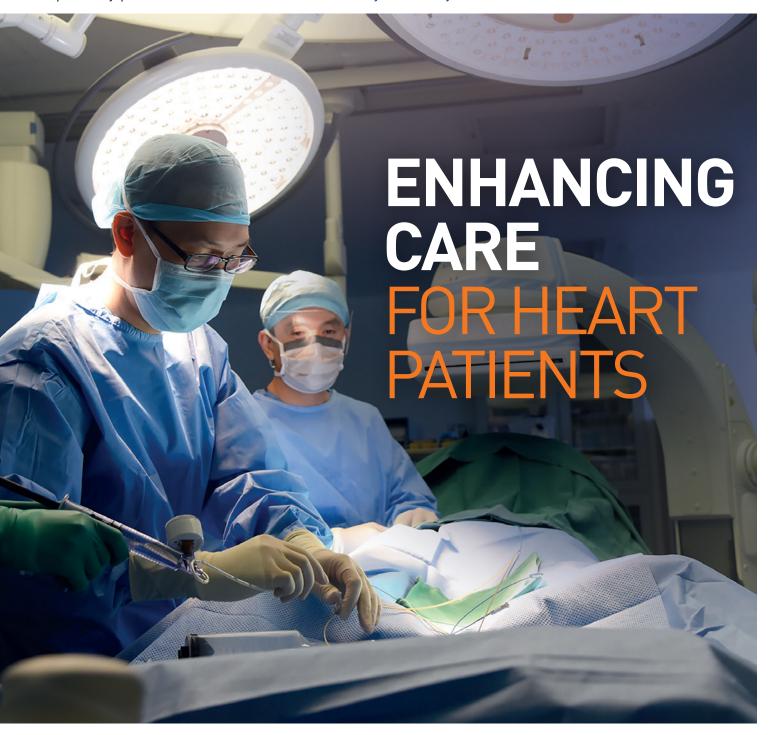
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Enhancing care for heart patients

The National University Heart Centre, Singapore introduced a new treatment for patients with heart defects.



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Giving in every way

NUHS Fund Limited applauds partners who have reached out to underprivileged patients in interesting ways.





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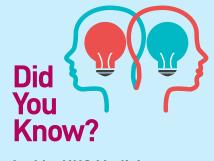
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12 Fresh Perspective

The heart matters

Dr Koo Chieh Yang shares how he takes time to connect with patients.





Led by NUS Medicine students, the annual Public Health Service provides free health screenings to residents aged 40 and above. The 11th edition in 2016 introduced a hearing station and exhibition on mental health, and was supported by close to 50 sponsors and partners.

Feature Gaining through giving

Find out how NUHS volunteers have gained from giving back to the community.



About National University Health System

The National University Health System (NUHS) is an integrated academic health system in Singapore that delivers value-driven, innovative and sustainable healthcare.

Grouping National University Hospital (NUH), National University Cancer Institute, Singapore (NCIS), National University Heart Centre, Singapore (NUHCS), National University Centre for Oral Health, Singapore (NUCOHS), National University of Singapore (NUS) Yong Loo Lin School of Medicine, NUS Faculty of Dentistry and NUS Saw Swee Hock School of Public Health under a common governance structure, NUHS creates synergies for the advancement of health by integrating patient care, health science education and biomedical research.

NUHS also works closely with health and social care partners in the public, private and people sectors to develop and implement programmes that contribute to a healthy and engaged Singapore population in its role as a Regional Health System.

For more information on NUHS, visit www.nuhs.edu.sg

















Congratulations to our PS21 award winners!

NUHS staff bagged several accolades at the PS21 ExCEL Awards 2016, organised by the Public Service Division to recognise innovations in delivering public goods and services.

