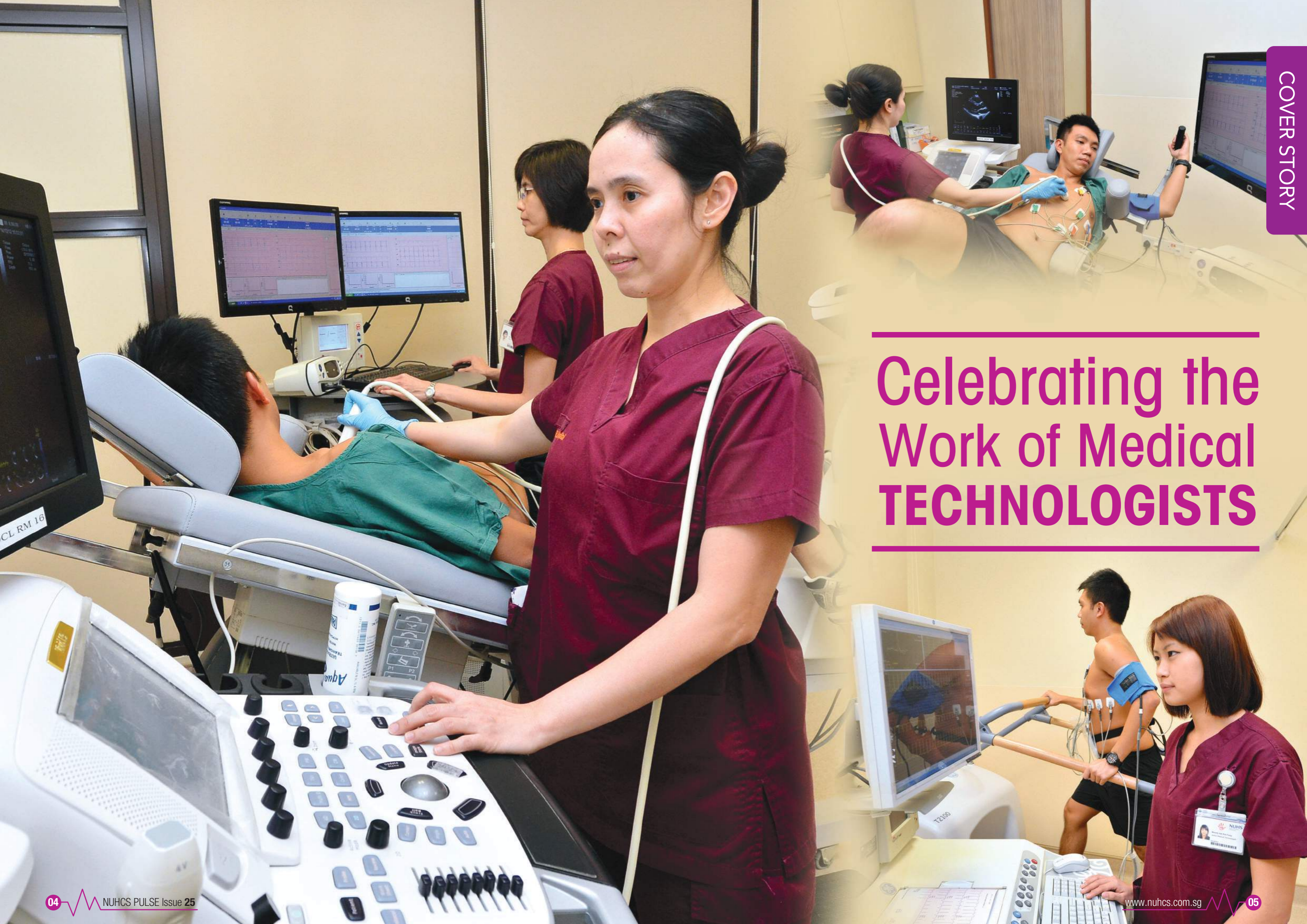
The seminar certainly provided much fodder for 2015 and beyond. •



By Dr. Daniel Tan

Assistant Chief Operating Officer, Ops & Admin, NUHCS

Dr. Tan graduated with a double Bachelor's Degree in Science (Honours) in Cell Pathology and MBBS from University College of London. He earned his MRCS and subsequently obtained an MBA from the National University of Singapore. His current responsibilities in NUHCS include all clinical operations as well as research administration for Cardiovascular Research Institute (CVRI).



Celebrating the Work of Medical TECHNOLOGISTS

TOUCHING HEARTS AND LIVES

They work tirelessly behind-the-scenes, performing and analysing laboratory tests with precision and accuracy to provide the diagnosis that could save a life. They are the unsung heroes of the cardiovascular field.

We dedicate this special feature to the medical technologists of National University Heart Centre, Singapore (NUHCS) as we invite Ms. Shermaine Fun, who leads this special team in NUHCS, to tell us about the work they are passionate about.

A VITAL PART OF CARE

A medical technologist is an essential part of a multidisciplinary team behind cardiovascular care. They perform and analyse the results of complex scientific tests using sophisticated procedures and equipment. Simply put, they play a crucial role in providing doctors with a firm diagnosis of various clinical conditions with accuracy and precision.

That is why "getting to the heart of the matter" should be the motto of a medical technologist, both literally and figuratively.

RECOGNISING TECHNOLOGISTS OF NUHCS

The technologists specialise in different cardiovascular aspects to provide comprehensive testing to uncover a patient's ailment. They are like deep-sea divers, venturing into the nooks and crannies of the heart. Echo-technologists specialise in heart imaging and use ultrasound equipment to examine the heart chambers, valves and vessels. Non-echo technologists perform electrocardiogram tests, ambulatory holter or ambulatory blood pressure tests and stress test. Vascular

technologists measure the patient's blood pressure and volume in their extremities to evaluate blood flow and identify blockages. Without these medical technologists, a firm diagnosis cannot be made.

With a specialised skillset, there is another group of technologists whom assist the doctor with various cardiac procedures ranging from cardiac catheterisation (which involves the threading of a catheter through the patient's artery to the heart), insertion of pacemaker and stents to more complex procedures such as Transcatheter Aortic Valve Implantation (TAVI) and Mitraclip Therapy.

Some have likened a medical technologist to a plumber's assistant – he or she assists the plumber (doctor) in identifying blockages and subsequently clears the drains (arteries) to ensure proper liquid (blood) flow.

In addition to studying the human heart and providing cardiovascular services, our medical technologists also serve an important role in

education. They collaborate with several institutions such as polytechnics and other hospitals to share best practices, expertise and knowledge.

Selected technologists also have the privilege to assist doctors in their research. Some of these research papers have been subsequently published in the American Heart Society Conference.

TOUCHING HEARTS AND LIVES

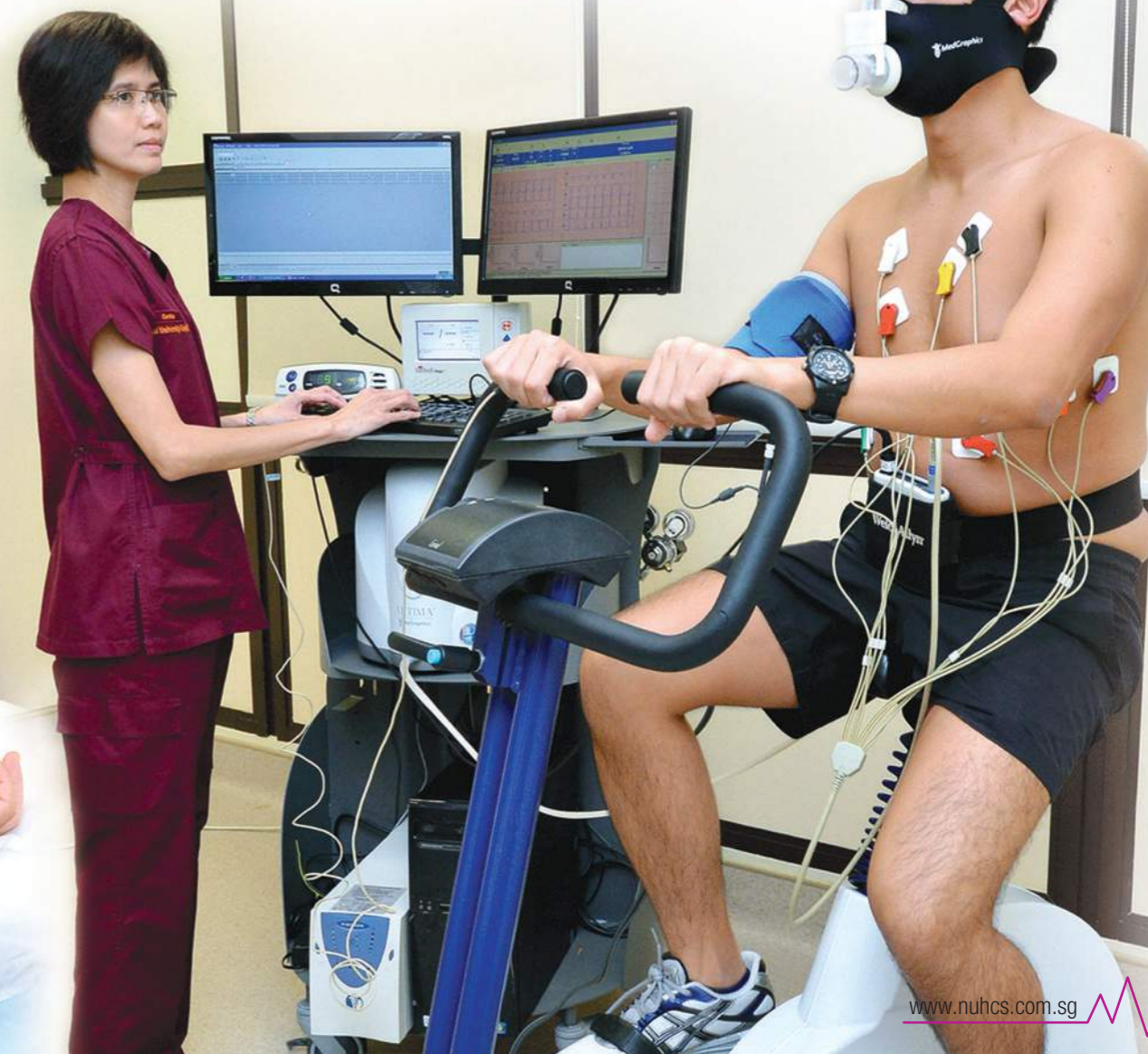
The role of a medical technologist is an exciting and rewarding career as we can literally touch a fellow human's heart and thus actively make a difference in their lives. As Helen Keller said: "The most beautiful things in the world cannot be seen or even touched – they must be felt with the heart". What we do, we do with all our heart. ●

By Ms. Shermaine Fun

Principal Medical Technologist, Diagnostic Cardiac Laboratory, NUHCS



Shermaine has been with the Diagnostic Cardiac Laboratory for 15 years, rising from a Junior Medical Technologist to a Principal Medical Technologist. She has been assisting in the operation of the laboratory for the past 9 years and currently heads a team of 27 staff. She provides clinical support and professional advice to the laboratory and her team respectively.



