

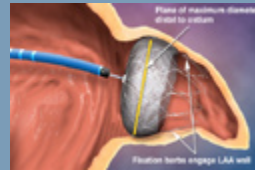


# Murmurs

OCT - DEC 2009 Issue 3 A quarterly publication of National Heart Centre Singapore MICA (P) 158/08/2009

## HIGHLIGHTS

- New Stroke Prevention Therapy for Atrial Fibrillation Patients
- Echocardiography Fellowship: A Taste of the Australian Culture
- New Ambient Experience Calms the Jitters



## First Robotic Hybrid OT in Southeast Asia



NHCS robotic hybrid operating theatre.

National Heart Centre Singapore (NHCS) introduced the first robotic hybrid operating theatre (OT) in Southeast Asia on 20 October 2009. Combining the capabilities of a full operating theatre (OT) with advanced imaging technologies, the new facility allows both interventional procedure and cardiovascular surgery to be performed in the same setting. This greatly enhances patient safety as the patient only needs to undergo the surgery once.

### Improves Patient Safety, Saves Time and Money

With the hybrid OT, doctors can easily convert a coronary angioplasty to an open bypass surgery if the need arises. This could be life-saving especially for the very sick patients as their condition may deteriorate while waiting for the surgery to be rescheduled. In addition, the patient-centric setup eliminates the hassle of moving the patients to multiple locations, putting them at greater ease and comfort.

Another key benefit of the hybrid OT is the ability to have clear, precise images of the heart anatomy which greatly helps in complex cases.

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The launch of the hybrid OT signifies the great collaboration and teamwork across various departments to bring forth seamless care to the patients.

"As a national and regional centre of excellence for cardiovascular disease, we have to constantly stay at the forefront of medical technology to offer our patients the optimal treatment possible in a timely and cost-effective manner. With the hybrid OT, it can help our patients save time and money with fewer operations, quicker recoveries and shorter hospital stays," said Associate Professor Koh Tian Hai, Medical Director, National Heart Centre Singapore.

Dr Kenny Sin, Head and Senior Consultant at the Department of Cardiothoracic Surgery, National Heart Centre Singapore adds, "In patients who will likely require both modalities of treatment, the hybrid theatre combines the best of both worlds, dramatically increasing patient safety. In very high-risk patients, we now offer a viable treatment option, previously not available till the hybrid OT setup."

This year, NHCS crossed the 20,000 cardiac surgeries mark, a significant milestone as it reflects the maturity of the centre's clinical expertise, reinforcing its status as a national and regional referral centre for cardiovascular disease.

### Types of Procedures

The hybrid OT is designed to handle both minimally invasive and open-heart procedures. The range of procedures that can be performed include minimally invasive cardiac surgical procedures, thoracic aneurysm stent grafts, diagnostic and therapeutic percutaneous vascular procedures, abdominal aneurysm stent grafts, combined open and endovascular procedures and percutaneous aortic valve replacements.



Performing a heart surgery in the hybrid OT.

*"With the hybrid OT, it can help our patients save time and money with fewer operations, quicker recoveries and shorter hospital stays."*

**Associate Professor Koh Tian Hai,  
Medical Director, NHCS**

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### HIGH-END TREATMENT MODALITIES @ NHCS

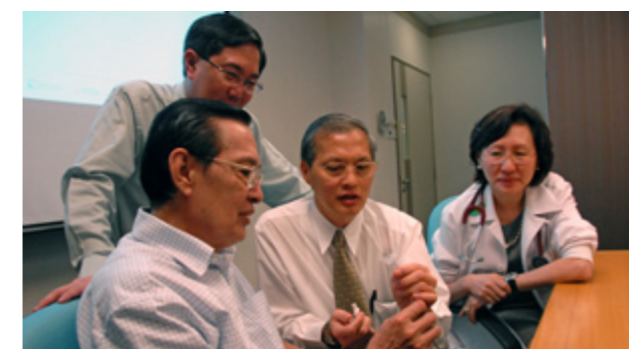
- Heart and lung transplant programme
- Mechanical heart assist device programme
- Extra-Corporeal Membrane Oxygenator (ECMO) in patients with acute heart failure and cardiogenic shock as a resuscitative measure
- Robotic-assisted minimally invasive cardiothoracic surgery
- Complex atrial fibrillation ablation
- Percutaneous aortic valve replacement (transfemoral and transapical)
- Aortic aneurysm endovascular exclusion
- Mitral valve surgery (repair/replacement) with simultaneous surgical radiofrequency ablation of associated atrial fibrillation
- Watchman device closure of left atrial appendage for prevention of stroke from atrial fibrillation

