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A quarterly publication of National Heart Centre Singapore



NHCS STAFF SHINE BRIGHT, SCORE HIGH AT SHQSA 2017



"SILENT" GENE MUTATIONS MAY CAUSE HEART FAILURE IN HEALTHY PEOPLE



RESEARCHERS TO
DEVELOP NEW PROTOCOL
FOR EXERCISE MAGNETIC
RESONANCE IMAGING TEST
FOR ENLARGED HEARTS







FEWER VISITS TO ARRIVE AT DIAGNOSIS

FOR POLYCLINIC REFERRALS







FEWER VISITS TO ARRIVE AT **DIAGNOSIS FOR POLYCLINIC REFERRALS**

NHCS partners with SingHealth Polyclinics to reduce one visit for referred patients and allow Polyclinic doctors to directly order cardiac diagnostic tests

ational Heart Centre Singapore (NHCS) sees about 5,000 referrals from SingHealth Polyclinics (SHPs) every year and chest pain is the top indication for the referrals, which accounted for about 30% of all referrals. Analysis into these new cases referrals however, revealed that 70% of the referrals had no significant cardiac abnormalities.

Previously, patients referred by polyclinics will visit NHCS for initial assessment and undergo cardiac diagnostic test during the second visit, before finally getting their test results and possible diagnosis at the third visit. The whole process may take several months. With the streamlined procedures, the whole process is shortened to just slightly over a month for the referred patients.



FRONT LOADING INITIATIVE REDUCES CONSULTATION VISIT

Front loading initiative leverages on a team of NHCS nursing and medical staff to review referral letters and electrocardiograms (ECGs) of the targeted group of patients before ordering diagnostic tests to be done prior to patients' first consultation visit at NHCS. With the diagnostic tests front loaded. referred patients can then discuss and receive their diagnosis at the first visit with the specialist. The front loading initiative has since been rolled out to all nine SHPs.



OPEN ACCESS PROTOCOL ALLOWS DIRECT ORDER OF CARDIAC TESTS

In a similar pilot scheme, an open access protocol is being progressively implemented across the polyclinics to allow doctors to order cardiac diagnostic tests directly at NHCS. Diagnostic tests will be ordered for suitable patients based on a set of algorithms pre-established by NHCS. The open access protocol has since been carried out across four SHPs - Outram, Bukit Merah, Marine Parade and Sengkang, and there are plans to extend the scheme to more polyclinics.



REDUCES CONSULTATION VISIT **FASTER DIAGNOSIS SAVES TIME AND MONEY**

Compared to the conventional referral process, both the front loading initiative and open access protocol not only help patients reduce one consultation visit and receive faster diagnosis, patients with normal test results can even be discharged sooner, and transferred to their primary physician for follow-up. Patients with normal test results under the open access protocol will be followed up directly at the polyclinics, without needing to go through the specialist consultation. These streamlined processes ultimately free up valuable consultation slots for chronic or more severe cases, optimising resources, offering patients a smoother and hassle-free experience, promoting right site of care





FRONT LOADING INITIATIVE / **OPEN ACCESS PROTOCOL**

FRONT LOADING INITIATIVE

VISIT TO POLYCLINIC

Decision to refer to NHCS

FIRST VISIT TO NH



NHCS TEAM REVIEWS AND ORDERS THE DIAGNOSTIC TEST BEFORE THE PATIENT SEES THE NHCS SPECIALIST



FIRST VISIT to undergo diagnostic test

SECOND VISIT

liagnostic tests and discharg if results are normal

CONVENTIONAL REFERRAL PRACTICE

VISIT TO POLYCLINIC

Decision to refer to NHCS



FIRST VISIT

to see NHCS specialist for initial assessment and order diagnostic test if needed



SECOND VISIT

to undergo diagnostic test



THIRD VISIT

diagnostic tests and discharge if results are normal

OPEN ACCESS PROTOCOL

VISIT TO POLYCLINIC

Decision to refer to NHCS and doctor orders cardiac diagnostic test



BASED ON A SET OF ALGORITHMS PRE-ESTABLISHED BY NHCS

FIRST VISIT TO NHCS SPECIALIST FOR INITIAL ORDER DIAGNOSTIC TEST



FIRST VISIT to undergo diagnostic test



NORMAL FINDINGS

no specialis assessmen

ABNORMAL FINDINGS

visit at NHCS, with specialist assessmen

EMPOWER WOMEN TO FIGHT AGAINST **HEART DISEASE**

NHCS officially opened its Women's Heart Clinic to lead women in the fight against cardiovascular disease (heart disease & stroke) – the number one killer among Singaporean women



esearch found that heart disease is deadlier in women, often undiagnosed or undertreated. Women tend to also be much older and have a higher risk of dying than men, when they suffer heart attacks.



dies of cardiovascular disease (heart disease and stroke) in Singapore, claiming more lives than breast cancer.