- Dr Lee Yee Mei (Head of Nursing, NCIS) was awarded the Innovation Champion (Silver) Award;
- The Innovation Spotlight (Merit) Award went to the NUH Telehealth Programme, led by Assoc Prof James Yip (Chief Medical Information Officer, NUHS); and
- The Most Innovative Project/Policy (Merit)
 Award was given to the NUHS-RHS
 Integrated Interventions and Care Extension
 (NICE) Programme.

New anti-diabetic drug developed

Researchers from the NUS Yong Loo Lin School of Medicine, together with NUHS' Investigational Medicine Unit and the Singapore Clinical Research Institute, have made headway in the national fight against diabetes by developing a potential anti-diabetic drug. In the successful Phase 1 clinical trial, the drug, known as DAA-1, improved the action of insulin (the hormone that regulates blood sugar and is defective in diabetics) and reduced chronic inflammation. The team will conduct further studies on the treatment, which stemmed from over 20 years of research.



From left: Prof Lee Kok Onn, Assoc Prof Teoh Yee Leong, Associate Professor Sim Meng Kwoon



The NUH-St Luke's Hospital Integrated Care project team together with Dr Amy Khor, Senior Minister of State, Ministry of Health and Ministry of the Environment and Water Resources (third from left).

3 Lauding best practices in integrated care

The National University Hospital-St Luke's Hospital Integrated Care project received the Best Practice Medal in Care Redesign at the inaugural National Healthcare Innovation and Productivity (HIP) Medals ceremony, organised by the Ministry of Health. The two hospitals' collaboration has enhanced step-down care for patients who need total knee replacement or total hip replacement. Patients have benefited from the reduced transfer time between the two institutions, shorter hospital stays, clearer communication of care arrangements, and better financial counselling.

NUHS group recognised for life-saving act

Five NUHS individuals answered the call of duty and revived a man who had a cardiac arrest at an MRT station, even though they were off work then. Their quick action and teamwork saved a life. For that, Dr Peng Kailing, Senior Staff Nurse Nurhana Binte Mohamed, Staff Nurse Hazel Tan and NUS medical students Peter Daniel and Kelvin Wui received the Public Spiritedness Award from the Singapore Civil Defence Force.



From left: Peter Daniel, SN Hazel Tan, Dr Peng Kailing, SSN Nurhana Binte Mohamed. Kelvin Wui

Debunking myths about antibiotics

An NUHS study, which aims to educate the public about the proper use of antibiotics, found that over 75% of patients do not know that antibiotics are not effective against viral infections, such as coughs, sore throats or runny noses. Patients expect antibiotics to be prescribed for such ailments and would see another doctor if such drugs were not given, according to findings. The study was conducted by NUS Medicine students, under the mentorship of Dr Mark Chen (NUS Saw Swee Hock School of Public Health), Dr Lee Tau Hong (Tan Tock Seng Hospital) and Dr Lim Fong Seng (NUH).



The mentors with Dr Magdalene Lee (second from left) and Dr Darius Pan (third from left) who represented the group of medical students who conducted the survey.



6 Commemorating and enhancing eye health

The NUH Eye International Congress, held in November 2016, saw eye health experts from around the world coming together to share knowledge and discuss ideas and issues in the field of eye health. Held in conjunction with the NUH Department of Ophthalmology's 30th anniversary celebration, the guest of honour was Dr Vivian Balakrishnan, Minister for Foreign Affairs (fourth from right in photo) and an alumnus of the ophthalmology department. The event also featured an art exhibition to raise funds for the visually impaired.



