



National Heart  
Centre Singapore  
SingHealth

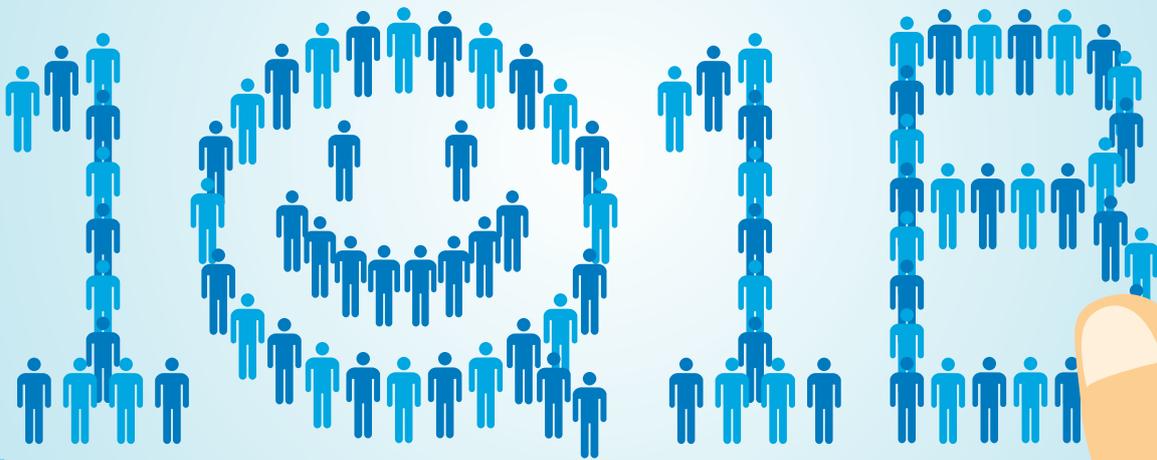


PATIENTS. AT THE HEART OF ALL WE DO.®

JAN-MAR 2014 ISSUE 20 MICA (P) 055/07/2013  
A quarterly publication of National Heart Centre Singapore

