

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

# PULSE

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Issue  
**No.23**  
January – June 2014



# INTENSIVIST LED CTICU

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CARDIOTHORACIC  
INTENSIVE CARE  
AT NUH

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

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MCI (P) 132/03/2014

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# JOURNEY OF KNOWLEDGE IN LONDON

**Dr. Wong Siong Sung shares his Health Manpower Development Programme (HMDP) training experience, which includes presenting cases, learning innovative software and performing imaging procedures at four established hospitals in London.**

## CMR AT ROYAL BROMPTON HOSPITAL

It was a memorable time for me when I was in London, United Kingdom (UK) from 2013 to 2014 for my HMDP training in the fields of Cardiovascular Magnetic Resonance (CMR), Cardiovascular and Nuclear Cardiology.

I was a fellow in the CMR unit at Royal Brompton Hospital, London, UK. Its CMR unit is one of the world's most established centre for CMR services and training. For the first 3 months, we had daily CMR lectures and reporting. Every morning, all fellows reported the cases on their own and took turns to present them to the consultant, while the other fellows watched on.

This is an amazing centre with a vast variety of cases. We were taught on how to obtain the left and right ventricular volumes, flow quantification and so on.

In the initial 3 months, a new fellow will tag along with a senior fellow. The senior will check the findings and report them to the consultant before the presentation to finalise with him or her. After 3 months, all fellows should report independently to the CMR Consultants.

## CARDIOVASCULAR CT AT ROYAL BROMPTON HOSPITAL

It was common to see more than 10 cases of Cardiovascular CT cases in a day. The referral includes CT coronary angiogram, bypass graft assessment, evaluation for the suitability for TAVI, post Watchman device implantation assessment and congenital cases. At Royal Brompton Hospital, we evaluated the CT images with a special CT software. This software is superior to the conventional work station as it is extremely easy to use and speeds up the time of analysis. In addition, it provides a good display of the coronaries and 3D volumetric image for the congenital or vascular cases. This definitely enhances productivity, efficiency and accuracy.

## NUCLEAR CARDIOLOGY AT ROYAL BROMPTON HOSPITAL AND HAREFIELD HOSPITAL

I worked with Prof. Richard Underwood at both hospitals. We used Cardiac SPECT (single photon emission computed tomography) imaging to assess myocardial ischaemia and viability. We also performed cardiac sympathetic imaging with 123-iodine metaiodobenzylguanidine [123-I MIBG] to risk stratify patients with heart failure as cardiac 123-I MIBG activity is a very powerful predictor of survival. I got to experience a different perspective in the field of nuclear cardiology.

## CARDIAC PET IMAGING AT UNIVERSITY COLLEGE LONDON HOSPITAL

I had the opportunity to evaluate both the PET myocardial perfusion scan using Rubidium-82 and the SPECT myocardial perfusion scan using MIBI-Tc in the same scan setting on top of the CT coronary angiogram in some of the research scans. I certainly can appreciate a better image resolution with PET imaging technique.

My HMDP journey in the UK would have been lonely without the support of my wife and my baby girl. We had a wonderful time there and their presence was greatly appreciated!•



**Dr. Wong Siong Sung**

Consultant, Department of Cardiology, NUHCS

Dr. Wong obtained the Membership of the Royal Colleges of Physicians of United Kingdom, MRCP (UK) and Membership of the Royal College of Physicians and Surgeons of Glasgow, MRCPs (Glasgow) in 2007. He was elected as Fellow of the Academy of Medicine, Singapore in 2011. He has a special interest in Nuclear Cardiology, Cardiac Magnetic Resonance Imaging and Cardiac Computed Tomography.

# INTENSIVIST LED CTICU

## – REVOLUTIONISING CARDIOTHORACIC INTENSIVE CARE AT NUH

A/Prof. MacLaren gives an overview on why cardiothoracic intensive care could further develop in Singapore, modelling after the United States' intensivist-led CTICU. With credentialed consultants, the focus on intensive care medicine could transform the landscape in Singapore.



A/Prof. Graeme  
MacLaren

Senior Consultant,  
Department of Cardiac, Thoracic  
and Vascular Surgery and Director,  
Cardiothoracic Intensive Care, NUHCS

As an adult and paediatric cardiac intensivist, A/Prof. MacLaren is trained in critical care medicine. His main professional interests are extracorporeal life support and cardiac intensive care. He is currently the Vice President (Asia-Pacific) of the Paediatric Cardiac Intensive Care Society and serves on both the Executive Committee of the Society of Intensive Care Medicine of Singapore and the Steering Committee of the Extracorporeal Life Support Organization (ELSO).

In 2012, the American Heart Association published a scientific statement on the evolution of cardiothoracic intensive care units (ICUs) in the United States. This document highlighted 3 key points:

- 1. ICU-related complications are a major determinant of patient outcomes.**
- 2. Complications are fewer and mortality is lower when specially trained, dedicated intensive care specialists (or 'intensivists') direct overall care.**
- 3. Intensivist-led, integrated multidisciplinary care from medical, nursing and allied health teams is an important means of optimising patient care.**

The writing committee, led by David Morrow from the Harvard Medical School, concluded that leading hospitals in the United States should develop cardiothoracic ICUs staffed by cardiac intensivists. In Singapore, we at the National University Heart Centre, Singapore (NUHCS) have adopted this model of care for several years in our cardiothoracic ICU (CTICU).

**The CTICU should be managed by sub-specialised cardiac intensivists. These doctors should be trained, credentialed, and experienced in general critical care, perioperative, and cardiovascular medicine; they should be adept in relevant technologies such as echocardiography, continuous renal replacement therapy and extracorporeal life support; they should have no other clinical responsibilities and be available 24/7; and they should devote their entire clinical practice to intensive care medicine.**



**Intensive  
Care Medicine as a  
Sub-specialty in Singapore**

It took  
**5** years  
to hire  
sufficient  
consultants  
to provide  
**24/7**  
service  
**365**  
days a year

**Extracorporeal Life  
Support Programme**  
**Weekly**  
critical care teaching

**Bimonthly**  
simulation training

**Biannual**  
workshops

Although the goal was straightforward, it was not easy to achieve. Intensive care medicine only became a recognised sub-specialty in Singapore in 2009 and there were many administrative and bureaucratic hurdles to overcome in order to recruit the requisite staff. Perhaps because of the intense workload, significant sub-specialisation and complexities of training, local trainees did not initially seem interested in this career pathway, so staff had to be recruited from overseas. It took 5 years before sufficient consultants were hired so as to provide this service 24/7, 365 days a year.

Working in the cardiothoracic ICU is challenging and exciting. Caring for patients alongside the surgical teams is a necessity, thus teamwork and clear communication is vital. The ICU also attends to thoracic and vascular surgical patients, who offer a different set of management challenges from the cardiac patients. Both bed occupancy and patient acuity continue to

rise as the surgeons operate on higher risk patients and adopt more complex surgical techniques.

Several milestones have been reached. An extracorporeal life support programme was established to help patients with refractory heart or lung failure. Before the NUHCS paediatric cardiac surgical programme began in 2009, we helped train nursing and medical staff in the paediatric ICU to manage children after heart surgery. We conduct weekly critical care teaching, twice monthly simulation training, and biannual extracorporeal life support training workshops. As the only intensivist-run cardiothoracic ICU in Singapore, many associate consultants from other hospitals now choose to complete intensive care training here. Moving forward, we need more nursing and medical staff across all levels of seniority for new operating theatres and we will need to redesign and build a bigger ICU, as we cater

to a larger surgical workload with patients who have more complex diseases.

As cardiothoracic intensive care evolves, training pathways and credentialing will need to be reconsidered. At present, cardiologists and surgeons cannot practise as registered sub-specialists in intensive care medicine in Singapore, even after gaining the necessary additional training. This model contrasts with other countries such as the USA and Australia and may prove too restrictive. Time will tell if it is worthwhile changing. Nevertheless, cardiothoracic intensive care is a young, fascinating sub-specialty that should continue to evolve in Singapore. •

# VASCULAR MEDICINE FELLOWSHIP – A YEAR AT STANFORD UNIVERSITY



**Dr. Peter Chang**  
Associate Consultant,  
Department of Cardiology, NUHCS

Dr. Chang is board certified in internal medicine and was a hospital medicine specialist before completing his cardiology fellowship. He is also trained in vascular medicine and is currently in charge of the vascular wellness service in NUHCS. He focuses on an integrated and interdisciplinary approach to vascular conditions with an emphasis on non-invasive diagnosis and management.

**Highlighting on peripheral arterial disease and the challenges of recognising it, Dr. Peter Chang was sent for training in vascular medicine in a mission to enhance patient care in NUHCS.**

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Peripheral arterial disease (PAD), coronary artery disease, and cerebrovascular disease are the three major syndromes of atherosclerosis. PAD is a progressive disease manifested by end-organ ischemia that affects men and women equally. The global estimate of disease prevalence reached 202 million (approximately 12% overall) in 2010 and older individuals, diabetics, and smokers are at the highest risk, with nearly one in three over the age of 70. To counter the global burden of atherosclerosis, PAD should be recognised and treated with great concern. Statistically, individuals with PAD have a 2-fold greater risk of total mortality and a 5-fold greater risk of coronary heart disease than those without PAD. As such, the American Heart Association has recognised PAD as a coronary heart disease equivalent and put forth guidelines to advocate screening for at-risk individuals. It is an increasingly important public health problem here in Asia due to persistent tobacco usage and expected rise in diabetes.