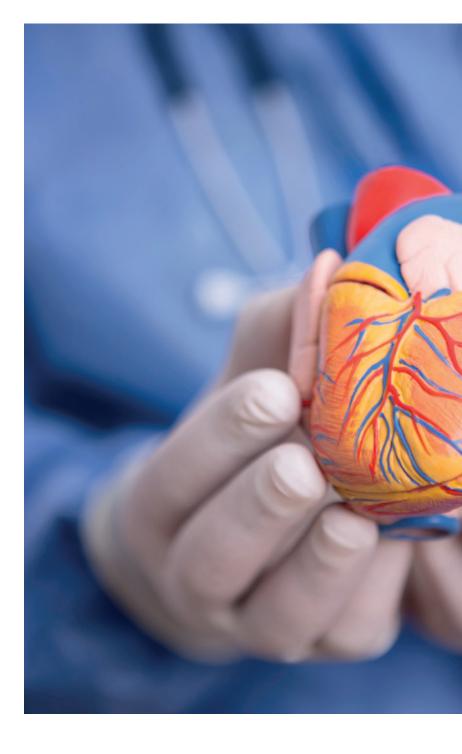
Joint effort to address public health issues

At the 2nd Singapore International Public Health Conference, organised by NUS Saw Swee Hock School of Public Health and held in September 2016, NUHS public health experts gathered with local and overseas healthcare professionals to discuss solutions to pertinent healthcare challenges. These ranged from infectious diseases such as Zika to diabetes. Dr Amy Khor, Senior Minister of State, Ministry of Health and Ministry of the Environment and Water Resources, opened the conference as the guest of honour.



ENHANCING CARE FOR HEART PATIENTS

People with heart defects usually face a series of open heart surgeries. Evidence+ looks at how the National University Heart Centre, Singapore strives to minimise such traumatic operations and provide better care for its patients.



very surgery has its risks. For a small group of people, they may need to take this risk once every decade to survive. Born with an abnormal connection between the heart and the blood vessel that supplies blood to the lungs (see sidebox on page 5: "Congenital pulmonary valve defects"), patients may have to undergo three open heart surgeries by the time they are in their 30s.

These procedures are crucial as they allow doctors to implant an artificial tube-like vessel into the heart to help increase blood flow to the lungs, or replace an implant that has degenerated over time.

But Dr Edgar Tay, a cardiologist from the National University Heart Centre, Singapore (NUHCS), has seen many patients put off their surgeries due to their apprehension. "It is a big psychological burden. Some patients or their families see each surgery as 'testing fate'," shares the Senior Consultant.

Dr Tay's patient, Mr Tan Xin Chun, 32, recalls the painful recovery from his third open heart surgery in 2010: "I was very weak and in a lot of pain. I needed help to do everything – from eating, to drinking, to getting dressed. I even had to learn to walk again."

Put off by the painful recovery and the risks involved in the operation, Mr Tan even tried to delay his next major operation by ignoring his symptoms and "learning to live with the breathlessness and fainting spells".

Aware of patients' concerns, congenital heart specialists from NUHCS and the National University Hospital's (NUH) Division of Paediatric Cardiology





Some patients or their families see each surgery as 'testing fate'.

Dr Edgar Tay, National University Heart Centre, Singapore

patients did not need open heart surgery five years after the minimally invasive intervention.

The treatment is part of the Congenital and Structural Heart Disease Programme, one of NUHCS' core clinical areas (see page 7: "About the NUHCS").

Fewer operations, more benefits

Associate Professor Quek Swee Chye, who heads the NUH Division of Paediatric Cardiology, says the new method offers significant benefits for patients, many of whom have undergone surgeries in their younger days. "With each open heart surgery, the risks become higher because the chest had been previously opened, and there is underlying scar tissue which makes surgery more difficult," says the Senior Consultant, who works closely with Dr Tay on the procedure.

Apart from reducing surgical risks, the minimally invasive approach also lowers the psychological trauma associated with a major surgery.

introduced a new minimally invasive procedure that can help to reduce the number of major surgeries needed in a lifetime. The doctors worked with imaging specialists and surgeons to push out the treatment.

This new approach involves inserting an artificial valve within the deteriorated implant to prop up its walls and re-open it, explains Dr Tay. A thin tube, which contains the specially-designed valve (see sidebox on page 6: "The minimally invasive valve"), is inserted through a vein in the leg, pushed up to the heart and into the failing implant.

According to Dr Tay, this procedure does not replace open heart surgery but offers the possibility of delaying the next time the high-risk operation is needed. Studies in the United States, Europe and Canada have shown that over 90% of

Congenital pulmonary valve defects affect 0.8% to 1% of all patients born with a heart disease. The pulmonary heart valve allows low-oxygen blood to be pumped from the heart to the lungs to be replenished with oxygen. If the valve is improperly formed or does not exist, the blood pumped out from the heart flows back and not enough of it reaches the lungs. This results in oxygen shortage in the rest of the body.



The minimally invasive valve – created from a cow's neck vein and a stretchable metal stent – is inserted through a leg vein and guided up to the heart. First trialled in the United Kingdom in 2000, the valve became commercially available in 2006. Before launching it in Singapore in 2016, NUHS doctors had monitored the long-term medical evidence of its safety, reliability and suitability.

Mr Tan, who became the first patient in Singapore to receive the treatment in August 2016, is glad that the procedure has bought him more time before having to undergo the next open heart surgery.

Other advantages of the new procedure include the shorter stay of just a few days, compared to several weeks needed to recuperate from open heart surgery, as well as being able to return to regular activities almost immediately after being discharged.

Integrated care from childhood to adulthood

Dr Tay notes a key reason that enabled NUHCS to offer this new technique: "For such a programme to be approved, there has to be an integrated child-adult cardiology service, in addition to surgical expertise."

Seamless treatment for patients from childhood to adulthood is one of NUHS' key offerings for heart patients. There is also an integrated multidisciplinary team of cardiologists and surgeons to plan and perform the procedure.

"Both NUHCS and the NUH paediatric cardiology teams are conjoined. Our foetal cardiologists, adult cardiologists and cardiac surgeons traverse to treat both child and adult patients. We hold multidisciplinary discussions and are able to assess patients holistically to recommend the best option for each of them," says Dr Tay.

Assoc Prof Quek adds: "Working together as a team affords much synergy. The patients benefit from our combined expertise as well as familiar faces and surroundings."

Making a difference to heart patients

Months after the procedure, Mr Tan remains in the pink of health and spends his time tackling a busy schedule as a consumer experience consultant. He is grateful for the medical advances that have enabled him to now live without suffering constant fatigue and breathlessness. "My doctor calls me a 'good living example' to others. I hope to show that even someone with a heart condition can live an active and vibrant life," he says.

NUHS aims to extend the same procedure to more patients in 2017, and develop NUHCS as a regional referral centre as well as teaching and training hub for the technique. With these efforts, more heart patients could become empowered and enjoy a healthy life away from fear, the same way Mr Tan has benefited. •



Doctors from NUHCS and NUH work closely to offer integrated treatment for heart patients.



66

The patients benefit from our combined expertise as well as familiar faces and surroundings.

Assoc Prof Quek Swee Chye, National University Hospital



The **Heart Failure Programme** comprises a multidisciplinary team of physicians, case managers, nurses, dietitians, social workers, pharmacists and physiotherapists. It has successfully reduced re-admission rates, length of hospital stays and mortality rates.

The **Heart Rhythm Programme** seeks to deliver better treatment and management of heart rhythm disorders, which are increasing as the population ages. It offers a range of evaluation techniques and treatment procedures, and works closely with the Heart Failure Programme to comanage high-risk patients.

The Congenital and Structural Heart Disease Programme offers continuous care throughout patients' lifespans. Besides surgeries for inborn heart conditions and minimally invasive procedures, the programme includes pre-natal testing and genetic counselling for parents with a history of congenital heart disease.

The Acute Coronary Syndrome Programme provides timely help for heart attack patients. It has reduced the time it takes to move such patients from admission to the procedural room for "ballooning" (to unclog heart blockages). At 47 minutes, it has exceeded international standards of 90 minutes.

The Vascular Medicine and Therapy Programme aims to reduce limb amputations that result from the hardening of the arteries. It offers personalised patient care, including diagnostic testing, patient education and surgery.

The **Women's Heart Health Programme** is a local programme dedicated to women with or at risk of heart disease. It aims to raise awareness and create a comfortable one-stop environment for the evaluation, management and education of cardiovascular conditions in women.



Each core programme aims to provide tertiary level of care to diseases of strategic importance to Singapore.

Prof Tan Huay Cheem, Director, National University Heart Centre, Singapore



GIVING IN EVERY WAY

NUHS Fund Limited pays tribute to everyone who has made a difference to the lives of NUHS patients.

Written by the NUHS Development Office, which manages NUHS Fund Limited.

here are many ways to lend a hand to needy patients, from providing financial support to spending time to cheer them up.

Inspired by partners who have contributed in innovative ways, NUHS Fund Limited – the charity arm of the National University Health System (NUHS) – themed its 2016 Giving Tree donor appreciation event around "Giving in Every Way".

To kickstart a new year, NUHS Fund Limited looks back at how individuals and organisations have contributed to the welfare of NUHS patients in 2016.

More ways to engage and give

Rather than just making an outright donation, Timbre Group chose to engage its patrons to do good too. Since October 2016, the restaurant chain has been encouraging customers at its food and drink outlets to round up their bills to the nearest \$10, with the difference going to children who require financial support for their medical treatment. Every dollar raised is matched by Timbre, until the target amount of \$100,000 is reached.

The philosophy behind this micro-giving initiative is that everyone is generous and, if presented with an opportunity to give, they will. Mr Edward Chia, Cofounder and Managing Director of Timbre Group, hopes that through this partnership, "Timbre





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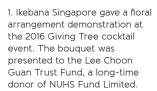
can be a force for good in making a difference to families who need additional support".

Other partners of NUHS Fund Limited have also displayed the same dedication. The estate of Ms Pacita Abad, a late artist who was a patient at the National University Cancer Institute, Singapore, endorsed NUHS' collaboration with Takashimaya Department Store to sell leather-bound notebooks with inserts of Ms Pacita's paintings. The funds raised go to patients in need of financial aid.

The vibrant inserts are accompanied by inspirational quotes by the artist, one of which illustrates her giving spirit: "I have always believed that an artist has a special obligation to remind society of its social responsibility."

This campaign, which runs from December 2016 to February 2017, is one of the many creative ways that NUHS Fund Limited has collaborated with corporate partners to raise funds and awareness for the underprivileged.





- 2. Diners at Timbre can round up their bills to the nearest \$10, with the difference going to young patients in need.
- 3. Make-A-Wish Foundation brought some Disney magic to the children's ward at NUH.
- 4. NUH paediatric patients were treated to a day of fun and games on XL Catlin's Global Day of Giving.



ABOUT NUHS FUND LIMITED

NUHS Fund Limited is a Company Limited by Guarantee and a registered charity with IPC status. The charity was set up by the National University Health System (NUHS) to promote medical research and development as well as provide health-related services to

A key objective is to address unmet gaps not covered by existing government and community assistance schemes, as well as support patients who are determined to be in need of financial assistance with the costs of medical treatment and the recovery process.

NUHS Fund Limited relies on the support of benefactors and donors. Every dollar donated goes in its entirety to help beneficiaries and their families. Donations may be made via this link: bit.ly/NUHSfund.

Beyond dollars and cents

Understanding that giving extends beyond financial support, the team from Bunge Asia Private Limited has committed 400 hours of service to spend time with elderly patients at the National University Hospital (NUH). The seniors have cognitive impairment in conversations and activities. Every week, staff from the agribusiness and food company visit the wards to interact and engage patients in activities planned by NUH's nursing and rehabilitation departments.

The volunteers have commented that they have picked up new skills to interact with the elderly, through training sessions by the nurses and handson experience in the wards. They added that the experience has given them more insights on how to deal with their elderly relatives.

NUH patients also benefited from global insurance agent XL Catlin's Global Day of Giving in May 2016. Child patients and their siblings were treated to a day of fun and games organised by XL Catlin staff. The activities gave the patients a much-needed break from the routine of their hospital stay.

The XL Catlin staff found the project so meaningful that they signed up again to organise a Christmas event for more young patients. They brought joy to the children with a magic show as well as roving Santas and Elves who distributed presents in the wards, Intensive Care Unit and Emergency Clinic at NUH.

Mr Mark Houghton, XL Catlin's Regional Manager, shared that the company is "thankful for the opportunity to bring cheer to these children... to be able to offer them some time away from their wards and relish what it is like to be a kid, even if just for a moment". •



GAINING THROUGH GIVING

By giving back to the community, volunteers in NUHS' local and overseas outreach programmes have, in turn, gained valuable life lessons.



very year, over two weekends, students from the National University of Singapore's Yong Loo Lin School of Medicine (NUS Medicine) go knocking on hundreds of doors in HDB estates. They offer an important service – free health screenings for low-income residents above the age of 40 to detect conditions such as diabetes, hypertension and cancer.

In 2016, the volunteers screened over 600 residents in Taman Jurong and Marine Terrace. Subsequently, the students followed up with the residents to discuss the screening results, and will continue to make home visits or phone calls to address outstanding issues.

This Neighbourhood Health Service (NHS) programme is one of a series of projects undertaken by the National University Health System (NUHS) and its institutions to reach out to those in need.

Volunteers involved in such outreach programmes, both in Singapore and overseas, have received more than just the joy of giving through their experiences.

Gaining lessons from giving help

Lawrence Wong, second-year NUS Medicine student who co-chairs the 2016 NHS, says his interactions with residents have shown him how important empathy is, as well as the value of placing medical problems in the social context.

He recalls one man, in his 50s, who had been flagged during the initial screening as having high

blood pressure and being a heavy drinker. But he insisted he was healthy and became defensive about his excessive alcohol consumption.

The team lent him a listening ear and tried to understand why. "We realised it wasn't only about drinking for him – it was also his fear of losing his friendships if he stopped," says Lawrence.

"This experience showed me the importance of understanding the patient's point of view. Healthcare is essential and people want it, but there could be other barriers we might not have thought of. Until these are resolved, we can't tackle the medical aspect," he adds.

Third-year NUS Medicine student Justin Ng co-helms another student-led initiative – the Public Heath Service (PHS). This annual event brings medical, nursing, pharmacy and dentistry students together to offer free health screenings to individuals aged 40 and above. Started in 2004, PHS has been conducted in neighbourhoods such







On the ground, you get to hear about their lives, not just the conditions they have.

Justin Ng, NUS Medicine student, Co-chair for Public Health Service 2016

- 1. Students conduct door-to-door health screenings to reach out to residents with mobility issues, as part of the Neighbourhood Health Service.
- 2. Students teach the Public Health Service participants proper oral hygiene, among other health tips.
- 3. Dr Ng (far right) enjoys helping the Burmese doctors improve their dialysis programme, so they can benefit more patients.

as Toa Payoh and Clementi. In 2016, the team screened over 1,362 people in Clementi.

"On the ground, you get to hear about their lives, not just the conditions they have," says Justin.

For instance, hawker stall owners wanted to attend the screenings but could not leave their stalls unattended for too long. To tackle this, the PHS team provided a priority queue for hawkers to reduce their waiting time.

The feeling is "priceless" each time the team successfully helps someone, shares Justin. He remembers a participant, who had discovered a breast lump at the screening and later had it removed, calling them to express her gratitude. "Even if it's just for this one person, all our efforts are worth it," he says.

Building bridges overseas

NUHS' outreach programmes have extended beyond our shores to benefit people in countries such as China (see sidebox), the Philippines, Indonesia and Myanmar.

In Myanmar, NUHS staff have played a key role in improving the treatment of kidney failure in children. This is significant due to the shortage of doctors there who specialise in this field. Currently, only nine paediatric nephrologists serve a population of 55 million.

Assistant Professor Ng Kar Hui, consultant from the National University Hospital's (NUH) Division of Paediatric Nephrology, conducted a five-day paediatric dialysis workshop at Myanmar's Yangon Children's Hospital in November 2015. This is part of a collaboration funded by the Fung Clinical Fellowship programme, which was set up by Hong Kong-based Fung Foundation and NUS to help NUHS healthcare staff train their overseas peers.

Dr Ng and her team have been making regular trips to Yangon Children's Hospital to train its

medical staff and audit their processes. She says she was inspired both by having given to the community and by the people she met during her stint. She was touched by the dedication of the Burmese doctors who, despite their financial limitations, took her advice to heart and used their own money to upgrade a medical toolkit.

"I am very humbled by the resilience of the people, and I always come home feeling blessed," she says. •

THE NUHS-SIF YUNNAN OUTREACH

This three-year programme by NUHS and the Singapore International Foundation (SIF) aims to enhance healthcare for the elderly in China's Yunnan province. The first phase in 2015 involved sending a team of NUHS doctors, nurses and allied health professionals to Yunnan to train the local staff. The team provided technical expertise and did planning and execution work, says Prof Sunil Kumar Sethi, Vice-Chairman Medical Board (Outreach) of NUH who oversees the initiative.

Mr Chin Yong Sak, SIF's Country
Manager for China, praises the NUHS
team's efforts. "I've witnessed how they
worked through the night to prepare
training materials," he says. "The time,
talent and resources that the NUHS
team has brought to this project are
invaluable, and has led to improvements
in the quality of care for patients."





r Koo Chieh Yang is a familiar and friendly face at the National University Heart Centre, Singapore, where he cheerfully greets the nurses by name and is acquainted even with the cleaning staff.

On his daily rounds, the candid 31-year-old uses various languages and dialects to reach out to patients decades older than him. He is fluent in Cantonese and has picked up Hokkien and Malay on the job.

The Senior Resident explains the benefit of speaking in his patients' native tongues: "Elderly patients would immediately open up and develop an affinity for you, which is unlikely to happen if you are *jiak kang tang* (Singlish for 'eating potatoes' i.e., westernised and speaking only English)."

Taking time to connect with patients, as Dr Koo has discovered, reassures them and helps them better handle their conditions. Although doing so can be time-consuming, the thoughtful doctor particularly enjoys this aspect of his work.

"As medical professionals, we are exposed to human experiences that are very humbling. No other job lets you into people's lives to make an impact in quite the same way," says Dr Koo. He sees patients with various heart conditions in his daily work. Besides doing his best for his patients through clinical duties, Dr Koo also dedicates time and effort to heart-related medical research as he thinks it is important to "stay inquisitive and challenge oneself when young". He is currently enrolled in a Masters of Clinical Investigation course at the National University of Singapore to further his research interest.

Describing himself as the "medical equivalent of an adrenaline junkie", Dr Koo was attracted to cardiology because of its fast pace and intensity.

But he admits that if he were not a doctor, he would have contemplated an "idyllic" life as a fisherman. He is equally modest about his medical aspirations. "I want to inspire confidence in patients, and be someone whom they trust and have a genuine connection with." •

QUICK FACTS ABOUT DR KOO CHIEH YANG

Department: Cardiology, National University Heart Centre, Singapore Current research areas: Sleep apnea and cardiovascular health



WE BRING QUALITY & VALUE TO YOU

At NUHS, we aim to deliver value to our patients through providing quality and cost-effective care. We explore ways to reduce wastage and optimise efficiency to achieve sustainable healthcare. With an eye on the future, we are developing the next generation of healthcare professionals who are committed to providing value-driven care to our patients.