# MURMURS®

• 1 QUEUE 1 BILL •



## NEW PATIENT FLOW AT NHCS TAKES AWAY 3 QUEUES AND 2 BILLS

### CLINICS DESIGNED FOR THE FUTURE



REVOLUTIONS IN  
PERCUTANEOUS  
CORONARY  
INTERVENTION  
TECHNIQUES

**TAVI MILESTONE –  
SMALLER WOUNDS,  
BETTER OUTCOMES**

NEW DEPUTY MEDICAL  
DIRECTOR AT NHCS  
LEADS BY EXAMPLE

NHCS Medical Social Worker  
wins Superstar Award

**NHCS research  
earns recognition  
from Nobel Laureate**

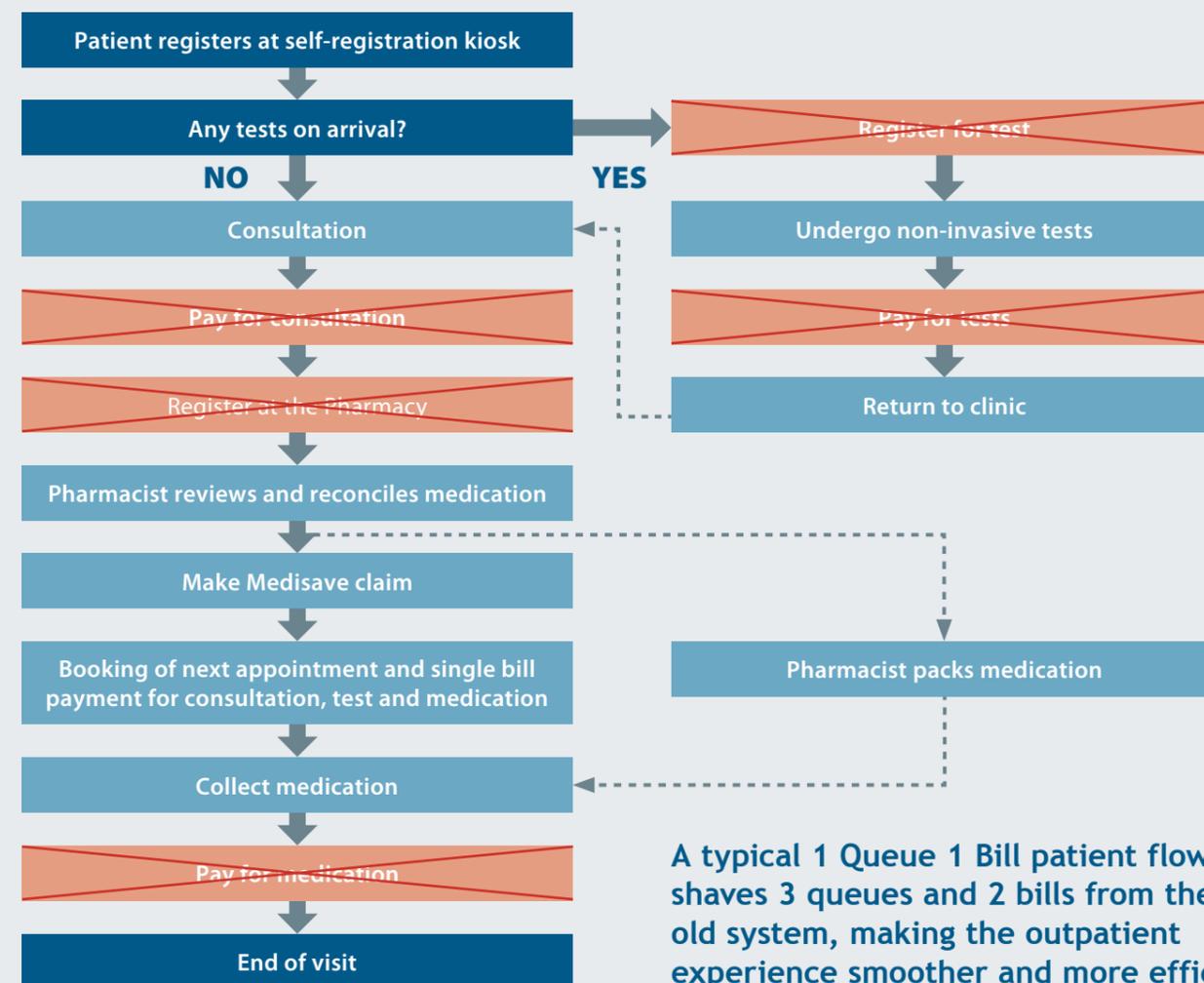
# SEEING A DOCTOR IS AS EASY AS 1,2,3

**G**one are the days where heart patients need to obtain separate queue numbers, make multiple payments and find their way to the different services.

National Heart Centre Singapore (NHCS) has introduced a new 1 Queue 1 Bill (1Q1B) system that simplifies the patients' outpatient experience at its new building located at 5 Hospital Drive, across Block 4 of Singapore General Hospital.



The self-registrations kiosks at NHCS are easy to use with simple instructions in four language options – English, Mandarin, Bahasa Melayu and Tamil.



A typical 1 Queue 1 Bill patient flow shaves 3 queues and 2 bills from the old system, making the outpatient experience smoother and more efficient.

## Less is more

Patients to the NHCS new building will notice a new machine when they first arrive at the outpatient clinics. This machine is a self-registration kiosk that does more than just scanning and printing tickets. It is wired to a complex outpatient management system and is the patients' gateway into the 1Q1B system.

When patients turn up for their appointment, they will head to the self-registration kiosk indicated on the appointment card or letter, and scan their appointment card, request form or identity card and the kiosk will generate a 1Q1B ticket upon successful self-registration. This ticket - printed with just one queue number and the patient's personalised journey - will serve the patient for the entire day's visit. What this means for the patient is less confusion, less hassle, less queuing.

Before the 1Q1B system came about, patients had to pick up at least four different queue numbers at the various service points, which include the blood test, electrocardiogram (ECG), measurement of height, weight and blood pressure, and collection of medication. They were also required to make separate payments at the Cardiac Laboratory, clinic and pharmacy. Now all they need to do is follow the journey plan printed on their 1Q1B ticket and pay for all services utilised during the visit at the end. With the 1Q1B system, the patient journey starts with one queue ticket, and ends with a single bill, effectively cutting out at least three queue tickets and two bills from the previous workflow.

Patients get to save some money too as they need only pay the processing fee once for the Medisave claims all thanks to the single consolidated bill in the 1Q1B system.

To translate the enhanced patient journey process into practical convenience for heart patients, a sound marriage between the intangible patient flow and the tangible locations of services was necessary.

## Services centred around patients

The NHCS new building's design philosophy is all about the patients.

Services that used to be clustered according to departments are now decentralised, and hence patients are now able to undergo an ECG, see a doctor, process their claims and clarify their medication orders within the same level and using the same 1Q1B ticket. The convergence of services is especially important for wheelchair users and the growing population of elderly patients. In fact, the accessibility features of the building go right down to the finest details, such as the wheelchair-adjusted height of the self-registration kiosks and armchairs in waiting areas to aid elderly patients in getting up from their seats.

The pharmacy located at Level 2 will be the last stop for most patients who are prescribed medication. It is strategically located at the concourse so that patients can pick up their medication on their way out of the building. In addition, patients enjoy shorter waiting time at the pharmacy as their medications will be packed while they make payment and schedule their next appointment in the clinic.