Yet, most Singaporean women are not aware that it is the leading cause of death, according to a survey done by Singapore Heart Foundation last year.

The Women's Heart Clinic at National Heart Centre Singapore (NHCS) aims to empower women to take charge of their heart health through greater awareness of their risk factors and symptoms. The clinic offers end-to-end services, from prevention to diagnosis, treatment and rehabilitation, customised to the specific needs of women. It will also serve as a knowledge centre, providing specialised training for medical students and doctors in Singapore and the region. The end goal is for patients to be identified early and receive appropriate treatment, and to prevent disease in others at risk, thus ensuring better outcomes for all women with, or at risk of, cardiovascular disease.

We wanted to cater to the biological, physiological and psychological needs of our women patients which are different from men. Women are more likely to ignore symptoms, inaccurately assess their own personal risks of heart disease and delay seeking medical treatment. Knowing all of this, we have chosen to put women's needs at the 'heart' of our services and empower more women to take charge of their own heart health. Our clinic will guide and reassure them on their health journey," said Professor Carolyn Lam, Senior Consultant, Department of Cardiology, NHCS, also currently the cardiologist running the clinic.



Guest-of-honour. Prof Ivy Ng, Group CEO, SingHealth (left), with Prof Carolyn Lam, Senior Consultant. NHCS (right), at the opening ceremony of NHCS's Women's Heart Clinic on 21 September 2016.

GENDER MATTERS

Heart disease affects both men and women but some unique factors and symptoms will explain why gender differences matter and how women are more susceptible to poor outcomes following heart attacks.



SYMPTOMS

While both men and women share most of the common symptoms of heart disease, women are more likely to exhibit atypical symptoms such as shortness of breath; nausea and vomiting; back,

neck or jaw pain; and fatigue. These symptoms tend to be ignored or excused by women, leading to delayed diagnosis and treatment.



MECHANISMS

Heart attacks are caused by interruption of blood supply to the heart muscle. This is usually caused by obstruction of the main blood

vessels (coronary arteries) of the heart by fatty deposits (atheroma) or blood clots. However, women may still suffer heart attacks even without obstructions in their main coronary arteries, because of disease in the smaller arteries (microvascular disease) or lining of the arterial wall (endothelial dysfunction, coronary dissection).



OTHER TYPES OF HEART **DISEASE AFFECTING WOMEN**

Women are uniquely predisposed to certain types of heart disease such as heart failure with

preserved ejection fraction (also called diastolic heart failure), stress-induced cardiomyopathy (popularly known as 'broken heart syndrome') and pregnancyrelated heart failure. Specialised tests may be needed to make these diagnoses.



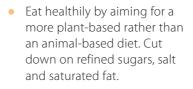
PREVENTION IS STILL THE KEY

Prevention is still better than cure and keeping a healthy lifestyle cuts risks of getting a heart attack.



Some tips for a healthy heart:

- Don't smoke.
- Exercise for at least 30 minutes, five times a week, at moderate levels.
- Check your blood pressure, cholesterol and sugar levels yearly. If you have high blood pressure, high cholesterol or diabetes, take your medications and keep these conditions under control.



- Pick up relaxation techniques (e.g. meditation, breathing exercises and yoga).
- Think positively to support a healthy mind.



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WOMEN'S HEART CLINIC

The Women's Heart Clinic aims to empower women to take charge of their heart health though greater awareness of their risk factors and symptoms. The clinic offers end-to-end services, from prevention to diagnosis, treatment and rehabilitation, customised to the specific needs of women.