## **DID YOU KNOW?**

Unfortunately, PAD is recognised less than 50% of the time in primary care setting. Physicians often feel unfamiliar with PAD demographics, screening methods and diagnostic approaches. Only 8 out of 10 individuals with PAD were aware of it and surprisingly, less than half of their physicians knew about their diagnosis. The general public is simply less familiar with PAD than other cardiovascular conditions and is unexpectedly more familiar with relatively uncommon diseases such as Lou Gehrig's,

## Demographics of Peripheral Arterial Disease (PAD)

Individuals at the **highest risk** of developing PAD



**1 in 3** of those affected are over the age of **70**



Individuals with PAD are

**2X** at greater risk of total mortality 

**5X** at greater risk of coronary heart disease 

as compared to Individuals without PAD

multiple sclerosis, or cystic fibrosis.

A challenge of recognising PAD is the spectrum of symptoms that varies, from asymptomatic and intermittent claudication to critical limb ischemia. If only claudication is considered, as much as 90% of the patients might be missed. The opportunity for effective management, symptom relief, functional improvement and prevention of adverse cardiovascular events would be lost. As health care providers, we must make every effort to recognise this disease and do so at an early stage. With a prompt diagnosis, we can then perform a comprehensive evaluation, assess risk factors, and design a comprehensive long-term care plan.

### NEW VASCULAR MEDICINE SERVICE IN NUHCS

Through my training in vascular medicine at Stanford University, I gained the fundamentals of vascular diseases and skills in the assessment and medical management of PAD. I became familiar with various diagnostic modalities, medical managements, catheter-based endovascular interventions, surgical options, and clinical trials in stem-cell based therapy and novel agents such as Ticagrelor in patients with PAD. In the upcoming months, NUHCS will put forth a new vascular medicine service with committed expertise in diagnosis, imaging, and treatment of vascular disease. I hope this will increase PAD awareness among the National University Hospital (NUH) community of allied health professionals.



Furthermore, I hope to enhance patient care by working alongside the Vascular Surgery team and develop collaborative relationships with others in disciplines such as Haematology, Rheumatology and Radiology. Over time, I hope I can deliver different values to different patients such that a patient with vascular disease in multiple territories can receive assistance and improve on his or her quality of life; an undiagnosed vascular patient can get proper follow-up and utilise community resources; and a patient otherwise without revascularisation options can access endovascular treatments or stem cell therapy.

There are many compelling reasons for developing a new vascular medicine service in NUH. Most importantly, it will result in the overall improvement of patient care. Vascular disorders affect the entire vascular system rather than a single vascular bed in isolation.

**Thus, the recognition of a disease should trigger comprehensive evaluation, management, and prevention of associated vascular disease elsewhere. This is the rationale for an integrated approach in managing vascular disease.**

In all, I hope to apply my training from Stanford University to generate awareness and interest of vascular diseases here in Singapore. •

# MOMENTOUS OPPORTUNITIES

## AT THE MEDSTAR HEART RESEARCH INSTITUTE

Through the advanced fellowship training, Dr. Joshua Loh shares how he gained clinical research experience.

It was both a privilege and an honour to receive the Academic Medicine Development Award (AMDA) scholarship to pursue my advance training in Washington, DC, US. Flying halfway across the globe from sunny Singapore, I stepped into a 2-year Interventional Cardiology Fellowship programme at the MedStar Washington Hospital Center (MWHC) in December 2011, just at the start of winter. Thus begins my daily 42km commute (each way) from a quiet Maryland suburb in North Potomac, to the hospital at the heart of the city.

### CLINICAL OUTCOMES RESEARCH PROGRAMME

The first year was an academic programme dedicated to clinical outcomes research, under the supervision of Dr. Ron Waksman, a renowned interventionist, thought leader, and principal investigator of many clinical and preclinical trials. The MedStar Heart Research Institute (MHRI) maintains a large Percutaneous Coronary Intervention (PCI) database, complementary to the high volume of clinical cases.

For more than 20 years, the clinical and procedural data of patients undergoing PCI are prospectively collected and stored. The patients are then systematically followed up, and clinical outcomes are recorded and adjudicated. Under a dedicated team led by Rebecca Torguson, the director of Clinical Research Operations, the data coordinating centre manages and performs the analysis of collected data. I learnt not only about maintaining a large clinical database, but also its utility in answering important clinical

questions. I took on many projects which have come to fruition in terms of manuscript publications and presentations at scientific conferences. Some areas which I studied are related to the comparative effectiveness outcomes analysis of first- and second-generation drug-eluting stents, bleeding outcomes in PCI, stent thrombosis in PCI, use of novel antiplatelet agents, effects of antiplatelet therapy discontinuation on stent thrombosis, comparative outcomes after staged PCI, and outcomes after primary PCI.

### PARTICIPATION IN STUDIES AND LAB WORK

I was also given the opportunity to review and present the utility of drug-coated balloons, a device which is currently not available in the United States but has considerable interest within the interventional cardiology community. In addition, I was involved in a multicentre registry for drug-coated balloons. I attended and reviewed the proceedings of a Food and Drug Administration (FDA) Circulatory System Devices Panel Advisory Committee Meeting for an implantable pulmonary artery (PA) pressure measurement device. There, I learnt about the rigorous process of weighing the efficacy and safety of a device, and drilling down the trial data in order to recommend the device for premarket approval.

Part of the research activity centred on the core laboratory, in which data from clinical trials are being analysed. I was involved in Quantitative Coronary Angiography and

Intravascular Ultrasound analysis for stent and drug-coated balloon studies. I took part in activities in the animal lab, where new and different interventional devices were evaluated in animal models. I also participated in the recruitment of patients for clinical trials, seeing trial patients on follow-up visits, adjudicating procedural information and clinical events, and setting up an aortic valve stenosis database which captures all the patients who underwent transcatheter aortic valve implantation and balloon aortic valvuloplasty at MWHC.

### Diversity in Culture and Practices

Many of our projects required the input of several team members. I was fortunate to get to work with an international group of fellows. Throughout my 2-year fellowship, I worked with fellows from the Middle East (Egypt, Israel), Asia (Malaysia, China, Japan), South America (Brazil, Venezuela), Europe (Spain, France) and the USA. We were able to bounce ideas off one another, draw on our various background experiences, and learn about one another's culture and interventional cardiology practices.

Another aspect of the clinical research experience was presenting our research projects at cardiology and interventional conferences such as the American College of Cardiology and Transcatheter Cardiovascular Therapeutics. We have maintained the reputation of the MHRI, with strong representations in most of the meetings.



**It was a truly enriching experience for me. I learnt about teamwork, organisation, having the inquisitive mind in answering clinical questions, and the diligence and patience to see the projects through. With the knowledge gained, I hope to contribute actively to NUHCS. •**



**Dr. Joshua Loh**  
Consultant, Department  
of Cardiology, NUHCS

Dr. Loh has authored or 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.

# NEW INNOVATIONS AND SKILLS AT THE MEDSTAR WASHINGTON HOSPITAL

**Dr. Joshua Loh obtained training at a centre that performs thousands of interventions yearly. He had the opportunity to learn from expert interventionists and was introduced to "Code Heart", a mobile application solution that provides a real-time video and audio stream that can be used in critical care situations, such as ambulances in transit.**



The second year of my training was spent mostly in the Cardiac Catheterization (cath) Laboratory of the Medstar Washington Hospital Center (MWHC), a high-volume tertiary care referral centre for coronary and structural interventions. MWHC has 10 cath labs performing 25,000 procedures yearly, including 6,000-7,000 interventions. The interventional fellowship programme is accredited by the Accreditation Council for Graduate Medical Education (ACGME). In addition to continuing my research projects for the second year, I spent a total of 14 months in the cath lab.

## LEARNING THE ROPES

I was fortunate to get to train under a stellar group of interventionists. I started my cath lab rotations training under Dr. William Suddath who, besides coronary interventions, performs procedures such as right heart catheterisations and endomyocardial biopsies for patients with advanced heart failure and heart transplantation. I then spent half a year with Drs. Lowell Satler (Cath Lab Director) and Augusto Pichard (Director of Structural Interventions), where the focus was on complex coronary interventions and transcatheter aortic valve implantation (TAVI). Besides advanced interventional techniques, I learnt the use of adjunct devices such as rotational and laser atherectomy, and embolic protection devices. I also learnt the use of intravascular ultrasound (IVUS), near infra-red spectroscopy (NIRS), and optical coherence tomography (OCT) for imaging. In addition to performing systematic evaluation of patients considered for TAVI, the team does 1-2 TAVI procedures daily, usually under conscious sedation. I was fortunate to have participated in both the Edwards Sapien and the CoreValve systems for TAVI. I also

participated in other procedures, namely balloon aortic valvuloplasty and percutaneous mitral valve repair using the MitraClip.