In essence, the 1Q1B system seeks to simplify the outpatient experience and integrate the various services into a seamless process for patients.



Prescribed medications will be ready for collection once patients and caregivers reach the pharmacy, as medication orders are packed while they are making payment and scheduling the next appointment at the clinic.

# MORE THAN MEETS THE EYE



The healing garden concept provides a calm, reassuring and welcoming environment that supports the healing of heart patients.

## Specialist outpatient clinics designed for the future

The National Heart Centre Singapore (NHCS) is poised for growth.

NHCS has increased its specialist outpatient clinic consultation rooms from 18 to 38 at its new building in anticipation of the surge in patients come 2030, where NHCS will see an estimated 200,000 patients at its outpatient clinic, almost twice the number seen in 2013. While the expansion in capacity is obvious upon entering the clinic, numerous subtle enhancements to the clinic facilities have been made to create a more convenient and comfortable environment for patients.

## Rethinking the flow for seamless care

NHCS used to have its various services – such as blood test, electrocardiogram (ECG) and measurement of height, weight and blood pressure – situated in separate clusters in its former facility at Mistri Wing on the Singapore General Hospital campus.

Back there, heart patients had to travel from floor to floor as they move between service points for their medical appointment. Fortunately, the Mistri Wing building was modest and hence patients did not have to travel very far within the building to get from the blood test area to the treadmill test room for instance. Keeping to the same workflow after moving to the new 12-storey building, however, was bound to cause great inconvenience for the patients, due to the fact that the new building is much larger than Mistri Wing.

Rather than having patients go to the different service points, NHCS has planned for the services to be revolved around them at the expanded facility.

At the NHCS new building, the main patient services have been decentralised and brought into the clinic. Heart patients can now have their blood test, ECG, medication order, Medisave claims and consultation with the doctor done within the clinic. The deliberate close proximity of services on Levels 4 and 5 is aimed at helping elderly patients and wheelchair users move around the clinic more easily.

To cut down on travelling for patients even further, NHCS has also set up its own Admissions Office and Pre-Admission Tests Centre so that heart patients no longer need to travel to Singapore General Hospital to have their hospitalisation paperwork done.

## Going digital, going green

Interior spaces illuminated by natural daylight that flood in through long corridors of glass panels, and the warm, woody feel of furnishings and wall treatments creates a strong first impression of a soothing and therapeutic healing environment at the NHCS new building. Do not let the green pockets scattered across the building fool you, because underneath all the cosiness of the wood grain, the NHCS is on its way to become a digital heart hospital.

In creating a more efficient system for delivering quality patient care, NHCS has embarked on a digital transformation of its key processes. Most imaging scans, for instance, have moved away from film printing and are now transmitted electronically from the laboratory straight to the clinics and wards. Technology also lends a hand in reducing hassle for patients, through initiatives such as the 1 Queue 1 Bill system (flip to page 2 for more details). The shift to a clinical workflow that uses less paper and more electronic data allows quick and accurate sharing of information across multiple healthcare workers, departments and institutions. It also helps to bring forth best practices according to the latest evidence and standardisation by providing clinical decision support at the point of care.