I carry your heart + with me

By Ms. Yvonne Lin

Senior Assistant Manager,
Communications &
Development, Ops & Admin,
NUHCS



Yvonne is a part of the Communications & Development team, which works closely with colleagues across the NUHCS and its associates to maintain and develop the Centre's reputation. The team tells the stories of its people, patients and programmes, keeping in mind the mission to provide a comprehensive and holistic approach to the treatment of cardiovascular problems. She manages the website, media relations and external engagements for NUHCS.

A celebration of love, art and nature – patients, donors, working partners and staff were treated to a dance of healing and rejuvenation, expressed through Bharatanatyam Butoh with inspiration from our own Sculpture Garden. Come relive the night with a stunning photo collage.

Leading experimental dancers, Nirmala Seshadri and Neewin Hershall, expressed a dance of healing and rejuvenation – a celebration of love, art and nature through Bharatanatyam and Butoh.

"The moment I walked into the Sculpture Garden, I felt inspired to respond to the setting through movement (of Bharatanatyam and Butoh)." – Ms. Nirmala Seshadri, one of the lead dancers.

"In the metaphor of Michelangelo, Nirmala and Neewin are dance devas hidden in the granite blocks ... they emerge from the sculptures to create a moving poem." – Dr. Tan Swie Hian, the artist behind NUHCS Sculpture Garden

NUHS TOWER BLOCK



"The fact that this performance – about affairs of the heart – is being staged at a place which is dedicated to caring for the heart ... is something logical, even natural." – Prof. Tan Huay Cheem, Director of National University Heart Centre, Singapore (NUHCS).



Syv Bruzeau



Samuel Wong



Vishnu Veluri



Johnny Chia



Nirmala Seshadri



Neewin Hershall



"...my friend and I found ourselves literally in the centre of the performance ... It made for an unforgettable viewing experience! ... Nirmala and Neewin were mesmerising to watch." – Pooja, notabilia.wordpress.com

Mutual Empowerment

for a Healthy Heart

Learn more about the National University Heart Centre, Singapore (NUHCS) Heart Support group, an invaluable platform for heart patients to receive emotional support and share knowledge on how to overcome heart disease.

The Heart Support Group was formed in January 2014 by a group of like-minded heart patients. The objective of this support group is to create a support network amongst fellow heart patients. This is achieved through monthly meetings at Heart Rehab. The support group members share their stories to educate fellow members on recognising the different symptoms of heart attack.

The rich and diverse story sharing session at the regular meetings give members a better picture of the various possible symptoms of heart attack and unhealthy lifestyle practices, which attributed to their heart attack. Patients also share their own heart-healthy tips that help them to prevent another attack.

A SPECIAL BOND

The support group agreed that a mid-year leisure trip would be a good respite from their daily lives and would provide a good opportunity for bonding among the members. Family members and supporting staff were also invited to the trip. The group gathered in the early morning of 28 June to set off to Batam for a 2D1N trip. Throughout the trip, the members got to interact and understand each other better on the personal side.

Members had collectively given feedback that they had wonderful memories from the trip and it has fostered a deeper friendship amongst the members. •

The members of the Heart Support Group had a great time bonding during the short getaway.

By
Ms. Amanda Chiam



Senior Executive Assistant,
Communications &
Development, Ops &
Admin, NUHCS

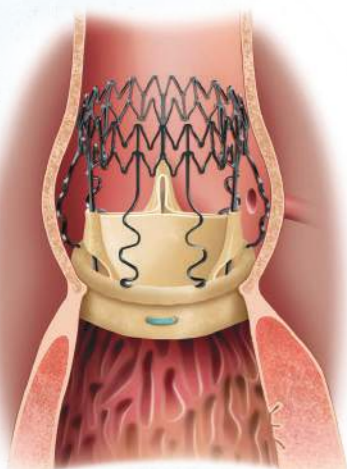
Amanda is a member of the NUHCS Communications & Development team, which works closely with colleagues across NUHCS to deliver heart health messages and programmes of the Centre to the public. She takes care of the support groups, website, events and campaigns.



Due to its characteristic of allowing sutureless positioning and anchoring at the implantation site, the sutureless valves offer significant advancements in surgical Aortic Valve Replacement.

Sutureless Valves: Reshaping Aortic Valve Disease Treatment

Sutureless valves are powerful tools in the surgical treatment of aortic valve disease. In 2012, our surgeons implanted the first sutureless valve in Asia, in a series of patients. Till date, more than 25 valves have been implanted and the outcomes are excellent. With a proctorship status in Asia, we offer coaching in other countries and conduct workshops in National University Hospital (NUH) to host doctors and nurses from around the world. On 1-2 April 2015, we welcomed an international group at the Perceval Preceptorship event in NUH. There were lectures, hands-on wet lab training, as well as life case observations and discussions.



Sutureless valves allow precise positioning and help reduce complexity in challenging and time-consuming procedures.

Benefits of Sutureless Valves

Reduce trauma of operation

- Shorter ischemic times
- Reduced trauma to aortic structures
- Reduced risk of renal failure
- Standardisation of minimally invasive cardiac surgery (MICS) approaches
- Less blood transfusion

Better patient outcomes

- Shorter ventilation time
- Shorter ICU and ward stay
- Faster recovery

With its introduction in Asia, **sutureless valves is recommended as a key option for surgical treatment of valvular disease in a tertiary centre with cutting-edge technology.**

Our objective for education is to expand our expertise in niche areas not available elsewhere. Teaching and bringing in advanced therapies are part of developing NUHCS as an established training hub in Asia. •



By A/Prof. Theodoros Kofidis

Senior Consultant,
Department of Cardiac,
Thoracic & Vascular
Surgery

Head, Division of Adult
Cardiac Surgery, NUHCS

•••••
A/Prof. Kofidis offers a wide range of less invasive, small-incision and keyhole access procedures for blocked coronary arteries and heart valves. His specialties are minimally invasive procedures for the repair/replacement of the heart valves, which he has introduced into the robotic cardiac surgery programme he started at NUHS. They minimise trauma to patients, shorten length of stay and produce better cosmetic result.

When Heart-Cancer Join Forces

NUHCS-NCIS Arteriovenous
Thrombosis Forum 2015

In partnership with National Cancer Institute of Singapore (NCIS) and global healthcare company, Sanofi-aventis Singapore, an educational forum filled with thought-provoking discussions and unravelling of various hot topics was held.

On 24 and 25 April, the 2-day symposium leverages thrombosis – a common problem that complicates many diseases, including heart attacks, strokes, diabetes and cancer – as a unified platform to educate healthcare providers (HCPs) on a broad range of clinically important diseases.

INCORPORATING ARTERIAL THROMBOSIS

The brainchild of former NUHCS head vascular surgeon, A/Prof. Peter Robless, this Asia Pacific workshop has been running for more than a decade. In 2013, A/Prof. Robless expanded the predominantly venous thrombosis programme to include arterial thrombosis. This brought me into the fold as co-director of the symposium and I was eager to lend my support as a cardiologist of NUHCS. As the workshop has always had major inputs from haematologists from NCIS, this year, we solidified the partnership with NCIS as joint host of the workshop.

EXCHANGING VIEWS AND COMBINING EFFORTS

A record number of delegates, more than 300 each day, attended the symposium this year. The programme mainly comprised scenario-based learning across several disciplines, including cardiology, neurology, surgery and obstetrics, coupled with lively debates and a number of keynote lectures by our international faculty, Prof. Richard Troughton from Christchurch Heart Institute, New Zealand, and Dr. Alan Fong from Sarawak General Hospital Heart Centre, Malaysia.



By A/Prof. Mark Chan

Senior Consultant,
Department of Cardiology,
NUHCS

•••••
A/Prof. Chan has authored or co-authored more than 70 papers in peer reviewed journals and is the principal investigator of multiple large outcomes studies in acute coronary syndrome. He supervises acute coronary syndrome and thrombosis research at Cardiovascular Research Institute (CVRI) and the high-risk acute coronary syndrome clinic at NUHCS.

The delegates particularly enjoyed the sparing sessions between members of the faculty, who posed challenging clinical situations and put each other in the hot seat.

We would like to thank Sanofi for their regular support of this conference. The private partnership with Sanofi has also enabled us to record and make available all lectures and slides online, through unrestricted grant for Continuing Medical Education (CME), Continuing Professional Education for pharmacists (CPE) and Continuing Nursing Education (CNE) – Championing Opinion Leader Advocacy and Continuous Medical Education for HCPs (COACH). COACH aims to be an interactive repository of high-value, continuously-updated medical education that is accessible to all HCPs who attended this conference. As we have always strived to make this educational event free for all HCPs despite a narrow budget, Sanofi's staff gallantly chipped in to support the event.

Most of all, we thank all the delegates for making this forum such a success. •

Singapore Cardiac Society 27th Annual Scientific Meeting (ASM)

State-of-the-Art in
Cardiovascular Care



By **Asst. Prof.
Joshua Loh**

Consultant, Department of
Cardiology, NUHCS

Asst. Prof. Loh has authored and co-authored more than 30 articles in peer-reviewed journals and has presented many abstracts in international scientific meetings. His specialty interests include coronary artery disease and acute coronary syndromes. He supervises the post-myocardial infarction clinic, focusing on patient care after their heart attack.



Snapshots of the 27th ASM, which saw the major participation of various NUHCS physicians.

The 27th ASM of the Singapore Cardiac Society (SCC) was held on 18-19 April 2015 with resounding success. This year's theme – "State-of-the-Art in Cardiovascular Care" – reflects the exciting developments and challenges in cardiovascular medicine.

The ASM attracted close to 400 participants locally and regionally, with close to 70 faculty members, including 10 international speakers from 7 countries and an unprecedented number of abstract submissions.

The Guest of Honour, A/Prof. Benjamin Ong, Director of Medical Services, Ministry of Health, delivered the opening speech, emphasising on nationally supported hospital programmes to tackle the burden of cardiovascular disease in Singapore, encouraging primary prevention through

cardiovascular risk factor management, and urging greater collaborations among healthcare professionals for the benefit of the patients.