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# New Stroke Prevention Therapy for Atrial Fibrillation Patients

70-year-old retiree Cheong Ching Chuan has long-term atrial fibrillation and is at high risk of stroke. Previously on long-term warfarin therapy, it was discontinued after he developed haematoma in the brain when he knocked his head twice in 2009. As an alternative therapy for stroke prevention, his doctors at the National Heart Centre Singapore (NHCS) recommended him the new percutaneous closure of the left atrial appendage using the Watchman device.

On 12 October 2009, NHCS medical team together with Dr Shephal Doshi, a visiting expert from USA, jointly performed Asia's first percutaneous closure of the left atrial appendage using the Watchman device on Mr Cheong. In the two-hour procedure, doctors implanted the mini parachute-like device in Mr Cheong to prevent him from having a stroke caused by blood clots in the heart. After a short stay in the hospital, Mr Cheong was discharged and has not experienced any bleeding since.



A/Prof Koh Tian Hai (seated in the centre), Dr Teo Wee Siong (standing) and Dr Ding Zee Pin demonstrating the Watchman device to Mr Cheong Ching Chuan (extreme left).

Visibly well and happy, Mr Cheong said, "Previously I have to take warfarin daily and watch what I eat as warfarin can interact with foods such as those with a lot of vitamin K like soybean, spinach or broccoli. Now, I no longer have this worry."

Trial findings from PROTECT-AF, a multi-centre overseas study conducted in 707 atrial fibrillation patients showed that in those who were candidates for warfarin therapy, device closure of the left atrial appendage using the Watchman device was associated with a reduction in haemorrhagic stroke risk versus warfarin, and all-cause stroke and all-cause mortality outcomes were comparable to warfarin. Of the patients receiving the device, 86 per cent were able to stop warfarin therapy at the 45-day follow-up. The combined rate of stroke and cardiovascular death was 3.4 per 100 patient-years in the device group versus 5.0 in the warfarin group.

The centre estimates up to 100 high-risk atrial fibrillation patients would be suitable for this new therapy each year.

### What is atrial fibrillation?

Atrial fibrillation is a heart condition in which the heart beats irregularly. It can cause blood to stagnate and form clots in the left atrial appendage of the heart, which increases one's chances of having a stroke or other related problems.

In Singapore, atrial fibrillation occurs in about 0.5 to 1 per cent of the general population. Its prevalence increases with age as seen in 5 per cent of patients 65 years old and above, and 10 per cent in patients 80 years old and above. It has been estimated that the number of patients with atrial fibrillation will increase 2.5-fold over the next 50 years.

### What is the current therapy for stroke prevention in atrial fibrillation patients?

Currently, to prevent blood clots from forming, doctors use a drug commonly known as warfarin. However, a possible side effect could be bleeding, especially in patients 65 years old and above. In addition, it is difficult to maintain within the narrow therapeutic range of INR (international normalised ratio) 2.0 – 3.0 due to multiple drug and food interactions and it requires frequent monitoring and dose adjustments.

### Who are suitable for this new treatment?

1. Increased bleeding risk with Warfarin anticoagulation eg. bleeding gastroduodenal ulcers, liver hepatitis and cirrhosis, history of intracranial haemorrhage, cerebral arteriovenous malformations.
2. Patients with frequent falls.
3. Associated bleeding disorders.
4. Psychiatric disorders and dementia.
5. Patients with multiple drug interactions whilst on Warfarin.
6. Patients unwilling to take long term Warfarin/ poor compliance.

### How does it work?

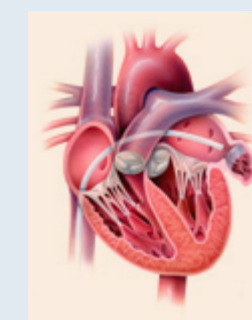


Illustration of the Watchman device in the heart, courtesy of Atritech, Inc. Minneapolis, MN.