I spent the remaining months training under Drs. Robert Gallino and Robert Lager, both of whom perform their coronary interventions via the Transradial approach. Additionally, I joined Dr. Ron Waksman for many of his vascular brachytherapy cases to treat in-stent restenosis. I was also fortunate to have worked with Dr. Michael Slack, a Paediatric Structural Interventionist. He demonstrated the utility of Intra-Cardiac Echocardiography (ICE) for many of the structural cases such as closure of atrial septal defects. I was also fortunate to have the opportunity to train under Dr. Kenneth Kent, one of the eminent pioneer interventionists, and who has just recently retired.

## "CODE HEART"

Another aspect of my clinical training was participating in the "Code Heart" programme. MWHC functions as a primary percutaneous coronary intervention (PCI) facility in a STEMI network. The cath lab receives patients suspected of having acute myocardial infarction ("Code Heart") from its own emergency department, as well as via helicopter transport from 25 other hospitals in DC, Maryland and Virginia, over a radius of 150 miles. As such, a systematic organisation is required. I was involved in adjudicating the performance metrics of the Code Heart cases (which included

breakdowns of door-to-balloon times), collating the data, presenting them in a monthly audit, and coordinating with various parties involved on improving the system processes. One of the unique features is utilising a "Code Heart" app (on tablets or smart phones), which was developed by Dr. Satler. It allows real-time 2-way face-time interaction between the managing physician and the interventionist to discuss the ECG and decide on the best course of action for the patient. These interactions comply with the privacy act within a secure server, and are recorded and archived for future references.

**I learnt that in intervention, planning is the key to success. Learning from my mentors, I developed the skill to approach every problem systematically and logically, backed by scientific evidence. I am confident that the training has prepared me adequately to serve the patients in the National University Heart Centre, Singapore (NUHCS).**

## WORK-LIFE BALANCE

Besides a really enriching training programme, I got to explore the region with my family. Weekends are usually spent taking day trips to nearby towns such as Annapolis or Baltimore, spending an afternoon in DC by exploring the museums and memorials, taking walks by the Potomac River or the nearby farms, or just visiting the nearby playground or supermarket. We enjoyed the four seasons and their colours thoroughly as well as the American way of life. We were fortunate to have met many kind and warm people throughout our stay, and we will remember this time fondly. •

# KEY TAKEAWAYS AT THE 25<sup>TH</sup> ANNUAL NATIONAL FORUM ON QUALITY IMPROVEMENT IN HEALTH CARE



**IHI's National Forum is a premier conference with the mission of improving health care. This annual event drew nearly 6,000 health care professionals from around the world including those via satellite broadcast. Jessyln Ng joined like-minded professionals in an energising conference setting, and a zoo excursion, to find new ways to create a culture of continuous improvement and chart a bold new course for the future.**

I attended the Institute for Healthcare Improvement Forum from 8-11 December 2013 in Orlando where there were many renowned speakers, including Mr. Erik Weihenmayer, who gave an inspiring speech on Motivational Change as he introduced the concept of using adversity to advantage and living a "No Barriers Life". As the only blind person to reach the summit of Mount Everest and a prominent worldwide speaker with a Time magazine cover story, his lecture was one of several that I was excited to attend. There was a keynote session where they brought a

patient to the conference and interviewed her on her hospital experience. This shed intimate insights on what patients felt when they were hospitalised and how we could improve their experience. There was also a lecture on Motivational Leadership, which discussed ways to motivate staff and bring about change more easily. With all the rapid changes taking place around health care quality, I have often felt overwhelmed. Not everyone welcomes change. Therefore, I found the lecture enriching as there were many lessons to be learned — some of which I endeavoured to have implemented as soon as I got back home.

The field trip to Central Florida Zoo left a lasting impression on me. The zoo has been around since 1975, thus its structure was quite old and run down. It was nothing compared to the famous San Diego Zoo nor our very own Singapore Zoo. Despite all that, one would be surprised to see the calibre of the staff members that they have there. They were full of zest and were extremely passionate about their work. They have very clear standard operating procedures (SOPs) for every situation that can happen. All the staff members were very familiar with the SOPs and were very well-informed on where they can obtain references. Having a strong sense of

teamwork, they look forward to work and to bond with their colleagues everyday. They are so proud of their work and peers that one can feel it just by listening to them. NUHCS could strive towards a similar goal.

Moving forward, I hope to be able to build up the teamwork at our Heart Clinics so that we can also enhance our competencies and give patients a great experience that will make us a National Centre of choice. •



**Ms. Jessyln Ng**  
Clinic Manager,  
Heart Clinics, NUHCS

Jessyln was a Nurse Manager in the NUHCS wards (63 and 64) for 9 years. She had helped to drive various improvement initiatives including the high usage of the discharge lounge in ward 63, which reduced the waiting time for the admission of patients. Her wealth of experience in cardiac nursing and overall leadership in all outpatient areas serve to enhance service and nursing excellence in NUHCS.



*One of the standard operating procedures of the Central Florida Zoo was clearly labelled on the fridge. It listed the high-risk drugs and venom.*



Ms. Bushra  
Tanvir

CHAPPS member &  
volunteer parent

Bushra is a psychologist and a mother of three, with one that needs more attention than normal kids. Despite all the responsibilities at home and at work, she volunteers her services at various places. She is an active member at CHAPPS and part of the outreach team.



# ROAD TO A HEAL - *Thy* HEART

Mr. Pang  
Poi Wong

CHAPPS member &  
volunteer patient

Poi Wong is a 21-year-old congenital heart disease patient who is currently a student at Ngee Ann Polytechnic. Despite his busy schedule and health condition he still volunteers at CHAPPS by providing assistance in writing and design.



Bushra and Poi Wong are members of CHAPPS, a support group that is the pillar of strength for the paediatric patients of Congenital Heart Disease (CHD) and their families. CHAPPS hopes to establish a network between patients, parents, doctors and staff at NUHCS that serves as a vital resource to both existing as well as new patients with CHD.

In 2013, a support group was formed to provide lifelong emotional and practical support to patients with Congenital Heart Disease (CHD), the world's most common birth defect. Congenital Heart Association for Patients and Parents Support (CHAPPS) is a non-profit association and the first of its kind in Singapore. Its goal is to provide the much needed emotional support to both the young patients and their parents and equip them with the necessary information. This is to enable them to cope with their condition and lead normal lives.

### MISSION

The patients of the National University Hospital and their parents formed CHAPPS to address the many concerns and questions that have been posed to staff and doctors over the years. The support group provided a way to bring these individuals and families together in difficult times. Through time and continuous support, the families have bonded and come together to face challenges, and to celebrate their happy moments in life as well. Patients and parents become more trusting of their doctors who spend time with their patients and become more involved in their lives outside the operating rooms.

**Through CHAPPS, the families receive essential information about treatment options, research innovations, social support resources, and other topics that make the journey after diagnosis less frightening.**

The group also gives helpful information via workshops, group meetings, and seminars.

CHAPPS' group meetings provide invaluable interactions and forums for families to make personal connections with one another and the medical community. These meetings give children with heart defects a chance to meet others like themselves who face similar frustrations and challenges, thus, allowing them to know that they are not alone. Likewise, parents who are under tremendous

stress when their children undergo the procedures also get a chance to meet other parents who have similar fears and concerns.

CHD patients have played and will continue to play a big part in the coming together of CHAPPS. Being members of CHAPPS bonds these patients to face the challenges together. With a strong support system, CHAPPS drives the message that although CHD brings many challenges in life, it is not the reason to give up. CHD patients may not be able to do what their peers do in their daily lives, nonetheless, they are able to lead equally enriching lives in their own right.

### AWARENESS AND MANAGEMENT

Many people are still unaware that CHD is a common birth defect in the world but is treatable in most situations. In many cases, CHD is part of a patient's medical history such as Down Syndrome, Loays Dietz Syndrome, and Marfan Syndrome, just to name a few. With many examples of successful and inspiring cases, CHAPPS works towards educating parents to be better prepared and not lose hope on their bundle of joy.

Often, parents find out about their baby's CHD during pregnancy. This can be devastating and may require making major decisions by these parents. CHAPPS offers emotional support and other relevant information so they can make the best possible decisions for their family.

However, the real challenge begins when parents take their child home, as they have to cope with the difficulties of taking care of a child with special needs. In such situations, answers to questions such as dietary restrictions, physical activities, and alternatives to performing day-to-day routines can be a tremendous help. Some families may need additional resources to support their family and their medical needs,

lack of which may add to their stress. By associating with CHAPPS, they can access these answers easily.

### REACHING OUT TO PARENTS AND CAREGIVERS

One important fact that often gets overlooked is the health and well-being of the parents and caregivers. If they are well, they can take care of their children better. Thus, CHAPPS makes sure that their needs are also met. Parents, who have already gone through those painful situations, possibly several times, can provide invaluable advice and tips on taking care of a child with CHD. Learning to take care of the child would help lessen the stress.

CHAPPS reaches out to families through personal visits, phone calls, and web resources. The volunteers who help to carry these out are family members of the patients and have had experiences with CHD, open-heart surgeries, and other procedures.

The Board of Management Committee was formed in the year CHAPPS was formed. The members are volunteers who are either patients or their parents, having similar concerns. All of them have joined on a voluntary basis and are dedicated to lending a helping hand to anyone who needs it.