The ASM was mostly dual-track, offering topics for both the primary care providers and the specialist cardiology team. The topics include novel antiplatelet and anticoagulation therapies, stroke prevention, cardiometabolic risk management, pulmonary hypertension, advanced heart failure devices, coronary perfusion imaging, sudden cardiac death syndromes, hypertension management, new stent platforms and an ECG symposium.

NUHCS was heavily involved in the ASM. I participated as the Organising Chairman, together with committee member, Asst. Prof. Lim Toon Wei, and under the guidance

of A/Prof. Poh Kian Keong, President of SCC, we managed to organise this comprehensive 2-day programme after months of planning. Many NUHCS physicians also contributed as chairpersons, speakers and abstract presenters.

NUHCS dominated the Young Investigator's Award (YIA) competition, with 5 out of 6 finalists from NUHCS. Asst. Prof. Edgar Tay was the winner in the YIA clinical abstracts competition for presenting the CONTRAST Trial, a multicentre study led by NUHCS. Among the 6 free paper sessions, abstracts from NUHCS accounted for almost a quarter of all abstracts presented (refer to page 39).

I would like to thank everyone in NUHCS for your enthusiastic participation at the 27th ASM. See you again next year! •

10th Introductory Course in Interventional Cardiology

The 10th installment of this distinguished event saw the hands-on training of various advanced tools and our fruits of labour.

The National University Heart Centre, Singapore (NUHCS) celebrated the 10th anniversary of its introductory course in interventional cardiology on 9th to 10th May 2015. Created for cardiologists with little or no experience in interventional cardiology, this percutaneous coronary interventional (PCI) simulator training course attracted attendees from regional countries and beyond.

This course has grown from strength to strength over the years with expanded content and training stations. Besides the usual hands-on training vascular models and virtual-reality simulators offering transradial and transfemoral training, trainees also get to practise on intravascular ultrasound (IVUS) and optical coherence tomography (OCT) simulators – the latest imaging techniques in the catheterisation laboratory this year. The training curriculum has been structured and tailored based on today's practice. Over the years, more than 260 doctors, industry trainees, nurses, technologists and researchers have benefited from this programme.

NUHCS appreciated all faculties who have devoted their time and commitment to this cause in the last decade, and also our long-term partners – Siemens Singapore, Terumo Medical Corporation and Boston Scientific Asia Pacific Pte Ltd. •



By Prof. Tan Huay Cheem

Senior Consultant,
Department of Cardiology,
NUHCS
Director, NUHCS



With a Masters of Medicine in Internal Medicine and Membership of Royal College of Physician, UK, Prof. Tan went on to complete four other fellowships. He also received vascular ultrasonography and carotid stenting training. He is an active clinical researcher, visiting professor to several hospitals in China and is an invited speaker to many international cardiology meetings.

the donor artery; collateral perforation or occlusion; equipment entrapment within septal collaterals; radiation injury; and contrast-induced nephropathy.

Retrograde CTO PCI has a high degree of safety, success (in excess of 90%) and efficiency in experienced hands. It is a technique that is now adopted at NUHCS for patients with complex CTO lesions that cannot be treated by traditional antegrade techniques. Nonetheless, only the most experienced operators – with a wide knowledge of various CTO guidewires, techniques of intervention, and management of complications – should undertake it. •

antegrade is very challenging. This would include lesions such as ostial or long (>30mm) occlusions; occlusions without a stump, with large side branches at the proximal cap, or with severe tortuosity or calcification; small or poorly visualised distal vessels; and visible continuous collaterals. Its techniques require special consideration of vascular access, and choice of guiding catheters, guidewires and microcatheter. Limitations include poor maneuverability of the retrograde wire. It requires careful study of the coronary anatomy, wiring collaterals, crossing lesions retrogradely and treating lesions after crossing.

In good hands, the risk of retrograde is low and often manageable. Some of its unique and serious complications include life-threatening thrombosis or dissection of

The Retrograde Approach to Coronary Artery Chronic Total Occlusions: A NEW APPROACH

Prof. Tan offers his knowledge on retrograde approach that successfully treats patients with complex chronic total occlusion (CTO) lesions.

CTO still represents the final frontiers in percutaneous coronary intervention (PCI). Antegrade, a conventional approach to treating CTO lesions, has a suboptimal success rate of 70%. It involves the insertion of all equipment proximal to the proximal cap before attempting crossing the obstruction.

DONE INDEPENDENTLY AT NUHCS

The new retrograde approach is an important adjunct for CTO operators to improve success, using collateral channels (CC) provided by contralateral vessel or bypass grafts to reach the distal end of the occlusion. The distal fibrous cap is softer and more favourable for successful passage of guidewires.

Retrograde is now an initial strategy when

Percutaneous Pulmonary Thrombectomy

By Asst. Prof. Pipin Kojodjojo

Consultant, Department of Cardiology, NUHCS



Asst. Prof. Kojodjojo is actively involved in clinical research with an emphasis on applying novel techniques and therapies to optimise catheter ablation and device-based treatment of complex cardiac arrhythmias. He has been awarded several nationally competitive research grants. Having attained a Ph.D. in clinical cardiac electrophysiology (EP) for his research on atrial fibrillation, he performs EP procedures that includes catheter ablation and device implantation.

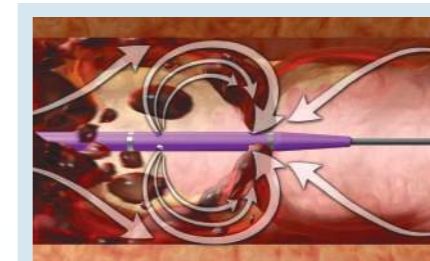
A MINIMALLY INVASIVE PROCEDURE FOR TREATMENT OF LIFE-THREATENING PULMONARY EMBOLISM (PE)

Each year, more than 1 million people globally are affected by PE, a potentially life-threatening condition, where a large blood clot blocks the passage of blood into the lungs and results in a sudden, dramatic drop in blood oxygen levels and blood pressure, causing breathlessness and occasionally, cardiac arrest. The risk of death is 58% in PE patients with low blood pressure (massive PE). Patients who are older, have undergone recent surgery, have a past medical history of cancer or have been immobilised for prolonged periods of time are at greater risk. However, PE can also happen to super-fit, young professional athletes.

EXISTING CONDITIONS LIMIT TREATMENT OPTIONS

Thrombolysis or clot-busting medications help break up the clots and restore normal circulation for patients with massive PE. Yet, half of them are ineligible for thrombolysis due to other co-existing medical conditions, such as recent surgery or stroke, which greatly increase the risk of bleeding complications after thrombolysis. The only option available in the past was surgical embolectomy, an open-chest surgery that removes clots from the lungs. This surgery is very risky as patients are already unstable and is less effective if there are multiple clots in the lungs.

Thus, a new minimally invasive technique, percutaneous pulmonary thrombectomy (PPT), was launched in National University Heart Centre, Singapore (NUHCS). During the hour-long procedure with minimal side effects, a tiny catheter is inserted into the circulation from the large vein of the leg (femoral vein) and positioned into the blood vessels of the lung where the clot is obstructing blood flow. A specialised catheter delivers high-velocity jets of saline to break up and remove the clot.



A specialised catheter is inserted into the thrombus and releases high-speed water jets to remove it.

A LIFE-SAVING PROCEDURE

The first PPT patient, a 71-year-old man, was treated at National University Hospital (NUH) in March 2015. He was making a good recovery from stroke but on the fourth day of admission, he suddenly collapsed. He was revived with cardiopulmonary resuscitation (CPR) but 20 minutes later, his circulation stopped again. The next round of CPR was unsuccessful. An emergency computed tomography (CT) scan confirmed the presence of multiple large PE, which meant that thrombolysis was not possible. Thus, he was brought to the NUH Angiography Centre for a PPT operation. His blood pressure improved and he was discharged a few days later. Two weeks later, another CT scan showed that his body has naturally removed all the clots in his lungs.

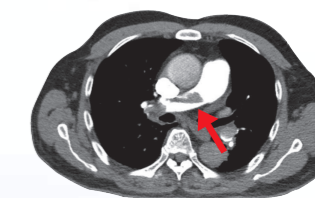
This new 24/7 PPT service forms part of a comprehensive, hospital-wide protocol to deliver world-class treatments to, and improve survival and reduce long-term complications for all our patients diagnosed with PE. It is built upon the long-standing, pre-existing infrastructure at NUHCS that has already been providing life-saving primary angioplasty to patients with heart attacks. •

By Asst. Prof. Joshua Loh

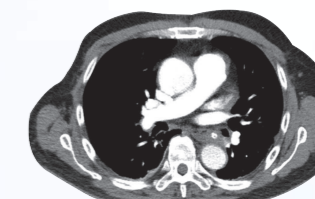
Consultant, Department of Cardiology, NUHCS



Asst. Prof. Loh has authored and co-authored more than 30 articles in peer-reviewed journals and has presented many abstracts in international scientific meetings. His specialty interests include coronary artery disease and acute coronary syndromes. He supervises the post-myocardial infarction clinic, focusing on patient care after their heart attack.