The cardiologist will guide the WATCHMAN device into your heart through a catheter inserted through a vein in your upper leg. Once the catheter is in the correct position, pictures of your heart will be taken to take appropriate measurements of your left atrial appendage. These measurements will determine the size of the device to be used. After the device is put into place, additional measurements and pictures will be taken to make sure the device is in the correct position. Once your doctor has confirmed the position, he will release the device and leave it permanently implanted in your heart. It takes about 45 days for the heart tissue to heal. During that time, you will need to continue taking the blood thinning medications.

# Echocardiography Fellowship: A Taste of the Australian Culture

*This issue, the Murmurs team sat down with Dr See Chai Keat, Consultant of the Department of Cardiology at the National Heart Centre Singapore to learn of his fruitful fellowship experience at the Princess Alexandra Hospital, Brisbane, Queensland, Australia from July 2008 – August 2009.*

## Why Princess Alexandra Hospital

Princess Alexandra Hospital is one of three tertiary level facilities in Queensland, providing care in all major adult specialities except obstetrics. It is one of the Australia's leading teaching and research hospitals. I was fortunate to have Professor Thomas Marwick, who heads the University of Queensland, Cardiovascular Imaging Group and a world-renowned expert in stress echocardiography and strain imaging as my mentor.



*Dr See Chai Keat (2nd row, 3rd from left) and his mentor, Prof Thomas Marwick (2nd row, 1st from right) with the University of Queensland Cardiovascular Imaging Group 2008-09.*

## The Comprehensive Training

During my one year training, I have learned the tips and tricks of stress echocardiography which equipped me with a more systematic way of interpretation. This helps to improve the accuracy of stress echocardiography interpretation. I also became versed in offline stress echocardiography interpretation using the EchoPAC software system. All stress echocardiography images acquired are transferred to a main workstation for subsequent detailed offline analysis. This comprehensive clinical workstation has a software that enables us to optimise the image quality, step through the images and conduct offline strain analysis for equivocal cases. It also allows for advanced echocardiography imaging, like Speckle Tracking Echocardiography (using 2-dimensional strain method) for torsion analysis.

I acquired new skills and knowledge in echocardiographic strain and strain-rate imaging (deformation imaging) which is a non-invasive method for assessment of myocardial regional and global function. As the strain and strain rate imaging using the colour-coded Tissue Doppler Imaging (TDI) is time consuming, it is useful only as adjunctive tool in stress echocardiography interpretation of the moderate coronary disease patients.

Another advanced echocardiography imaging that I picked up was the assessment of cardiac torsion. In layman terms, this means the twisting of the heart. We investigate to see whether the abnormal twisting is the earliest manifestation of diastolic dysfunction in asymptomatic obese individuals and hypertensive response to exercise individuals using the innovative 2-dimensional Speckle Tracking Echocardiography (STE). This may serve as a new additional echocardiography tool in the assessment of diastolic function in the future. I also honed my skills in Contrast Echocardiography Imaging. This is useful for LVO (Left Ventricular Opacification) in patients with more than two uninterpretable segments during resting echocardiography study.

Over the course of my fellowship, I had performed over 1400 cases of stress echocardiography.

With 30 per cent of my time devoted on research, I have published my research works at the American Society of Echocardiography 2009, the European Society of Echocardiography 2009, the American Heart Association Scientific Sessions 2009 and the 13th Asia Pacific Congress of Doppler Echocardiography, Brisbane, Australia.

## The Australian Mindset

Over in Australia, they have a very good primary healthcare system. Australian patients have a totally different mindset. If they have a medical



*Dr See Chai Keat at the Princess Alexandra Hospital.*

problem, they will consult their GPs first. Rarely do they seek a specialist consultation directly. This helps to reduce congestion at the public hospitals.

## Memorable Moments

I went to Brisbane in July 2008, the coldest month of the year. Being accustomed to a tropical climate, it took me a while to get used to the cold winter. However the worst was summer, at a blistering 38 degree celsius. I had to seek refuge in shopping centres to stay out of the blazing heat during the weekends.