CHAPPS' website is currently under construction. Hence for further enquiries about the support group, please email to the following personnel:

Jacqueline WM Kong - (Member)  
Email: [jacqueline\\_wm\\_kong@nuhs.edu.sg](mailto:jacqueline_wm_kong@nuhs.edu.sg)

Amanda Chiam - (Member)  
Email: [amanda\\_chiam@nuhs.edu.sg](mailto:amanda_chiam@nuhs.edu.sg)





# NUHCS WORKPLAN SEMINAR 2014

Dr. Daniel Tan reflects on the discussions and topics raised at the workplan seminar. Held to review the past work and plans for the future, the seminar touched on the milestones achieved in the past year and the balance of quality and quantity. New findings, services and advancements this year will also enhance treatments for patients as NUHCS effectively takes on new challenges.

Our National University Heart Centre, Singapore (NUHCS) workplan seminar is an annual event held to reflect on our past work and plans for the future. It serves as a platform to keep everyone apprised of the good work that is often done without ceremony on a daily basis and also offers us an opportunity to capitalise on the momentum that will keep us going for the coming year.

In his opening remarks, A/Prof. Tan Huay Cheem articulated the broad overview of NUHCS' key milestones for 2013, which acknowledged that it was a challenging year for all services within Cardiology and Cardiac, Thoracic and Vascular (CTVS) surgery. The backdrop of ever-increasing demand for health services is widespread throughout the health system and this is where we need to embark on a fine calibration of balance between quality versus quantity.

This was the recurring theme of all the presentations from the respective Heads of Departments of CTVS, Cardiology, Nursing, and Operations.

**There was a common understanding among all presentations – the need for deeper collaborations and teamwork to address the multiple medical problems of our patients. It presents us with opportunities to explore new models of care for better utilisation of services and better outcomes for our patients.**

NUHCS will continue to synergise the good works of the Cardiovascular Research Institute in developing its core programmes around heart failure, both in terms of research studies and in clinical services.

Our aim is to focus on key questions that will deepen our understanding of the epidemiology behind Asian patients who develop heart failure and extend these findings to new clinical guidelines that will change our treatments for our patients. We will complement this through the pursuit of new services for advanced heart failure therapy such as the portable ecmo, ultra-filtration for resistant heart failure patients and initiate advance care planning for patients with end stage heart failure.

We acknowledge that 2014 will be equally challenging and the problems we face may seem insurmountable at times, but A/Prof. Tan sums it all up when he quoted Nelson Mandela, who said, "It always seems impossible until it is done." •





### **Dr. Daniel Tan**

**Head, Operations & Administration,  
NUHCS**

Daniel 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).



# ACHIEVEMENT AT THE

# 22<sup>ND</sup>

# ASCTVS MEETING, ISTANBUL, APRIL 2014



**A/Prof. Theodoros Kofidis tells us how NUHCS has made a mark in the international arena. Distinguished CTVS experts from all over the world congregated at this significant event. NUHCS had the most strongly represented delegation and our team conducted a very well-received course.**

The 22<sup>nd</sup> Annual Meeting of the Asian Society for Cardiovascular and Thoracic Surgery (ASCTVS) was held at the historical city of Constantinople (Istanbul), where Oxident meets Orient, and more than 1,600 delegates assembled. Some of the world's "Gurus" in the field of cardiovascular and thoracic surgery shared the stage with Asian talents, to offer a rich spectrum of talks and tutorials, that reflected the tremendous wave of change occurring in the field.

*Prof. Sertaç Çiçek,  
Congress President,  
ASCVTS 2014 (left) and  
Prof. Lee Chuen Neng,  
Deputy Director,  
NUHCS.*



This year, no other organisation was as strongly represented as the NUHCS/CTVS, with a 15-strong delegation. Our doctors and scientists contributed to the event by creating posters; giving invited lectures and satellite courses; taking on chairmanships; and managing scientific and organisational aspects. Everyone – from the youngest trainee, to the division chiefs who rocked the stage – formed friendships and shared the panel area and dinner table, thus expanding our NUHCS reputation and reach around the globe.

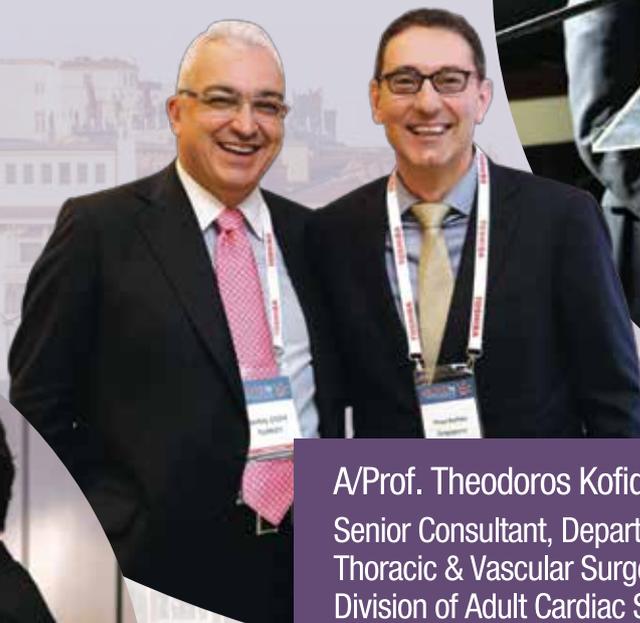
Clinical subjects dominated, as Dr. Chang Guohao, Dr. Harish Mithiran Muthiah and Dr. Ooi Oon Cheong impressed the audience with state-of-the-art talks. Dr. John Tam Kit Chung shone with his talk on the pioneering technique of VATS/SITS lungs surgery.

They came from Australia, Germany, USA, Japan, and many countries. The course was the first of its kind, with distinguished faculty from some of the world's leading institution. Our surgeon, Dr. Jimmy Hon, was honoured to share the stage as invited faculty, providing insights of our expertise in NUHCS. Our affiliation was featured notably in the media, on the congress's daily newspaper and on the Internet. NUHCS/CTVS is now a highlighted term on the global stage in our field, thus continuing a legacy started by its founding leadership.

**Our team has also offered the “icing on the cake” with the first ever truly global course in Minimally Invasive Cardiac Surgery. The innovative course was comprehensive and highly regarded, which instead of the planned 48 participants, drew some 120 delegates, as well as 100 more observers from around the world.**

There would not be a ceremonial success in Istanbul if it were not for the unsung heroes who sacrificed their participation in order to ensure a smooth workflow and service back home in Singapore. A heartfelt thank you to all these surgeons, along with the promise that they will man the next mission and raise the NUHCS/CTVS flag again on the international arena.

We vow to continue to strive for such esteemed distinction, so the hard work that all our deserving staff – nurses and doctors of all wards and subdivisions – can be seen, acknowledged and celebrated. Congratulations to all, and keep the flame of excellence burning!•



### **A/Prof. Theodoros Kofidis**

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

As an expert minimally invasive heart surgeon, A/Prof. Kofidis promotes and 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 and stress to the patient, shorten length of stay and produce better cosmetic result.



# IMMERSIVE LEARNING AT THE 9<sup>TH</sup> INTERVENTIONAL CARDIOLOGY INTRODUCTORY COURSE

Dr. Saket S Junagade gave an overview of the intensive 2-day practice-oriented workshop, which participants learn about the angiographic projections, the right selection of catheters, and even the tips and tricks of wire techniques in a simulated learning environment. Many cardiologists with little or no experience in interventional cardiology have benefited from the course and Dr. Junagade believes that it will continue to benefit more physicians in the future.

The introductory course in interventional cardiology was a 2-day intensive course for physicians, cardiology trainees and budding interventional cardiologists. The course has been running successfully since its inception in 2006, as evidenced by

the strong response, with participants hailing from as far as Brazil in the West and New Zealand in the East.

## KNOWLEDGE SHARED AT THE COURSE

The course had both interactive lectures and hands-on training with simulators and was managed entirely by interventional cardiologists from NUHCS.

This year, the speakers included A/Prof. Adrian Low, A/Prof. Ronald Lee, A/Prof. Tan Huay Cheem, Dr. Joshua Loh and Dr. Edgar Tay. The topics were based on how to obtain optimal angiographic pictures, an art that can be mastered with attention to finer details; a pragmatic overview on guiding catheter selection; coronary

anomalies and complication management in the cath lab; the selection of guidewires, balloons and stents, and tips and tricks on selecting the right devices for a successful intervention.

For the hands-on sessions with simulators, the participants were divided into 4 groups for effective teaching and hands-on learning. The simulators gave an almost real life experience to the participants without having to worry about the complications!

## CONNECTING AND INTERACTING

The 2-day course was a treat for the senses as it featured excellent lectures, visuals and hands-on experience with the simulators as well as delicious food for the taste buds! The dinner at 'The Carousel' gave the participants an opportunity for an informal interaction with the faculty in a relaxed setting.

The feedback from the delegates was excellent, as trainees such as myself benefited greatly from the course. I am sure that the course will continue to educate and train many physicians in years to come. •

A/Prof. Tan Huay Cheem doing a demonstration using the simulator.