WOMEN'S HEART CLINIC SPECIALIST

Prof Carolyn Lam Su Ping Senior Consultant

FEMALE CARDIOLOGISTS

Assoc Prof Ding Zee Pin Senior Consultant, Echocardiography

Adj Assoc Prof Ewe See Hooi Senior Consultant, Non-invasive

Multi-modular Cardiovascular Imagina

Adj Asst Prof Ho Kah Leng Senior Consultant, Electrophysiology

& Pacing

Adj Asst Prof Tan Ju Le Senior Consultant, Adult Congenital

Heart Disease, Pulmonary Hypertension, and Cardiac Disease and Pregnancy

Prof Carolyn Lam Su Ping Senior Consultant, Heart Failure

Asst Prof Angela Koh Su-Mei Consultant, Cardiac Imaging

Dr Nadira Binte Hamid Consultant, Echocardiography

Dr Laura Chan Lihua Associate Consultant, Heart Failure

Dr Go Yun Yun Associate Consultant, Echocardiography

and Cardiac Magnetic Resonance

Imaging

Dr Ho Jien Sze Associate Consultant, Cardiovascular

Rehabilitation and Preventive Cardiology

Dr Ruan Wen Associate Consultant, Echocardiography

and Pulmonary Hypertension

FOR THE FULL LIST OF NHCS SERVICES AND SPECIALISTS. PLEASE VISIT www.nhcs.com.sg.

SUPERSTAR AWARD WINNERS

MDM KAMIM PINTI HUNGSE, ION EART RES

SEN Kamimah Binti Hussien, Ward 56, NHCS - Superstar Award recipient for the Nursing Category.

Try to put yourself in the shoes of the patient. There is always a reason behind every action."

- SEN KAMIMAH BINTI HUSSIEN

"She is a person to confide your problems with. Kamimah displays motherhood love and shower you with care. Her love shown to patients is remarkable! I am grateful to her."

- IVAN LIM (PATIENT) ON KAMIMAH

NHCS STAFF SHINE BRIGHT, SCORE HIGH AT SHQSA 2017

Two superstar winners and a total of 197 staff recognised for their exemplary service

he Singapore Health Quality Service Awards (SHQSA) 2017 ceremony took place on 17 January 2017 at University Cultural Centre and saw 3,585 winners from across 26 public and private healthcare institutions, community hospitals and agencies bagging home the coveted service quality awards. SHQSA was organised by the SingHealth Duke-NUS Academic Medical Centre since 2011, to honour healthcare professionals who have delivered exemplary quality care and service to patients.

National Heart Centre Singapore (NHCS) walked away with 197 award winners in the Star, Gold and Silver categories this year. For the first time in history, NHCS produced two Superstar winners, and on top of that a Special Mention Award presented to the multi-disciplinary HEARTS team, who had introduced a new bandage removal process that is painless for the patients. Heartiest congratulations to the winners!

SHQSA 2017 NHCS AWARD WINNERS 2 SUPERSTAR
Awards

19 STAR Awards

53 GOLD Awards

NHCS 197 award winners at the SHQSA 2017 ceremony, graced by guest-of-honour, Minister of State for Health, Mr Chee Hong Tat.



SPSO Norzana Bte Ayub, Cardiac Clinic, NHCS - Superstar Award recipient for the Ancillary Category.

I always share with my colleagues that we should really learn to listen to our patients. It is important to understand their needs and help as best as we can."

- SPSO NORZANA BTE AYUB

"She is the best counter staff I have come across. Very courteous and very helpful in everything I ask. We need more service staff like her. Thank you."

- K. VISWANATHAN (PATIENT) ON NORZANA

123 SILVER Awards

SPECIAL MENTIONAward

SAY GOODBYE TO PAINFUL ADHESIVE BANDAGE REMOVAL

Hearts Team won the SHQSA Special Mention Award for making the removal of adhesive bandage a painless process

Adhesive bandage dressing is commonly used on patients where pressure is applied to stop bleeding, after cardiac procedures and invasive lines insertion. Due to the strong adhesiveness, however, patients may experience skin tear during the bandage removal, especially for the elderly with delicate skin. As a result, some patients had to put up with pain during the removal and some had to extend their hospital stay to treat the wound caused by the skin tear.

Determined to find a way to make the adhesive bandage removal a less painful process for patients, the Hearts team tried out many different methods, before finding a solution that is painless, easy and of low-cost. The team was surprised that a simple and yet effective solution, that is, using olive oil, was the answer to alleviating the painful adhesive bandage removal experience. They then quickly developed a set of quidelines to remove adhesive bandages with olive oil.