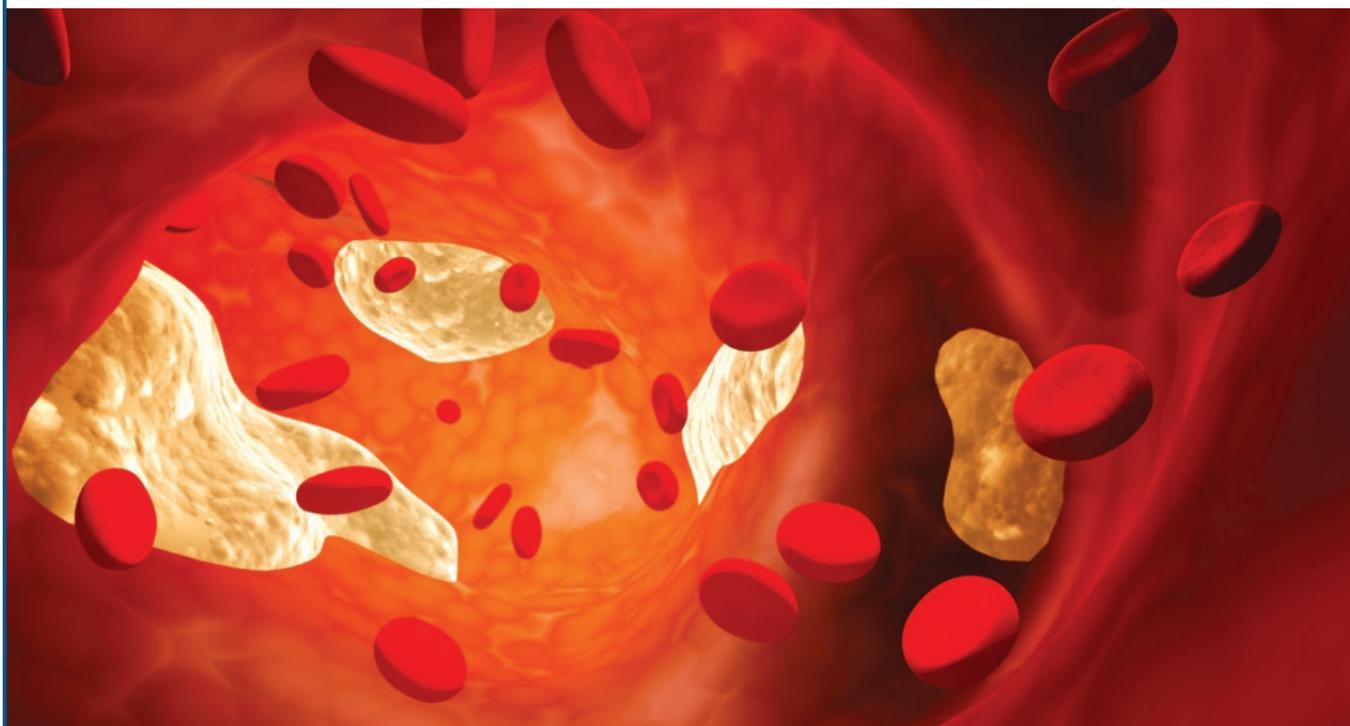
NHCS endeavours to bring the best in technology to better treat patients, without turning the clinic into a place that is all cold steel and wires. Alike the organic feel that is consistent in the many aspects of its new building design, the NHCS outpatient clinics will continue to run on a living, breathing system that adapts to the needs of its heart patients.



The Admissions Office and Pre-Admission Tests Centre located at Level 4 of NHCS saves heart patients the hassle of travelling to Singapore General Hospital for their hospitalisation paperwork.

# REVOLUTIONS IN PCI

COMING FULL CIRCLE AFTER 20 YEARS



Coronary artery disease develops when plaque (the yellow bits) builds up in the artery and obstructs the blood flow to the heart.

**C**oronary stent implantation has become a well-established therapy in the management of coronary artery disease (CAD). Today, multitudes of patients worldwide undergo the procedure for indications ranging from life-threatening acute myocardial infarction to stable angina. Percutaneous coronary intervention (PCI) has proven to be both safe and efficacious with such a low morbidity rate that it has been adopted as a same day procedure.

The procedure has been accepted into popular culture that started with Andreas Gruentzig's introduction of balloon angioplasty in 1977. Numerous advances in interventional cardiology techniques have occurred since that time and it appears we are moving a full circle in the revolution of PCI.

The FDA approval of the Palmaz-Schatz stent (Johnson & Johnson) in 1994 was a transformational milestone. Coronary stents provided luminal scaffolding that virtually eliminates elastic recoil. It effectively treated severe dissections caused by acute vessel occlusions in the early days of plain old balloon angioplasty (POBA) therapy that necessitated emergency bypass operations.

This was the bane of POBA that kept interventional cardiologists awake at night. Studies such as the Stent Restenosis Study (STRESS) and the Belgium-Netherlands Stent (BENESTENT) trials demonstrated convincingly that stenting is superior to POBA with respect to restenosis in de novo lesions. The Achilles' heel for bare metal stent (BMS) implantation is a relatively high incidence (20 to 50 per cent) of in-stent restenosis (ISR) requiring repeat interventions. The Cypher stent (Johnson & Johnson) was the first drug-eluting stent (DES) approved by the FDA in 2003. The advent of DES coupled with improvements in stent design and implantation techniques resulted in a significant decrease in rates of ISR to single digit figures. DES was dubbed the third revolution for PCI after POBA and BMS. Chemotherapeutic agents that inhibit cell-cycle progression such as sirolimus and paclitaxel were used with good clinical effect to reduce neointima formation in clinical studies. However, a new problem, namely late stent thrombosis, was described and took the shine off the era of DES. This was in part due to poor in-stent endothelial coverage from poor healing.