# VISIT BY EMINENT EXPERT – DR. DECLAN O'REGAN

## What new knowledge can be gained from a visiting cardiovascular magnetic resonance (CMR) expert?

The National University Heart Centre, Singapore (NUHCS) was honoured to have had the opportunity to host Dr. Declan O'Regan, an expert in CMR, on 30 April 2014. He was a visiting expert under the Ministry of Health's Health Manpower Development Plan (HMDP). Dr. O'Regan is a consultant cardiac radiologist at the Robert Steiner magnetic resonance imaging (MRI) Unit of Hammersmith Hospital, Imperial College London. He is also working on the investigation of the genetic and environmental causes of heart diseases at the MRC Clinical Sciences Centre. He has an ongoing collaboration with the National Heart Centre Singapore (NHCS) on using 3D-MRI and genetic sequencing to identify genes responsible for heart failure and the effects of body fat on the cardiovascular system and heart disease.

### CMR TOPICS OF INTEREST

Dr. O'Regan started the afternoon with a lecture on the role of CMR in the evaluation of acute myocardial infarction (AMI). He presented on the utility of various CMR sequences for identification of myocardial oedema, microvascular obstruction, myocardial infarction, and the myocardium at risk. He also talked about the value of

CMR in AMI risk prognostication. This lecture was followed by the presentation of four cases of intracardiac and paracardiac masses scanned at the National University Hospital. Dr. O'Regan provided invaluable insights into the magnetic resonance characteristics of various cardiac tumours and suggestions on how to optimise scanning parameters. The final session was a discussion on how best to teach CMR to our local cardiology and radiology trainees. Dr. O'Regan shared his experience with the CMR training programme at the Hammersmith Hospital and gave suggestions and ideas on how to improve our teaching programme.

### APPRECIATION AND LEARNING OPPORTUNITY

We were privileged to learn from Dr. O'Regan, who is a truly warm and friendly gentleman and generously shared his knowledge and experience.



He is multi-talented as we learnt that not only is he an accomplished radiologist and researcher but he is also a licensed helicopter pilot who indulges in landscape photography.

I would like to thank Prof. Terrance Chua, deputy medical director of NHCS; Dr Lynette Teo, senior consultant, Department of Diagnostic Imaging; Dr Devinder Singh, consultant, Department of Cardiology; and the secretarial and administrative staff of NUHCS for helping to organise this visit and making it a success. •



**Dr. Chai Ping**  
Senior Consultant,  
Department of Cardiology  
and Director of Clinical Services,  
NUHCS

After being accredited as a specialist in cardiology in 2002, Dr. Chai did his fellowship in cardiovascular magnetic resonance at the Royal Brompton Hospital, London, United Kingdom from 2004 to 2005. His specialty interest lies in heart failure and non-invasive cardiovascular imaging. He is heavily involved in medical and nursing education.

# NEW PRESIDENCY AT THE SINGAPORE CARDIAC SOCIETY



**Elected President of the Singapore Cardiac Society this year, A/Prof. Poh hopes to advance cardiovascular medicine and lead the society to greater heights.**

A/Prof. Poh Kian Keong started becoming active in the Singapore Cardiac Society (SCS) when he was a medical officer attending the weekend SCS Annual Scientific Meetings (ASM). These meetings are not only interesting, but also provide good medical learning experiences and insights into cardiac technology and management conundrums.

In 2001, he became one of the first associate members of the society as the memberships opened for cardiac registrars. Upon returning from his Health Manpower Development Programme (HMDP) stint in Boston, USA, he participated in the 19<sup>th</sup> ASM as a faculty, debating on a stem cell topic in 2007. He was part of the organising committee for the 20<sup>th</sup> ASM in 2008 and then the organising chairman for the 21<sup>st</sup> ASM. He has been part of the SCS council since 2008, as Honorary Treasurer for two consecutive years, Honorary Secretary in 2010 and Vice President from 2011-2013. This year, he was elected President. He is the third person elected President from NUHCS. The other two presidents from NUHCS were A/Prof. Tan Huay Cheem from 2003/04, 2004/05 and Prof. Chia Boon Lock in 1977/78, 1980/81, 1983/84 and 1990/91.

A/Prof. Poh is extremely grateful for the opportunity and is indeed humbled by the appointment.

He aims to advance the knowledge and practice of Cardiovascular Medicine, promote research and publications of medical and scientific works, and regional and international co-operation in the field.

He wants to involve and benefit more SCS members in meetings including new speciality seminars that SCS will organise over the year. He wants to lead SCS with an academic inclination by involving SCS and its members more in education and research. Furthermore, he hopes SCS will mature into the leading society locally and in the Asean and Asia Pacific region. •

**A/Prof. Poh Kian Keong**  
Senior Consultant,  
Department of Cardiology, NUHCS

Prof. Poh did his training in cardiology at NUHCS. He is currently the Editor of PULSE, a bi-annual publication of NUHCS and Editor-in-Chief of the Singapore Medical Journal. His key interests lie in endothelial progenitor cells, echocardiography and cardio-metabolic conditions.



SCS Council 2014/15 and office bearers.

# Singapore Cardiac Society Annual Scientific Meeting Awards

**NUHCS has certainly done well in the SCS ASM Young Investigators' Awards and Free Paper Sessions this year and almost every year. With a strong research culture, it encourages seniors to mentor juniors for research projects that are achievable over their busy clinical schedules and training.**

The presentation titles and authors receiving prizes at the SCS ASM this year are:

## Young Investigators' Awards

### Basic Science

**1<sup>st</sup>** – NUHCS Department of Cardiology

#### **Improvement Of Endothelial Progenitor Cell Number And Function In Diabetes And Obesity With Thymosin Beta-4**

Poay Sian Sabrina Lee<sub>1</sub>, Lei Ye<sub>2</sub>, Tiong Cheng Yeo<sub>1</sub>, Arthur M. Richards<sub>1</sub>, Huay Cheem Tan<sub>1</sub>, Kian Keong Poh<sub>1</sub>

**2<sup>nd</sup>** – NUHCS Department of Cardiology

#### **Obstructive Sleep Apnea And Coronary Plaque Characteristics**

Adeline Tan<sub>1</sub>, William Hau<sub>2</sub>, Hee-Hwa Ho<sub>3</sub>, Haleh Ghaem Maralani<sub>4</sub>, Germaine Loo<sub>2</sub>; See-Meng Khoo<sub>1</sub>, Bee-Choo Tai<sub>4</sub>, Arthur M. Richards<sub>2,5</sub>, Paul Ong<sub>3</sub>, Chi-Hang Lee<sub>2,5</sub>

### Clinical Science

**1<sup>st</sup>** – NUHCS Department of Cardiology

#### **Ethnicity-And Sex-Specific Electrocardiographic Criteria For Left Ventricular Hypertrophy: Community-Based Data From An Asian Population**

Chang Fen. Xu, Eugene S.J. Tan, Liang Feng, Rajalakshmi Santhanakrishnan, Michelle MY Chan, Ling Lieng Hsi, Arthur M. Richards, Tze P. Ng, Carolyn S.P. Lam

**2<sup>nd</sup>** – NUHCS Department of Cardiology

#### **Prognostic Implication Of Obstructive Sleep Apnea Diagnosed By Post-Discharge Sleep Study In Patients Presenting With Acute Coronary Syndrome**

Germaine Loo, Adeline Y Tan, Chieh-Yang Koo, Bee-Choo Tai, Arthur M. Richards, Chi-Hang Lee

**3<sup>rd</sup>** – NUHCS Department of Cardiology

#### **Long-Term Prognostic Impact Of Acute Heart Failure Among Patients Hospitalized For Acute Myocardial Infarction**

Leonardo P. Carvalho<sub>1</sub>, Fei Gao<sub>2,8</sub>, Qifeng Chen<sub>2</sub>, Ling-Ling Sim<sub>2</sub>, Tian-Hai Koh<sub>2</sub>, David Foo<sub>3</sub>, Hean-Yee Ong<sub>4</sub>, Khim-Leng Tong<sub>5</sub>, Huay-Cheem Tan<sub>1</sub>, Tiong-Cheng Yeo<sub>1</sub>, Chow-Khuan Yew<sub>6</sub>, Arthur M. Richards<sub>1</sub>, Eric D. Peterson<sub>7</sub>, \*Terrance Chua<sub>2</sub>, \*Mark Y. Chan<sub>1</sub>

### Free Paper Session 1

**1<sup>st</sup>** – NUHCS Department of Cardiology

#### **Iron Deficiency In A Multi-Ethnic Asian Population With Heart Failure**

Tee Joo Yeo<sub>1</sub>, Raymond C. C. Wong<sub>1</sub>, Poh Shuan Daniel Yeo<sub>2</sub>, David Sim<sub>3</sub>, Gerard Kui Toh Leong<sub>4</sub>, Hean Yee Ong<sub>5</sub>, Fazlur Jaufeerally<sub>6</sub>, Tze Pin Ng<sub>7</sub>, Arthur M. Richards<sub>1,8</sub>, Carolyn S P Lam<sub>1</sub>

### Free Paper Session 2

**1<sup>st</sup>** – NUHCS Department of Cardiology

#### **Impact Of Obstructive Sleep Apnea On Cardiovascular Outcomes In Patients Treated With Percutaneous Coronary Intervention: Rationale And Design Of The Sleep And Stent Study**

Chieh Yang Koo, Germaine Loo, Junjie Zhang, Ruogu Li, Rithi Sethi, Thun-How Ong, Bee-Choo Tai, Chi-Hang Lee

### Free Paper Session 3

**1<sup>st</sup>** – NUHCS Department of Cardiology

#### **Valvulo Arterial Impedance And Systemic Arterial Compliance Are Associated With Changes In Flow Category In Severe Aortic Stenosis With Preserved Left Ventricular Ejection Fraction On Medical Therapy**

Ivandito Kuntjoro, Glenn Kay Mun Lee, Edgar Tay, Tiong Cheng Yeo, Kian Keong Poh

This is an impressive record and we look forward to NUHCS' good performance each year.