The improved bandage removal process was progressively implemented to the wards and after just one month, the team achieved the remarkable result of reducing the number of patient stays due to serious skin tears to zero. The patients welcomed the improved process and nurses no longer had to face patients' frustrations over the old painful way of bandage removal. The team was delighted by the encouraging feedback but nothing rewards them as much as patients' satisfying experience and the significant improvement to patient care.



The NHCS HEARTS Team (from the top left, clockwise): ANC Koh Hwee Hong, Ward 44; Jacqueline Huo, Operations; SSN Anne Lee, Ward 44; NC Low Hui Ling, Ward 44 (Leader); NC Wirdawati Binte Salimin, CTICU; NC Belinda Wong, Ward 47B (Co-leader); SNM Jasmine Lee, Ward 44 (Facilitator).

"SILENT" GENE MUTATIONS MAY CAUSE HEART FAILURE IN HEALTHY PEOPLE

Study revealed that gene mutations in a protein called titin would potentially trigger heart failure in one percent of healthy individuals worldwide



' ITIN, THE BIGGEST GENE AND LARGEST PROTEIN IN THE HUMAN BODY, PLAYS A VERY IMPORTANT ROLE

in dilated cardiomyopathy, one of the most common forms of inherited cardiac conditions, whereby the heart muscle becomes weakened, enlarged and cannot pump blood efficiently



THIS CONDITION AFFECTS 1 in 250 PEOPLE GLOBALLY

The multinational study, led by National Heart Centre Singapore (NHCS) involved over 2,490 dilated cardiomyopathy patients and 1,400 healthy volunteers, discovered that gene mutations previously thought to affect only patients with dilated cardiomyopathy could actually affect the heart function of even the healthy individuals.

In the study, researchers generated two rat models to understand the impact of the titin gene mutations at the molecular level and heart function; conducted cardiac gene sequencing tests on patients with dilated cardiomyopathy; and performed 3D cardiac magnetic resonance imaging (MRI) on healthy volunteers. Results from these tests showed that those carrying the gene mutations were found to have an enlarged heart, in a pattern similar to that seen in heart failure patients. The enlarged heart, although functioning in a compensated state because of the stress caused by the gene mutations, would still be working fine, until it encounters additional stressors that may cause the heart to fail.

Asst Prof Sebastian Schäfer, (left), Senior Research Fellow, NHCS, who is the first author of the paper, together with Prof Stuart Cook (right), Tanoto Foundation Professor of Cardiovascular Medicine at the SingHealth Duke-NUS Academic Medical Centre and co-senior



Currently, one percent of the world's population carry these gene mutations and since it is now known that these "silent" gene changes can adversely affect the heart, it is crucial to find out next what these additional stressors are that may put certain people with titin mutations at risk of heart failure. A study on one possible stressor, pregnancy, has already been published; if a woman with the titin gene mutation were to become pregnant, she would be at risk of heart failure.

A gene test, developed by NHCS with Imperial College London, can also now help doctors screen for mutations in genes known to cause inherited cardiac conditions, in a shorter time and at a lower cost. Previously, patients could only screen two to three genes with the old technology, and the process could take up to half a year. The new test can screen 174 genes for 17 inherited heart conditions, diagnose the exact condition and gene, and get tailored treatment. The test would also offer peace of mind to families of patients with the gene mutations, as family members who are tested negative for the mutated genes can now avoid lifelong monitoring, while those who are tested positive can have the doctors to intervene early.

NHCS led the study in collaboration with Duke-NUS Medical School, Medical Research Council Clinical Sciences Centre (UK), Imperial College London (UK) and Max Delbrück Center for Molecular Medicine in the Helmholtz Association (Germany), and the paper "Titin-truncating variants affect heart function in disease cohorts and the general population" was published in leading medical journal, Nature Genetics.

The Tanoto Foundation, National Medical Research Council Singapore, SingHealth Duke-NUS Institute of Precision Medicine, Medical Research Council Clinical Sciences Centre UK, NIHR Biomedical Research Unit in Cardiovascular Disease at Royal Brompton & Harefield NHS Foundation Trust, and Imperial College London and British Heart Foundation UK, among others, funded the work.