## FULLY BIORESORBABLE SCAFFOLD: The Fourth Revolution in Interventional Cardiology?

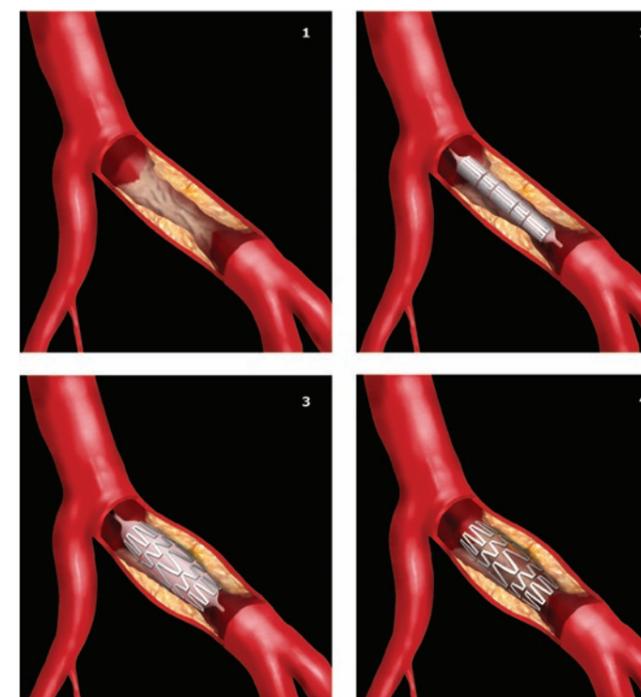
The advent of fully biodegradable scaffolds has been heralded as the fourth revolution in interventional cardiology. The technology offers intra-procedural scaffolding to prevent acute vessel closure. It also elutes an antiproliferative drug to prevent excessive neointimal hyperplasia and therefore tackle ISR.

Finally, after two years, the stents which are made of poly-L-lactic acid (PLLA) are completely resorbed and allow the healed vessel to regain its vasomotor function. Follow-up imaging with cardiac computed tomography (CT) or magnetic resonance imaging (MRI) is also possible as there is no metallic material. In the pilot ABSORB cohort A study, optical coherence tomography (OCT) revealed 100 per cent of the scaffold struts to be fully tissue-covered and apposed. The current scaffolds under study are composed of either a polymer or bioresorbable metal alloy. Absorb everolimus-eluting bioresorbable vascular scaffold (BVS) from Abbott Laboratories was the first commercially available stent utilising a poly-L-lactide polymer and approved for the treatment of coronary artery disease. Many large-scale randomised trials, however, are needed to validate these benefits and in the process improve on the bioresorbable platform.

In recent years, drug-eluting balloons (DEB) have emerged as a potential alternative to combat restenosis. The chemotherapeutic agent Paclitaxel was identified as the primary drug for DEB because of its rapid uptake and prolonged retention. DEB technology demonstrated safety and efficacy in randomised clinical trials for patients with in-stent restenosis and may become the "comeback kid" of PCI, obviating the need for stents in cases that achieves a suitable result with POBA alone.

The years of improvements in PCI technologies has been accompanied by numerous large multi-centre randomised trials lending evidence in the field of cardiology to better treat our patients with CAD. These trials have refined our interventional techniques for stent strategies in hostile anatomies like left main lesions, multi-vessel disease therapy and bifurcation stenting methods. We have refined our invasive methods of lesion assessment anatomically through intravascular ultrasound (IVUS) and OCT or physiologically employing fraction flow reserve (FFR) wires to better understand which lesions need to be treated and which ones can be safely left alone. When we do intervene, imaging has allowed us to achieve more durable and safer results than ever before. Developments in more potent anti-platelet agents like prasugrel, a third generation thienopyridine and ticagrelor, a novel nucleoside analogue, has also made stenting safer in reducing the rates of stent thrombosis.

**We have come a long way in the 20 years since the first Palmaz-Schatz stent was implanted in 1994 and it is exciting for me to witness and partake in the further revolutions to come in the next 20 years for the field of interventional cardiology.**



The process of deploying a stent in the artery with the use of a balloon catheter.



**Dr Jack Tan**

Deputy Head and Senior Consultant,  
Department of Cardiology  
Director, Coronary Care Unit  
National Heart Centre Singapore

Dr Tan's sub-specialty interest is in interventional cardiology. He graduated with his Bachelor of Medicine and Surgery degree in 1997 and obtained his Master of Medicine (Internal Medicine) in 2002 from the National University of Singapore. Dr Tan spent a year in the University of California, Davis, USA, where he sub-specialised in complex coronary and peripheral vascular interventions. In 2008, he received his Registered Physician in Vascular Interpretation certification from the American Registry for Diagnostic Medical Sonography.

# SMALLER WOUNDS AND BETTER OUTCOMES

## STUDY SHOWS LOWER MORTALITY IN MINIMALLY INVASIVE PROCEDURE VERSUS SURGERY



TAVI valve implants come in various sizes for patients of different anatomies.

**H**eat patients with severe aortic at high surgical risk stenosis may soon be offered a minimally invasive valve replacement procedure as the default treatment option.