In my free time, I will take a one-hour train ride to Gold Coast occasionally to visit the theme parks – Sea World, Warner Bros., Movie World, Dream World and Sunshine Coast. In addition, the scenery of the Brisbane city itself is quite fascinating, especially along the Brisbane River, which divides the city into North and South. The city hosts several unique architectures such as the colourful Treasury Building, the famous Story Bridge and the Giant Ferris Wheel.

Chinatown in Brisbane is virtually a very quiet town without much attractions. Instead, majority of the Asians will go to the Sunnybank, a suburb in Brisbane for grocery shopping and savour the familiar Asian cuisine.

## New Initiatives in the Pipeline

We plan to procure a comprehensive clinical workstation to allow detailed offline stress echocardiography interpretation and advanced echo imaging including Speckle Tracking Echocardiography (2-dimension strain imaging) for torsion analysis and future research work.

*Youngest in the family, Dr See Chai Keat chose to specialise in echocardiography as it is a portable way to relate to the patients their heart condition. He derives immense satisfaction from the visible transformation of the patient's state of health, from sick to well. The humble and affable man enjoys playing table tennis, swimming and brisk walking once to thrice a week.*



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## NHCS Echocardiography (Imaging and Haemodynamics) Services

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- Transoesophageal echocardiography
- Stress echocardiography – exercise
- Stress echocardiography – pharmacologic
- 3D echocardiography

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### SENIOR CONSULTANTS

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Dr Lee Chung Yin

Dr K Gunasegaran

Dr Tan Ju Le

### CONSULTANT

Dr See Chai Keat

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## NHCS Collaborates with IME on Faster and Simpler Test Kit for Heart Attacks

A research collaboration between the National Heart Centre Singapore (NHCS) and the Institute of Microelectronics (IME) on a rapid and sensitive integrated system to test for specific cardiac biomarkers in blood, has reaped promising results. The new integrated system significantly cuts sample preparation and analysis time by six times, from 6 hours to just 45 minutes with just a drop of blood. In addition, as several cardiac biomarkers can be measured simultaneously, it contributes to the accuracy of diagnosis. The system is also less invasive since it just requires a finger-prick of blood.

In this collaboration, NHCS proposed the clinical problems and the 'chokepoints' for rapid point of care (POC) test for diagnosis of heart attacks. Citing the potential benefits to heart patients, Associate Professor Philip Wong, Senior Consultant Cardiologist and Director of the Research and Development Unit at the National

Heart Centre Singapore said, "The key to saving lives in heart attack scenarios is time. The quicker and more accurate the diagnosis can be made, the faster proper care and treatment can be instituted. The test kits can be rapidly deployed, and tests to confirm clinical diagnosis can be completed within short time frames. As the kits are deployed on-site as opposed to a central laboratory, confirmation of condition is rapid without the need to transport patients' specimens."

Cardiac biomarkers, such as troponin-T and creatinine kinases are proteins used for heart attack diagnosis. Troponin and creatinine are constituents of the cardiac muscle cells that are released into the blood when the cells and tissues are injured after a heart attack. Hence elevated levels of troponin-T or creatinine kinases in the blood alert the doctors that a heart attack has taken place.

## CTO Interventions Live Course 2009



An overwhelming 110 participants from Asia attended the CTO (Chronic Total Occlusions) Interventions Live Course 2009 held from 24 to 25 October 2009 at the National Heart Centre Singapore. Besides local faculty, the course also had the privilege to have two of the world's top CTO experts, Professor Masahiko Ochiai, Professor of the Division of Cardiology and Cardiovascular Surgery at the Showa University Northern Yokohama Hospital, Japan and Dr Osamu Katoh, Director of the Research Centre at the Toyohashi Heart Centre, Japan to share their wealth of experience.

Sharing on the educational role, Associate Professor Koh Tian Hai, Medical Director, National Heart Centre Singapore and the course director said, "Southeast and South Asia have traditionally lacked behind in CTO advances. There is a need for a specialised teaching course on retrograde techniques and more specialised antegrade approaches. The CTO Interventions Live Course 2009 serves to plug this knowledge gap."

Besides live interventions with case reviews, participants also enjoyed a stimulating exchange with various skilled interventionalists from Singapore, Malaysia, Indonesia, India and Bangladesh.

## Awards and Appointments

### 76 win EXSA



NHCS EXSA winners at the first inaugural EXSA Healthcare Industry Award National Ceremony held on 24 November 2009 at the RELC International Hotel.