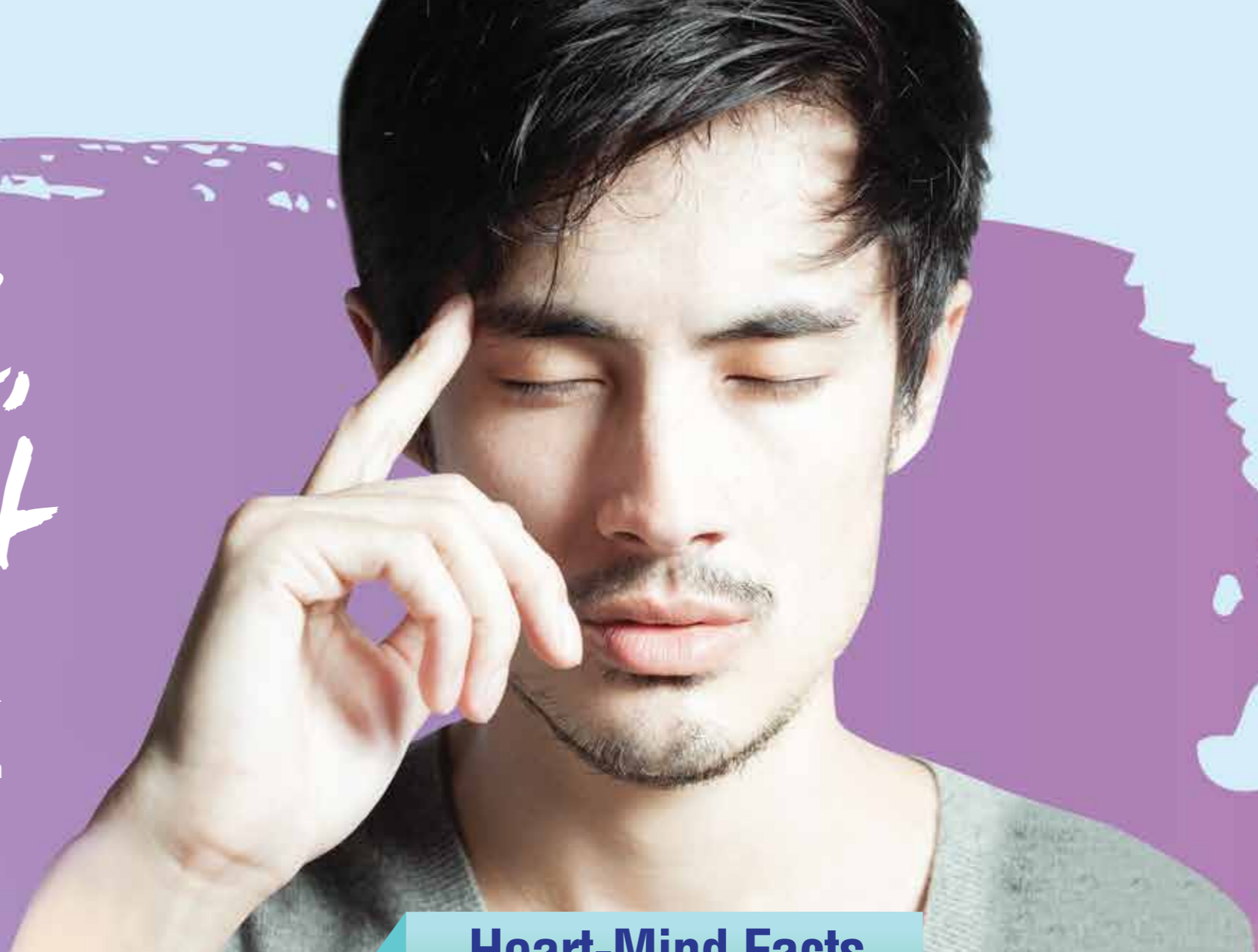


Before | The red arrow shows a large pulmonary embolus.



After | This image shows the resolution of all clots from the lungs after the thrombectomy.

A Healthy Mind, A Healthier Heart



By Dr. Lai Yew Min

Senior Consultant
Psychiatrist, Heart Centre
Psychiatry Service, NUHCS



Dr. Lai is trained as a specialist in psychiatry. Her clinical interests are general adult psychiatry and psychosomatic medicine in relation to heart disease. She has a special interest in the cognitive behaviour therapy of mood and anxiety disorders.

At National University Heart Centre, Singapore (NUHCS), we don't just tend to our patients' physical development. We also care for their emotional wellbeing. Dr. Lai shares more on the introduction of psychiatry services offered to heart patients who are battling psychological challenges in addition to heart disease.

Heart-Mind Facts

The NUHCS Psychiatry Service is an in-house psychiatry clinic located in the outpatient clinic at NUHCS. Its key objective is to provide an integrated psychological service that is readily accessible and favourable to heart patients.

Depression and anxiety are commonly experienced by heart patients and are associated with reduced quality of life, poorer self-management and health outcomes, as well as increased incidence of cardiac events and health service utilisation.

A depressed or anxious heart patient is a much sicker heart patient.

MATTERS OF THE HEART AND MIND

In addition, patients with anxiety and depression commonly present with cardiac symptoms such as palpitations, chest pain and breathlessness. These symptoms, together with sweating and dizziness, overlap with several of the 13 diagnostic symptoms of panic, a particularly common condition in the cardiology setting.

Heart patients present to the psychiatry service with a range of psychological needs in terms of severity, complexity and duration. These difficulties are broadly associated with adjustment to having cardiovascular problems, including:

- Concerns about the significance and impact of symptoms.
- Distress about being diagnosed with a serious cardiac problem, with fear and uncertainty about the future.

- Coping and engaging in everyday activities.
- Modifying behavioural risk factors for coronary artery disease.
- Catastrophic interpretations about cardiac symptoms.
- The re-emergence or intensification of pre-morbid psychological difficulties.

WHO NEEDS THE SERVICE?

Heart patients with coronary artery disease, atypical chest pain, arrhythmia, hypertension, heart failure, cardiomyopathy, or valvular heart disease and experience panic, health anxiety, depression, insomnia, or other psychological symptoms will be referred to the NUHCS Psychiatry Service by their doctors.

Estimated prevalence of conditions in coronary artery disease (CAD) patients:



Depression
15-40%



Anxiety
20-25%



Panic disorder
52%

Prevalence of panic disorder in patients with atypical chest pain:

The services offered will match patient's needs to treatment intensity. The services include:

Psychoeducation

Addressing adjustment issues and reducing psychosocial risk factors for heart disease (depression, anger, anxiety).

Individual therapy

Using cognitive-behavioural therapy for panic, health anxiety, depression and insomnia.

Pharmacotherapy

Prescribing a safe, appropriate and economical mix of drugs based on patient's needs and preferences.

PRECIOUS GIFTS From The heart

Your financial gift will make a difference to many lives. In fact, your generosity has helped one such patient recover from his battle with a heart condition.

Mr. Quek Cheun Lock, a Heart Fund recipient, leads a self-sufficient and productive life now.

Mr. Quek Cheun Lock will tell you that he is one lucky man. "It's even better than striking the lottery – I won a chance to enjoy the golden years of my life with my loved ones," he said.

For the last decade, the exuberant 73-year-old has been living with mitral regurgitation, a heart condition in which the heart's mitral valve is unable to close completely, causing blood to flow backwards in the heart, thus failing over time. Patients become increasingly weak and breathless. After years of controlling it with medication, his condition recently worsened.

A PATIENT IN NEED

At first, Mr. Quek was reluctant to go for surgery. "I was around 70 (years old) then, and my condition was too high risk for the

conventional open heart surgery. My specialist recommended the less invasive Mitraclip procedure," he recounted. However, Mr. Quek could not pay \$43,000 for it and was left in a tight spot.

"At that time, the medication that I was taking didn't help. I was breathless and tired. My heartbeat was weak. My doctor was very concerned, and he linked me up with the Department of Medical Social Work immediately," he explained. "That's when I met the Medical Social Worker who took my case and helped me apply for the Heart Fund."

A NEW LEASE OF LIFE

With the Heart Fund, Mr. Quek successfully underwent surgery. He now returns to NUHCS for regular follow-ups but is no

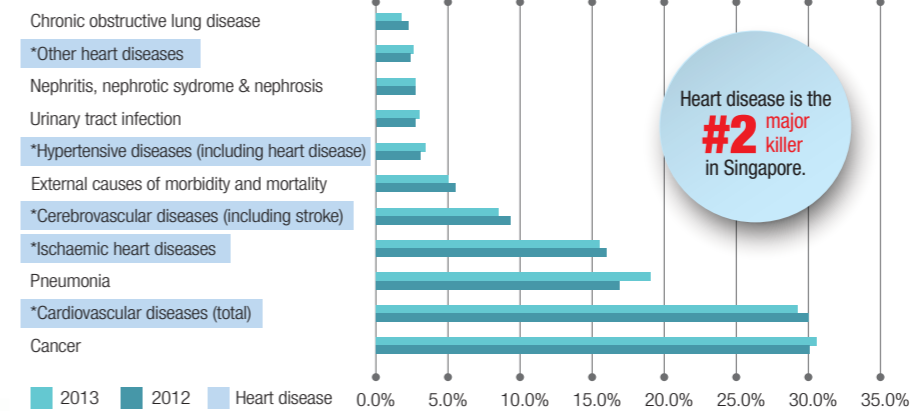
longer distressed over his heart condition. Instead, he has returned to work as a coffee shop assistant and enjoys simple pleasures such as eating a home-cooked meal with his loved ones.

"I was lucky I could focus on my health without worrying about money," and earnestly added, **"Please share my story to let more people know more about the Heart Fund. Their gifts will empower patients who need help."**

Know Your Heart Fund Facts

How significant is heart disease?

Principal Causes of Death in Singapore



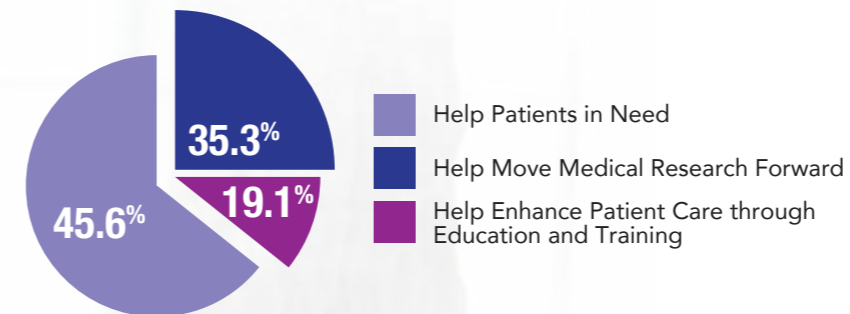
In 2013, 29.5% of deaths in Singapore are due to cardiovascular diseases.

Source: Ministry of Health.

WHAT does the Heart Fund do?

The Heart Fund was established in 2005 by NUHCS to assist its needy patients and support continuous medical research and education programmes in the field of cardiovascular.

WHAT are the funds used for?



HOW can needy patients apply for the Heart Fund?

Doctors/nurses refer needy patients to Medical Social Workers (MSWs).

Patients and their immediate family undergo financial assessment.

MSW puts up an application to The Heart Fund to request for funding.

By Ms. Yeo Si Ying



Intern, Communications & Development, Ops & Admin, NUHCS

Si Ying is a third year SMU student majoring in Psychology and Corporate Communication. She is currently supporting NUHCS Communications & Development team as an intern under Ms. Angeline Tan's guidance. Si Ying researches on patient motivations and partakes in a spectrum of communication responsibilities such as educational videos, patient collaterals, event publicity, fundraising and editorial support.