**Emeritus Professor Chia Boon Lock and Dr. Charles Toh (Mount Elizabeth Hospital), who were both former Presidents, received the inaugural Singapore Cardiac Society Lifetime Achievement Award.**

**Prof. Chia also delivered the prestigious 20<sup>th</sup> Sukaman Memorial Lecture at the 20<sup>th</sup> ASEAN Federation of Cardiology Congress which was held in Kuala Lumpur in June 2014. The topic of his lecture was 'ST segment elevation – new electrocardiographic insights in 2014.'**

# A FULFILLING EXPERIENCE AT THE AMERICAN COLLEGE OF CARDIOLOGY EVENT 2014

**Dr. Eugene Tan reflects on a humbling and enriching experience where NUHCS was invited to present two of our ongoing studies at an international scientific event.**

At the recent American College of Cardiology (ACC) 63<sup>rd</sup> Annual Scientific Session and Expo 2014 held in Washington DC, I had the opportunity of representing the National University Heart Centre, Singapore (NUHCS). Led by A/Prof. Carolyn Lam, our team was invited to present two of our ongoing studies. The first, entitled 'Association of Ethnicity, Age, Body Size and Gender on Electrocardiographic Values in the Community', was presented as an oral moderated poster, and the second, 'Ethnicity and Sex-specific Echocardiographic and Electrocardiographic Criteria for Left Ventricular Hypertrophy: Community-Based Data from an Asian Population', was presented as a traditional flat-board poster.

We were extremely pleased and honoured to be awarded the 'Highest Ranking Abstract from Singapore' for our work on 'Association of Ethnicity, Age, Body size and Gender on Electrocardiographic values in the Community', in ACC 2014, of which credit went to A/Prof. Carolyn Lam and the rest of the team.

The 63<sup>rd</sup> Annual Scientific Session and Expo was held on the 29 to 31 of March this year, amidst the unpredictably chilly Washington spring. Adding to the occasion, Washington snowed unexpectedly without any early red flags, to further welcome the conference attendees.

Merely being at the conference itself was a humbling experience. Top, renowned cardiologists, all leading experts in their own fields, from different corners of the world, congregated to discuss what they know best – cardiology. The three days brought forth an exchange of technological and therapeutic advances, a wealth of knowledge and fresh anecdotes, and a multitude of educational sessions. The scale of the scientific meeting meant that at any one time, lectures and speeches were given on individual cardiology subspecialties, and participants such as myself were given the luxury to select beforehand the sessions we wanted to attend.

Over the three days, leading experts were on hand to demonstrate the importance of refining the work we put into our daily clinical practice, and it was greatly satisfying to learn and saturate my mind fully with new knowledge.

Work aside, the meeting also served as a platform to interact with other doctors from all over the world. They ranged from residents to senior consultants, and it was exciting to meet these doctors. We shared our experiences and nature of work in our respective home countries.

The session had indeed been a great learning opportunity and a truly unforgettable experience. I am very thankful to A/Prof. Carolyn Lam and team for this wonderful opportunity, and I look forward to attending the next ACC Annual Scientific Meeting in 2015. •

**The amount of effort and work presented at the scientific meeting were hugely inspiring, highlighting the future of cardiovascular medicine and the constant need to revisit tried and tested strategies, and seek new ones to surpass well-proven methods used at present.**

**Dr. Eugene Tan Siang Joo**

**MBBS (Australia)  
Resident, Internal Medicine, NUHS**

Dr. Tan graduated from Monash University, Australia in 2011. He completed his housemanship in Singapore across various hospitals in 2012. Following this, he joined the NUHS Internal Medicine Residency Programme in July 2013 and has been a part of NUHS ever since.



# PROJECT ON 'NURSE-LED SWALLOWING SCREENING IN POST-EXTUBATION PATIENTS'

**Awarded with an oral presentation at JBI International Convention, the EBP project by Ms. Lo Chew Yong and team recognises the importance of an initial screening of patients' swallowing function.**

After months of working on the first Coronary Care Unit (CCU)'s nursing evidence-based practice (EBP) project on 'nurse-led swallowing screening in post-extubation patients', NC Hui Qing and I were delighted that this project was awarded with an Oral Presentation at the Joanna Briggs Institute (JBI) International Convention on 21 and 22 October 2013. This was indeed an affirmation of our team's hard work and efforts, which paid off with the great opportunity to showcase our project internationally.

## Background and Context

We are aware that the use of endotracheal tube is temporary but unfortunately, it is not without risk. The complications include laryngeal injury and dysfunction of the swallowing reflex. The major consequence of dysphagia, which can be unrecognised, is aspiration pneumonia. It is associated with increased hospital costs, prolonged length of stay, and increased morbidity and mortality.

*Getting ready to deliver the oral paper.*



*From left: Dr. Emily Ang, Nurse Clinician Nyeo Hui Qing and Advance Practice Nurse Lo Chew Yong at the JBI International Convention, Adelaide, Australia, 2013.*

**We recognised that the bedside nurse can play a big difference in clinical by undertaking an initial screening of swallowing function from a group of patients on post-extubation, using an evidence-based swallowing screening tool.**

Once the patient is identified as having a potential or actual risk of dysphagia, the patient will be kept nil by mouth and referred to a speech therapist (ST) for a formal assessment. A sample of 20 post-extubated patients was audited during the implementation of this new practice from December 2012 to March 2013. Three patients were appropriately referred to ST, while the other 17 patients were discharged without complication of aspiration pneumonia.

## Recognising contributions

The success of this project was attributed to the EBP nursing team's enthusiasm and commitment, the support from the clinical directors of CCU, management and stakeholders, and the positive responses from the nurses. We believe that time, positive feedback and auditing are crucial elements to ensure practice change and sustainability.

## On reflection

Personally, I am very proud of this very first EBP project implemented in CCU. Not only does it improve patient safety and care, it

also streamlines the processes of ST referral workflow as well as creating a standardised workflow for our nurses. I am delighted to see that the nurses in CCU are motivated by this milestone and have even moved on to our second and third EBP projects with the aim to improve our patient care.

Hui Qing and I received our first-hand experience of making an oral presentation overseas through this project. The exposure at the conference and networking with international delegates have allowed us to share and gain experience, knowledge and finding areas in need of evidence-based nursing practice to continuously improve the effectiveness and efficiency of our nursing care for our patients. •



## Ms. Lo Chew Yong

**Acute Care Advance Practice Nurse,  
Coronary Care Unit (CCU), 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 Master 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 practices, and groom experienced nurses to be nurse clinicians.

# NMRC

## Award Winners 2014 - Our four proud recipients

**The National University Heart Centre, Singapore (NUHCS) is honoured to have clinched multiple awards at the National Medical Research Council (NMRC) Awards Ceremony 2014. Recipients were awarded based on their calibre and potential to be outstanding clinician scientists in their field.**

Held on 26 and 27 February at Grand Copthorne Waterfront Hotel, Singapore, the 2014 NMRC Awards Ceremony and Research Symposium is an initiative to recognise Human Capital and Talent Development awardees and to highlight achievements from the various NMRC-funded research programmes. This year, the theme of the event is 'Research

and Innovation for Better Health', combining the Awards Ceremony and the Research Symposium into a single event.

The Research Symposium was inaugurated in 2010 and is a platform to promote and inculcate the spirit of Translational and Clinical Research in Singapore's biomedical and healthcare research landscape. The Awards Ceremony recognises outstanding Clinician Scientists under the various NMRC Human Capital and Talent Development Programmes, including the Singapore Translational Research (STaR) Investigator Award and the Clinician Scientist Award (CSA).

The CSA provides salary and funding support for outstanding clinician scientists, who possess a consistent record of excellence in research, to enable them to carry out internationally competitive translational and clinical research. The Senior Investigator (SI) Category is to primarily recognise clinician scientists who multitask with sustaining high levels of leadership and productivity in their research and mentoring MBBS-PhD students and junior clinician scientists.

The applications were evaluated through a two stage review process comprising an international peer review stage followed by a local selection panel. The rigorous review process took 5-6 months after the closing of the application. We have A/Prof. Carolyn Lam, A/Prof. Roger Foo, A/Prof. Ronald Lee and Dr. Yeo Tee Joo to share with us what the award means to them.



Associate Professor Carolyn Lam

### CLINICIAN SCIENTIST AWARD – SENIOR INVESTIGATOR CATEGORY

The award for **Heart Failure (HF) Clinical Studies** helps to deepen close collaborations with top cardiovascular centres within Asia, and to forge new links with industry partners for cardiovascular research in Asians. The ASIAN-HF network forms a novel platform for scientific exchange with Western counterparts, via joint efforts such as combined scientific sessions at annual congresses, educational events, and, importantly, training and fellowships which I hope to encourage and advance Singapore to become a regional hub for cardiovascular research in Asia.