This comes after results of the CoreValve US Pivotal Trial published in late March 2014 showed that transcatheter aortic valve implantation (TAVI) performed using a particular type of prosthetic valve achieved a lower death rate at the end of one year when compared with open heart surgical aortic valve replacement. The death rates were reported to be 14.2 and 19.1 per cent respectively in the combined group of 747 patients with a mean age of 83. This is a significant development for the procedure as TAVI has thus far only been proven to be equal to surgical intervention in terms of outcomes for patients at high surgical risk. TAVI is presently the standard of care for inoperable patients and an alternative for high-risk patients, while valve replacement via surgery remains the gold standard for patients who are suitable for it.

Since its introduction in France in 2002, valve implants have become smaller, techniques are more refined, and the risks associated with TAVI have also reduced over the years. The prosthetic valve used when National Heart Centre Singapore (NHCS) performed Asia's first TAVI case had an 8.5mm outer diameter in its unexpanded form. NHCS has since moved on and adopted the use of advanced generation cobalt chromium valves measuring approximately 6.5mm in diameter.

While the reduction of 2mm in size may seem trivial in absolute terms, the valve implants have effectively shrunk by more than 20 per cent and will pose significantly less stretch when inserted through arteries of about 6mm in diameter in elderly patients. Larger valve implants in the past had a higher chance of causing an artery to rupture when it is en route to the heart during the TAVI procedure.

### TAVI explained

Aortic stenosis is the hardening and narrowing of the aortic valve, which leads to the heart having to work harder to pump blood and eventually exerting a toll on the heart muscle. Symptoms of severe aortic stenosis include chest pain, shortness of breath, fatigue and fainting spells when exerting the body.

**“Aortic stenosis primarily affects elderly patients aged 75 and above, and about 4 per cent of them will develop the condition as they age,” said Dr Soon Jia Lin, Consultant, Department of Cardiothoracic Surgery, NHCS.**

TAVI is a minimally invasive procedure to treat aortic stenosis and it involves implanting a prosthetic valve, typically constructed of animal tissue and a metal frame, through either the femoral artery near the groin or the chest wall. The prosthetic valve is mounted on a deflated balloon and guided to the aortic valve through a catheter, and propped open by inflating the balloon. The valve implant will take over the function of the hardened aortic valve and make it easier for the heart to pump blood to the rest of the body.

### Asia's first TAVI patient: 5 years on



Mr Tang Yat Cheong, 83, is the first patient in Asia to undergo the TAVI treatment at NHCS in 2009.

Mr Tang Yat Cheong is often told he looks younger than his actual age.

The 83-year-old is the first patient in Asia to undergo the TAVI procedure at NHCS back in 2009. He was suffering from severe aortic stenosis but was deemed unsuitable to undergo another open heart surgery as he had a coronary artery bypass graft surgery

done when he was 62. TAVI was thus the only viable option for him. His two-hour procedure was a success, but back then no one knew whether the prosthetic valve inside his heart could last beyond five years.

**“After the procedure, I felt much better and was no longer feeling breathless. I was also able to go back to doing my normal exercise routine,” said Mr Tang, “But I was worried that the valve will stop working after five years.”**

Fast-forward to 2014, and Mr Tang is still doing well and going strong with his daily exercise regime. Though it has now been found that prosthetic valves have an average lifespan of 10 years, Mr Tang does not have to lose sleep over this, as his implanted valve can be replaced with a new one through a repeat TAVI procedure.



National Heart  
Centre Singapore  
SingHealth

### CONTACT US

**GP FAST-TRACK APPOINTMENT** Tel 6704 2222

**NHCS CALL CENTRE** Tel 6704 2000 Fax 6222 9258  
Email central.appt@nhcs.com.sg

**GENERAL ENQUIRIES** Tel 6704 8000 Fax 6844 9030  
Email nhcs@nhcs.com.sg

### NHCS INTERVENTIONAL CARDIOLOGY PROCEDURES

- Coronary angiography/cardiac catheterisation
- Percutaneous coronary intervention (PCI) – angioplasty, stent implantation and rotator treatment
- Percutaneous device closure of atrial septal defect (ASD)/ patent foramen ovale (PFO)
- Percutaneous closure of the left atrial appendage using the Watchman device
- Percutaneous balloon valvuloplasty of mitral, aortic and pulmonary valves
- Transcatheter aortic valve implantation
- Intraaortic balloon counterpulsation
- Intravascular ultrasound imaging (IVUS)
- Pressure wire measurement
- Percutaneous cardiopulmonary bypass
- MitraClip procedure for severe mitral regurgitation
- Renal denervation
- Peripheral vascular intervention

### OUR SPECIALISTS (INTERVENTIONAL CARDIOLOGY)

Prof Koh Tian Hai	Senior Advisor and Senior Consultant
Assoc Prof Lim Soo Teik	Deputy Medical Director and Senior Consultant, Director, Cardiac Catheterisation Laboratory
Dr Aaron Wong	Head and Senior Consultant, Director, Interventional Cardiology
Dr Jack Tan	Deputy Head and Senior Consultant
Assoc Prof Philip Wong	Senior Consultant
Asst Prof Chin Chee Tang	Senior Consultant
Assoc Prof Yeo Khung Keong	Senior Consultant
Dr Ho Kay Woon	Consultant
Dr Fam Jiang Ming	Associate Consultant

For the full list of NHCS services and specialists, please visit [www.nhcs.com.sg](http://www.nhcs.com.sg).