By Ms. Angeline Tan

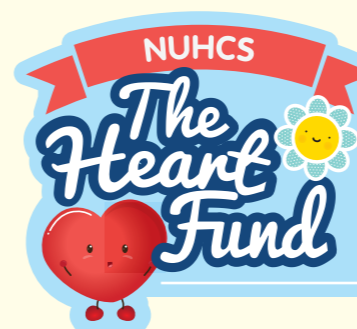


Senior Assistant Manager, Communications & Development, Ops & Admin, NUHCS

Angeline is one of the key members of the NUHCS Communications & Development team, responsible for orchestrating all events, internal and external communication. They ensure timely and effective messages on heart health matters to reach our patients, staff, media, corporate partners and the general public. Angeline manages the corporate and patient education collaterals under NUHCS, video production and The Heart Fund. She is part of the editorial team behind PULSE.



Mr. Quek jovially spoke about how his life has changed due to the Heart Fund.



Until no patient needs us, the Heart Fund needs you! Make a difference at <http://sggives.org/nuhs>.

Find out more about the Heart Fund at <http://nuhcs.com.sg/about-us/make-a-gift.html>.

Pushing the Envelope in Conventional CT IMAGING

Introducing the next generation in Dual Source computed tomography (CT) – gain insights into how this new innovation enables faster imaging and more precise diagnosis; extends advanced CT imaging capabilities; and presents dose-reduction features to some of the most challenging patients.

The National University Hospital (NUH) has installed a technologically-advanced CT scanner in January 2015. Its highly unique dual source gantry and high-pitch table enable CT imaging at unprecedented acquisition speed. This high-end cardiac scanning benefits patients suffering from irregular heart rates or atrial fibrillations by taking only 250 ms – *about a quarter of a heartbeat* – to perform a scan.



The new CT scanner generates CT images that are highly diagnostic with a more flexible and accurate analysis. Its benefits include:

- 1 It is capable of performing CT coronary angiogram faster, for patients with a **heart rate of more than 70 beats per minute**, whereas the previous generation can only scan heart rates that are less than that, widening the scope of patients eligible for CT scans.
- 2 A **breath-hold** to acquire sharp images and motion artefacts for patients with high heart rates is **not needed**.
- 3 It is able to **automatically select the most appropriate tube potential and tube current** based on the patient's body habitus and size.
- 4 This translates to **lower radiation dose** (by up to 50%), which **lessens the risk of developing radiation-induced cancer** particularly among young patients.
- 5 This also translates to **lower contrast dose** (by 33%), which is **beneficial to patients with reduced renal function** as it lowers the risk of contrast-associated nephropathy. A contrast medium containing iodine can also place an additional burden on the kidneys of older patients – particularly those with chronic illnesses.

TRANSLATING BETTER HEALTHCARE FOR SINGAPORE

We hope that with the vast benefits of the new CT scanner, we are making a difference by providing better healthcare for the community in Singapore. •

Achieve a Fitter Heart With Cardiac Rehabilitation

Determined to empower patients to maintain a strong heart after recovery, Dr. Yeo Tee Joo undertook cardiac rehabilitation (CR) training. Follow Dr. Yeo on his learning journey.



By Dr. Yeo Tee Joo

Associate Consultant, Department of Cardiology, NUHCS

Dr. Yeo graduated from the National University of Singapore and is a Member of the Royal College of Physicians (UK). He is completing his subspecialty fellowship training in Cardiovascular Prevention and Rehabilitation at the Toronto Rehabilitation Institute and will continue to train in Sports Cardiology at St George's University of London thereafter.



"YES!!" Rob exclaimed with pure joy after receiving news that his heart failure patient had almost doubled her peak VO₂ after 6 months of CR. Rob, a senior kinesiologist and CR supervisor, had the response that perfectly encapsulated the passion, dedication and persistence of the Rumsey Centre Cardiovascular Prevention and Rehabilitation Unit of the Toronto Rehabilitation Institute (TRI).

EMPOWERING PATIENTS WITH CR

As an awardee of the Ministry of Health Training Scholarship, I embarked on a subspecialty training in CR for 12 months under the CR programme at TRI Rumsey Centre, which is one of the largest and most established in North America, seeing up to 2,000 patients annually. Dr. Terence Kavanagh, one of the pioneers in this field, established it in 1968. His vision of a regular exercise programme supplemented by a multidisciplinary team that empowers

patients is still practised to this day. **They had the world's first post-Myocardial Infarction patients and heart transplant recipients to run and complete the Boston marathon in 1973 and 1985 respectively.**

Headed by my two wonderful supervisors – Dr. Paul Oh (Medical Director) and Dr. David Alter (Research Chair) – Rumsey Centre performs up to 115 Cardiopulmonary Exercise Tests (CPETs) every week. They are used for fitness assessment and exercise prescription for all patients, coupled with comprehensive online platforms. A fantastic team of cardiac technicians, exercise technicians, exercise leaders, rehab supervisors and volunteers utilises the centre's marvelous facilities supplemented by comprehensive online platforms to maximise every patient's CR journey. These patients span a remarkably wide spectrum from primary prevention and risk factor only, to ischemic heart disease, heart transplants, Left Ventricular Assist Devices (LVADs) and heart failure.

KNOWLEDGE AND EXPERIENCE EARNED

I have accumulated clinical exposure to the

entire CR journey from CPET supervision, exercise prescription and stress management, to giving lectures to existing and graduate patients. I have also participated in several research projects in areas such as post-Transcatheter Aortic Valve Implantation CR, the impact of age on CR outcomes, a novel low-level treadmill protocol, CR and spontaneous coronary artery dissection, and VO₂ (a measure of the volume of oxygen used by the body) prediction for coronary artery disease patients. Finally, I was very fortunate to get the chance to work with the International Council of Cardiovascular Prevention and Rehabilitation (ICCP) on a consensus statement for CR in low resource settings.

This has been an unforgettable, fruitful year in Toronto and I am truly thankful for this opportunity. I eagerly anticipate imparting my knowledge and experience to the NUHCS CR team to bring us to new heights! •



NMRC Award Winners 2015

MOH Healthcare Research Scholarship

Dr. Lim Shir Lynn

In line with the Ministry of Health's (MOH) move to promote clinical and translational research in Singapore, National Medical Research Council (NMRC) supports clinicians pursuing medical research. Dr. Lim Shir Lynn shares more about her research scholarship awarded by NMRC.



By **Dr. Lim Shir Lynn**

Associate Consultant,
Department of Cardiology,
NUHCS

Dr. Lim completed her general cardiology fellowship in Singapore and is currently pursuing her Master of Clinical Investigation (MCI). Upon the completion of this course and the clinical trial, she intends to further sub-specialise in cardiovascular intensive care.

The high quality of medical care we enjoy today is built upon decades of efforts by medical professionals and scientists investigating the causes and potential treatments for diseases. Their tireless efforts provided insights to lessen the impact of today's greatest health problems, such as cardiovascular disease, a major cause of mortality worldwide, including Singapore. While significant progress has been made in our management of cardiovascular disease, much work still needs to be done.

Clinicians are well-positioned to identify gaps in knowledge that are relevant to patient management and to conduct research that will impact patient care. I was privileged to receive the MOH Healthcare Research Scholarship that funded the Master of Clinical Investigation (MCI). This was a part-time programme that equips aspiring medical researchers like myself with the necessary skills and qualifications to conduct sound clinical research. Its flexible yet structured training route integrated almost seamlessly into my clinical commitments.

MULTI-CENTRE, MULTI-DISCIPLINARY

A core component of the programme is the

development of an individual research project under close supervision. Under the guidance of A/Prof. Carolyn Lam, I worked on designing a clinical trial evaluating the use of a combination of hydralazine and nitrates in cardiorenal syndrome. Designed as a pilot trial, this was a collaborative, multi-centre, multi-disciplinary effort bringing together scientists, cardiologists and renal physicians from three restructured hospitals in Singapore. This trial is the first in Asia evaluating the use of hydralazine and nitrates combination therapy in cardiorenal syndrome, in a clinical trial setting. It pioneers the assessment of endothelial function as one of the study endpoints.

JOURNEY AHEAD

One of the early achievements of this project was its successful procurement of research funds. As a testament to the quality of the study, it has not only obtained funding from the MCI programme but it also clinched the National University Health System (NUHS) Clinician Research Grant (CRG), a short-term grant designed to support clinical and translational research that answers specific, targeted research questions or to perform pilot feasibility studies. It aims to provide opportunities for small project funding and encourage junior

clinicians to participate in scientific research. It is designed to support smaller exploratory studies that should provide preliminary findings for larger research proposals.

Besides funding from MCI and CRG, this study was supported by A/Prof. Lam's Clinician Scientist Award and collaborations with Cardiovascular Research Institute (Prof. Arthur Mark Richards and A/Prof. Dominique de'Klein). The additional support allowed us to tap on the expertise of Singapore Clinical Research Institute in trial management and monitoring, as well as to perform novel biomarker analysis.

The trial started in March, with National University Heart Centre, Singapore (NUHCS) recruiting the first patients. National Heart Centre Singapore and Changi General Hospital will start patient recruitment by May. The journey ahead promises to be exciting and challenging; this is made possible with supervision and support from A/Prof. Carolyn Lam, Prof. Arthur Mark Richards, co-investigators and collaborators from the various institutions, and Department of Cardiology. •

STaR Investigator Award Prof. Arthur Mark Richards

Prof. Arthur Mark Richards is another NMRC Award winner from NUHCS, clinching the STaR Investigator Award for his IMMACULATE research project.

Read more about his award won in Pulse Issue 24 (Jul-Dec 14), on page 30.



“persevere

to persist in anything undertaken; maintain a purpose in spite of difficulty, obstacles, or discouragement; continue steadfastly.

NMRC Award Winners

Clinician Scientist Award

A/Prof. Ronald Lee

A/Prof. Ronald Lee recounts his journey to gaining recognition for his research. Despite certain trials and tribulations, his unwavering determination led him to success.

December 2011.

My debut clinician scientist award application was turned down by National Medical Research Council (NMRC).

Various career options came to my mind. I decided to continue my research endeavour with whatever resources available. Not to flourish, just to survive.

Every cloud has a silver lining. I received immense support from my superiors and colleagues during this period, including having their acceptance and understanding. The Cardiovascular Research Institute (CVRI) Director's scientific contribution to my research projects helped me to maintain a steady publication output. Colleagues who succeeded in attaining research grants were generous in giving me advice on writing grants.

One day, I met a physician who specialises in sleep disorders and we started talking about obstructive sleep apnoea (OSA) and cardiovascular disease. We decided to design a clinical trial to evaluate the role of OSA screening and treatment on outcomes of patients admitted with acute coronary syndrome.