**Ms. Angeline Tan**  
Assistant Manager,  
Communication &  
Development, Operations &  
Administration, NUHCS

Angeline is a member of the Communication & Development team, which is responsible for orchestrating events and all internal and external communication. The objective is to ensure timely and effective messages on heart health matters to reach our patients, staff, media, corporate partners and the general public. Angeline's role in the team is to manage all the corporate and patient education collaterals under NUHCS, video production and The Heart Fund. She contributes towards the editorial work of PULSE.



Associate Professor Roger Foo



Associate Professor Ronald Lee



Dr. Yeo Tee Joo

Heartiest congratulations to four of our doctors from NUHCS who have exceeded expectations and received recognition at this distinguished annual event. You have done NUHCS proud!

### CLINICIAN SCIENTIST AWARD – SENIOR INVESTIGATOR CATEGORY

This award has allowed me to return to Singapore and continue being a clinician scientist here in my home country. I am able to further my research in **Heart Failure Epigenomics and Epigenetics** which I began in Cambridge, United Kingdom since 1999.

### TRANSITION AWARD

The principal objective of the Transition Award is to assist budding, young clinicians who have just returned from formal research training, to build up their capability in research and enhance their probability of success in obtaining independent research support. The long-term goal of the award is to increase the cohort of new and talented, NMRC-supported independent clinician scientists. I am pleased with the award for my research in **Relationships between Sleep Apnea and Cardiovascular Disease**.

### MINISTRY OF HEALTH HEALTHCARE RESEARCH SCHOLARSHIP (MASTER OF CLINICAL INVESTIGATION)

To promote clinical and translational research in Singapore, the Research Scholarships aims to equip a selected group of Medical Specialist Trainees and Residents with the academic qualifications and skills to pursue careers as Clinician Scientists through a structured yet flexible training route.

The award is a springboard to a structured research programme that equips me with the relevant knowledge and skills to carry out research more effectively. My area of research interest lies in **intravenous iron therapy, sports cardiology and cardiac rehabilitation**.•

## WHAT'S ON

The first official meeting of the Heart Rehab support group was held on 17 February. A/Prof. Tan invited Mr. Vernon Kang, CEO of Singapore Heart Foundation (SHF), and Ms. Jacqueline Leong, Assistant Manager of SHF's Heart Wellness Centre, to share their experiences in organising and managing their own support groups.



▲ The objective of the Heart Rehab Support Group is to encourage heart patients to take charge of their lives.

A/Prof. Tan has been appointed as Visiting Professor of Guangdong General Hospital and Guangdong Academy of Medical Sciences, his seventh Professorship in China.



Live a Healthy Lifestyle,  
Stay away from Heart Disease and Stroke



▲ Behind the scenes of Channel 5 programme, Body and Soul – 'The Heart of The Matter', featuring A/Prof. Tan and A/Prof. Carolyn Lam on 24 January.

Go Red for Women, held on 7 February, raised awareness of heart disease amongst women by encouraging them to dress in red to show their support and organising fun and healthy activities at NUHS Tower Block.





A snapshot of the farewell dinner held at the Vineyard, HortPark on 2 May 2014 for Residents and Medical Officers (MOs) who were a part of the NUHCS team from 3 May 2013 to 2 February 2014.

▶ Chief of Department of Cardiology, A/Prof. Yeo Tiong Cheng, came to give his support at the NUH Nursing and Allied Health Open House on 8 March.



A/Prof. Tan performed a live intervention demonstration at the CardioVascular Summit-TCTAP 2014, Seoul, Korea, on 23 April.



▲ Dr. Peter Chang was a guest on Channel NewsAsia's programme, First Look Asia, on 10 April. He discussed on how too much running may damage the heart and shorten life span.

# NEW COLLEAGUES AND PROMOTIONS



## NEW COLLEAGUE

Dr. Loh Poay Huan  
Department of Cardiology  
Consultant  
Apr-14

## NEW COLLEAGUE

Dr. Md Faizus Sazzad  
Department of Cardiac,  
Thoracic & Vascular Surgery  
Clinical Fellow  
Apr-14

## PROMOTION

Dr. Kang Giap Swee  
Department of Cardiac,  
Thoracic & Vascular  
Surgery  
Consultant  
Jan-14

## PROMOTION

Dr. Chester Drum  
Department of  
Cardiology  
Consultant  
Jan-14

## PROMOTION

A/Prof. Mark Chan  
Department of  
Cardiology  
Senior Consultant  
Jan-14

# ABSTRACTS

## **American College of Cardiology 63<sup>rd</sup> Annual Scientific Session & Expo. Washington, DC, United States of America. 29 – 31 March 2014**

Association of ethnicity, age and body size with electrocardiographic values in the community.

Tan E, Chang XF, Santhanakrishnan R, Chan MQ, Seow SC, Ching CK, Richards AM, Tze PN, Lim TW, Lam CS.

Body mass index and the effect on left ventricular remodeling in aortic stenosis in an asian cohort.

Lin WQ, Poh KK.

Characterization of the aortic pulse profile of patients with aortic stenosis versus controls using a novel radial artery applanation tonometry device.

Lee GK, Oinuma S, Ting CM, Poh KK.

Circadian dependence of infarct size and clinical outcomes in 6710 patients with ST elevation myocardial infarction.

Seneviratna A, Lim GH, Devi A, Carvalho L, Chua T, Tan HC, Foo D, Tong KL, Ong HY, Richards AM, Yew CK, Chan MY.

Ethnicity and sex-specific echocardiographic and electrocardiographic criteria for left ventricular hypertrophy: community-based data from an asian population.

Chang XF, Tan E, Liang F, Santhanakrishnan R, Chan M, His LL, Lim TW, Richards AM, Tze PN, Lam CS.

Functional iron deficiency in heart failure with preserved versus reduced ejection fraction.

Yeo TJ, Yeo D, Sim D, Kui G, Ong HY, Jaufeerally F, Lee KY, Ling LH, Richards AM, Lam CS.

## **World Congress of Cardiology Scientific Sessions 2104. Melbourne, Australia. 4 – 7 May 2014**

Functional iron deficiency in heart failure with preserved versus reduced ejection fraction.

Yeo TJ, Yeo D, Sim D, Kui G, Ong HY, Jaufeerally F, Lee KY, Ling LH, Richards AM, Lam CS.

Iron deficiency in a multi-ethnic Asian population with heart failure.

Yeo TJ, Wong RC, Yeo D, Sim D, Kui G, Ong HY, Jaufeerally F, Ng TP, Richards AM, Lam CS.

## **American Thoracic Society 2014 International Conference. San Diego, United States of America. 16 – 21 May 2014**

Obstructive sleep apnea and coronary plaque characteristics.

Tan AY, Hau W, Ho HH, Maralani G, Loo G, Khoo SM, Tai BC, Richards AM, Ong P, Lee CH.

The influence of timing of sleep study and diagnosis of obstructive sleep apnoea in patients presenting with acute myocardial infarction and stable coronary artery disease.

Tan AY, Low TT, Hong WZ, Tai BC, Khoo SM, Chan MY, Richards AM, Lee CH.

## **22<sup>nd</sup> Annual Meeting of the Asian Society for Cardiovascular and Thoracic Surgery. Istanbul, Turkey. 3 – 6 April 2014**

A rare presentation of intralobar Pulmonary Sequestration with two aberrant vessels connected to aorta in an asymptomatic adult asian female.

Nieh CC, Chua YC, Agasthian T.

Cannulation strategies in type A aortic dissection in a tertiary institution.

Chang G, Kofidis T.

Dual delivery of vascular endothelial growth factor and angiotensin-1 via injectable PEGylated fibrinogen hydrogel increased degree of microvascular maturity in ischemic hearts.

Jalil RA, Johari NA, Thien DTD, Wang J, Plotkin M, Seliktar D, Lee CN, Kofidis T.

Improvement in left ventricular function assessed by tissue doppler imaging after aortic valve replacement for severe aortic stenosis.

Nieh CC, Teo A, Oinuma S, Soo WM, Zhang J, Lee G, Singh D, Poh KK.

Myocardial abscess in the crux of the heart.

Chang G, Kofidis T.

Perceval valve experience in Singapore.

Muthiah HM.

Role of micro RNA in arterial wall remodeling in patients with advanced coronary artery disease undergoing bypass surgery.

Sorokin V, Woo CC, Lin XY, Kofidis T, Lee CN.

Secondary chondrosarcoma arising from a solitary benign enchondroma in a young asian female: a case report.

Nieh CC, Chua YC, Agasthian T, Htet HM.

Self-assembling heparin mimetic peptide scaffolds stimulates robust degree of arteriogenesis in ischemic myocardium.

Jalil RA, Ramanujam VS, Garip CI, Guler MO, Tekinay AB, Kofidis T.

Spontaneous haemopneumothorax: our experience with surgical management.

Tay J, Yee YC, Asmat A.

Takotsubo cardiomyopathy – the forgotten syndrome.

Ooi OC.

# PUBLICATIONS

Bedside pleural procedures by pulmonologists and non-pulmonologists: a 3-year safety audit. *Respirology*. 2014 Apr. 19(3):396-402. See KC, Ong V, Teoh CM, Ooi OC, Widjaja LS, Mujumdar S, Phua J, Khoo KL, Lee P, Lim TK.