# RESEARCH HIGHLIGHT

**Circulation.** 2013 Jul 16;128(3):237-43. doi: 10.1161/CIRCULATIONAHA.112.001139. Epub 2013 Jun 14.

## The Long-Term Multicenter Observational Study of Dabigatran Treatment in Patients With Atrial Fibrillation (RELY-ABLE) Study.

Connolly SJ<sup>1</sup>, Wallentin L, Ezekowitz MD, Eikelboom J, Oldgren J, Reilly PA, Brueckmann M, Pogue J, Alings M, Amerena JV, Avezum A, Baumgartner I, Budaj AJ, Chen JH, Dans AL, Darius H, Di Pasquale G, Ferreira J, Flaker GC, Flather MD, Franzosi MG, Golitsyn SP, Halon DA, Heidbuchel H, Hohnloser SH, Huber K, Jansky P, Kamensky G, Keltai M, Kim SS, Lau CP, Le Heuzey JY, Lewis BS, Liu L, Nanas J, Omar R, Pais P, Pedersen KE, Piegas LS, Raev D, Smith PJ, Talajic M, Tan RS, Tanomsup S, Toivonen L, Vinereanu D, Xavier D, Zhu J, Wang SQ, Duffy CO, Themeles E, Yusuf S.

<sup>1</sup>Population Health Research Institute, McMaster University and Hamilton Health Sciences, Hamilton, Canada.connostu@phri.ca

### ABSTRACT

**BACKGROUND:** During follow-up of between 1 and 3 years in the Randomized Evaluation of Long-term Anticoagulation Therapy (RE-LY) trial, 2 doses of dabigatran etexilate were shown to be effective and safe for the prevention of stroke or systemic embolism in patients with atrial fibrillation. There is a need for longer-term follow-up of patients on dabigatran and for further data comparing the 2 dabigatran doses.

**METHODS AND RESULTS:** Patients randomly assigned to dabigatran in RE-LY were eligible for the Long-term Multicenter Extension of Dabigatran Treatment in Patients with Atrial Fibrillation (RELY-ABLE) trial if they had not permanently discontinued study medication at the time of their final RE-LY study visit. Enrolled patients continued to receive the double-blind dabigatran dose received in RE-LY, for up to 28 months of follow up after RE-LY (median follow-up, 2.3 years). There were 5851 patients enrolled, representing 48% of patients originally randomly assigned to receive dabigatran in RE-LY and 86% of RELY-ABLE-eligible patients. Rates of stroke or systemic embolism were 1.46% and 1.60%/y on dabigatran 150 and 110 mg twice daily, respectively (hazard ratio, 0.91; 95% confidence interval, 0.69-1.20). Rates of major hemorrhage were 3.74% and 2.99%/y on dabigatran 150 and 110 mg (hazard ratio, 1.26; 95% confidence interval, 1.04-1.53). Rates of death were 3.02% and 3.10%/y (hazard ratio, 0.97; 95% confidence interval, 0.80-1.19). Rates of hemorrhagic stroke were 0.13% and 0.14%/y.

**CONCLUSIONS:** During 2.3 years of continued treatment with dabigatran after RE-LY, there was a higher rate of major bleeding with dabigatran 150 mg twice daily in comparison with 110 mg, and similar rates of stroke and death.



# LEADING BY EXAMPLE

He is described by patients and staff at National Heart Centre Singapore (NHCS) as caring, conscientious, dedicated and approachable. Assoc Prof Lim Soo Teik, who became Deputy Medical Director of NHCS on 1 January 2014, has inspired those around him with his commitment to excellence in patient care, education and research.

Assoc Prof Lim Soo Teik is known for his excellent clinical skills among his peers in interventional cardiology. Before taking on the role as Deputy Medical Director of NHCS, he served as Head of NHCS' Department of Cardiology for six years, during which he introduced numerous key initiatives.

Many of his patients have come forward with compliments on the way he explains heart conditions and treatments in easy-to-understand terms, and how he treats them with patience, respect and genuine care. Regardless of how busy he is, Assoc Prof Lim always welcomes queries from his patients with a broad smile, and he makes the effort to give a thorough explanation to patients and clarify any doubts they may have about their treatment.