November 2014.

Three years after my debut was rejected, the abstract of my next attempt was drafted.

'OSA is being recognised as an emerging cardiac risk factor and prognostic marker. We have reported that OSA was a prevalent, as well as an independent predictor of plaque burden and adverse outcomes in patients presenting with acute coronary syndrome. In this clinical trial, which is a continuation of my research and publication trajectory, 180 patients presenting with acute coronary syndrome will be randomly assigned to Sleep Study Guided Multidisciplinary Therapy, SGMT (n=90) (Figure) or Standard Therapy (n=90) groups. Both groups will receive guideline-mandated treatment for acute coronary syndrome. Those assigned to SGMT will undergo an overnight sleep study. Those found to have OSA will attend the SGMT clinic run by a multidisciplinary team at baseline, 1-, 3-, and 6-month. Advice on continuous positive airway pressure and behavioural therapy (weight loss, exercise, positional therapy,

abstinence of alcohol and sleeping pills) will be given. The primary endpoint is plasma NT-pro BNP concentration in 6-month follow-up. The secondary endpoint is 10-year risk of cardiovascular mortality based on European SCORE algorithm which includes age, sex, smoking status, systolic blood pressure, and serum total cholesterol or total/HDL-cholesterol ratio'.

June 3, 2015.

I received an email entitled 'NMRC Clinician...'. I closed my eyes, took a deep breath, and opened the email.

For younger colleagues and friends who are passionate about academic medicine, perhaps what I can share with you is the two keys in winning research grants: First key – relentless perseverance; Second key – don't forget the first key. •

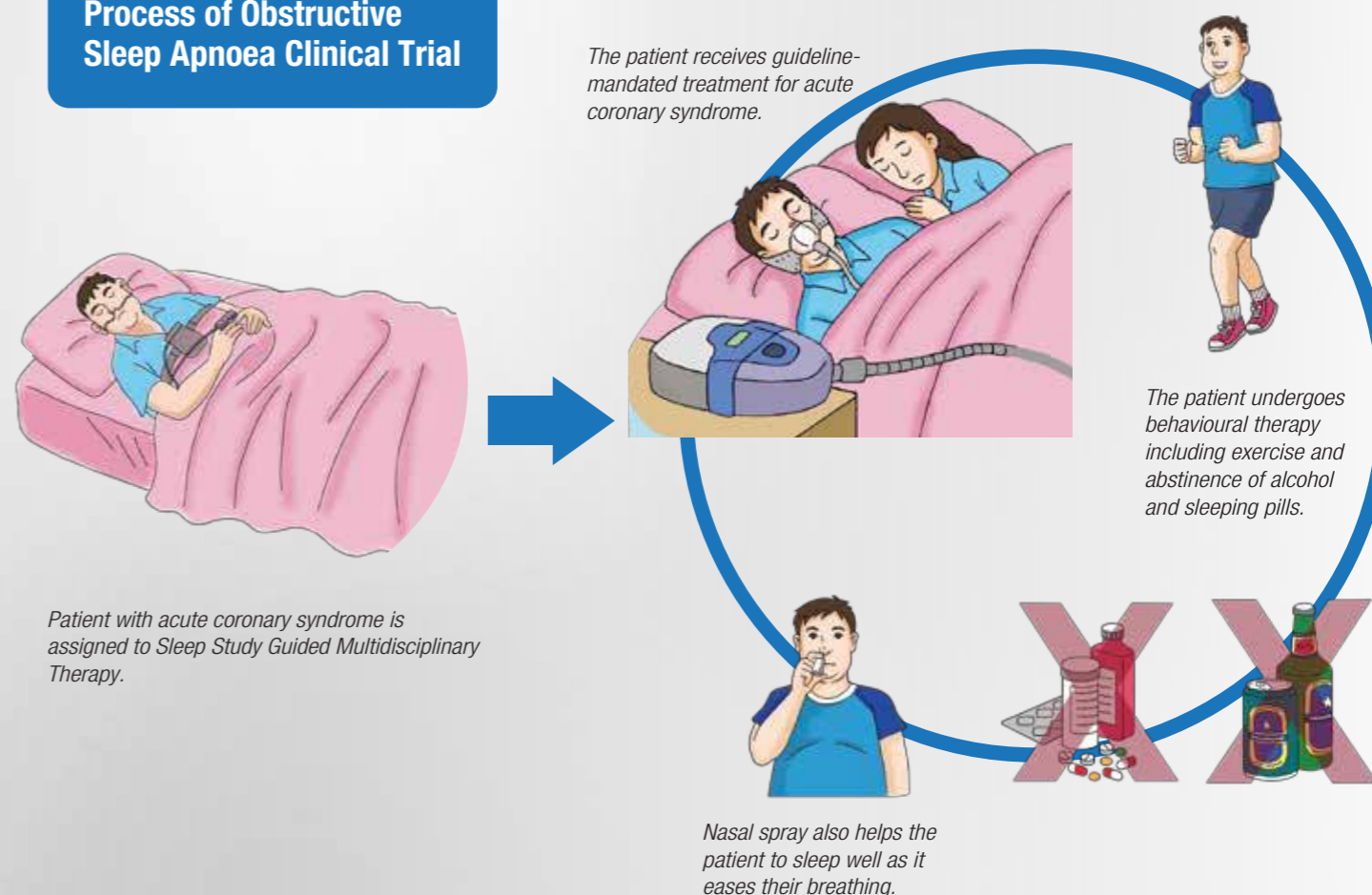
By A/Prof. Ronald Lee



Senior Consultant,
Department of Cardiology,
NUHCS

A/Prof. Ronald Lee is an accredited specialist in cardiovascular medicine and had completed an interventional cardiology fellowship. His research interests focus on percutaneous coronary intervention, intravascular imaging, and sleep-disordered breathing. He was awarded the National Medical Excellence Award in 2011 and has authored or co-authored more than 130 articles in peer-reviewed journals or chapters in medical textbooks. He serves as a reviewer and editorial member for a number of peer-reviewed journals. A/Prof. Lee is holding research grants from several local and international councils.

Process of Obstructive Sleep Apnoea Clinical Trial



By Ms. Juvena Gan

Advanced Practice Nurse,
Coronary Care Unit (CCU)
Ward 28, NUHCS



Juvena graduated from National University Singapore (NUS), Master in Nursing (Acute Care) in 2010 and became a full-fledged APN in 2012. Since then, she has been practicing in CCU, collaborating with medical and nursing colleagues to improve quality of patient care. As part of the transitional care team, she is proud to be awarded the FY2015 Academic Medicine Development Award (AMDA) for care integration.

Spreading Warmth Beyond Nursing

ACCOLADES

The Healthcare Humanity Award is a legacy of the SARS epidemic in 2003, when healthcare staff risked their lives to care for infected patients. Its recipients exemplify the values of courage, extraordinary dedication, selflessness, and steadfastness in ethics, compassion and humanity in the course of their service. National University Heart Centre, Singapore's (NUHCS) very own Ms. Lo Chew Yong and Ms. Juvena Gan, are proud recipients of the Healthcare Humanity Award this year.

Many of my friends and colleagues would describe me as a person who is full of energy. With this enthusiasm at heart, I am dedicated to my patients, doing everything for them with passion and love. I see challenges as opportunities to learn and grow professionally. I also strongly believe that the basic ethics of care are to do no harm and to respect human rights.

HOW NURSING CHANGED MY LIFE

During my younger years, pessimism often took hold of my mind. Whenever unforeseen events happened in various aspects of life, I got overwhelmed with undesirable thoughts. The turnaround came when I joined nursing 14 years ago. From innumerable encounters with patients, I discovered the true meaning of life. Being a critical care nurse since graduation, I am constantly reminded that life is fragile. One should count his or her blessings and offer a helping hand to those who are underprivileged.

A PASSION FOR GOODWILL

I began to participate in the child sponsorship programme with World Vision International, the

largest child-focused aid organisation in the world. I am heartened to see that my humble monthly contributions have benefited numerous children and their families.

With the aim of providing warmth to the needy, I became more active in voluntary activities such as visits to old folks' home and participating in medical outreach.

I feel honoured to be nominated and awarded this year's Healthcare Humanity Award. I would like to express my gratitude to my superiors – Deputy Director of Nursing, Ms. Chia Lay Hoon and Assistant Director of Nursing (APN), Ms. Karen Koh – and many of my colleagues for their nomination and support. Encouragement and love from my family are also important factors for moulding my capacity to love and care. My family, especially my mum, is always supportive and never stops me from going forward to lend a helping hand.

This award serves as an opportunity for me to reflect on what I have done so far and how much I can do in the future, and I know there is more awaiting me.



Having a strong desire to be a nurse, I decided to join nursing at the age of 25. With my passion and the opportunities given, I grew professionally and take great pride in my nursing career. I have contributed as an Advanced Practice Nurse in many areas beyond the routine clinical services – telehealth monitoring, transitional care and cardiometabolic clinic, just to name a few. The first two services have resulted in the reduction of rehospitalisation rate for heart failure patients.

HELPING THOSE IN NEED

With my professional experience and expertise, I volunteer to serve poor elderly residents and migrant workers in our community. On one of the Saturdays of every month, I will join a team of volunteers to set up a clinic at the void decks of one-room HDB flats, and on other months, a clinic at different migrant dormitories. Together with volunteer physicians, I provide consultation to the elderly residents and migrant workers; diagnose and treat their ailment; and initiate polyclinic referral if further investigation and follow-up are needed. Often, I also spend time listening to their pain and frustrations, and offer comfort and suggestions to improve their health and well-being.

With my years of nursing experience, I am very flexible in providing my services to the clinic. I am not only playing a role of nurse practitioner, but also dispense medication, provide simple wound dressing and provide health teaching and education whenever appropriate. As and when the need arises, I will make home visits together with a physician to provide consultation and treatment to the frail elderly living in one-room flats.

A HEARTWARMING INSPIRATION

My recent encounter with a migrant worker had really touched my heart. During the brief consultation and health teaching with this worker, I learnt that he is keeping healthy to earn enough for his own family and support his disabled brother. It was a humbling experience to witness his courage and compassionate spirit despite struggling to make ends meet. This inspires me to help them even more, be it giving my personal time and/or resources. I am glad that I can bring comfort and care to those in need.