RESEARCHERS TO DEVELOP NEW PROTOCOL FOR EXERCISE MAGNETIC RESONANCE **IMAGING TEST FOR ENLARGED HEARTS**

Study demonstrated the new ExCMR protocol as highly reproducible with a potential for clinical use in physiological studies of the heart and circulation

ational Heart Centre Singapore (NHCS) used a supine cycle ergometer to successfully develop a protocol for real-time Exercise Cardiovascular Magnetic Resonance (ExCMR) imaging test. The protocol involved attaching the supine cycle ergometer to the scan table, allowing patients to exercise while in the bore, and capturing the heart images real-time. Compared to the typical Magnetic Resonance Imaging (MRI) diagnostics tests, the new ExCMR imaging test provides additional information on the characteristics of one's heart at peak activity, hence facilitating the diagnosis of potential underlying heart problems.

Researchers at NHCS studied a group of athletes and healthy volunteers using the CMR compatible cycle ergometer and real-time CMR, to evaluate the feasibility and reproducibility of the exercise protocol and examine its potential to differentiate athletes from healthy volunteers. Participants were asked to cycle at an initial workload of 25W (watts) followed by 25W-increment every minute until exhaustion. Free-breathing imaging was performed at the end of every stage during a brief period of stopping exercise. A repeat scan using the same exercise protocol was then performed on some individuals, at least seven days from the first scan, to assess scan-rescan reproducibility.

Results from the ExCMR protocol demonstrated excellent inter-observer and scan-rescan reproducibility. Researchers were also able to characterise exercise physiology at every stage, and observe differences in exercise physiology between athletes and healthy volunteers. Findings of the study were published in the Journal of Cardiovascular Magnetic Resonance in January 2017.

The research team is currently at their next phase of recruiting patients for the ExCMR protocol, to research on heart diseases that are prevalent in Singapore, such as ischaemic heart disease. Interested parties who are keen to volunteer may drop an email to mribike@nhcs.com.sg.



The greatest advantage of the ExCMR imaging test is that it allows cardiologists to use one imaging modality to study the function of the heart.

and stress in addition to the characteristics of the heart achieve the same results.

NHCS new ExCMR protocol where the supine cycle ergometer is fitted onto the





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GLEANING FROM MY STINT AT YALE-NEW HAVEN **HOSPITAL**

Dr Pang Yi Kit Philip, Associate Consultant, Department of Cardiothoracic Surgery, National Heart Centre Singapore (NHCS), came back from a one-year Advanced



Dr Philip Pang (third from the right) with colleagues at Yale-New Haven Hospital, including Dr John Elefteriades (far right), world-renowned aortic surgeon. Below inset: Dr Pang in a surgery with Dr Elefteriades.

Fellowship Training Programme in Cardiothoracic Surgery just late last year. He opened up to us on his valuable experience at Yale-New Haven Hospital and how the exposure broadened his horizons.

WHAT WAS THE TRAINING LIKE AT YALE-NEW HAVEN HOSPITAL?

My one-year fellowship in adult cardiac surgery at Yale University and Yale-New Haven Hospital was divided into two main rotations, the first half focusing on valvular heart disease, in particular mitral valve reconstruction. The emphasis of the second half was on thoracic aortic disease, under the mentorship of the Director of the Aortic Institute and world-renowned aortic surgeon, Dr John Elefteriades. My responsibilities included the operative and perioperative management of patients undergoing minimally invasive valve surgery, reoperations, and complex thoracic reconstruction.

A typical day at Yale started at 6am and ended around 8pm. I began with my ward rounds before gathering for the surgical pause in the operating room at 7.30am. I was fortunate to be in the operating room every working day. We generally complete two mitral valve surgeries or one major aortic surgery by 3pm. We see new patients and review postoperative cases in the outpatient clinic each afternoon. The early evenings are reserved for research meetings and journal clubs. The day ends after completing our evening and preoperative rounds. In addition, as an Advanced Cardiac Surgery fellow, I was rostered six to eight in-house calls per month, during which I was the most senior cardiothoracic surgical staff responsible for the ICU, wards, emergency and operating rooms.

HOW HAS THE EXPERIENCE HELPED YOU?