### Believing in education and harnessing technology

When he is not seeing patients or performing procedures in the laboratory, Assoc Prof Lim has his sleeves rolled up teaching the next generation of healthcare professionals. In fact, the Diploma in Biomedical Science (Cardiac Technology) programme jointly run by NHCS and Singapore Polytechnic was his brainchild. This fruitful collaboration has produced cardiac medical technologists equipped with the right skills and knowledge to run the non-invasive diagnostic test laboratories at NHCS, as well as the ability to adapt and keep abreast of the rapid developments in the field. They are an integral part in the delivery of quality patient care and are instrumental in the accurate diagnosis of heart conditions in patients.

Aside from actively tutoring junior doctors and medical graduates, Assoc Prof Lim is also an Advanced Cardiac Life Support instructor with Singapore General Hospital's Life Support Training Centre since 1995. In addition, he is a lecturer and content advisor for the Master of Nursing course at the National University of Singapore.

Assoc Prof Lim believes in translating the power of technology into better care for patients. He is involved in many workgroups that look into designing and refining systems that leverage on new technology for greater efficiency and efficacy in clinical systems.

His efforts will go towards transforming NHCS into a digital heart hospital, while his passion keeps the warmth in patient care going strong.



# MAKING OF A STAR



*NHCS Senior Medical Social Worker Jan Koh (centre) with Assoc Prof Benjamin Ong, Director of Medical Services, Ministry of Health, and Prof Ivy Ng, Group Chief Executive Officer, SingHealth.*

Ms Jan Koh, Senior Medical Social Worker, Medical Social Services, National Heart Centre Singapore (NHCS), made the institution proud when she received the Superstar (Allied Health) Award at the Singapore Health Quality Service Award ceremony on 14 January 2014. Superstar Awards are conferred on the top winners in the Clinical, Nursing, Allied

Health and Ancillary categories who have demonstrated exemplary commitment to delivering quality care and excellent service.

Ms Koh often goes the extra mile to ensure that the needs of patients are met, and being able to make a positive impact on her patients' lives, no matter how small, is her driving force. Over her nine years of service at NHCS, she still stays in contact with many of those whom she has cared for.

**"For us social workers, we never close a case. It is a lifelong relationship that you develop with a patient,"** said Ms Koh.

## NHCS stem cell research lauded by field experts

NHCS Staff Research Scientist Dr Wei Heming (5th from right) with Prof Shinya Yamanaka (middle) and other winners at the science symposium.

Nobel laureate Prof Shinya Yamanaka, renowned for his breakthrough research in induced pluripotent stem (iPS) cells, presented the Excellent Poster Award to Dr Wei Heming, Staff Research Scientist, NHCS, on 18 January 2014 at the 7th Takeda Science Foundation Symposium on PharmaSciences. The scientific meeting was held in Osaka, Japan, from 16 to 18 January 2014. Dr Wei's poster, titled *Modeling Type 1 Long-QT Syndrome with Patient-Specific Induced Pluripotent Stem Cell-Derived Cardiomyocytes*, impressed the judging panel which comprised Prof Yamanaka and other heavyweights in the study of iPS cells.



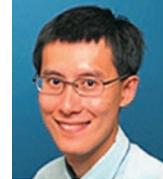
*NHCS Staff Research Scientist Dr Wei Heming (5th from right) with Prof Shinya Yamanaka (middle) and other winners at the science symposium.*

## PROMOTIONS



### ASSOC PROF LIM SOO TEIK

Deputy Medical Director  
Senior Consultant,  
Department of Cardiology



### DR DANIEL CHONG

Consultant,  
Department of Cardiology



### DR ERIC LIM

Associate Consultant,  
Department of Cardiology

## APPOINTMENTS WITH DUKE-NUS



### PROF KOH TIAN HAI

Adjunct Professor



### PROF TERRANCE CHUA

Adjunct Professor



### ASSOC PROF CHUA YEOW LENG

Adjunct Associate Professor



### ASSOC PROF KENNY SIN

Adjunct Associate Professor



### ASSOC PROF YEO KHUNG KEONG

Adjunct Associate Professor

#### ADVISOR

Prof Koh Tian Hai

#### MEDICAL EDITOR

Dr Ewe See Hooi

#### EDITORIAL TEAM

Yvonne Then  
Jessica Koh  
Lim Peizhen

*We value your feedback. For comments or queries on Murmurs, please email us at [nhcs@nhcs.com.sg](mailto:nhcs@nhcs.com.sg).*

All rights reserved. No part of this publication is to be quoted or reproduced without the permission of National Heart Centre Singapore (Registration no. 199801148C). The information in this publication is meant for educational purposes and should not be used as a substitute for medical diagnosis or treatment. Please consult your doctor before starting any treatment or if you have any questions related to your health or medical condition.

A RAZORSHARK Design