By Ms. Lo Chew Yong

Acute Care Advanced Practice Nurse,
Coronary Care Unit (CCU)
Ward 28, NUHCS



After obtaining an Advanced Diploma in Critical Care, Chew Yong joined NUHCS in 1998 as a Nurse Clinician in CCU. She also completed two years of Masters in Nursing at the National University of Singapore in 2010. She works closely with nurses and allied healthcare professionals to provide value-added and patient-centred care. In addition, she provides education to nurses (formal or informal), promote evidence-based practice and groom experienced nurses to be nurse clinicians.

Guiding and Motivating as a Nurse Leader

The Outstanding Nurse Leader award recognises nurse leaders who take pride in their nursing leadership role as well as mentoring and developing others. The National University Heart Centre, Singapore (NUHCS) is honoured to have one such nurse leader amongst us – Ms. Doreen Chew.



BECOMING WHO I AM TODAY

The nursing profession in NUHCS is active in making revolutionary changes – from new practice guidelines, expanded nursing roles, shared governance and technology to influencing nursing practice and improved patient care. Through these fast growing trends in the healthcare industry, it has helped shape my character and attitude for these past 15 years. I have diligently pursued my studies to attain an advanced diploma, Bachelor's and Master's degrees. Besides my clinical obligations, I had the opportunity to sit on committees of various organisations – Professional Practice Council, Advanced Practice Nurse Council and Product Evaluation Committee.

REFLECTING AND ENVISIONING

The learning experiences that I have gathered have definitely been enriching and fulfilling for my nursing career. **There were times when I doubted my own abilities to push on, especially when the task and time expected of me were too overwhelming. Despite this, the encouragement and support from my peers and even patients spurred me further to achieve what I have accomplished today.**

I would not say that I have finished what I need to attain in nursing for it is a journey with a mission; it is far beyond a simple job and what words can express.

I receive this accolade with humility and am deeply moved by the recognition and trust that have been placed in me. It is a great honour. It is an even greater responsibility. I would like to share this Outstanding Nurse Leader award with those who have in one way or another touched my life since I started my nursing career – my family, peers, senior leaders and lastly, my patients who have taught me patience and the essence of being a nurse. •



By Ms. Doreen Chew

Acute Care Advanced Practice Nurse, Cardiothoracic Intensive Care Unit (CTICU) Ward 20, NUHCS

Upon attaining Masters of Science (Nursing), Doreen provides direct clinical care to the patients in CTICU, and is also part of the Left Ventricular Assist Device (LVAD) programme team that oversees the care of patients who has undergone LVAD implantation. She chairs the Professional Practice Council in NUH where clinical practices are being evaluated and standardised. She is also an active member in both the APN Council and Product Evaluation Committee.

PROMOTIONS



Dr. Darren Lee Hai Liang

Department of Cardiac, Thoracic & Vascular Surgery
Associate Consultant
Jan-15



Dr. Dharmaraj Rajesh Babu

Department of Cardiac, Thoracic & Vascular Surgery
Associate Consultant
Jan-15



Dr. Harish Mithiran Muthiah

Department of Cardiac, Thoracic & Vascular Surgery
Associate Consultant
Jan-15



Dr. Jimmy Hon Kim Fatt

Department of Cardiac, Thoracic & Vascular Surgery
Senior Consultant
Jan-15

NEW COLLEAGUES

Dr. Gunasekaran Ramsamy

Department of Cardiology
Clinical Fellow
Feb-15

Dr. Mohammad Minhazur Rahman Chowdhury

Department of Cardiac, Thoracic & Vascular Surgery
Clinical Fellow
Feb-15

Dr. Senthil Kumar Subbian

Department of Cardiac, Thoracic & Vascular Surgery
Associate Consultant
Jan-15

Dr. Humayun Kabir

Department of Cardiac, Thoracic & Vascular Surgery
Clinical Fellow
Jan-15

Dr. Leonardus Timmers

Department of Cardiology
Clinical Fellow
Jan-15

HAPPENINGS AT NUHCS



↑ ↗ A-B

The 2nd Congenital Heart Association for Parents and Patients Support (CHAPPS) on 29 November 2014 saw children engaging in fun activities and parents of the support group exchanging knowledge and bonding together.

→ F

Dr. Yeo Tee Joo presented to the world's leading cardiovascular professionals at the 64th Annual Scientific Meeting of the American College of Cardiology held on 14-16 Mar 2015, San Diego, California.

↗ G

Prof. Tan was awarded with a Visiting Professorship from Beijing 206 Military Hospital, 20 March 2015, his 9th award in China.



↑ C

Members of the Heart Rehab Support Group gathered on 27 February 2015 for a prosperous Chinese New Year dinner.

G



↓ D-E

Interested participants performed hands-on assessment at the NUH-NUHCS Open House on 14 March 2015.



F



D



E



↑ H

NUHCS Chinese Alumni gathered in Beijing on 21 March 2015 to strengthen ties.

↓ → I-J

Asst. Prof. Lim Toon Wei with Coronary Care Unit ward 28 nurses, and Asst. Prof. Pipin Kojodjojo with ward 7A nurses, received commendation for their consistent performance in Hand Hygiene compliance rates of 70% for the past two quarters.



↑ K-L

Mr. Noel Cheah, COO of NUH, presented the Values-in-Action award, which recognises the extraordinary efforts and exemplary behaviours of staff, to Alan Low (individual category) and Christine Neo, Don Chan, Eileen Huang, Jaslyn Loh and Foo Yen Ching (team category) at the Stars@NUHCS Award Presentation Ceremony on 29 April 2015.

The awardees are from NUHCS Ops & Admin and Cardiovascular Research Institute respectively.



↑ M

Ms. Wendy Tan Lay Ping was conferred the Best Patient Service Associate (PSA) Mentor Award for her excellent mentoring to the new PSAs, and Ms. Nurliyana Binte Mohd Saleh won the First Impressions Award for her professionalism and good service on 22 April 2015. Both are from Heart Clinics, NUHCS.

← N

Asst. Prof. Joshua Loh won the Best Case Award at the Korea Transcatheter Cardiovascular Therapeutics Asia Pacific (TCTAP) Interventional Cardiology meeting held on 28 April – 1 May 2015.

Publications

Absorb bioresorbable vascular scaffold versus everolimus-eluting metallic stent in ST-segment elevation myocardial infarction: 1-year results of a propensity score matching comparison: the BVS-EXAMINATION Study (bioresorbable vascular scaffold-a clinical evaluation of everolimus eluting coronary stents in the treatment of patients with ST-segment elevation myocardial infarction). *JACC Cardiovasc Interv.* 2015 Jan. 8 (1 Pt B):189-97. Brugaletta S, Gori T, Low AF, Tousek P, Pinar E, Gomez-Lara J, Scalone G, Schulz E, Chan MY, Kocka V, Hurtado J, Gomez-Hospital JA, Munzel T, Lee CH, Cequier A, Valdes M, Widimsky P, Serruys PW, Sabate M.

An autologous platelet-rich plasma hydrogel compound restores left ventricular structure, function and ameliorates adverse remodeling in a minimally invasive large animal myocardial restoration model: A translational approach: Vu and Pal "Myocardial Repair: PRP, Hydrogel and Supplements". *Biomaterials.* 2015 Mar. 45:27-35. Vu TD, Pal SN, Ti LK, Martinez EC, Rufaihah AJ, Ling LH, Lee CN, Richards AM, Kofidis T.

Angiotensin receptor neprilysin inhibition compared with enalapril on the risk of clinical progression in surviving patients with heart failure. *Circulation.* 2015 Jan 6. 131(1):54-61. Packer M, McMurray JJ, Desai AS, Gong J, Lefkowitz MP, Rizkala AR, Rouleau JL, Shi VC, Solomon SD, Swedberg K, Zile M, Andersen K, Arango JL, Arnold JM, Belohlavek J, Bohm M, Boytsov S, Burgess LJ, Cabrera W, Calvo C, Chen CH, Dukat A, Duarte YC, Erglis A, Fu M, Gomez E, Gonzalez-Medina A, Hagege AA, Huang J, Katova T, Kiatchosakun S, Kim KS, Kozan O, Llamas EB, Martines F, Merkely B, Mendoza I, Mosterd A, Negrusz-Kawecka M, Peuhkurinen K, Ramires FJ, Refsgaard J, Rosenthal A, Senni M, Sibulo AS JR, Silva-Cardoso J, Squire IB, Starling RC, Teerlink JR, Vanhaecke J, Vinereanu D, Wong RC, PARADIGM-HF Investigators and Coordinators.

Are Medical Students' Views of an Ideal Physician Eroding? A Study on Perceived Qualities of a "Role Model" Doctor Before and After Housemanship and between Two Cohorts Five Years Apart. *Ann Acad Med Singapore.* 2015 Mar. 44(3):79-84. Koh GC, Tam JK, Lee JN, Agrawal N, Koh DR, Samarasekera D, Tan CH.

Biomarkers of coronary artery disease differ between Asians and Caucasians in the general population. *Glob Heart.* 2015 Mar 7. Pii:S2211-8160(14)02671-4. Gijsberts CM, den Ruijter HM, Asselbergs FW, Chan MY, de Kleijn DP, Hofer IE.

Circadian dependence of infarct size and acute heart failure in ST elevation myocardial infarction. *PLOS One.* 2015 Jun 3. 10(6): e0128526. Aruni S, Tan GH, Devi A, Carvalho LP, Chua T, Koh TH, Tan HC, Foo D, Tong KL, Ong HY, Richards AM, Yew CK, Chan MY.

Circulating microRNAs in heart failure with reduced and preserved left ventricular ejection fraction. *Eur J Heart Fail.* 2015 Apr. 17(4):393-404. Wong LL, Armugam A, Sepramaniam S, Karolina DS, Lim KY, Lim JY, Chong JP, Ng JY, Chen YT, Chan MM, Chen Z, Yeo PS, Ng TP, Ling LH, Sim D, Leong KT, Ong HY, Jauffeally F, Wong R, Chai P, Low AF, Lam CS, Jeyaseelan K, Richards AM.

Common carotid artery dissection: A rare cause of acute neck swelling. *Ear Nose Throat J.* 2015 Mar. 94(3):111-2. Khan MA, Moffat A, Ahmed W, Wong J, Jadun C.

Does oral calcium intake or body habitus relate to the degree of valvular calcification and adverse events in patients with severe aortic stenosis? *Int J Cardiol.* 2015 Feb 1. 180:74-5. Muhammad N, Yap SE, Seet D, Chia BL, Poh KK.

Effectiveness of early cardiology undergraduate learning using simulation on retention, application of learning and level of confidence during clinical clerkships. *Singapore Med J.* 2015 Feb. 56(2):98-102. Lin W, Lee GK, Loh JP, Tay EL, Sia W, Lau TC, Hooi SC, Poh KK.