The experience gained from my fellowship at Yale has broadened my horizons and increased my confidence in dealing with complex mitral valve and aortic disease. A significant proportion of patients referred to Yale University were from other tertiary centres across the USA, where they were initially deemed inoperable. I had the privilege of participating in more than 120 mitral valve surgeries under the mentorship of Yale's Director of Valve Surgery, Dr Sabet Hashim. Approximately half of these were complex mitral and tricuspid valve repairs, high-risk reoperations and minimally invasive mitral valve surgeries. My stint with Dr Elefteriades was particularly enriching and beneficial. Under his guidance, we performed in excess of 100 aortic root, arch or descending thoracic surgeries, many of which were complex and high-risk, requiring hypothermic circulatory arrest. Well known as a gifted teacher, Dr Elefteriades has selflessly imparted his wealth of knowledge in thoracic aortic disease to me and honed my surgical skills in the operating room. His impeccable bedside manner has also left a lasting impression on me. He also shared valuable insights and pearls of wisdom pertaining to his industrious research team consisting of 23 postgraduates, who publish high-quality articles ranging from genetics of thoracic aortic disease to long-term outcomes of aortic reconstruction. I was very fortunate to be involved in some of these projects. In addition, the intense in-house call duties have undoubtedly improved my multi-tasking and crisis management skills.

WHAT WERE YOUR MOST **MEMORABLE MOMENTS?**

My most memorable moments were in the operating room. There were several cases etched in my memory.

The first was a high-risk, complex descending thoracic aortic surgery with Dr Elefteriades. I was responsible for extricating a thoracic endovascular stent which was densely embedded in the aorta, during a crucial period without circulatory support. This rather dramatic sequence was presented at the Society of Thoracic Surgeons meeting earlier this year. During my time with Dr Hashim, we encountered an extremely rare complication of acute bioprosthesis failure during mitral valve replacement. This required reinstitution of cardiopulmonary bypass and replacement with a tissue valve from a different manufacturer. I was very impressed by Dr Hashim's calm demeanour and handling of this rare but serious event. In keeping with the high volume of mitral valve surgeries at Yale, we experienced the same complication several weeks later, on a different patient. This preceded a nationwide recall of this particular bioprosthetic valve. We have since published our experience in the Annals of Thoracic Surgery.



JOIN US!

NHCS HEART CARE SYMPOSIUM — HEART FAILURE

This symposium targets mainly General Practitioners and Doctors with an interest in cardiology. Through this Symposium, participants will be able to understand more about Heart Failure; as well as learn how to manage the co-morbidities in Heart Failure. An update on the pharmacological therapy and use of devices in heart failure would be shared at the Symposium as well.

27 May 2017, Saturday Date:

Time: 1pm - 4.30pm

Venue: Lecture Theatre, Level 7,

> National Heart Centre Singapore 5 Hospital Drive, Singapore 169609

Free admission. Limited seating, pre-registration required. Registration closing date: 19 May 2017.

For enquiries, please call 6704 2381/2389 or email nhccme@nhcs.com.sg.

5TH CORONARY CARE SYMPOSIUM

Designed for residents, fellows, medical students and nurses, this is a basic course in coronary intensive care covering the management of cardiac patients and basic equipment and modalities used in the CCU. Interactive case discussions/quizzes will cover the crucial topics in a stimulating and fun way while hands-on stations will support in-depth learning of the various tools and techniques essential to the daily CCU work.

9 September 2017, Saturday Date: National Heart Centre Singapore Venue:

5 Hospital Drive, Singapore 169609

Registration Fees: For Physicians' Track

S\$50 for medical students;

· S\$200 for physicians / doctors-in-training

For Nurses' Track (Nurses / Allied Health Professionals)

• S\$80 for afternoon programme;

• S\$110 for full day programme

Registration closing date: 25 August 2017.

For enquiries, please call 6704 2389/2382 or email nhccme@nhcs.com.sg.

APPOINTMENTS AND PROMOTIONS



ADJ ASSOC PROF SOON JIA LIN Senior Consultant, Department of Cardiothoracic Surgery

Subspecialty interest: Cardiac Surgery (Adult), Transcatheter Valve Therapies, Heart Failure Surgery (including VAD & Transplant), VATS, Minimally Invasive Cardiac Suraerv



DR ONG **BOON HEAN** Consultant, Department of Cardiothoracic Surgery Subspecialty interest: Cardiac



DR KANG NING Associate Consultant, Department of Cardiothoracic Surgery

APPOINTMENTS WITH DUKE-NUS MEDICAL SCHOOL



SOON JIA LIN Adjunct Associate Professor, Department of Cardiothoracic Surgery



ADJ ASSOC PROF **TAN SWEE YAW** Adjunct Associate Professor, Department of Cardiology



PROF LAM SU PING CAROLYN Professor, Department of

Cardiology

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