Combined transcatheter therapy of aortic stenosis and thoracic aortic aneurysm. *Ann Acad Med Singapore*. 2014 May. 43(5):279-81. Tay EL, Hon JK, Yip JW, Teoh KL, Poh KK, Ang SB, Tan LK, Robless P.

Comparison of different surgical techniques in 112 consecutive patients with aortic root operations: when should the valve be spared? *J Heart Valve Dis*. 2014 Jan. 23(1):9-16. Blehm A, Schurr P, Sorokin VA, Zianikal I, Kamiya H, Albert A, Lichtenberg A.

Developing therapies for heart failure with preserved ejection fraction: current state and future directions. *JCHF*. 2014 Apr. 2(2):97-112. Butler J, Fonarow G, Zile M, Lam CS, Roessig L, Schelbert E, Shah S, Ahmed A, Bonow R, Cleland J, Cody R, Collins S, Dunnmon P, Filippatos G, Lefkowitz M, Marti C, McMurray J, Misselwitz F, Nodari S, Connor C, Pfeffer M, Pieske B, Pitt B, Rosano G, Sabbah H, Senni M, Solomon S, Stockbridge N, Teerlink J, Georgiopoulou VV, Gheorghiade M.

Effect of sex and body size on qrs duration thresholds of benefit from cardiac resynchronization therapy. *European Heart Journal*. 2014 Jan 15. Lam CS, Lim TW.

Effects of fluid resuscitation with 0.9% saline versus a balanced electrolyte solution on acute kidney injury in a rat model of sepsis. *Crit Care Med*. 2014 Apr. 42(4):e270-8. Zhou F, Peng ZY, Bishop JV, Cove ME, Singbartl K, Kellum JA.

Fiber optic projection-imaging system for shape measurement in confined space. *Scientific World Journal*. 2014 Feb 10. Chen L, Bavigadda V, Kofidis T, Howe RD.

Haemopneumothorax related to acupuncture. *Acupunct Med*. 2014 Mar 25. Tan KQ, Asmat A.

Heart failure with preserved ejection fraction: a clinical dilemma. *European Heart Journal*. 2014 Jan 27. Komajda M, Lam CS.

Hemolysis in pediatric patients receiving centrifugal-pump extracorporeal membrane oxygenation: prevalence, risk factors, and outcomes. *Crit Care Med*. 2014 May. 42(5):1213-20. Lou S, Maclaren G, Best D, Delzoppo C, Butt W.

Is continuation of antiplatelets until coronary artery bypass safe in Asians? *Asian Cardiovasc Thorac Ann*. 2014 Jan 27. Vu TD, Zaw MH, Chang G, Hu SL, Tay CW, Ng CW, Chia DK, Lee CN, Kofidis T.

Missed case of sinus venosus atrial septal defect post coronary artery bypass grafting. *J Cardiothorac Surg*. 2014 May 19. De SD, Aye M, Shankar S.

Mistaking complications of critical illness for those of critical care. *Crit Care Med*. 2014 Feb. 42(2):e173-4. Maclaren G, Butt W, Peek G, Lynch WR, Bartlett RH.

Not off the assembly line but properly tailored: customizing cannulation for extracorporeal life support. *Pediatr Crit Care Med*. 2014 May. Maclaren G, d'Udekem Y, Butt W.

Perioperative applications of deformation (myocardial strain) imaging with speckle-tracking echocardiography. *J Cardiothorac Vasc Anesth*. 2014 Feb. 28(1):128-40. Chong A, Maclaren G, Chen R, Connelly KA.

Quantitative profiling of the rat heart myoblast secretome reveals differential responses to hypoxia and re-oxygenation stress. *J Proteomics*. 2014 Feb 26. 98:138-49. Li X, Ren Y, Sorokin V, Poh KK, Ho HH, Lee CN, de Kleijn D, Lim SK, Tam JP, Sze SK.

Sex-specific cardiovascular structure and function in heart failure with preserved ejection fraction. *Eur J Heart Fail*. 2014 May. Gori M, Lam CS, Gupta D, Santos A, Cheng S, Shah A, Claggett B, Zile M, Krainer E, Pieske B, Voors A, Packer M, Bransford T, Lefkowitz M, McMurray J, Solomon SD, PARAMOUNT Investigators.

Single incision minimally invasive cardiac surgery (simics). *World Society of Cardio-Thoracic Surgeons*. 2014 Jan 31. Kofidis T, Vu DC, Ti LK, Tay E, Lee CN.

The antimalarial drug artesunate inhibits primary human cultured airway smooth muscle cell proliferation. *Am J Respir Cell Mol Biol*. 2014 Feb. 50(2):451-8. Tan SS, Ong B, Cheng C, Ho WE, Tam JK, Stewart AG, Harris T, Wong WS, Tran T.

The global health and economic burden of hospitalizations for heart failure: lessons learned from hospitalized heart failure registries. *J Am Coll Cardiol*. 2014 Apr 1. Ambrosy A, Fonarow G, Chioncel O, Greene S, Vaduganathan M, Lam CS, Sato N, Shah A, Gheorghiade M.

Volume-outcome relationships in extracorporeal membrane oxygenation: is bigger really better? *Crit Care Med*. 2014 Mar. 42(3):726-7. Maclaren G, Pasquali SK, Dalton HJ.

What's new in paediatric extracorporeal membrane oxygenation? *Intensive Care Med*. 2014 Jun 5. MacLaren G, Brown KL, Thiagarajan RR.

**The National University Heart Centre, Singapore (NUHCS) puts together cardiac specialists and experts from a multitude of medical and surgical disciplines. Our cardiologists from the Department of Cardiology and surgeons from the Department of Cardiac, Thoracic and Vascular Surgery work closely to provide high quality cardiovascular care.**



Every day, we save lives by providing financial relief to needy patients, funding groundbreaking research, and training our medical specialists to enable the delivery of the latest and best possible care to patients. This is why the support we receive from individuals, and charitable trusts and foundations, is essential.

Make a donation and help us continue the fight for every heartbeat!

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**The NUHCS provides a broad spectrum of cardiovascular services, spanning from screening and diagnosis to treatment in a one-stop centre for its patients.**

### Department of Cardiology

Our cardiologists are specialised in the diagnosis and treatment of heart disease.

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|--|--|
| <b>Associate Professor Yeo Tiong Cheng</b> | <ul style="list-style-type: none"> <li>• Head</li> <li>• Senior Consultant</li> </ul>  |
| <b>Associate Professor Adrian Low</b>      | <ul style="list-style-type: none"> <li>• Programme Director, Acute Coronary Syndrome</li> <li>• Director, Angiography Centre</li> <li>• Senior Consultant</li> </ul>   |
| <b>Associate Professor James Yip</b>       | <ul style="list-style-type: none"> <li>• Programme Director, Congenital/Structural Heart Disease</li> <li>• Senior Consultant</li> </ul>   |
| <b>Dr. Raymond Wong</b>                    | <ul style="list-style-type: none"> <li>• Programme Director, Heart Failure</li> <li>• Director, Cardiac Rehabilitation, Diagnostic Cardiac Laboratory and Nuclear Cardiology</li> <li>• Senior Consultant</li> </ul> |
| <b>Dr. Seow Swee Chong</b>                 | <ul style="list-style-type: none"> <li>• Programme Director, Heart Rhythm</li> <li>• Senior Consultant</li> </ul>  |
| <b>Dr. Chai Ping</b>                       | <ul style="list-style-type: none"> <li>• Clinical Director</li> <li>• Senior Consultant</li> </ul>   |

### Department of Cardiac, Thoracic and Vascular Surgery

Our surgeons are specialised in the surgery of the heart, lungs, chest, oesophagus and the major blood vessels of the body.

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|--|---|
| <b>Adjunct Associate Professor Michael Caleb</b> | <ul style="list-style-type: none"> <li>• Head</li> <li>• Senior Consultant</li> </ul>   |
| <b>Associate Professor Theodoros Kofidis</b>     | <ul style="list-style-type: none"> <li>• Head, Division of Adult Cardiac Surgery</li> <li>• Director, Robotic Cardiac Surgery Program</li> <li>• Senior Consultant</li> </ul> |
| <b>Dr. Julian Wong</b>                           | <ul style="list-style-type: none"> <li>• Head, Division of Vascular Surgery</li> <li>• Director, Diagnostic Vascular Laboratory</li> <li>• Senior Consultant</li> </ul>       |
| <b>Dr. John Tam</b>                              | <ul style="list-style-type: none"> <li>• Head, Division of Thoracic Surgery</li> <li>• Senior Consultant</li> </ul>   |
| <b>Associate Professor Graeme MacLaren</b>       | <ul style="list-style-type: none"> <li>• Director, Cardiothoracic Intensive Care</li> <li>• Senior Consultant</li> </ul>  |
| <b>Associate Professor Jackie Ho</b>             | <ul style="list-style-type: none"> <li>• Director, Endovascular Therapy</li> <li>• Consultant</li> </ul>  |
| <b>Dr. Kristine Teoh</b>                         | <ul style="list-style-type: none"> <li>• Clinical Director</li> <li>• Senior Consultant</li> </ul>  |

For more information, please contact us at:

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|--|--|
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