76 NHCS staff did the centre proud by bagging home the Excellent Service Award (EXSA), Healthcare Industry 2009. Launched in 1994, the Excellent Service Award or EXSA is a national award that recognises the crème de la crème who have delivered outstanding service. Since 2004, NHCS has nurtured a total of 522 EXSA winners.

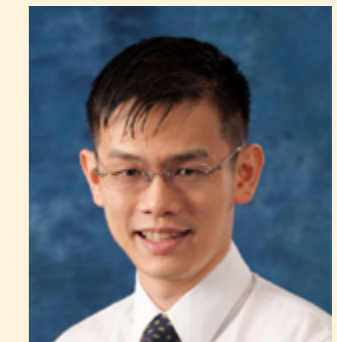
### NHCS Doctors' Creative Teaching Styles Scores with Duke-NUS GMS Students



Dr Kenny Sin (left) and A/Prof Hwang Nian Chih (right).

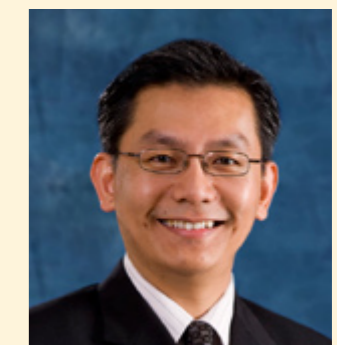
Dr Kenny Sin, Head, Department of Cardiothoracic Surgery, NHCS and A/Prof Hwang Nian Chih, Head, Department of Cardiothoracic Anaesthesia, NHCS's out-of-the-box teaching styles have earned them the Outstanding Innovator Award (Normal Body Module) and Outstanding Innovator Award (Body and Disease Module) respectively by the Duke-NUS Graduate Medical School. The awards, presented during the Duke-NUS Faculty Appreciation event on 30 October 2009, recognises the ability of the faculty to educate using innovative concepts and methods.

### New Appointments



#### DR VICTOR CHAO

Consultant, Department of Cardiothoracic Surgery appointed as the Director of Vascular Laboratory, retrospective from 1 January 2009.



#### DR CHING CHI KEONG

Consultant, Department of Cardiology appointed as Co-director, Electrophysiology and Pacing with effect from 1 October 2009.

Both appointments are for a 2-year term.

## New Ambient Experience Calms the Jitters

Heart procedures have traditionally been a rather nerve-wrecking experience for the majority. To allay patients' fear and anxiety, the National Heart Centre Singapore (NHCS) and Philips introduced the first Ambient Experience cardiac catheterisation laboratory in Singapore on 19 November 2009. Using a tablet PC, patients get to choose a room 'theme' prior to the interventional or cardiac electrophysiology procedure. When the selected theme is activated, the room is transformed into a multi-sensorial experience through dynamic lighting, sound and projections. Walls appear to fade away, calming sounds and accompanying images wrap the patient in a relaxing ambience. This creates a comforting atmosphere for the patients and reduces anxiety.



75-year-old Neo Bee was the first to enjoy the Ambient Experience at the NHCS cardiac catheterisation laboratory while having her coronary angioplasty done to open her blocked arteries. Describing the experience, Mdm Neo shares, "I saw birds and kangaroos on the ceiling and there was soothing music too. I felt calm and relaxed."

## NHCS Website Gets a New Look

The National Heart Centre Singapore (NHCS)'s corporate website had undergone a makeover in December 2009. It has also been redirected to [www.nhcs.com.sg](http://www.nhcs.com.sg). Do visit our revamped site for the latest updates and developments.



## President's Challenge 2009 – "Healthcare, I Care!"



Supporting the President's Challenge 2009, NHCS garnered 569 smiles and raised \$1095.70 between 12 to 16 October 2009 under the SingHealth's "Healthcare, I Care!" 10K Smiles Project.

In addition, 15 staff led by NHCS Acting Chief Operating Officer Malcolm Koh shared plenty of warmth and laughter with some 70 elderly folks at the Yong-En Care Centre on 31 October 2009. Through karaoke singing, movie screening, ball games, and birthday celebrations, the staff and the residents had a fun and meaningful time. Besides a sumptuous lunch, the residents also received a goodie bag.

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