Fasxiator, a novel factor Xa inhibitor from snake venom, and its site-specific mutagenesis to improve potency and selectivity. *J Thromb Haemost.* 2015 Feb. 13(2): 248-61. Chen W, Carvalho LP, Chan MY, Kini R, Kang TS.

Idiopathic pulmonary arterial hypertension in Asians: a long-term study on clinical outcomes. *Chest.* 2015 Apr. 147(4):e160-3. Tan GM, Tay EL, Tai BC, Yip JW.

Impact of the joint association between sex, age and diabetes on long-term mortality after acute myocardial infarction. *BMC Public Health.* 2015 Mar 31. 15(1):308. Gao F, Lam CS, Sim LL, Koh TH, Foo D, Ong HY, Tong KL, Tan HC, Machin D, Wong KS, Chan MY, Chua TS.

In vitro investigation of the hemodynamics of transcatheter heterotopic valves implantation in the cavo-atrial junction. *Artif Organs.* 2015 Apr 29. Ismail M, Kabinejadian F, Nguyen YN, Tay E, Sim S, Leo HL.

Left main percutaneous coronary intervention improves left ventricular systolic function assessed by tissue Doppler echocardiography. *Int J Cardiol.* 2015 May 6. 187:4-6. Kajiya T, Low AF, Lee CH, Tan HC, Poh KK.

Long-term prognosis and risk heterogeneity of heart failure complicating acute myocardial infarction. *Am J Cardiol.* 2015 Apr 1. 115(7):872-8. Carvalho LP, Gao F, Chen Q, Sim LL, Koh TH, Foo D, Ong HY, Tong KL, Tan HC, Yeo TC, Chow KY, Richards AM, Peterson ED, Chua T, Chan MY.

Lung Injury From Use of a Suction Catheter via the Double-Lumen Tube. *J Cardiothorac Vasc Anesth.* 2014 Dec 19. Yeoh TY, Ng ES, Agasthian T, Ti LK.

Miniaturized versus conventional cardiopulmonary bypass and acute kidney injury after cardiac surgery. *Perfusion.* 2015 Apr 24. Chew S, Ng R, Liu W, Goh SG, Caleb MG, Ti LK.

Numerical Modeling of Intraventricular Flow during Diastole after Implantation of BMHV. *PLoS One.* 2015 May 11. 10(5):e0126315. eCollection 2015. Su B, Kabinejadian F, Phang HQ, Kumar GP, Cui F, Kim S, Tan RS, Hon JK, Allen JC, Leo HL, Zhong L.

Predictors of in-hospital adverse events in patients with prosthetic valve infective endocarditis. *Heart Lung Circ.* 2015 Feb 16. Pii:S1443-9506(15)00051-7. Tan HL, Chai LY, Yeo TC, Chia BL, Tambyah PA, Poh KK.

Prevalence of dysglycemia and association with outcomes in pediatric extracorporeal membrane oxygenation. *Pediatr Crit Care Med.* 2015 Mar. 16(3):270-5. Lou S, MacLaren G, Paul E, Best D, Delzoppo C, Butt W.

Rage, rage against the dying of the light? Intensive care for the very elderly. *Minerva Anesthesiol.* 2015 Feb 5. MacLaren G.

Safety of therapeutic hypothermia in children on veno-arterial extracorporeal membrane oxygenation after cardiac surgery. *Cardiol Young.* 2015 Feb. 27:1-7. Lou S, MacLaren G, Paul E, Best D, Delzoppo C, d'Udekem Y, Butt W.

Simultaneous enrichment of plasma soluble and extracellular vesicular glycoproteins using prolonged ultracentrifugation-ERLIC approach. *Mol Cell Proteomics.* 2015 Apr 10. Cheow ES, Sim KH, de Kleijn D, Lee CN, Sorokin V, Sze SK.

The SHARPEN clinical risk score predicts mortality in patients with infective endocarditis: An 11-year study. *Int J Cardiol.* 2015 May 1. 191:273-276. Chee QZ, Tan YQ, Ngiam JN, Win MT, Shen X, Choo JN, Chan YH, Tambyah PA, Poh KK.

Unravelling the Proteome of Degenerative Human Mitral Valves. *Proteomics.* 2015 Apr 24. Tan HT, Lim TK, Richards AM, Kofidis T, Teoh KL, Ling LH, Chung MC.

Vascular access for pediatric coronary angiography on extracorporeal membrane oxygenation. *World J Pediatr Congenit Heart Surg.* 2015 Jan. 6(1):126-9. Thuys C, MacLaren G, d'Udekem Y, Eastaugh L.

Abstracts

American College of Cardiology 2015, San Diego, United States of America, 14 – 16 March 2015

Nine-month Primary endpoint results of the EVOLVE II QCA Study: A Prospective, multicentre trial assessing clinical, angiographic a, and IVUS outcomes with the novel Platinum-Chromium abluminally-coated bioabsorbable polymer SYNERGY everolimus-eluting stent in de novo coronary stenosis
Meredith I, Jaffe W, El-Jack S, Webster M, Scott D, Saito S, Wong A, Ormiston J, McClean D, Tan HC, Whelan A, Walters D, Allocco DJ, Dawkins KD.

Singapore Cardiac Society 27th Annual Scientific Meeting – Young Investigator's Award: Finalist's presentations Society Annual Scientific meeting, Singapore, 18 – 19 April 2015

ADAMTS4 promotes atherogenesis and enhances and plaque vulnerability in Apoe^{-/-} mice
Kumar S, Chen M, Li Y, Wong F HS, Thiam CW, Hossain MZ, Poh KK, Hirohata S, Ogawa H, Veronique A, Ge RW.

Comparison of combination therapy of high dose oral N-acetylcysteine and intravenous sodium bicarbonate hydration with individual therapies in the reduction of contrast induced nephropathy during cardiac catheterization and percutaneous coronary intervention (contrast): A multicenter, randomized control trial
Tay E, Chong E, Poh KK, Lu QS, Zhang JJJ, Tan N, Hou XM, Ong HY, Azan A, Chen SL, Chen JY, Ali RM, Fang WY, Lau WL T, Tan HC.

Effects of renin-angiotensin blockers on left ventricular remodeling in severe aortic stenosis
Goh SN, Lee PS, Tay E, Kong W, Chan YH, Yeo TC, Poh KK.

Sleep apnoea screening in patients scheduled for coronary artery bypass surgery
Zhao LP, Kofidis T, Chan SP, Ong TH, Yeo TC, Tan HC, Lee CH.

Sphingolipid profiling reveals ceramides as prognostic biomarkers and therapeutic targets in acute coronary syndrome
Carvalho L, Ching JH, Tan SH, Tang ZQ, Poh SC, Tang CC, Kuznetsov VA, Richards AM, Troughton RW, Fong YYA, Yan B, Kovalik JP, Summers SA, Chan M.

3rd Singapore-ANZICS Intensive Care Forum, Singapore, 24 – 26 April 2015

Dengue myocarditis mimicking acute myocardial infarction
Murughan K, Ramanathan KR, MacLaren G.

Positive Outcome of Simulation Based Learning in Critical Care
Oon SE, Oh SLP, Kee LLJ, Ong GS, MacLaren G, Ramanathan KR, Jahidin J, Kowitlawakul Y.

EuroPCR 2015, Paris, France, 19 – 22 May 2015

Outcome of combo-dual therapy stent following primary percutaneous coronary intervention in STEMI patients
Ayyachamy SS, Lee CH, Loh L, Chan KH, Loh PH, Chan MYY, Low AFH, Tan HC.

The HEART Truth: **REVEALED**



The Biennial Public English Symposium of NUHCS

Date: Saturday, 25 July 2015
Time: 2:00PM to 5:00PM (Doors open at 1:30PM)
Venue: NUHS Tower Block Auditorium,
1E Kent Ridge Road, Singapore 119228
Website: www.nuhcs.com.sg

Ticket prices:

\$5 EARLY BIRD
Book by 10 July

\$10 REGULAR
PRICE

Buy your tickets now through the SISTIC Website: www.sistic.com.sg
SISTIC Hotline: 6348 5555 and SISTIC Authorised Agents islandwide.
Note: Prices exclude \$1 SISTIC booking fee.



Heart failure epidemic in Singapore: What should I do?

Dr Raymond Wong

Senior Consultant, Department of Cardiology, NUHCS
Programme Director, Heart Failure Programme, NUHCS

Heart failure occurs when the heart is unable to function effectively. The aging population and problems of hypertension and diabetes may lead to a brewing heart failure epidemic in Singapore. Hear about some strategies you can adopt to stay healthy and away from heart failure.



Sudden death from abnormal heart rhythm: Am I at risk?

Dr Pipin Kojodjojo

Consultant, Department of Cardiology, NUHCS

Sudden death refers to death that occurs unexpectedly, usually within 24 hours after the onset of symptoms. Most cases are caused by arrhythmias and can affect the young, old and even athletes. Gain a better understanding, be aware of the warning signs, techniques and prevention of sudden death.



Heart attack treatment: A journey of a 100 years

Professor Tan Huay Cheem

Director, National University Heart Centre, Singapore
Senior Consultant, Department of Cardiology, NUHCS

Heart attacks are caused by blockages in the coronary (heart) arteries which result in heart muscle death. Learn about early recognition of the symptoms, the current life revolutionary treatments as well as cardiac rehabilitation to prevent recurrence among heart attack survivors.



Coronary Artery Bypass Surgery: What do I need to know?

Dr Kristine Teoh

Senior Consultant, Department of Cardiac, Thoracic & Vascular Surgery, NUHCS
Clinical Director, Department of Cardiac, Thoracic and Vascular Surgery, NUHCS

Coronary Artery Bypass Surgery seeks to improve the flow of blood to the heart muscle when the coronary (heart) arteries are severely narrowed or blocked. Many people have heard of 'bypass' surgery, but do you really know what the surgery is about, what is needed before and after the operation? Get your answers here.



Leg amputation: How do I prevent it?

Dr Julian Wong

Senior Consultant, Department of Cardiac, Thoracic & Vascular Surgery, NUHCS
Head, Division of Vascular and Endovascular Surgery, Department of Cardiac, Thoracic & Vascular Surgery, NUHCS

The most common reason for an amputation is poor circulation caused by Peripheral Arterial Disease (PAD). What are the symptoms and treatments? Who is at risk? Find out about the facts and how it can be treated early to ensure leg preservation and improve the quality of life.

Gold Sponsor:



Silver Sponsors:

