

# Medicine

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DOSSIER

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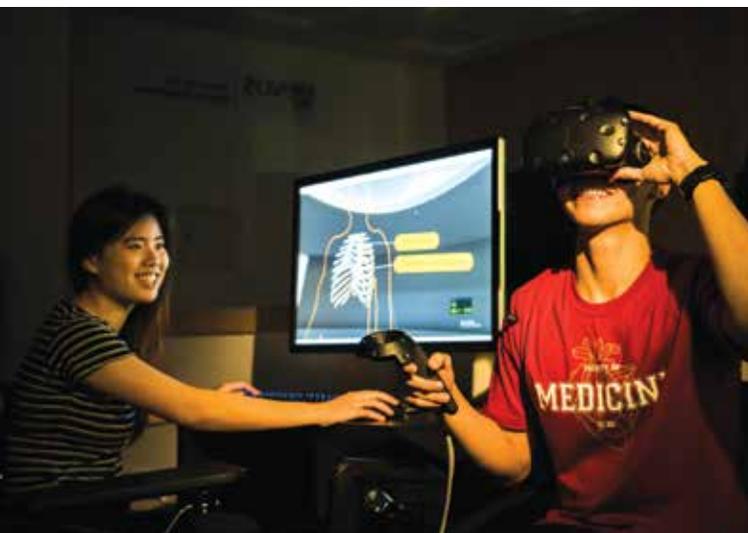
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YONG LOO LIN SCHOOL OF MEDICINE  
 DEAN'S OFFICE  
 1E Kent Ridge Road  
 NUHS Tower Block, Level 11  
 Singapore 119228  
 TEL 6772 3737 FAX 6778 5743  
 EMAIL [medmedia@nus.edu.sg](mailto:medmedia@nus.edu.sg)

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# DEAN'S MESSAGE



Dear Reader,

As we begin a new year, I would like to highlight some of our recent accomplishments.

## Outstanding students

This past July we graduated 302 new doctors and 158 new nurses. With 216 receiving support through bursaries and scholarships, many of these new healthcare professionals would not have been able to complete their medical studies without help from the School's generous supporters. It is very heartening to note that 22 of the 68 bursaries at the School were established by our alumni.

Our graduates benefited from a curriculum that goes well beyond traditional teaching methods. As an example, using the Virtual Interactive Simulation Environment, they "became" members of an emergency medical response team, learning how to triage casualties and perform respiratory, circulatory and physical disability assessments. As part of a community service elective, they took part in community initiatives under the School's GoHelp programme, such as the Public Health Service, which provides health screenings to thousands of HDB households. It is important to us that as doctors of the future, they are motivated to actively give back to the community even as students.

Another hallmark of an NUS medicine graduate are the qualities of adaptability and innovation. To this end, our annual Medical Grand Challenge, another donor-supported initiative, is designed to spark these qualities in our young doctors-to-be. In this annual competition, they identify an unmet or unaddressed medical or healthcare issue, develop a solution, prepare a prototype, and design a business implementation strategy. Fourth-year student Julian Low continued innovating after his team won the 2016 competition and set up a healthy food social enterprise.

## Life Changing Research

In the past year, our researchers have received accolades and recognition for their life-changing work and this is also thanks to our donors. Professor John Eu-Li Wong, past Chief Executive of the National University Health System and the holder of the Isabel Chan Professorship, was accorded one of the highest medical honours in the world last year when he was elected to the U.S. National Academy of Medicine. Another colleague, Prof Dario Campana, was awarded the prestigious Jacob and Louise Gabbay Award for his breakthrough work in CAR-T cell therapy. This is an immunotherapy regimen that has dramatically improved outcomes for certain leukaemias and lymphomas. Prof Campana and Associate Prof Allen Yeoh, through their work at the VIVA-NUS Centre for Translational Research in Acute Leukaemia, continue to drive efforts to classify and treat leukaemia cases more effectively for better outcomes for children living with the disease.

As a medical school affiliated with a university, we are in a privileged position to foster the careers of clinician-scientists who apply research discoveries to advancing medical care. Last year, our clinician scientists garnered several National Medical Excellence and National Medical Research Council awards, including the National Outstanding Clinician Scientist Award (Adjunct Professor Goh Boon Cher), the STaR Investigator Award (Professor Toshio Suda), as well as multiple Clinician Scientist and Transition Awards. One Transition Award winner, Dr Andrea Wong, is being mentored through the Cancer Summit Research Programme, one of six initiatives supported by the Yong Loo Lin Fund. The award enabled her to develop a therapy aimed at cancer cell metabolism, one of the last frontiers in cancer research.

## Exceptional Faculty

Central to everything we do is the quality and dedication of our faculty. Last year, we hired five tenure-track faculty in the areas of orthopaedic surgery, cancer biology, neurodegenerative diseases, healthy ageing, dementia care and nursing education. Among these was Dr Dennis Hey who has won various young researcher awards and the Best Teacher Award in the NUHS Orthopaedic Surgery Residency Program. Another newly tenured faculty member, Dr Vivian Wu, is involved in work that is funded by the NUS Mind Science Centre, a research initiative at the School's Department of Psychological Medicine that is strongly supported by our donors. Two of our existing faculty, Drs Long Yun Chau and Shefaly Shorey, were awarded the University-wide Annual Teaching Excellence Award in recognition of their efforts and dedication to teaching.

Many of these successes, whether they be opportunities given to financially needy students to realise their potential as Singapore's next generation of physicians, or life-changing medical treatments brought about by innovative research, are made possible by our generous benefactors. We thank them and look forward to their continued partnership.

With best wishes for a very healthy and successful 2020.

Yours sincerely,

*Yap Seng*

# MEDICAL GRAND CHALLENGE 2019



Organised by NUS Yong Loo Lin School of Medicine's Centre for Medical Education, the Medical Grand Challenge started in 2017 to nurture creativity while encouraging NUS Medicine undergraduates to cultivate an inquiring and entrepreneurial mind. At the same time, the multi-disciplinary nature of the competition draws students from different faculties and fosters collaborative teamwork.

In 2019, students from various NUS faculties—Medicine, Business, Computing, Engineering and Law—and their counterparts from Nanyang Technological University (NTU) and Yale-NUS, presented innovative solutions to unmet healthcare challenges they have identified. Over the past year, these students went through interdisciplinary boot camps to develop and refine their proposed solutions and prototypes, conceived to solve existing healthcare problems.



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TO VIEW VIDEO

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Besides being professionally competent, doctors also need to be innovative to keep refreshing and improving the healthcare tools we have at our disposal. Hence, we provide students with platforms that hone problem-solving skills, to expand their modes of thinking and perspectives. Innovative thinking and collaborative team work are part of our training at NUS Medicine, alongside the academic rigour and soft skills training that students go through.

— Prof Chong Yap Seng  
Dean, NUS Medicine

## Winners of MGC 2019



First Prize Winners  
**Kenn**

Team comprising students from NUS Medicine, Law, and Engineering

“Various ailments restricting hand functions affect our ageing population, particularly those that cause weakened grip strength and finger dexterity e.g. stroke, hand arthritis. Kenn is a modular hand splint with the novel approach of serving multiple functions in one, with no size restriction on writing tools that can be attached on the splint.”



Second Prize Winners  
**Project 21**

Team comprising students from NUS Medicine, Engineering, and Information Systems – Computing

“Falls are a serious hazard for the elderly, and pose problems for healthcare stakeholders. Project21 is a wearable hardware tool that assesses the elderly early for fall risks and identifies them for early intervention. The tool’s features include gait tracking and control via a mobile app.”



Third Prize Winners  
**P1 Probe**

Team comprising students from NUS Medicine, NTU Electrical Engineering, and Business & Accountancy

“There is a prevalence of pressure ulcers and limited reliability in the existing ways we identify high-risk patients. P1 Probe is a non-invasive, portable probe to detect tissue damage before visible skin changes using impedance spectroscopy, with an integrated data interface.”



1. Award presentation ceremony featuring all winning groups and judges
2. Students from shortlisted teams presenting their projects to the judges
3. Participating students explaining their idea and prototype to Professor Chng Wee Joo, Vice-Dean of Research (right)
4. Students from shortlisted teams presenting their projects to the judges

# AH LENG'S CANTEEN

Counsellor, banker, provider of food and drink – *Wong Ngiap Leng* operated Ah Leng's canteen on the University's former campus. He is remembered fondly by several generations of students for the kindness he showed to many of them who could not pay for their meals. Mr Wong reminisced about the time when he operated the canteen for seven days a week, from 1947 to 1983.



Ah Leng and his wife at their canteen for the last time before it was shut down on 2 June 1983

**T**he funny part about Ah Leng's Canteen is that it wasn't a name picked by my father, who started the canteen in the 1920s, or me. At that time, the hospital was called Sepoy Lines by the British and my father just ran the canteen... and it never had a name. Ah Leng's Canteen was just the way all the medical students of that time referred to it and I guess it just stuck. And, in a way, it is apt since I was born there!

I took over the canteen in 1947 when my father went back to China – he had to shut it during the war (World War II). I was 19 years old and had just got married, so my wife helped me at the canteen.

Many of our customers were students who returned to medical school after the war. At the time, there was no Singapore or Malaysia, so there was no difference. It was just hostelites at King Edward VII College of Medicine and non-hostelites. And because we lived on the premises, we opened the canteen at 6am and closed only around 7pm. At that time, we served toast with half-boiled eggs, coffee, tea, Milo, Horlicks, curry puffs and ham and cheese sandwiches. One piece of toast at the time cost 10 cents.

Later, we started serving kway teow, chicken rice, bee hoon and eventually even hamburgers for lunch and dinner. I remember Dr Mahathir (former Malaysian Prime Minister Tun Dr Mahathir Mohamad, Class of 1947) liked my bee hoon soup.

After I closed my canteen at 7pm, I ran a small stall on the roof of KE Hall, serving snacks and hot drinks to the hostelites until midnight. Then I would go home. It was like that seven days a week.

I don't know why the students liked my canteen. It was a cosy corner where they all sat and chatted. But I can still recall the smell of the chemicals wafting into the canteen from the anatomy department (now a carpark near Harrower Hall). Or was it the smell of the dead bodies? I was not sure.

Some of the students were hiding from lecturers, others were waiting for boyfriends or girlfriends. I don't want to say who they are but most of them are successful doctors now. And because we were near the sports field, students would pop in after playing football, cricket or hockey. There were a few fights after the games, but not at my canteen.

My wife and I lived at the back of the canteen with our four children until we bought our flat at Tiong Poh Road in 1966. We could walk across the road from the canteen. There was no expressway (AYE) then and we walked through the field using a torch because it was so dark.

It is true some of the students borrowed money from me to pay their fees or for food. Some of them also gambled. I kept records of what people owed me in the tiga lima buku (555 books). Most of them paid me back once they started working. Some forgot, but it is okay. The names are still in some of the 555 books which are in a locked box. I won't let anyone see them.

I collect all the newspaper articles about the canteen. I also received a copy of a special book (the Centenary of Tertiary Education by the Medical Alumni) where the doctors printed my name on the cover. Dr Ngiam Tong Lan also wrote a poem about me. In 2005, Professor Tan Ser Kiat asked me to make tea at the opening of Duke-NUS Graduate Medical School at the Singapore General Hospital (SGH) grounds. I was so happy to go back to SGH to make the same tea I made for all of them when they were students.

I am 86 years old now. I still remember everything; I remember everyone. They are always in my head and in my heart.





The organising committee and facilitators of Operation CPR

# Xin Chào! Operation CPR

by Lee Zhi Yan, Shariel Leong  
Phase III Medical Students

Started in 2017, Operation CPR is one of the first overseas community-based basic cardiac life support initiatives that targets public health. Conducted in Vinh Tuong, Vinh Phuc, Hanoi, Vietnam, it was founded by A/Prof Koh Dow Rhoon from the Department of Physiology. Led by Dr Li Zi Sheng and Dr Jonathan Tang from the National University Hospital, this year's exercise was organised by a team of students from the Yong Loo Lin School of Medicine and the Vietnam Military Medical University (VMMU).

Vietnam is facing an epidemiological shift in disease mortality from communicable to non-communicable diseases. Based on World Health Organisation's (WHO) Non-communicable Diseases Country Profiles in 2018, cardiovascular diseases have the highest mortality rate amongst non-communicable diseases in Vietnam. Currently, there are operational policies to change dietary habits, tobacco use and treatment of high blood pressure in the country, but basic cardiac life support initiatives have been minimal. This is where Operation CPR comes in—to raise awareness, impart knowledge and encourage confident action in an emergency.

A team of 10 students from NUS Medicine travelled to Hanoi together with Dr Li and Dr Tang on 25 October 2019. We were warmly welcomed by the VMMU students, who treated us to a traditional music performance and an exciting programme that gave us insight into the Vietnamese culture and the university. In turn, we shared more about the academic programme and student life at NUS Medicine. It was interesting to note how each of our curriculum is tailored to the unique practice environment of our countries.

Working with 45 students from VMMU, we conducted a half-day workshop for 120 high school students from Nguyen Hue High School for Gifted Students on 27 October. The workshop commenced with a keynote address by the Head of Nursing Department, VMMU, A/Prof Le Anh Tuan, who gave an overview of the increasing prevalence of NCDs in Vietnam and highlighted the importance of being prepared to respond to cardiovascular emergencies. Following this, Le Huyen Trang, a Year 6 VMMU medical student, gave the students a quick introduction about CPR, clearly explaining how to approach and help someone who had a cardiovascular emergency.

The high school students were all very attentive and eager to learn and were quizzed through a series of mini station games. Through the fun and laughter, important CPR knowledge was further reinforced to the students. They were encouraged to apply their knowledge during a practical session, during which they cleared any doubts, to ensure that they knew exactly how to approach someone undergoing cardiac arrest. With the guidance of VMMU and NUS Medicine students, the high school students performed CPR on mannequins with feedback to ensure that their technique was accurate. It was heartening to see the high school students enthusiastically trying out their newly learnt skills and excitedly discussing their applications during the practical session. We have also received feedback that the workshop was very entertaining and useful.



High school students having fun learning



NUS Medicine students Xie Jiaying (with loudspeaker) and Sean Wang (kneeling) explaining CPR procedures to a group of high school students in Hanoi, Vietnam

To consider the long-term prospects of the workshop, we conducted a survey on the knowledge, skills and attitudes of high school students and how they have changed after going through the CPR workshop. The results were promising: the students showed a marked improvement in their understanding and competence to perform CPR.

We hope that through this exercise, the Vietnamese students would be able to react in cardiac emergencies and apply new-found skills and knowledge to those in need. As global citizens in the larger scheme of things, we have a sense of duty to do our part and contribute to the regional community. We aim to expand this project in the near future and reach more students, while setting standards for resuscitation, first aid practice and training for healthcare providers and lay rescuers. In doing so, we hope to achieve our vision of having at least one first-aid in every household in Vinh Tuong.

We are very thankful to the professors and students from VMMU, who were very helpful and supportive throughout the project. We would especially like to give special thanks to A/Prof Le Anh Tuan; A/Prof Le Van Dong, Head of Centre of Military Toxicology at VMMU and Dr Pham Thai Dung, Vice-Head of Intensive Care Unit of Hospital 103 for their unwavering support.



The team of NUS medical students and NUH doctors



High school students practicing CPR on a mannequin, with guidance from VMMU and NUS medical students

# The NUCOT Diaspora in Myanmar

by Dr Tan Yi Quan and Associate Professor Tiong Ho Yee  
Department of Urology, University Surgical Cluster, National University Health System



Prof Vathsala (2nd row, 4th from left) and A/Prof Tiong (2nd row, first from right) with Yangon nephrologists and urologists in May 2019

Dr Tan Yi Quan and A/Prof Tiong Ho Yee from the Department of Urology trace how the National University Centre for Organ Transplantation (NUCOT) started its efforts to lead medical education. They also outline the ways in which the faculty lend their expertise to emerging countries and created the NUCOT Diaspora in Myanmar.



Prof Prabhakaran (2nd row, 4th from left), Prof Yap (2nd row, 5th from left), A/Prof Tiong (2nd row, 1st from left) and Dr Tan (3rd row, 2nd from right) with Mandalay paediatric nephrologists, paediatricians, paediatric surgeons, anaesthetists and nurses in May 2019

The International Society of Nephrology (ISN) Sister Renal Centres Programme (SRC) is dedicated to addressing the disparity between developing and developed countries in the research, diagnosis, treatment, and prevention of kidney disease. The National University Centre for Organ Transplantation (NUCOT) has been actively involved in the ISN SRC, developing renal transplant capabilities for both Adult and Paediatric transplant programmes at multiple renal centres in Myanmar.

As part of NUCOT's aspirations to develop into a regional centre of transplant excellence, Professor A. Vathsala, Co-Director of the National University Centre for Organ Transplantation at the National University Health System initiated NUCOT's participation in the ISN SRC as a matured academic medical centre in 2012. Funding from the SRC enabled NUCOT to nurture a partnership between NUH and the Thingangyun Sanpya General Hospital (TSGH), a 430-bed public hospital in Yangon, Myanmar. In 2012, NUCOT and TSGH were introduced to the ISN SRC Programme by the Ministry of Health (MOH) and in 2013, NUCOT and TSGH were officially recognised as a Sister Renal Centre Pair by ISN. Since the start of the programme, 27 TSGH doctors and nurses have visited NUH to: firstly, build capability through training; secondly, expose the TSGH team to multidisciplinary patient care, and thirdly, understand the operating theatre infrastructure set-up and protocols.

Prof Vathsala and A/Prof Tiong Ho Yee also visited TSGH to share expert advice on optimising ward and operating theatre protocols for adult kidney transplantation. Following that, an exchange visit of the TSGH clinical team to NUH NUCOT was successfully carried out in late 2017 with attendance to clinics, operating theatres and transplant coordinator training courses. There are three levels of support under the ISN SRC Programme, each level delineating the progress of the partnership, the funding scope and benefits. NUCOT has also been accorded the highest possible status (Level A), one of the few transplant centres internationally to be awarded this accolade. With close collaboration between the two centres, Prof Vathsala and A/Prof Tiong successfully enabled the local team to perform adult kidney transplantations in April 2019 at TSGH.

The Shaw-NKF-NUH Children's Kidney Centre has been the ISN Sister Renal Centre to Yangon Children's Hospital's Renal Unit since 2015. Led by Prof Yap Hui Kim, Head & Senior Consultant, Division of Paediatric Nephrology, Dialysis and Renal Transplantation, Department of Paediatrics, Khoo Teck Puat-National University Children's Medical Institute, National University Hospital, the NUH team has conducted multiple dialysis workshops in haemodialysis and peritoneal dialysis. Burmese paediatric nephrologists were trained in NUH as clinical fellows under the International Paediatric Nephrology Association Programme. In 2017, the ISN SRC programme was expanded to include a second centre, the Mandalay Children's Hospital.

With the success of the chronic dialysis programmes, another problem arose – there was no Paediatric renal transplant programme. Haemodialysis-dependent children had to stay in the main city hospitals together with their caregivers, and were unable to return home. To address this critical need, Prof Yap and Prof K. Prabhakaran, Emeritus Consultant, Department of Paediatric Surgery, Khoo Teck Puat-National University Children's Medical Institute, National University Hospital, started the Paediatric Transplant programme in Myanmar. The first living-related kidney transplant was conducted successfully on 24 Feb 2017 in Mandalay Children's Hospital. The initial NUH team included a paediatric nephrologist, paediatric transplant surgeon, adult urologist, vascular surgeon, paediatric radiologist and a paediatric anaesthetist. Since then, deliberate efforts at expertise and skills transfer have allowed the local transplant team to operate with increasing levels of autonomy.

The most recent trip in May 2019 saw an adult urologist and a paediatric transplant surgeon operating alongside the local transplant team. There has been a total of 10 paediatric kidney transplants in Myanmar, with the children returning back to school and achieving catch-up growth. The eventual goal is for the local transplant team to perform transplants independently, with the NUH team assisting in difficult cases.

NUH NUCOT is the only transplant centre in Singapore providing both paediatric and adult organ transplant services. By taking the lead in medical education and expertise transfer to emerging countries like Myanmar, NUH NUCOT is well poised to contribute significantly to the regional healthcare landscape.

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*A/Prof Tiong and Dr Tan were part of the NUCOT team that conducted the 9th and 10th living-related paediatric kidney transplants at the Mandalay Children's Hospital, Myanmar in May 2019. Dr Tan travelled to Myanmar under the Fung Clinical Fellowship Programme. Established by the Victor and William Fung Foundation and in collaboration with NUHS, the Fellowship enables the NUS Yong Loo Lin School of Medicine to aid disadvantaged populations in ASEAN countries and in China. The Fellowship supports both outbound local expert faculties and inbound doctors from the region, enabling Singapore to partner our regional neighbours, extending support and expanding influence. This Fellowship will also allow future inbound fellows from Myanmar to train in NUH, to sustain a long-term mutually beneficial partnership.*

# A CURE FOR HORMONE-RELATED HYPERTENSION

by Dr Khor Ing Wei  
Senior Manager, Research Office

Hypertension is a serious and underestimated silent killer in Singapore and around the world, with one in four adults aged 25 years and above diagnosed with the illness here.<sup>1</sup> Left untreated, hypertension is a leading risk factor for heart disease, kidney problems and stroke.

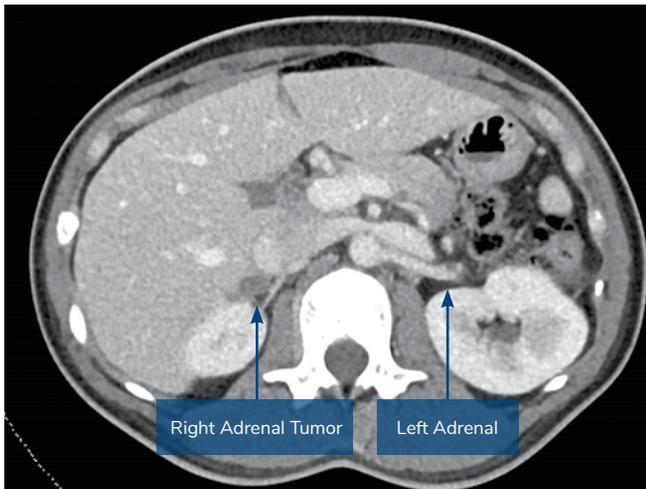


Figure 1.

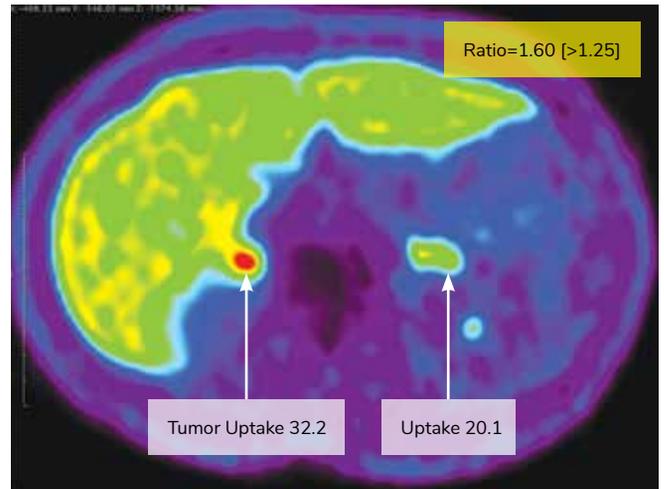


Figure 2.

The Global Burden of Disease 2017 report found that hypertension accounted for about 48% of deaths from cardiovascular disease in Singapore. Recent studies indicate that as many as 33% of Singaporean adults diagnosed and treated for hypertension continue to have uncontrolled blood pressure (BP) readings despite treatment with medications (systolic BP  $\geq$  140 mmHg or diastolic BP  $\geq$  90 mmHg).<sup>2</sup>

Most patients with hypertension have to take lifelong medication to control their condition. However, approximately 5% of patients have a treatable underlying condition called primary aldosteronism (PA).<sup>3</sup> Appropriate treatment of this condition may lead to improved blood pressure and, possibly, a complete cure of hypertension in some patients.

Now, a novel imaging technique can identify the source of the hormonal excess in patients with PA, according to Professor Roger Foo from the Department of Medicine at the NUS Yong Loo Lin School of Medicine and Senior Consultant Cardiologist at the National University Heart Centre, Singapore; and Adjunct Assistant Professor Troy Puar, Consultant Endocrinologist at Changi General Hospital (CGH). They believe that these findings are pertinent to Singapore and also relevant to patients worldwide.

#### TOP:

A tumour was detected in the right adrenal gland of a woman in her 30s with hypertension and low potassium levels by CT (Figure 1). A <sup>11</sup>C-metomidate PET-CT scan revealed that the tumour in the right adrenal gland was producing an excessive amount of aldosterone (Figure 2; red area indicates high aldosterone levels). The woman underwent surgery to remove this adrenal gland, after which her hypertension and low potassium condition were cured

## What is PA and how is it detected and treated?

Hypertension can be explained by either excess salt in the body, or excess vasoconstriction (tightening of blood vessels): two ends of the hypertension disease spectrum. Ideally, knowing where the patient lies on this spectrum will enable a more successful choice of treatment that targets the underlying problem. Hormone measurement helps to tell where the patient is located along the spectrum.

This understanding has also led to the recognition that more patients than previously suspected have salt excess because of a hormonal problem.<sup>3</sup> This condition, PA, occurs when the adrenal glands (small glands above the kidneys) produce too much of the hormone aldosterone, resulting in hypertension. In half of these patients, only one adrenal gland is affected. This condition is termed unilateral PA.

Keyhole (laparoscopic) surgery to remove the abnormal adrenal gland cures PA in these patients.<sup>4</sup> After surgery, aldosterone levels return to normal. Most patients see an improvement in their blood pressure or are able to either stop their antihypertensive medications altogether. The other half of patients with PA have excessive aldosterone production in both adrenal glands (bilateral adrenocortical hyperplasia). These patients are usually managed with medications, such as mineralocorticoid receptor antagonists, rather than surgery.

PA may be suspected in patients with difficult-to-control hypertension or those with low potassium levels. If suspected, the patients should then be referred to a specialist for evaluation, who will confirm the condition.

Currently, if hormone levels are high, patients with unilateral PA are identified through further testing using an invasive procedure called adrenal vein sampling (AVS). Even though CGH has improved their sampling success to 100% in more than 60 patients with PA over the last 5 years, AVS remains an invasive, technically difficult and expensive procedure. In many centres, failure to successfully sample the adrenal veins can lead to inconclusive results in as many as 50% of patients. Thus, having an alternative, non-invasive method to detect unilateral PA will identify more patients who can be helped by surgery, leading to better health outcomes and improved quality of life for these patients.

... having an alternative, non-invasive method to detect unilateral PA will identify more patients who can be helped by surgery, leading to better health outcomes and improved quality of life for these patients.

## Scan to non-invasively detect curable hypertension in patients with PA

Working with the Clinical Imaging Research Centre (CIRC) at the NUS Yong Loo Lin School of Medicine, Prof Foo and Adjunct Assistant Prof Puar used a sensitive functional imaging scan to pick up these abnormal adrenal glands. This scan, called 11C-metomidate PET/CT, is able to identify small (<1 cm) growths in the adrenal gland, and show if the gland is producing too much aldosterone (see Figures 1 & 2). The PET/CT scan can be done in less than an hour, without the need for hospitalisation.

Local studies have found that about 5% of all patients with hypertension have PA and may benefit from further assessment. Prof Foo and Adj Asst Prof Puar hope that, one day, many more of such patients could be evaluated for unilateral PA using the 11C-metomidate PET/CT scan and receive the appropriate treatment. They emphasise that the procedure is currently being evaluated in a relatively small clinical trial involving 25 patients, and requires a larger patient cohort validation before being ready for clinical use. A limiting factor is the scarcity of centres that are able to provide this sophisticated imaging. CIRC is one of only three centres in the world equipped to perform the new scan and is on track to being the first to demonstrate the effectiveness of the scan in a large cohort of patients. However, as the method is validated in more patients, the number of centres performing the imaging technique is likely to increase.

This scan, called 11C-metomidate PET/CT, is able to identify small (<1 cm) growths in the adrenal gland, and show if the gland is producing too much aldosterone. The PET/CT scan can be done in less than an hour, without the need for hospitalisation.

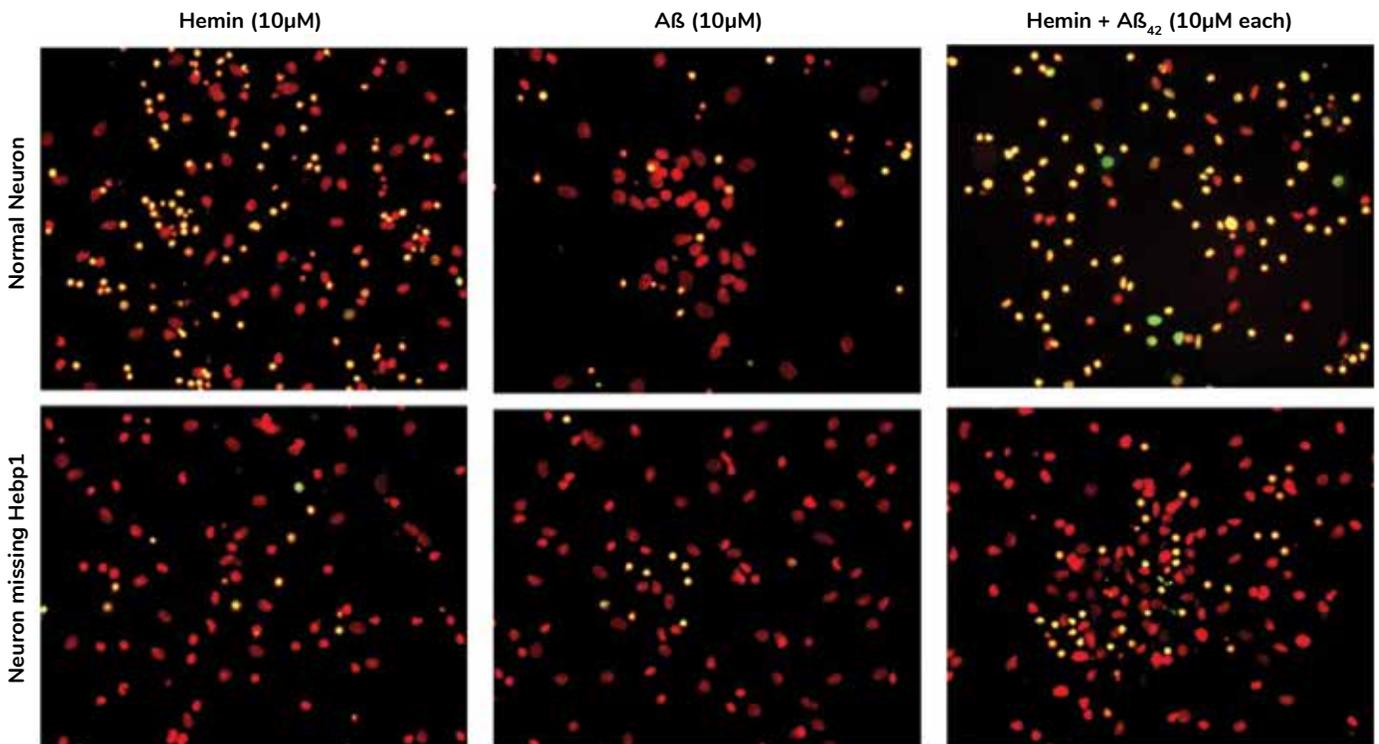
The research study is being supported through a grant from the National Medical Research Council.

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# HEBP1 A POTENTIAL EARLY MARKER OF ALZHEIMER'S DISEASE

by Dr Khor Ing Wei  
Senior Manager, Research Office



*Figure 1.*  
Hebp1 is needed for killing of neurons by free heme and abnormal Aβ protein in early stages of Alzheimer's disease

**A protein in the body helps excessive amounts of free heme to kill neurons in early-stage Alzheimer's disease (AD), and may be a promising early marker of AD.**

As AD markers go, abnormal aggregates of the amyloid-beta (Aβ) and Tau proteins are the obvious indicators. However, they do not fully correlate with the progress of cognitive decline in AD. Aβ and Tau aggregates also tend to come into play later in the AD disease process, when symptoms of the disease may already be apparent (unsurprisingly, they were discovered in postmortem brains of people who suffered from AD). By this point, the initial biological events that pave the way for disease development have already occurred. Having a marker of AD that shows changes at an early stage would help doctors to diagnose AD earlier (even before symptoms occur), and sheds some light on what happens early in the disease process.

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## Promising early marker of AD

In August 2019, Assistant Professor John Chua Jia En of the Department of Physiology at NUS Medicine, his former PhD student Dr Oleksandr Yagensky (now at the Max Planck Institute for Biophysical Chemistry in Goettingen, Germany), and collaborators published an article about the potential early marker of AD, heme-binding protein 1 (Hebp1), in the prestigious open-access journal eLife.

The team of researchers presented strong evidence to support a role for Hebp1 in the development and progression of AD, encompassing findings in both preclinical models and postmortem brains of AD patients. By analysing the data for many proteins in the brain, the researchers identified the Hebp1 protein as showing the greatest change in concentration in AD vs control brains in a preclinical model of AD, at all time points. These time points were at 2 months (before symptoms appeared), 6 months (first behavioural changes), 12 months (first appearance of abnormal A $\beta$  proteins, a hallmark of AD) and 18 months (abnormal A $\beta$  and Tau proteins, another sign of AD).

Interestingly, when the researchers looked at Hebp1 levels in the postmortem brains of AD patients, they discovered that levels increased the most (vs controls) in rapidly progressing AD cases, in which the period from diagnosis to death was four years or less. This provocative finding suggested that Hebp1, besides being active early in AD, might also be involved in disease progression.

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## The role of Hebp1

Next, the team wanted to find out how Hebp1 influenced the development of AD. From previous work, the researchers knew that Hebp1 was likely to be involved in transporting the compound heme from the mitochondria to the cytosol of the cell. Although heme is needed for many biological processes, excessive levels of free heme can kill cells.

The panels in [Figure 1](#) show the killing of neurons in response to hemin (free heme), abnormal A $\beta$  protein (A $\beta_{42}$ ), and a combination of both. Every yellow spot indicates a dying neuron. Panels 1 and 2 show that free heme or abnormal A $\beta$  protein kill more normal neurons (more yellow spots) than neurons that are missing the Hebp1 protein. A combination of free heme and abnormal A $\beta$  protein (Panel 3) kills more neurons than each toxin alone (Panels 1 and 2). Again, the combination is more deadly in normal neurons than in neurons lacking Hebp1. These results indicate that Hebp1 is involved in the killing mechanism of free heme and abnormal A $\beta$  protein.

Asst Prof Chua and colleagues showed that excessive levels of heme damaged the mitochondrial membrane, causing Hebp1 to be released from the mitochondria in neurons. They postulated that the liberated Hebp1 sets off a series of events that culminates in the death of neurons, which in turn contributes to the cognitive decline in AD.

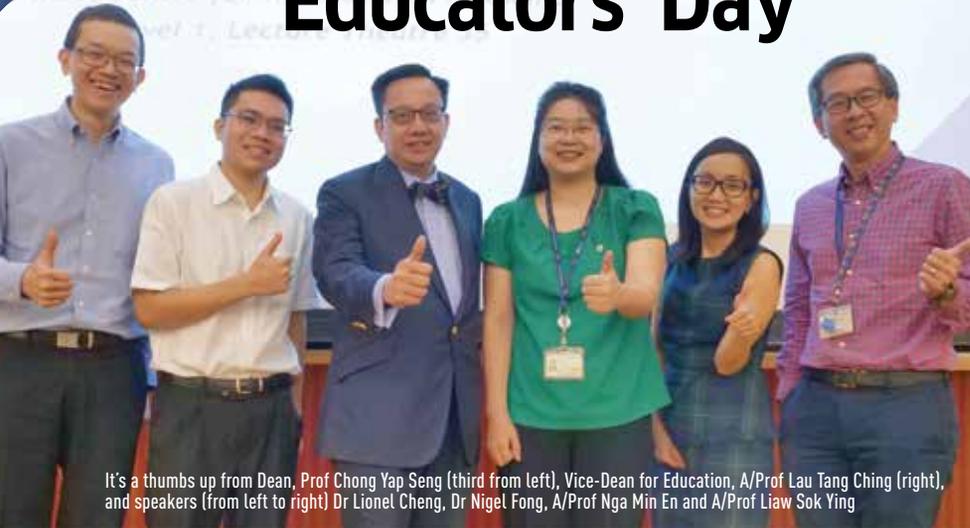
Interestingly, the researchers found that Hebp1 was also involved in the destruction of neurons induced by abnormal A $\beta$  protein. The combination of excessive heme and abnormal A $\beta$  protein induced twice the rate of neuronal death, compared with that caused by abnormal A $\beta$  alone. Neurons that lacked Hebp1 showed much less neuronal death when exposed to excessive heme or abnormal A $\beta$  protein, or to a combination of both toxins. These findings, illustrated in [Figure 1](#), point to the potential use of Hebp1 as an early marker for AD and a target for novel AD therapies.

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## What this could mean for people with AD

Asst Prof Chua hopes that this discovery could eventually contribute to earlier diagnoses of AD and improved management of the disease. He adds, "The possibility to slow down or even reverse early neuronal damage would be immensely helpful in improving the quality of life of patients with AD."

# NUS Medicine Educators' Day



It's a thumbs up from Dean, Prof Chong Yap Seng (third from left), Vice-Dean for Education, A/Prof Lau Tang Ching (right), and speakers (from left to right) Dr Lionel Cheng, Dr Nigel Fong, A/Prof Nga Min En and A/Prof Liaw Sok Ying

by Education Division

September is the month when we celebrate teachers and the critical role that they play in training and nurturing our students. The inaugural NUS Medicine Educators' Day served as a platform for educators to share their ideas and best practices to enhance medical teaching, as we brought them together on the morning of 14 September 2019 to express our appreciation for them.

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In NUS Medicine, everyone teaches.

Our best teachers revolutionise learning.

Our best researchers reconceptualise understanding.

Our best doers transform healthcare.

Together, we *inspire* health.

— Prof Chong Yap Seng  
Dean, from his opening address

In his welcome address, Professor Chong Yap Seng, Dean of the Yong Loo Lin School of Medicine, highlighted that education is the primary focus of the School, and that the role of educators is evolving to extend beyond traditional teaching roles. Educators would also play leadership roles in curriculum development and demonstrate scholarship by education-focused publications. Importantly, educators are key to driving innovation in education, as they are best placed to successfully apply new technology and approaches to increase teaching effectiveness and meet changing learners' needs.

A/Prof Liaw Sok Ying of the NUS Alice Lee Centre for Nursing Studies presented her work on a simulation-based programme for inter-professional education, CREATIVE (Create Real-life Experience and Teamwork in Virtual Environment). Working in teams, students interact with one another and their “patients” using animated avatars. They use real-life scenarios such as bedside rounds to practise applying their clinical knowledge and develop their communication skills, following which there is a debrief to provide feedback that further enhances learning.

Showcasing another example, A/Prof Nga Min En from the NUS Medicine Department of Pathology spoke about Pathweb, an online resource to facilitate the teaching of pathology in a manner that is practical and clinically focused. Pathweb includes a virtual pathology museum with interactive, three-dimensional pathology specimens linked to clinical vignettes, radiologic images and microscopic correlates. There is also an open access resource for the teaching of general and systemic pathology, which includes video mind maps, quizzes and interactive pots and slides. A “Radiopath Museum” is currently being developed, which will focus on the structures of abnormal organs, including gross pathology and diagnostic imaging.



A/Prof Tay Sook Muay takes the floor with a question at the Q&A session

On the clinical front, Dr Lionel Cheng from the radiology department at Singapore General Hospital (SGH) shared more about the various initiatives and approaches used to enhance education in this field. Interactive workshops using a game show format have been very well received by students who are able to better focus and retain their knowledge. Using case-based discussions also ensured a high level of clinical relevance that successfully reinforced key learning points. In a pilot session, final year students also underwent a combined surgery-radiology interactive tutorial which better integrated teaching across different specialties and illustrated inter-disciplinary collaboration.

In addition, Dr Cheng experimented to see how different types of technology could support his teaching. He customised his teaching content with an online real-time audience response system and also tested the use of Google Classroom as a hosting site for teaching material and quizzes.

Learning certainly goes on after medical school. Highlighting an effort to enhance education through experiential learning and guided reflection, Dr Nigel Fong from Singapore General Hospital outlined Project HOpe (House Officer preparation exercise), an initiative by SingHealth internal medicine residents to support house officers in the SingHealth Medicine departments and to ease their transition into clinical practice. As part of the training, HOs receive an on-call handbook and attend a half-day workshop to improve their clinical care and facilitate experiential learning from night calls, through feedback and guided reflection exercises. Project HOpe also includes a feedback system to facilitate the communication of formative feedback from on-call medical officers to the house officers. There are plans for such near-peer support to extend to near-peer mentorship and to provide structured reflection sessions.

# REACHING THE UNDERSERVED: an NHS story

by Faye Ng, Caitlin Wee and Kenneth Loi  
Phase II NUS & NTU Medical Students and Committee Members of NHS 2019

SCAN QR CODE  
TO VIEW VIDEO



Audrey Koh, Phase II medical student and a volunteer for NHS 2019, interacting with a resident at the profiling station, where volunteers try to find out more about the resident's medical, social and family history

The annual health screenings by the Neighbourhood Health Service (NHS) took place at Kampong Glam Community Centre on 7 and 8 September 2019, and in Queenstown Leng Kee Community Centre on 5 and 6 October 2019. A total of 825 residents completed their screenings<sup>1</sup>: 484 residents in Kampong Glam and 341 residents in Leng Kee.



**RIGHT:**  
Volunteers, ready to greet the residents with their bright smiles. NHS works with the help of over 500 volunteers from the schools of NUS and NTU Medicine, NUS Social Work, SIT Physiotherapy and NUS Nursing

## In a Nutshell

Residents were screened at a “one-stop shop” in five distinct categories:

- **Chronic diseases**  
(diabetes mellitus, hyperlipidaemia, hypertension, obesity)
- **Functional modalities**  
(vision, oral health, hearing)
- **Fall prevention**  
(fall risk screening, physiotherapy education)
- **Cancer**  
(colorectal, cervical, breast)
- **Mental health**  
(dementia, depression)



A resident undergoing Advanced Vision screening

## New this Year



### SIT Physiotherapy assessment for fall-risk

With students from SIT Physiotherapy, NHS 2019 conducted fall-risk screening for elderly residents. This expanded our outreach to residents with mobility issues, who benefitted from fall-risk screening in the comfort of their own homes.



### On-site Mammogram Bus

In partnership with the Singapore Cancer Society, NHS 2019 introduced mammogram buses stationed at Leng Kee Community Club. This allowed residents to have a mammogram done on-site, saving them the hassle of receiving a referral for a later date.



Our door-to-door team seeks to bring comprehensive, holistic health service right to the doorsteps of residents-in-need



A resident undergoes Basic Vision screening with a Snellen chart

The “first-of-its-kind”, NHS was spearheaded by NUS Medicine in 2006 to take integrated, holistic health screening right to the doorsteps of residents-in-need. NHS engaged over 500 student volunteers from different schools, including NUS Medicine, NTU Medicine, NUS Nursing, and NUS Social Work. Volunteers were trained in key skills such as triage taking and motivation interviewing. In addition to designated screening stations set up at public spaces in Kampong Glam and Leng Kee, 66 home visits with full screening were carried out by interdisciplinary teams. With this year’s addition of a mobility and fall risk component designed by our Physiotherapy committee from the Singapore Institute of Technology (SIT), we could better serve residents on their mobility issues.



A volunteer and NHS committee member conducting triage for the resident

31.9% of the residents screened across Kampong Glam and Leng Kee came from rental units. In Kampong Glam alone, approximately 48.8% of residents<sup>2</sup> screened had a monthly household income of less than \$1,800. Beyond screening the underserved, NHS also aims to “reconnect, not replace”. A comprehensive, robust follow up programme, with three follow-up cycles through the year, ensures residents are well-taken care of, long after their screening.

Our community partners this year included: all three Regional Health Systems (NUHS, SingHealth, National Healthcare Group), the Health Promotion Board, the Ministry of Health, the Agency for Integrated Care, National Dental Centre Singapore, Singapore Cancer Society and the Active Ageing Council. The increasing presence of key healthcare partners from diverse backgrounds provides students with opportunities for interprofessional collaboration, to provide holistic, team-based care.

We made some observations: 37.4% of residents screened in Kampong Glam and 36% of residents screened in Leng Kee were either overweight or obese, 20.5% of residents screened in Kampong Glam and 28.1% of residents screened in Leng Kee had high blood pressure, and 48.5% of residents who underwent dental screening in Kampong Glam and 47.5% of residents who underwent dental screening in Leng Kee fell in the ‘unhealthy’ category. To tackle this, NHS included a health education component at the end of the screening, so that residents can be empowered with knowledge to improve their health.

Besides, 40.5% of residents screened across Kampong Glam and Leng Kee underwent blood tests. Residents with abnormal test results had their reports collated at nearby GP clinics to be explained and collected, in a bid to reconnect residents to the healthcare system and receive medication directly from the GPs. Those who had normal blood test results collected the reports through NHS volunteers as well as Tan Tock Seng Hospital’s health coaches, who explained the results and dished out general health advice.



Our volunteer having an enjoyable time with the residents

A robust follow up programme ensures sustainability and continuity of care. NHS reconnects residents to existing healthcare providers, providing detailed referrals to our community partners. Furthermore, volunteers follow up with residents in three-month cycles to assess medical compliance and encourage proper healthcare-seeking behaviour.

<sup>1</sup> This number is only reflective of residents who completed our screening and received a serial ID; the actual number of residents screened is slightly higher.

<sup>2</sup> 67 residents did not disclose their monthly household income.



NHS committee at Leng Kee Screening 2019

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*I am proud to be in NHS because of the level of relationship and understanding we establish with our residents, and being there with them is a genuinely special experience for me. I have come to realise that any health screening can only provide so much, yet there are often numerous far-reaching and deep seated issues that each resident presents with that as medical students or doctors, we do not have the ability to solve. And I believe that we are only scratching the surfaces of the hard truths and challenges that these residents living in rental blocks have to face every day.*

*I believe our role as medical students, is to fully support, encourage and empower these residents to actively seek the medical or social help they need. In this aspect, I particularly enjoy the collaborative and collegial relationship with SIT Physiotherapy, NUS Social Work and NTU medical students because of the different skills and experience that we can provide to NHS.*

*Personally, being in NHS has been a journey of growth both as a student and as a person who is learning what it means to serve others; to be genuinely involved in the problems and emotional baggage that residents come with and attempting to solve them together.*

**Bryan Leow**  
Publicity, Health and Community Outreach (PHCO)  
Committee Member, Phase II NUS Medicine

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*We had many opportunities to have conversations with the residents, be it at the screening itself or in their homes, and it is these conversations I will treasure the most. During our door to door publicity, speaking to the residents who tell me that they marked the date in their calendar, and come every year made me realise what a difference NHS is making to their lives. However, the residents who really leave an impact are those who have lost faith in the healthcare system. These residents are mostly reluctant to come for screenings because they think it is just another health screening that cannot solve their problems.*

*A handful take the opportunity to vent their frustration at us. In these cases, I have learnt that the residents need someone to genuinely listen and empathise with them, and it is a bonus when we are able to convince them to come down and give the screening a chance. It really brings to life the quote, “to cure sometimes, to care often and to comfort always”. Coming to the hospital or clinic may already have required a huge effort on their part due to various social and economic barriers they have, and as doctors, it is key to understand the barriers each and every patient faces in order to build better rapport with them, gain their trust, and be better able to refer them to the correct avenues where they can get help, financially or socially. Only then will the optimum level of healthcare be achieved, when the resident realises that it is their right to obtain proper healthcare and that there are many avenues of help available.*

**Kwong Shuen**  
Logistic Committee Member, Phase II NUS Medicine

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*Every trip down to the rental blocks was a humbling one. Being part of the follow-up committee, the house visits we conduct allow us to understand the rental block residents a little better - their living conditions, their concerns and the challenges they have in seeking healthcare. Sometimes, all we had to give was our time and a willing ear.*

*NHS also helped me gain a more holistic view on healthcare. As we partner with different healthcare and social work organisations, it unveiled the many aspects of healthcare and the set of challenges each aspect entails. Providing care for the residents is indeed a team effort and medical knowledge alone is clearly insufficient in reaching out to our future patients. It is always very heartening to work alongside committee members from different disciplines to understand the obstacles each resident is facing, slowly tearing down these barriers and reconnecting them back to the system.*

**Foo Fang Qing**  
Follow-up Committee Member,  
Phase II NUS Medicine

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*From the bottom  
of our hearts...*

”

# DISRUPTIVE BEHAVIOUR:

## Why We Should Nip It in the Bud

by Dr Inthrani Raja Indran and  
Associate Professor Tan Chay Hoon  
Department of Pharmacology



The inevitable “disruption” in healthcare may be viewed with optimism, given the hope that technological advances can help drive improvement in patient outcomes. “Disruptive behaviour” in healthcare may be similarly perceived to be inevitable. However, it is important to recognise that such behaviour is a concern that needs to be urgently addressed, because of its impact on healthcare team members and the risk that it poses to patient care and safety.

According to the American Medical Association, disruptive behaviour is defined as “personal conduct, whether verbal or physical, that negatively affects or that potentially negatively affects patient care.”<sup>1</sup> It is linked to a lack of professionalism and refers to language and actions that are inappropriate and uncivil. Commonly observed examples of disruptive behaviour include rudeness and disrespect, scolding of colleagues, abusive language and condescending actions.<sup>2</sup>

### Examples of Disruptive Behaviour<sup>3</sup>

- Use of language that is inappropriate, profane, rude, disrespectful, insulting, demeaning or abusive
- Shaming or reprimanding of colleagues or staff in front of colleagues, patients and/or visitors
- Inappropriate arguments
- Unnecessarily excessive negative comments about another healthcare team member
- Outbursts of anger, including throwing or breaking of objects
- Bullying behaviour
- Non-clinical comments (including jokes) about race, religion, sexual orientation, age, physical appearance, socioeconomic status or educational background
- Refusal to adhere to established protocols or practice standards

### CAUSES OF DISRUPTIVE BEHAVIOUR

Disruptive behaviour may be due to a wide range of factors linked to the individual and/or the working environment. Certainly, an individual’s personality and capability are key to determining how they interact and engage with other people. Some people may lack communication skills and/or the self-mastery that is critical for professionalism. Disruptive behaviour may also arise from mental health issues (such as depression) or factors such as stress, fatigue and illness.<sup>3</sup>

It has been shown that the high levels of stress that are typical of today’s healthcare working environment contribute to disruptive behaviour, particularly if there is pressure to see a large number of patients.<sup>4</sup> The hierarchical structure of hospitals also likely contributes to this sort of behaviour, particularly if disruptive behaviour is learned by previous recipients of such behaviour and/or those who tolerate it, thus perpetuating and exacerbating the problem. In fact, disruptive behaviour may increase in frequency when uncivil behaviour is tolerated, which may in turn result when people refrain from comment so as to avoid being targeted themselves. As the working environment becomes increasingly toxic, patient interactions are eventually also affected, putting patient safety at risk.<sup>5</sup>



## IMPACT OF DISRUPTIVE BEHAVIOUR AT THE INDIVIDUAL, TEAM AND INSTITUTIONAL LEVEL

Various studies have examined the impact of disruptive behaviour, proving that it affects the healthcare team, patient care and safety as well as the healthcare institution.

Effective communication and collaboration require that interpersonal interactions be respectful and civil. However, disruptive behaviour distracts people from their primary focus of patient care, reducing staff morale and job satisfaction. According to a recent study published in the *New England Journal of Medicine*, residents who reported experiencing discrimination, abuse, or harassment regularly (i.e., at least a few times per month) were more likely to show signs of burnout than residents who did not report such experiences.<sup>6</sup>

Disruptive behaviour renders the members of the healthcare team reluctant to discuss and cooperate in an open manner, undermining their ability to work together as a team. Fear of criticism and reprimands may cause anxiety that increases the risk of medical error, which may also adversely impact the quality of patient care.<sup>4</sup>

Therefore, there is risk to the healthcare institution that arises due to concerns not only regarding patient safety, but also staff engagement and retention. In fact, a 2018 study estimated that the financial cost of bullying and harassment in the UK's National Health Service (NHS) is approximately £2.28bn (USD 2.96bn) per year. This cost is due to absence (including sick leave), loss of productivity among staff who are physically present ("presenteeism"), staff turnover as well as compensation and litigation costs.<sup>7</sup>

### How prevalent is disruptive behaviour in healthcare?



In the UK, **24%** of NHS staff reported experiences of having been bullied.<sup>7</sup>



In the U.S., a study of **7,409** residents from 262 surgical residency programmes found that **30.3% of them reported verbal and/or physical abuse, 31.9% reported gender discrimination and 10.3% reported sexual harassment.**

The reporting rates were higher among women, with **65.1% and 19.9% of women reporting gender discrimination and sexual harassment** respectively.<sup>6</sup>

## WHAT SHOULD BE DONE?

Given the potentially negatively impact on patient care and safety, it is critical to address the problem of disruptive behavior at both the individual and organisational level.<sup>5</sup> However, there may be less attention paid to disruptive behaviour where the harm caused is not overt. Similarly, while it is important to address patterns of such behaviour, it should be noted that single occurrences do also exert potential significant impact on members of the healthcare team. As disruptive behaviour may be endorsed as a rite of passage required to develop resilient trainees, it is important to highlight that the quality of a training programme is determined by its content, structure and rigour, not by fear and incivility.

A key first step to address disruptive behaviour would be to raise awareness of the issue, so people recognise that disruptive behaviour is a problem that requires identification and intervention.<sup>8</sup> For example, a survey of final year medical students (n=68) revealed that a majority (86.8%) of the respondents did not feel prepared to manage the problem of disruptive behaviour if they encounter it. Therefore, it is important to educate students and healthcare professionals so that they recognise disruptive behaviour and know how to respond. It is also important that institutions clarify their expectations of professional behaviour by describing ethical conduct policies, e.g., a code of conduct.<sup>8</sup>

A second step to address the problem of disruptive behaviour would be to enable open and effective interprofessional communication, e.g., through interprofessional education.<sup>8</sup> As it is specifically designed to promote collaboration between the different healthcare professions, interprofessional education enables a better understanding of other people's perspectives and roles, fostering empathy for both patients and fellow healthcare team members, and equipping them with skills in emotional intelligence.

Finally, it is important to inculcate appropriate values to promote respect, collegiality, collaboration and teamwork among members of the healthcare team. The "EnRICH" programme currently under development at the Yong Loo Lin School of Medicine is part of a key new initiative to support the personal and professional development of our students. It is a longitudinal mentorship programme that complements the five-year medical curriculum, and aims to nurture the School values of respect, integrity, compassion and humility. To facilitate their transition from student to professional, the EnRICH programme provides students with the opportunity for facilitated discussion and guided reflection with peers and mentors.

These three steps are just the beginning of a long process needed to effect the necessary changes in our healthcare system, to mitigate the impact of disruptive behaviour on patient care and healthcare teams at the individual, group and institutional level.

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RIGHT:

Dr Henry Lee – one of the world's foremost forensic scientists and the founder of the Henry C. Lee Institute of Forensic Science at the University of New Haven, Connecticut, USA

# DR HENRY LEE: INSIDE THE MIND OF A FORENSIC SCIENTIST

As part of the 10th run of the Chao Tzee Cheng Visiting Professorship Programme 2019, NUS Medicine welcomed one of the world's foremost forensic scientists *Dr Henry Lee*, who gave a lecture on the opioid crisis in the United States. Find out more about his friendship with the late forensic pathologist Professor Chao Tzee Cheng, as he looks back at his career, his critics and gives his take on the latest developments and synergy in science and pathology.





“I know nothing”, pronounced the 82-year-old who has solved more than 8,000 cases around the world, co-authored more than 40 books, was conferred numerous medals and awards. Explaining himself, Dr Henry Lee added, “Because the world is too big, there’s too much to know—it is impossible to learn everything.”

Dr Lee really needs no introduction, famously known for his critical role in the investigation of the murder cases involving John F. Kennedy assassination and American footballer OJ Simpson, and who has dedicated his life to the field of forensic science in the pursuit of justice.

Perhaps it is this sense of intellectual humility that motivates Dr Lee to constantly adapt himself and which keeps him going.

## FAST FRIENDS: A FORENSIC SCIENTIST AND A FORENSIC PATHOLOGIST



Dr Henry Lee (left) with the late Prof Chao Tzee Cheng (Photo credit: Dr Henry Lee)

Dr Henry Lee first met the late Prof Chao in 1983 when they were both invited to give a keynote address at a scientific conference. The instant friendship lasted many, many years until 2000 when Prof Chao passed on.

“Basically in Singapore, in the forensic field, everyone knows

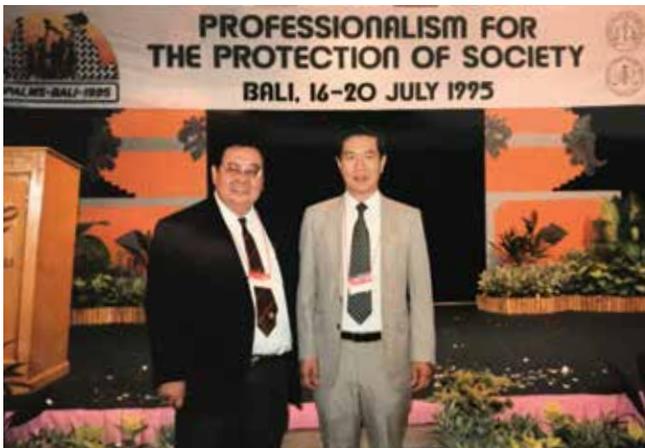
Professor Chao. He represents Singapore very well.” Dr Lee highlighted that with his knowledge, his warm demeanour and his openness, Prof Chao was able to quickly establish an international network which he could tap on when needed, to help with solving crimes back when technology was limited.

Dr Lee added that Professor Chao was often interested in what the new generation of technology was and what new scientific techniques were used in the laboratory in the United States, “He’s always the first one to come over to learn, to observe.”

Despite the major differences in applications and techniques of forensic pathology and forensic science, Dr Lee reckons that both should work together at the end of it all. “This was something both of us agreed on: to protect the public, to find the scientific truth. That’s the spirit of Professor Chao—and I really learnt so much from him.”

**“He’s a teacher, he’s a friend, and most importantly, he changed our world.”**

— Dr Henry Lee, on the late Prof Chao Tzee Cheng



Dr Lee and Prof Chao at a conference in Bali in 1995 (Photo credit: Dr Henry Lee)

## EMBRACING PROGRESS AND CHANGE

Alongside technological advancements, the field of forensic science has evolved to almost 36 different sub-disciplines today. Some are crime scene-related, some are related to e-crimes, while others, such as forensic pathology, are medicine-related.

From early anthropological measurements which yielded inconsistent results, to blood typing and to the latest biometric measurements, Dr Lee noted that we have come a long way in our methods of human classification and identification—which have greatly helped advance scientific techniques employed in solving crimes. All this would not be possible without progress in forensic pathology, where the discipline itself has become so specialised in the area of human identification, where pathologists could get information from a multitude of both physical and physiological traits. “Forensic pathology progresses together with forensic science to deliver what is relevant and possible in the current century,” he said.

Speaking of the current century, Dr Lee acknowledged that as societies move towards digitalisation, the proliferation of digital enclaves would bring about new problems as it would be increasingly difficult to identify people in the digital and online space. His response to this: “It is a natural development.”

For Dr Lee, change is the only constant and he believes that the various disciplines will naturally adapt using the latest technological advancements. Simply put, “we have to accept the new science and technology”, he added. Just as how forensic scientists are moving into a new era of forensic science by incorporating artificial intelligence in their constant expansion of various databases, forensic pathologists no longer only perform autopsies, but also gather a slew of information stored in databases to help determine the cause of death or illness.

### Did You Know?

The use of fingerprints as a means of human identification actually started in Asia where people have been using their fingerprints to sign off on official documents such as contracts and letters.

The technique of fingerprinting was then developed further by Sir William James Herschel after he observed this use of fingerprints as a mean of identification and developed the first fingerprint classification database during his work as a magistrate in colonial India in the 1850s.

"It is an exciting world, but it can also bother us, especially the older generation," he shared. When asked how can societies then adapt to such new changes, Dr Lee candidly shared, "I have no answer; I've tried to learn every new gadget but I'm just not quick enough... But at the same time, I'm so happy I don't have to worry about it anymore, I've become a piece of history."

Dr Lee shared that the use of artificial intelligence and big data is now "the future of solving cases". However, Dr Lee also cautioned that for both pathology and forensic science, even with the help of artificial intelligence, we still need to have a human to make decisions. Artificial intelligence or any form of the latest technology is important in helping us solve cases but we cannot take away human judgement in the process.



Dr Lee has been a prominent player in many of the most challenging cases of the last 50 years and has worked with law enforcement agencies to help solve more than 8,000 cases in his career as a forensic scientist (Photo credit: Dr Henry Lee)

## RISING ABOVE THE NEGATIVE

"As a forensic scientist, it is a "no-win" situation."

Having played prominent roles in numerous high-profile and highly-controversial cases in his career—such as in the O.J. Simpson trial and the "woodchipper" murder in the United States, Dr Lee shared that forensic scientists definitely have a hard time, "One side is going to like you, while the other side is definitely going to hate you, depending on which side the expert testifies for."

**"Make good notes, document everything, and that will protect you because otherwise, others are going to say anything they want. But the truth will prevail."**

Dr Lee added that things only get complicated with "fake news". He shared that the way TV news media report crimes have changed. "In the 1960s, they report case facts and let the viewer make the decision. By the late 70s and 80s, the reporter reports some of the facts that lead the viewer to a decision. By the 90s, reports only present a small portion of the fact, trying to make the decision for the viewer. But by the 2000s onwards, some reporters report no fact at all—some even make up the

facts." He is aware that there is a lot of fake information out there and now, "the viewer can't even decide what is fact or not."

"So what can you do? All this is human nature; and that's part of what we deal with in our profession", he said. The best one can do for him or herself as a forensic scientist is to keep all the records no matter what. Dr Lee emphasised, "Make good notes, document everything, and that will protect you because otherwise, others are going to say anything they want. But the truth will prevail."

## WORDS FOR THE NEXT GENERATION

For those who are interested in embarking on a journey in the forensic field, Dr Lee first warned that being a forensic scientist means long hours.

"People think that forensic scientists are what they see in the movies—they drive nice cars and by the second commercial, they've already figured out [the case] and can decide what to have for dinner. In reality, one often has to respond to emergencies and go without food or drink for the next ten hours after that!" Dr Lee exclaimed.

He has some advice to those eager to pursue a career in forensics or medicine, "Always be curious and willing to learn, willing to admit what you don't know," Dr Lee said. "Your best instrument to solve crimes is the telephone. I can easily call up somebody who knows something when I'm faced with a situation I'm unfamiliar with. It's useful to have friends and networks that you can go to for help when you need it!" He urged young forensic scientists, "Build good scientific knowledge in your mind, be courageous and take up challenges, and have honesty in your heart—you have to be honest and frank in your life".

**"People think that forensic scientists are what they see in the movies—they drive nice cars and by the second commercial, they've already figured out [the case] and can decide what to have for dinner. In reality, one often has to respond to emergencies and go without food or drink for the next ten hours after that!"**

## Chao Tzee Cheng Professorship in Pathology and Forensic Science Programme 2019

In memory of the late Professor Chao Tzee Cheng, the renowned forensic pathologist who elevated Singapore's level of professionalism in this field, his friends, students and colleagues set up the Chao Tzee Cheng Professorship in Pathology and Forensic Science in 2002. This includes a regular conference programme that is organised by the Department of Pathology at the NUS Yong Loo Lin School of Medicine.

Its 10th run in 2019 brought together eminent professors in the fields of pathology, forensic science and law to share their expertise and enhance cooperation in research and education.



A panel discussion during the programme with (from left) Dr Henry Lee, Assoc Prof Tan Soo Yong (Head of the Department of Pathology, NUS Medicine) and Assoc Prof Stella Tan (NUS Department of Biological Sciences, Faculty of Science)



SCAN QR CODE TO READ MORE EVENT HIGHLIGHTS



Cycling to keep fit: Prof Lee eating up the miles on the road

**Prof Lee I-Min** is a woman on a mission. As Professor of Medicine at Harvard Medical School and Professor of Epidemiology at the Harvard T.H. Chan School of Public Health, Prof Lee researches on the role of physical activity in preventing chronic diseases and enhancing longevity. Her work has been extensively covered in several publications, from scientific research journals such as the *Lancet* to news media and popular health columns. The alumna from the Class of 1984 tells us how she fell into research in the United States and recalls her student years at NUS Medicine in Singapore.

# THE SECRET TO LONGER LIFE – WALKING



Prof Lee and her husband, Geoff Kronik, at a pumpkin patch in an apple farm in autumn

“Medical training in Singapore provided me with knowledge on human pathophysiology, which is needed to understand the biological basis underpinning the effect of lifestyle behaviours—such as physical activity—on health. Training in clinical medicine also allows me better grounding in and understanding of clinical research.”

After completing her undergraduate studies at NUS Medicine, Prof Lee enrolled at Harvard to complete a masters programme in Public Health. During this time, she was exposed to “many wonderful professors who did fascinating research”, and described her path into research as one guided by serendipity.

“When I completed by masters degree, I wanted to go on to a doctoral degree. A wise professor suggested I work on a research project to assess if I truly wanted to spend my life this way. So I ended up working for a year at Stanford University investigating risk factors for mycosis fungoides.” It was at Stanford where she met the late Professor Ralph S. Paffenbarger, Jr., a pioneer and giant in the field of physical activity research.

“He persuaded me to work in his field, even though I had no background in the area and was initially not interested in the topic. I ended up writing a doctoral thesis that examined the role of physical activity in preventing cancer. Paff, as everyone called him, introduced me to many of his colleagues, including the late Professor Jeremy Morris from the London School of Hygiene and Tropical Medicine. Jerry and Paff are recognised as fathers of the field of physical activity epidemiology. Paff was instrumental in getting me started and interested in physical activity research, and was a wonderful mentor.”

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“Early in my career, I focused mainly on research for the sake of scientific discovery. The translational aspect, how the findings apply to the lives of people or inform policy, did not appeal much to me at first. Over time, I have come to realise that translation is as essential as discovery: scientific discoveries will not be meaningful if they are merely theoretical and not applied to improve lives in some way.”

## WE GOT TO MOVE IT, MOVE IT

Prof Lee mused that too many people are inactive and find it unavoidable that they sit for long hours at work. “The more I dug into the research, the more I realised how essential and beneficial physical activity is to health. We’re not looking at extreme performance like in athletes, but at regular folks—it affects practically all physiological systems in the body, with minimal side effects. What drug does this? Work that I have done with the international Lancet Physical Activity Series group estimates that inactivity is responsible for as many deaths worldwide annually as smoking!”<sup>1</sup>



The Lancet Physical Activity Series 1 Steering Committee at the launch of the series in London 2012, prior to the 2012 summer Olympic Games: (left to right) Prof Gregory Heath, University of Tennessee at Chattanooga, USA; Prof Pedro Hallal, Federal University of Pelotas, Brazil; Prof Harold Kohl 3rd, University of Texas at Austin, USA; Prof Lee; Prof Adrian Bauman, Sydney University, Australia; Dr Michael Pratt, Centers for Disease Control and Prevention, USA

She points out that research has shown that physical activity mitigates some of the health risks associated with sedentary behaviour. Even among overweight or obese persons who have a higher risk of chronic diseases such as heart disease, cancer, and diabetes, being physically active helps them live about 3 to 4 years longer than someone of similar weight who is inactive (PLOS Med 2012;9:e1001335). Regardless of genetic profile, physical activity is beneficial for health.

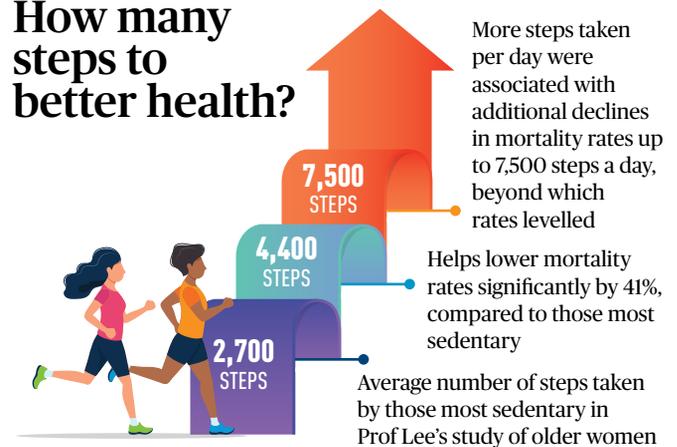
“Not smoking would be on the top of my list of healthy behaviours. Apart from that, what your grandparents likely told you still holds true! Eat healthily, exercise, and get enough sleep. That much we know; what we don’t, for which research continues, includes specific details needed for translation and informing guidelines. For my field of work, I think the message is very simple: move more; even a modest amount of movement is beneficial for health.”



Prof Lee was honoured as the 2014 Joseph B. Wolfe Memorial Lecturer, American College of Sports Medicine

Prof Lee admits that she has added motivation to be active—after all, how credible is a researcher who doesn’t practise what they lecture on? “I typically run 12 to 15 miles a week, and walk a lot for transportation since I’m not very fond of driving. In summer, when the weather is good, I bicycle also. I try to eat reasonably healthily, although chocolates and desserts are a weakness, and get sufficient sleep. And, of course, I don’t smoke.”

## How many steps to better health?



The findings may be encouraging to inactive individuals for whom “10,000 steps-a-day” poses an unattainable goal.

### Did You Know?

The 10,000 steps number originated as a marketing tool in Japan, rather than being scientifically derived.

## KEEPING THE SINGAPORE CONNECTION

Prof Lee lives with her husband in Boston and counts travelling, exercise, and exploring ethnic restaurants among her favourite activities to do with friends and family. She keeps the connection with family and friends who still live in Asia, making trips back to Malaysia and Singapore quite regularly.

“I have friends I am extremely close to whom I see yearly, if not more frequently, either in Singapore or in the US. I’m Malaysian and my parents live in Penang so I often go through Singapore on my way back home. My sister works in obstetrics and gynaecology in Singapore—another reason to stop by!

Prof Lee waxes lyrical about the food here. “I miss Malaysian/Singaporean cuisine and rely on my Singaporean friends to take me to the latest hot spot for *makan*<sup>2</sup>. I spend a fair amount of time in the Singapore airport while in transit. I have to say this airport is, in my opinion, the best in the world with regard to its efficiency, its aesthetics and the services available. I don’t miss the heat and humidity; although in the middle of long, cold winters in Boston, the heat doesn’t seem that objectionable after all!”



An MBBS class photo taken of Prof Lee and her classmates, in 1981; the students graduated in 1984

1 Read more here <http://www.thelancet.com/series/physical-activity>

2 Translates as ‘to eat’, from the Malay language.

# What is Precision Medicine?



While the term “Precision Medicine” is of fairly recent origin, the desire to provide accurate and unerring care for patients is a fundamental principle in the practice of medicine. It is the basis, for example, in the deliberate care taken to make sure patients in need of blood transfusions are matched with the correct blood type. In this new series, *Dr Khor Ing Wei*, Research Office, explains how precision medicine is using additional pieces of information such as genetic data to open an exciting new window of possibilities.

### Firstly, what is precision medicine?

As opposed to a “one size fits all” approach, precision medicine uses relevant biological, medical, behavioural and environmental information about a person to tailor their healthcare.

### What does it mean for your health?

Various types of information helps doctors to better predict patients’ disease risk, allows doctors to make more accurate diagnoses and select therapies that are more likely to work for a particular patient or group of patients. Researchers can also mine the data to develop new, more effective therapies.

### How is it different from today’s medicine?

Doctors already use information about us when deciding how to treat us. Currently, this information mostly consists of characteristics such as gender, body weight and ethnic group, as well as simple measurements such as blood sugar, cholesterol, and blood pressure.

One of the big advantages of precision medicine is that it also considers genetic factors, which explain up to 30% of health, such as how long one lives and which diseases may affect a person. Now, technology has advanced to the point where genetic sequencing of people is much more affordable, allowing us to study and understand the genetic contribution to disease better than ever before.

### A quick refresher about genes and genetic variants

Genes contain the basic information needed to code for the proteins, cells and tissues that make up all living things. They play a role in determining our physical characteristics. More importantly, genes determine how individual organs and cells work in our body.

Our genes are coded as sequences of 4 letters, C, G, A and T. Differences in one or more of these letters are called genetic variants. Genetic variants are part of what make us unique. They determine how vulnerable we are to certain diseases and how we respond to foods, medications, exercise and toxins. Genetic variants can be passed down from parents to children.

# Using genomics to uncover the secrets behind inherited diseases

In 2001, the first sequencing of the human genome (all of the genes in our body, plus non-coding DNA) was completed, taking 13 years and costing US\$3 billion.<sup>1</sup> Now, two decades later, it takes less than a day and under US\$1,000 to sequence a person's genome. In a few years' time, this may fall to as little as \$100 to \$200.<sup>2</sup> The implications for healthcare are nothing short of revolutionary, with the genomic sequencing of populations changing how scientists understand disease and the way that doctors care for patients.

Against this exciting possibility, researchers held the first Human Genomics Symposium in Singapore, which took place on 14 and 15 October 2019 at the National University of Singapore. Sponsored by the National University Health System, A\*STAR and the genetic sequencing company NovogeneAIT, this conference featured a wide range of speakers who are applying genomics in research and clinical care.



Dr Richard Scott

## THE GREAT ENGLISH GENOME HUNT

One of the invited speakers was Dr Richard Scott, who is the Clinical Lead for Rare Diseases at Genomics England (GeL), the national programme in the UK for incorporating genomic data in clinical care and research. The work that GeL has done, especially their landmark 100,000 Genomes Project, is helping to improve health in the UK. It presents a tantalizing vision of what this might mean for the genomics-based work that Singaporean clinicians and researchers are doing.

The 100,000 Genomes Project team has now sequenced all their targeted 100,000 genomes from individuals with cancer or rare inherited diseases, including family members recruited through a network of National Health Service (NHS) Genomic Medicine Centres. Genomics England is currently engaged in analysing the genomic data and returning the primary findings to NHS laboratories to review and report to participants who had consented to receive them.

## FIRST FRUITS

They have already chalked up some early successes. Dr Scott described a case involving a young boy who had various problems in growth and learning. Over five years, the boy and his parents consulted multiple doctors, but did not receive a definitive diagnosis. Finally, scientists at the 100,000 Genomes Project sequenced the boy's genome and found a change in one of his genes, or a genetic variant. This genetic variant causes the DNA repair disorder called Cockayne syndrome in just three out of every million live births.<sup>3</sup> Although there is no cure at present, aspects of the condition may be managed to maximise the patient's quality of life. For example, the

boy's doctors could avoid metronidazole, a commonly prescribed antibiotic that can cause fatal liver failure in people with Cockayne syndrome. His parents were also able to receive genetic counselling about the risks that any future children of theirs may face.

By collecting genomic data from this young boy and other people with Cockayne syndrome, and allowing authorised researchers to access the data, the 100,000 Genomes Project is increasing the chances that other children with the condition will be able to receive a diagnosis, and that new treatments for the devastating disease will be found. At the same time, the project is collecting and sharing data from people with many other diseases, which may stimulate the discovery of new and better treatments. As of now, 4,000 researchers at over 200 institutions around the world are authorised to access and view the data in a secure environment via virtual desktop, allowing it to be accessed remotely.

To ensure that the data is secure and that the participants' privacy is protected, a governance committee oversees the usage and sharing of data in the programme. Importantly, the committee includes several participants, who often surprise healthcare professionals with their progressive views about data sharing.

"Patients with rare diseases are often very keen on the data [about them] being made available to researchers," observed Dr Scott.

Other countries have established similar databases and are also applying the data in clinical care and research. Examples include the All of Us programme in the United States, as well as BioBank Japan and the TOP-GEAR and MASTER KEY cancer genetic testing programmes in that country.

## A SURE HELP FOR KIDS

Here, the Singapore Undiagnosed Diseases Research for Kids (SUREKids) programme at the National University Hospital (NUH) and KK Women's and Children's Hospital involves genomic sequencing and genetic testing (sequencing of a suspected gene or genes) of children to identify rare inherited diseases. The leaders of the 100,000 Genomes Project and SUREKids occasionally interact and share best practices, helping to advance both programmes.

One of the researchers involved in SUREKids, Associate Professor Denise Goh, is a paediatric geneticist at NUH. She uses genetic testing to help diagnose, assess prognosis and guide treatment for rare genetic diseases in children.

In some of the cases that A/Prof Goh has seen, the genetic information led her and other doctors to select a treatment that they might not otherwise have considered. One case involved a 1-year-old child with epilepsy that had not abated, despite treatment with anti-epileptic medications. A/Prof Goh noticed that the child also had delayed physical and cognitive development, slight abnormalities in movements and light-coloured hair, which suggested that another condition was causing the seizures. She ordered genetic testing, which revealed that the child had a rare genetic metabolic disorder. Based on this information, she selected another treatment for the child, who responded well. Having the diagnosis gave closure to the child's parents, and allowed A/Prof Goh to talk to them about their risk of having another child with the same disorder.

## AND HELP FOR ADULTS TOO

The principal investigator of the original research project that grew into the SUREKids programme is Professor Roger Foo, who is a cardiovascular geneticist at NUH. He uses genomic data to track down diagnoses in difficult adult cases.

For example, genomic data helped find the real cause of the heart condition affecting a woman in her 70s. She had previously received a diagnosis of hypertrophic cardiomyopathy, but this diagnosis encompassed too broad a range of conditions to be very helpful. The patient had her genome sequenced as part of a research project and, by comparing her

genetic variants against databases that included data from Asians, the researchers found a genetic variant linked to a rare condition called Fabry disease.

Fabry disease is an X-linked enzyme defect that causes a certain type of fat to accumulate, increasing the risk of heart attack, stroke and kidney disease. Some people, such as this elderly patient, also present with skin symptoms. Women tend to have a milder version of Fabry disease since it is an X-linked condition (transmitted on the X chromosome, of which women have 2 copies). Establishing the suspicion of a Fabry disease diagnosis meant that the woman could be referred to a doctor who was familiar with Fabry disease, who could evaluate whether she would benefit from enzyme replacement therapy. It also meant that her family could come forward for screening and be investigated for the condition.

Since the genetic variants linked to disease are often different among ethnic groups, consulting Western databases such as that of the 100,000 Genomes Project may not be optimal for Singaporean patients (see side bar).

"Our interaction with Dr Richard Scott of Genomics England emphasises to us in Singapore how important it is to have our own database to reference," notes Prof Foo. "An English normal cannot be taken as a Singaporean normal."

The continued efforts of Prof Foo and other geneticists, as well as the recent genomic sequencing of 5,000 Singaporeans by the Genome Institute of Singapore,<sup>4,5</sup> are moving us closer to the goal of a comprehensive Singaporean genomic database and its promise of improved health for our population.

## Why do we need Asian databases containing genomic and medical data?

- Aid doctors in establishing diagnoses for genetic diseases in Asians because some genetic variants are Asian-specific
- Help researchers identify novel Asian genetic variants linked to disease
- Help researchers discover new treatments that target Asian genetic variants
- Add to disease understanding by revealing new insights into Asian aspects of diseases

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# HOW LONG HAVE I GOT?

Like many aspects of medicine, prognostication in palliative care is both a science and an art. **Dr Noreen Chan**, Head & Senior Consultant in the Division of Palliative Care at the National University Cancer Institute, Singapore and Assistant Professor at the Department of Medicine, says that it is crucial to work out what and how to tell patients in their prognoses sensitively.

**M**ore than ten years ago, my grand-aunt (maternal grandfather's cousin) developed pancreatic cancer, and the news travelled swiftly through the extended family network from Kuala Lumpur to Singapore and beyond. She, however, was not informed of the diagnosis, which my mother felt was very sensible because "she worries about everything; one day before a doctor's appointment she cannot sleep, why make her worry more?". And that settled it. She passed away six months later, and I heard that the night she died, she told her family "I know I have cancer even though you all never told me".

I was reminded of this personal story when I read about a recently released film, "The Farewell" which stars Awkwafina, who shot to prominence after her breakout role in "Crazy Rich Asians". This comedy-drama made its debut at the Sundance festival in early 2019 and is written and directed by Lulu Wang, based on her own experience and "actual lie".<sup>1</sup>

Awkwafina plays Billi, the American granddaughter of a beloved matriarch living in China, who is diagnosed with terminal cancer. As the devastating news spreads, the extended family cooks up an elaborate scheme to organise a wedding dinner for a grandson, so that everyone has an excuse to return home to see the old lady for one last time. Billi's "Western" sensibilities are outraged by this deception, and the rest of the film follows her evolving struggles and understanding as the plot unfolds, and the inevitable clashes around culture, filial piety and values.

Fifty years ago, it was considered an acceptable professional practice—even a kind and moral act—for doctors to withhold diagnoses from patients. Nowadays, with changing social norms and expectations, more and more patients are aware of their diagnoses. In fact, it would be unethical for doctors to attempt to obtain consent for treatments and procedures without patients being adequately informed about their diagnosis, the various options for treatment, and the pros and cons of each option.

It is still common, however, that patients do not know the full truth about their condition. Common enough for us to have our own term in Singapore, called collusion. Collusion is conventionally used in the commercial sense, when parties secretly work together to deceive others, for example to fix prices. In healthcare, collusion refers to the situation where the healthcare team colludes with family members to withhold information from the patient.

This act of non-disclosure typically occurs when there is bad and sad news to be shared, and the family asks not to inform the patient for fear of upsetting them, destroying hope, or, as we might say in Singapore, the patient "cannot take it". The important thing to realise is that this all comes out of a place of love; perhaps misguided or misinterpreted, but love nonetheless.

Prognostication, from the Greek which is literally "to know beforehand", is predicting what is likely to happen in the future i.e. to foretell. In healthcare, this relates to making a judgement of the expected course of a disease over time. For example, the prospect of recovery, or in a palliative care setting, about how long a person might be expected to live, and what that time might be like.

<sup>1</sup> Article: <https://www.npr.org/2019/07/24/744805282/filmmaker-lulu-wang-based-the-farewell-on-her-family-s-real-life-lie>

## The art and science of prognostication



In his book “Death Foretold: Prophecy and Prognosis in Medical Care”, American sociologist Nicholas Christakis wrote that doctors are not actually very good at prognostication. Although the predictions get more accurate the closer a patient is to death, the tendency is to over-estimate a person’s survival and in some cases, by as much as four times. Meaning to say, if the doctor says you have one year, the actual time may be closer to three months. Not only that, he found that when doctors conveyed prognosis, they sometimes over-estimated again, so patients ended up “twice removed from the truth”.

Is it possible to prognosticate with greater accuracy? I certainly like to think so. There are a large number of tools, guidelines and approaches for different patient populations, and while there is inevitably some uncertainty, I believe that with study, practice and discipline, one can develop the skill. As a former supervisor of mine, Dr Paul Glare, wrote: “*The physician’s goal is to formulate an individualised prognosis for the patient starting with a generalised prognosis and modifying it using clinical observations, performance status, symptoms, co-morbidities, will-to-live and knowledge of illness trajectories.*”

Like many things in medicine, it is both a science and an art. And not only do doctors have to come up with a prognosis, they need to work out what to tell the patient.

## What does the scientific literature tell us about what patients want to know?



Dr Josephine Clayton is one of many researchers who has studied and written about prognostication and how to communicate about this. In a paper published in 2007, she and her co-authors found that:

- Patients/caregivers wanted information regarding the illness itself, likely future symptoms and their management, and life expectancy and information about clinical treatment options;
- They preferred a trusted health professional who showed empathy and honesty, encouraged questions, and clarified each individual’s information needs and level of understanding;
- In general, most patients/caregivers wanted at least some discussion of these topics at the time of diagnosis of an advanced, progressive, life-limiting illness, or shortly after. However, they wanted to negotiate the content and extent of this information.

In other words, they do want to know, but it’s up to the healthcare professional to find out **what** they want to know, and **when** and **how** they want to know it.

## What should doctors be discussing with patients and families about prognosis?



Dr Joanna Paladino (of Ariadne Labs’ Serious Illness Care Program) and co-authors recently published useful advice on how to have such a conversation.<sup>2</sup> As the title “Communication Strategies for Sharing Prognostic Information With Patients Beyond Survival Statistics” suggests, it is not just about “how long”.

The authors suggest three core topics, and what and how of each is shared, depends on the patient’s own preferences. “Communication about prognosis should explicitly balance medical realities with patients’ expressed hopes in the context of uncertainty”—not an easy balance to strike at the best of times.

These 3 points are:

1. **Time** – knowing how long one might have to live, allows for priorities and decisions to be made regarding important life events; there have been many occasions where marriage, birthday and other celebrations (even a Lunar New Year Reunion Dinner) have been brought forward for this reason;
2. **Function** – not only how much time is left, but what that time might be like, what adaptations will be needed to achieve certain goals, how much care will be needed;
3. **Unpredictability** – a crisis can occur anytime, but it is possible to prepare by thinking ahead about what is important and making an advance care plan.

<sup>2</sup> Free access at <https://jamanetwork.com/journals/jama/fullarticle/2748666>

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## So, do you really, really want to know?



BJ Miller and Shoshana Berger, writing in the NY Times “Don’t Tell Me When I’m Going to Die”<sup>3</sup> argue for a more nuanced approach to prognostic disclosure.

The article mentions a “Prognostic Declaration” form developed by Steve Scheier, through the experience of caring for his wife. This tool gives patients a few options to indicate their personal information needs to their doctors:

- Tell me everything;
- I’ve not decided what I want to know about my prognosis, so ask me over the course of my treatment;
- I want to participate in my treatment, but I don’t want to receive any information on my prognosis;
- I don’t wish to know any information about my prognosis but I authorise you to speak with [blank] about my case and for you to answer any questions that this person may have about my likely prognosis and treatment.

The pendulum of disclosure has swung from “don’t tell” to “must tell” and back towards “let’s ask the patient what he/she wants to know”. I think that is right. Some people really do not want to know that much, and we may not be doing the patient a favour by, as I sometimes like to say, “beating them about the head with the truth stick”.

As Miller and Berger say, “It’s simply an acknowledgment that knowing more sometimes serves us less.” The truth does hurt, and while it can be bitter medicine which the patient must swallow, we can learn how to “dose” and “administer” this crucial medicine with skill, kindness and sensitivity.

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<sup>3</sup> Article: [www.nytimes.com/2019/06/22/opinion/sunday/death-disease-life-expectancy.html](http://www.nytimes.com/2019/06/22/opinion/sunday/death-disease-life-expectancy.html)

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## What the Doctor Said

by Raymond Carver  
(1938-1988), from  
“A New Path to the Waterfall”

He said it doesn’t look good  
he said it looks bad in fact real bad  
he said I counted thirty-two of them on one lung before  
I quit counting them  
I said I’m glad I wouldn’t want to know  
about any more being there than that  
he said are you a religious man do you kneel down  
in forest groves and let yourself ask for help  
when you come to a waterfall  
mist blowing against your face and arms  
do you stop and ask for understanding at those moments  
I said not yet but I intend to start today  
he said I’m real sorry he said  
I wish I had some other kind of news to give you  
I said Amen and he said something else  
I didn’t catch and not knowing what else to do  
and not wanting him to have to repeat it  
and me to have to fully digest it  
I just looked at him  
for a minute and he looked back it was then  
I jumped up and shook hands with this man who’d just given me  
something no one else on earth had ever given me  
I may even have thanked him habit being so strong



# Are You the Cure?

Besides equipping students with sound clinical skills, a key focus of NUS Medicine is to nurture caring and compassionate healthcare professionals. The following stories are from our top prize winners of an essay competition, "Are You the Cure?", where students and staff were encouraged to think about values in healthcare and let their creative juices flow into the form of short stories.

# The Cure for Impudence

by Cheng Ryui-Wern,  
Reuven

Phase V Medical Student



## Doe-eyed, nervous, hopeful, brand new laptop in hand

Spring in my step, up the lecture theatre stairs, this shall be my throne: the top left corner facing the stage

G-protein coupled receptors, Flexor Carpi Radialis Longus, Parietal Cells, Paramedian Pontine Reticular Formation

The world in my palms, the possibilities endless, the lessons equally endless

"Let's get a quick bite, pack lunch, the lecture's gonna start soon"

"Don't need lah, the doctors are always late!"

## Clueless, hesitant, a space-occupying lesion, but still hopeful, school-issued iPad in hand

Clinicals is a foreign land, every PSA is a sister, every sister is a Sister

2pm clinic, 1:55pm, I give a knock, "Hi is this Dr X's clinic? I'm scheduled to join him today."

"Oh, come in boy, no worries, he'll usually be late, you can get a chair from the pantry."

The buzz of the afternoon clinic crowd fails to drown out my thoughts,

"then who sees these patients?"

---

The door swings open, lanyard and handphones on the table, I stand at attention

"Good afternoon Dr X, I am Reuven a thir-."

"Okay sit down."

---Silence---

2:45pm, "Okay, call the first patient in."

2:49pm, "Okay, please wait outside."

"Doctor I also have this hand pain."

"Okay I'll refer you to the hand doctors, please wait outside."

---Silence---

2:51pm, "Okay, call for the next patient."

## Tired, overwhelmed, dare I say jaded, large kopi-o-kosong in hand

Enter the tutorial room to an unexpectedly large crowd,

"Eh, is your whole clinical group here? Heard this tutor will lock the doors if we come late."

The door swings open, stern demeanor, coffee mug on the rostrum, pin-drop silence

7.30am, doors locked, I thought: this is the first time the whole class is on time!

The door handle rattles, flustered faces by the door frame: or so I thought.

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"Good afternoon Dr Y, my name is Reuven, a final year medical student, may I join your clinic today please?"

A warm hand extended, a brisk hand shake, "Come in young man, I was just about to call our first patient."

"Good afternoon Mr Z, so sorry for the long wait outside, how may I help you today?"

It was 15 minutes before Mr Z's scheduled appointment.

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6:15pm, "Thank you for joining my clinic young man, you've been a great help."

No Dr Y, I should be thanking you, for being the example that I needed all this time.

## Tired, overwhelmed, heart swelling with gratitude, change in my hands

### The Cure for Impudence is Punctuality,

the prevention is being early, the treatment is a dose of earnest penitence, that starts with me.

*Looking past medical knowledge, I have fortunately met doctors who have taught me to treat others better than I would like to be treated myself. They have taught me to be a man for others, before self. And for that I swear to emulate, and be better, and to pass on this simple Cure for Impudence.*

## The Cure for Indifference

by Trina Ng

Phase I Medical Student



It is 8 in the morning on a Saturday. I am at a dialysis centre.

Auntie looks grumpy. As a result, I start to feel a little grumpy too. It is 8 in the morning on a Saturday.

Dragging a plastic chair behind me I took a seat and got ready to start the conversation. I was apprehensive—with a mask covering half her face it was hard to gauge her emotions. A few cursory introductions later she offers me a piece of her chocolate. She has proffered acquaintanceship.

Like me, she is apprehensive at first, but she opens up slowly. It starts in drips—she shares about her family. She complains about her sons bringing her too much food for breakfast everyday. I smile because I sense an undercurrent of warmth and pride; this sounds so familiar. A sense of being loved in excess is a sweetness that lingers.

I talk about my own grandfather and his love for cooking. Auntie springs, almost jolts to life as she begins talking about her Peranakan heritage, of her kuehs stained with blue butterfly pea flowers, her buah keluak curries too spicy for the non-native tongue. There is a pride and joy found in creating things that are your own. For a moment I find myself in the misty room of her memories. Somewhere, there is a tiny kitchen. Her grandmother is hunched over a bubbling pot. Somewhere else, someone is using a mortar and pestle, the pounding rapid, rhythmic and persistent.

Tucked away on the top shelf of a cabinet somewhere in the corner of this room are fragments of a distant past: a kebaya and one side of a pair of yellow beaded slippers. It is quite a beautiful world in sepia.

“It’s easy! I can make everything myself. I mean, I could make everything myself. Not now, I don’t cook anymore.”

The record screeches to a painful stop. She shares her feelings of helplessness. She tells me about how she feels useless now that she can no longer pursue her hobbies. Sometimes, with only the moon for company, she cries. And she prays. I am not religious, but I want to pray for her happiness too.

As I get ready to leave, I realised I had hardly said a word about myself.

Growing up, I was always taught that there was a power in being loud. To command attention, we learn to enter a room with head held high, to speak loudly and firmly so people will listen. Over time, I have learnt to do the same, spoke only at people, relished the sound of my monologue.

An hour of conversation unfurls years of me wanting to be heard. Perhaps, the cure to indifference is simpler than we think: listening without trying to plan out what next to say is kindness. Where understanding begins, indifference ends.

It is 8 in the morning on a Saturday. For once, I don’t regret waking up early.

## The Cure for Duplicity

by Huang Chi Ming

Year II Nursing Student



Another shift from the attachment finally done and dusted. I only regretted that I did not finish earlier. On the outside, I said I missed the patients dearly, every one of them. However, I was excited on the inside to leave; to go out to enjoy the allowance I had earned, the fruits of my labour.

There were also times when we students interviewed the patients with so much care—enquiring about medical and social history, only to ignore that very same patient the next time we see them. I, regrettably, forgot my Standard Patient’s (SP) name after the module on effective communication. It was only when he waved at me—and upon seeing my puzzled expression, reminded me that he was my SP—that I remembered. I merely treated him only as a stepping-stone to getting decent grades for that module. I may be reluctant to admit, but, I was being duplicitous.

How then, I asked myself, will I establish a firm and stable therapeutic relationship with my patients without being fake? After nearly a year, I came to the conclusion that I am always putting on an act, apprehensive to show my inner self, for fear that I would be accused of not truly caring for my patients.

I came up with and tried a few solutions for myself. I stood in front of the mirror and told myself that I am enough. It is perfectly normal to want to get the best grades, a good reputation, decent pay cheques that allow me to enjoy life. However, caring for patients and executing care plans merely to obtain these would be unfair to the patients, myself and also the noble career of nursing. Sometimes just being myself and reminding myself of my initial passion to care for the sick allows me to take a step back for objective self-evaluation.

This is how I arrived at my next non-pharmacological cure for duplicity: I will earnestly recognise, admit and refine my shortcomings to avoid making the same mistakes again. The cure for duplicity comes from within. It starts from believing in ourselves, that we do not have anything to be ashamed of, and coming to terms with our own internal motivations. Nursing is a vocation that demands hard work, dedication, and compassion but not always at the same time. Gradually, as we progress, we earnestly own up to our failings. It is courageous to admit and forgive our own mistakes because to err is human, and to keep on caring is our humane mission.

# The Cure for Hubris

by Dr Tam Wai Jia  
Alumna

When we heard the hysterical shrieks, we knew someone had died next door.

Just days ago, a man in perilous condition was checked into the clinic near our home.

That weekend, scores of people came by.

In a foreign land, the cross-cultural stresses made simple day-to-day living challenging. In particular, new visitors at the clinic who stared at us at length each morning at our front porch frustrated me greatly.

As the hair-raising shrieks erupted into a cacophony of unrestrained screaming, we left home. When we returned, a crowd had gathered around our front porch. People were sitting on our chairs at our front door.

"Those are our chairs," I said, to my own shock, a little regretfully.

"Do you share chairs in your country?" The matriarch of the family shot us a bloody look. "This is Uganda. And in Uganda, we share chairs."

I wanted to retort, wanted to tell her that I was a doctor and that I had left behind a great career to be serving as a volunteer doctor in Uganda, that she ought not to talk to me like that.

But, panting heavily, I shut the door behind me, before I said something I would regret.

Suddenly, I was humbled. How quick we are to consider ourselves more superior. In Uganda, I often caught myself thinking, "After all I have given up, how can they treat me like this?"

That incident, however, enlightened me.

Serving others, was simply all about that-others. It was not about me, not about the house or career I had left behind.

While I was upset that our things were frequently being used and our privacy was often invaded, was I truly entitled to what I think I was?

Did I deserve staying at a home atop a hill overlooking the glorious sunset? Did I earn those chairs that were given to us? Did I deserve the no-pay leave graciously granted to me by my employers so I could serve in Africa?

When I started to see from a different perspective, I realized that I had no ownership rights not just over those chairs at our front porch, but over my entire life.

We often think we have much to impart to the locals. Instead, I am learning, we have much to learn from them. What comes across to us as their one-sided self-entitlement, is their value of sharing and caring for others in a heavily relational culture; what comes across as ingratitude to us, is merely their concept of family- they would do the same for us without expecting thanks; what comes across to us as being invasive, is just their way of showing affection.

On the contrary, what we perceive as independence in our self-made culture, is perceived as being self-seeking in theirs.

Later, we discovered that the person who died was not the elderly man, but a young child.

I am learning, that our values of right and wrong which are so easily circumscribed in our own culture, may be unceremoniously overturned in another.

Self-entitlement loses its compass when we realize it has nothing to anchor itself in.

As doctors, we are called to serve.

I am learning, that I too, need to learn how to share chairs.

# ADVOCATING HEALTH IN THE COMMUNITY

by Lee Yong Qin and Gan Ming Yi  
Phase III Medical Students and Directors of Public Health Service 2019

Public Health Service (PHS) is a student-initiated project established in 2004 under the NUS Medical Society by a small committee of medical students who had the passion to serve. Since then, PHS has developed, constantly adapting to the local healthcare landscape and the needs of the community, heeding its motto, "Promoting Health, Spreading Awareness".



## WHAT HAPPENS AT SCREENINGS?

Focusing on the primary prevention aspects and health education, student volunteers combine the various modalities for screening in one convenient location, over one weekend, so that residents will be able to receive a fuss-free and free-of-charge, comprehensive health screening. We even call up participants, post-screening, to remind them of all of the follow-up appointments that they have to go for, to ensure higher rates of compliance.

PHS 2019 screened over 740 Singaporeans and PRs, aged 40 and above, for chronic disease (blood pressure, blood cholesterol and glucose, BMI), cancer (colorectal, breast and cervical cancer), geriatric-relevant issues (cognitive, fall risk, visual, hearing, oral health) and oral health. Our door-to-door education and publicity efforts to the general public reached over 30,000 households this year, and our annual educational road show, Health Carnival, which raises awareness about prevalent health issues faced

by Singaporeans, reached out to over 1,000 participants. We encouraged visitors to take greater ownership towards their own metabolic health, through a series of interactive activities led by our student ambassadors.

With 483 student volunteers, 28 doctors and more than 100 external volunteers from healthcare institutions this year, PHS continued to foster inter-professional interactions among students and alumni from Medicine, Nursing, Dentistry, as well as healthcare professionals, to serve the community service and promote health. Throughout 15 years of service, PHS has reached out to more than 20,000 residents in various parts of Singapore and trained over 300 junior college and polytechnic students under our Young Health Ambassadors' Programme (YHAP), to advocate for health in their own communities.



**Screened over 740  
Singaporeans and PRs**



**Reached over 30,000  
households**



**483 student volunteers,  
28 doctors and more than  
100 external volunteers**



Our registration volunteers utilising the PHS application form to improve the screening process and flow for our participants



Visual acuity screening at our Geriatric station

## NEW INITIATIVES

For the first time this year, PHS 2019 worked with the Agency for Integrated Care (AIC) to include referrals to social services as part of the screening, to provide better social support for our participants. This station helped ensure that AIC Care Consultants can assist and refer participants to a wide variety of schemes and services: from financial aid, Seniors' Mobility and Enabling Fund (SMF), Caregiving Assistance, Home and Hospice Care, and many others. To this end, medical students from Phase III to V speak with participants to find out more about their lives and medical concerns when taking their histories, and through these personal conversations, find out if they require any form of social assistance. By then referring them to the social service team, PHS worked hand in hand with the AIC Care Consultants to ensure that participants who required social support received advice and assistance on the day itself. This new initiative was well-received by more than 150 participants.

In addition, eye screening services were boosted this year with a collaboration with the National University Health System (NUHS) and Singapore National Eye Centre (SNEC). A new mobile eye bus at the Canopy @ JLink tested senior citizens for glaucoma, cataracts, diabetic retinopathy or age-related macular degeneration, an addition to the Snellen's test which checks for basic visual acuity and any refractive errors.

## WORD OF THANKS

It has been a really meaningful experience working with the Public Health Service committee. When PHS first started out, there were no free large-scale health screening events in Singapore, and low public awareness of screening for chronic diseases and cancer. PHS filled this gap. Now, there are more public health screening initiatives, such as the Screen For Life Programme that was started in 2017.

We are extremely grateful to our project mentor, Associate Professor Lim Fong Seng for his immense dedication and nurturing the PHS committee so patiently over the years, as well as the School's unwavering support. Our heartfelt gratitude goes out to the PHS alumni who never fail to inspire and who guide us with their valuable insight and experience. We deeply appreciate our screening, exhibition partners as well as in-kind and financial sponsors: your support has been instrumental in allowing PHS 2019 to better serve the community.

It is our hope and wish that the spirit of volunteerism will continue to live on among the medical students and more can join PHS in our endeavour to make Singapore a healthier nation, and bring about meaningful change in the community.



**LEFT:**  
Our Guest-of-Honour,  
Minister for Culture,  
Community and Youth,  
Minister Grace Fu,  
interacting with our  
screening participants



**BOTTOM:**  
Our Zumba instructors  
posing for a picture with  
the School's mascot,  
Meddy, at the PHS  
Health Carnival

SCAN QR CODE  
TO VIEW VIDEO





Excerpts from  
**Being Human:  
Stories From  
Family  
Medicine**

# A Day In The Life Of A Family Doctor

Health promotion and prevention are part and parcel of a family doctor's daily work. As Henry de Bracton wisely said many years ago, "An ounce of prevention is worth a pound of cure."

In treating patients with heart diseases, a good family physician not only competently manages patients' conditions, but also strives to prevent them from worsening. Smoking is of course one of the key preventable risk factors of heart diseases, and doctors typically advise patients who are smokers, to kick the habit.

The following is a vignette by Dr Tan Su-Ming, who shares the difficulty of getting her patients to quit smoking. She wrote her thoughts and experience based on a drawing by medical students who reflected on their posting to family medicine. This is an excerpt from *Being Human: Stories from Family Medicine*, published by Adjunct Associate Professor Cheong Pak Yean and Dr Ong Chooi Peng.



## The Girlfriend from Hell

*"I spend much time telling my patients to quit smoking, eat healthier, start exercising, learn to relax, and enjoy life. I suspect most of us do so, and with limited success.*

*After twenty-odd years talking about quitting cigarettes with smokers, I now realise that I don't know what they go through, being a non-smoker myself. I am convinced about the detrimental effects of cigarette smoking, and I think smokers are too. But I have read that because nicotine feeds the pleasure centre of the brain, quitting cigarettes in some can be harder than kicking heroin. I try not to pontificate anymore these days. I just say, if you can, don't smoke anymore.*

*How you do it is not important, I tell them. If you can find a good Why to quit, the How is not so important."*

*In this drawing, a doctor tells a patient he needs to quit because he has had a stroke, an amputation and a heart attack. The patient's wife and daughter react with joy when the man says that he has. Actually, the fellow continues to clutch on to his cigarette but keeps it out of sight of his family!*

I love it when my patients have an Aha! moment.

I met a twenty-year-old man who had a cough he couldn't shake. We got to talking about his smoking habit. He'd smoked his first cigarette when he was twelve and he was smoking twenty a day now.

"You ever thought of quitting?" I asked. "Sure," he replied, "but it's very, very hard."

The cigarette was like his girlfriend from hell, I told him. This girlfriend would take everything from him – his health and his money, and give him nothing good in return. If he tried to break up with her, she wasn't going to let him go so easily.

"Exactly," he said. "Damned hard to break up with this girlfriend of mine." "What is your girlfriend's name?" I asked.

"Winston\*," he smiled, not missing a beat.

– Dr Tan Su-Ming

\*Winston is a brand of cigarettes.

# Work-Life Balance

"As one looks on a face through a window, through life I have looked on God. Because I have loved life, I shall have no sorrow to die." - Amelia Burr



## More Choices

*I need to be on time. I have to-do lists running a like continuous tape at the back of my mind. I need to function - function well! - and deliver, and care, and fulfill, and not generate adverse feedback.*

*The drawing on the next page shows how we always hope our day does not end. Just before closing time, a patient comes in with a long list of problems to be solved. His list wars with my to-do lists at five in the evening.*

*My workday ends and I go home. My daughter greets me. I put aside my to-do's and all the incessant buzzing for a while. How was your day? What was your story today? (How much screen time did you get today?)*

*We have dinner together on nights when my husband is not working, chatting about the day, discussing plans. What did my sister say? What is she doing about it? How are your brother's kids? A wife is something to be, not do. Not a list of to-do's but to be here, to be with, to be beside.*

*My daughter nags me to play with her. Sometimes, we do puzzles. Or I sit at her restaurant and we count change. Sometimes we struggle through a book or two so that she earns her television time. I shower her. She combs my hair and I comb hers. Bedtime story. Mummy can I have another story?*

## Me Time!

Sometimes I get none, if I fall asleep too soon. Or I catch Netflix or read a book. The last book was about a fire-breathing dragon. My husband enjoys his computer games, or Chinese *kung fu* novels. Men are still boys at heart.

My day tries to begin at five in the morning. I try to sneak in some work with my coffee, then my regular Grab driver picks me up. I reach the food court at six-twenty and sit there with paperwork, then I head to the clinic.

It's hard for me to grasp work-life balance. To me every hour of my life is bursting with mysterious, interesting, intense, rich flavours. I want to live life.

- Dr. Ann Toh

# STANDING ON THE SHOULDERS OF GIANTS

by Tseng Fan Shuen  
President, NUS Medical Society

The NUS Medical Society held its Annual General Meeting on 11 September 2019, where the 71st Executive Committee was officially sworn into office, thus taking over duties from their predecessors. The following is an edited outline of Tseng Fan Shuen's address at the event, as incoming President.

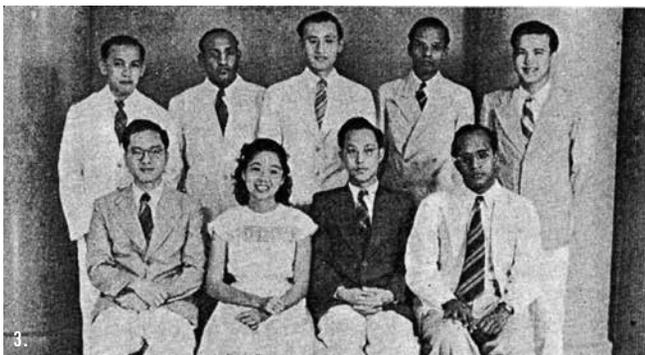
The NUS Medical Society (MedSoc) marked its 70th anniversary on 14 February 2019. In celebration of seven decades of student service and leadership, I thought I would take everyone on a trip back in time. While I do not profess to be an expert on the history of Medicine in Singapore, I believe that learning about the past helps us to understand the present, and plan for the future.



1.



2.



3.

## 1905

### The Birth of our School

We begin our journey in 1889, way before the year MedSoc was established formation, when Dr Max Simon, the Principal Civil Medical Officer, surfaced the idea of opening a new medical school. This would have happened as early as 1890, but no candidate could pass the entrance exam! An old female lunatic asylum was designated as the premises of this new medical school and on 3rd July 1905, the Straits and Federated Malay States Government Medical School opened with a grand total of 23 students. Student representative bodies existed at the time, albeit informally. Called the "students' recreation club", the earliest permutation of MedSoc worked to promote physical exercise through various sports.

## 1922

### Medical College Union

The first, formally recognised student representative body was the Medical College Union (MCU), founded in 1922. The committee comprised the President, Secretary, Treasurer, Secretary to the Literacy Department, and Captains of Cricket, Tennis, Football, and Indoor Games. Unfortunately, the MCU lost traction with the school administration afterward and temporarily faded into oblivion, although students continued to be elected into the new committee.

1. The first premises of the medical school, which was converted from a female lunatic asylum. Photo credit: National Archives of Singapore
2. The opening of the Tan Teck Guan Building in 1911, which housed the administrative offices, medical library, reading and lecture rooms, and a pathology museum. Photo credit: National Archives of Singapore
3. The 1st Executive Committee of the NUS Medical Society

## 1942

### WWII Tragedy

Tragedy struck in January 1942 when the Japanese invaded Singapore. Mr Yoong Tatt Sin, the MCU Secretary, was fatally injured by an exploding shell while resting in the student dormitories at Tan Tock Seng Hospital. The next day, intense shelling killed another 10 MCU members while they were burying Mr Yoong in an air-raid trench behind the College of Medicine Building at the Singapore General Hospital (SGH), resulting in the devastating loss of 11 young MCU committee members and doctors-to-be.

"How important was the Japanese Occupation on the fate of MedSoc?", you may ask. Well, it was important enough to be carved into our Constitution, which includes a reminder, that, *"The Management Committee shall preserve the memory of the students of King Edward VII College of Medicine who lost their lives on the 14th of February 1942."* Many of us have also walked past the War Memorial which commemorates that fateful day. We will always have them in our hearts as we serve in the society.

## 1945-49

### Post-WWII

After the war, academic administrator Sir Alexander Carr-Saunders headed a commission to look into the development of university education in Malaya. Prior to this, we only had university colleges, not full-fledged universities. Sir Alexander held extensive discussions with the then MCU President, Mr K Shanmugaratnam. Today, we know him as the father of pathology: the late Emeritus Professor K Shanmugaratnam. Seeing that the standards of existing university colleges was high, Sir Alexander agreed for the formation of a university in 1949. This university was named the University of Malaya, which has evolved into the National University of Singapore. By direct interpretation, the establishment of our school as a full-fledged university was partly due to the efforts by the MCU. The MCU was renamed the "Medical Society" in 1949.

## 1949-now

Since then, a few thousand past and present NUS Medicine students have taken up positions in the NUS Medical Society Executive Committee and Directorates. A few of our illustrious alumni include, but are not limited to:

### **Emeritus Professor Wong Hock Boon**

*"Father" of Paediatrics*  
1st Honorary General Secretary

### **Professor John Eu-Li Wong**

*Special Advisor, National University Health System*  
*Senior Vice President (Health Innovation & Translation),*  
*National University of Singapore*  
29th Honorary General Secretary

### **Professor Christopher Cheng Wai Sam**

*Chief Executive Officer, Sengkang General Hospital*  
32nd President

### **Professor Paul Ananth Tambyah**

*Senior Consultant, Division of Infectious Diseases,*  
*National University Hospital,*  
*Politician*  
37th Vice-President

### **Associate Professor Kenneth Mak Seck Wai**

*Director of Medical Services, Ministry of Health*  
38th President

### **Associate Professor Lau Tang Ching**

*Vice Dean (Education), NUS Medicine*  
39th President

### **Dr Chia Shi-Lu**

*Member of Parliament, Tanjong Pagar GRC*  
42nd Vice-President

### **Dr Mark Edward Puhaindran**

*Head, Division of Musculoskeletal Oncology,*  
*National University Health System*  
46th President

### **Professor Eugene Fidelis Soh Guan Chye**

*Chief Executive Officer, Tan Tock Seng Hospital & Central Health,*  
*National Healthcare Group*  
47th President

Fast forward to today, and we have 18 EXCO members and 200 directorate members ready to tackle the obstacles of the current term. As we serve, we must never forget the adage, *"If I have seen further, it is by standing on the shoulders of Giants."* These are big shoes to fill, but we take up the challenge and pledge to bring NUS Medical Society to greater heights in accordance with our motto, *"Not Pride of Knowledge, But Humility of Wisdom"*.



The 71st Executive Committee of the NUS Medical Society

# HOW DOCTORS ARE TEACHERS TOO

The research that garnered a prestigious AMEE Medical Teacher Poster Prize

Humbled, grateful and pleasantly surprised – this was how Phase III student **Clarissa Cheong** felt when she not only earned an opportunity to present her research on mentoring in Medicine at the annual Association for Medical Education in Europe (AMEE) Conference, but also took home a prestigious Medical Teacher Poster Prize. Follow her journey and find out what her main takeaways were from this experience.



The term doctor has its origins in the Latin word “*docere*”, which means “to teach”.

Before entering medical school, Clarissa never really understood what others meant when they say that when one becomes a doctor, one becomes a teacher too. This changed when Clarissa became a medical student and saw how her seniors and professors imparted valuable knowledge to her and exposed her to various opportunities in medical research.

One such occasion was the opportunity to present her research on mentoring in Medicine at the AMEE 2019 Conference in August. She was recommended by her mentors Associate Professor Lalit Krishna, Senior Consultant, Division of Supportive and Palliative Care, National Cancer Centre; and Dr Ann Toh, Resident, Family Medicine, National University Health System. The annual AMEE Conference is an international medical education conference where educators and learners come together to promote excellence in healthcare education.

“I didn’t expect to get in at first given the low acceptance rates to the conference but somehow, I did!” said Clarissa. With constant guidance from her mentors throughout the process, not only did Clarissa earn her chance to present her poster, titled, “A systematic scoping review of ethical issues in mentoring in internal medicine, family medicine and academic medicine”, but she also led her team into the Top 3 to bag a prestigious Medical Teacher Poster Prize at the AMEE 2019 Conference. This prize was judged by a committee which comprised medical education experts from around the world.

Clarissa’s interest in the role of mentoring in medicine started when she was in Year 1—she chose to focus her research on ‘mentoring’ out of many other options as she felt that Medicine itself is a very teaching-and-learning centred discipline and practice. Realising that mentoring in Medicine today may be jeopardised by various ethical factors, e.g. abuse in mentoring relationships, Clarissa decided to embark on this project, studying various ethical issues that may arise from the mentoring relationship, in the hopes of enhancing the mentoring culture in Singapore.



Clarissa (top row, 2nd from the left) along with her team mates and seniors; (top row, from left) Tan Shien Ru, Chua Wen Jie, Chester Tan, (bottom row, from left) Elishia Chia and Tay Kuang Teck



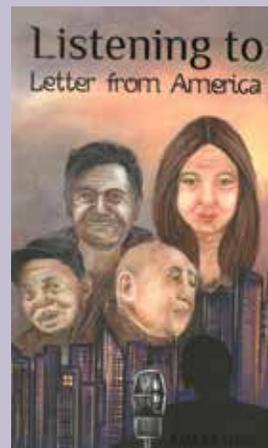
Clarissa gave a presentation on ethical issues in mentoring in internal medicine, family medicine and academic medicine at the AMEE 2019 Conference

Her research found that in a society like Singapore where most learn to be passive, resolving issues in a mentoring relationship could prove to be challenging: in order for the relationship to work, mentees have to take initiative to reach out to their mentors besides allowing themselves to be guided. It cannot be a one-way relationship. When asked if there were any surprising findings, Clarissa shared that she had always thought that one-to-one mentoring would be the best given the dedicated attention one could give to a mentee. However, this was not the case—she learned that group mentoring turned out to be more effective instead as it could reduce mentees' fears of approaching their mentor.

"I further saw the importance of mentorship as I continued on my journey writing the paper when my mentors, A/Prof Lalit Krishna and Dr Ann Toh, patiently gave me advice not only on the research but also on life in medicine." For Clarissa, this experience has been a thoroughly enriching and exciting one and she is thankful for the opportunity to work with her mentors who have given her advice about life beyond research as well.

Having gained varied and novel perspectives from both her research and the conference, Clarissa encourages more students to go for such experiences and is motivated to do the same as those before her—to guide and teach juniors as a way of paying it forward.

## “Listening to Letter from America”: A Book on Old Age and Loneliness



“Listening to Letter from America” by Professor Kua Ee Heok

Inspired by the BBC programme, *Letter from America* by journalist Alistair Cooke, **Professor Kua Ee Heok**, Consultant Psychiatrist at the National University Hospital, embarked on a journey to pen down the experiences of elderly Singaporeans who survived World War II and shed light on how they viewed their place in society post-war.

He is uncertain about the future, but is certain that a deeper respect for the elderly today will surely mean a brighter tomorrow.

— A quote from the book reflecting the protagonist, Dr Weng's feelings as he pondered about sharing the stories of the elderly he meets regularly during his weekly visits to the Woodlands Day Centre.

It took 12 years to write and is now used in Harvard University for a course on anthropology. Prof Kua's novel, “Listening to Letter from America”, is based on the true stories of a group of elderly people who met regularly at a community day care in Woodlands where they shared their sacrifices in defending the country and recalled the horrors of the war years.

In this book of fiction, it is through this mutual sharing of rich experiences that the psychological healing and restoration of their self-esteem began.

It is common for the elderly who live alone to slide into depression due to loneliness and a loss sense of social identity post-retirement. As in real life, it is heartening that these shared experiences allowed the elderly characters to find a common bond and form a sense of social connectedness and friendship, vital to having good mental health in old age, according to Prof Kua.

Prof Kua has always been motivated to share such invaluable stories. He pointed out, “These stories are about people with common experiences coming together, and about the moral courage and mental resilience of the elderly.” He hopes that this novel would encourage the younger ones to take a step back and reflect on how and why the elderly are frequently misunderstood and misrepresented.

Having written 22 books on psychiatry, stress, ageing and depression, Prof Kua is no stranger to writing. Notably, his book, “Speaking Up for Mental Illness”, which detailed Prof Kua's research on mental illness in Singapore over the past 38 years, was recently awarded the REX Karmaveer Medal in the non-fiction category, as a book which champions positive change.



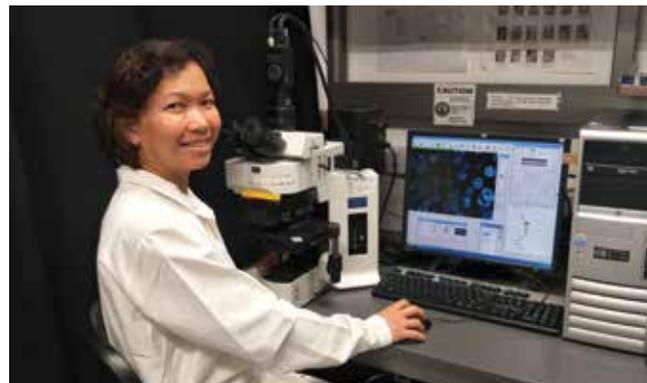
Chi Kuen (6th from the left) with the SEA Games training squad from the Singapore Underwater Hockey Women's Team and their team coach (Photo credit: Stirling Underwater Hockey Club)

# DIVING TO NEW DEPTHS

Despite being unable to swim, Assistant Laboratory Manager **Lee Chi Kuen** from the Department of Pathology boldly attempted underwater hockey 13 years ago and eventually made the women's team that won all the golds on offer at the recent SEA Games in December 2019.



Chi Kuen (fifth from right) with her fellow team mates from the Singapore Underwater Hockey Women's Team (Photo credit: Carlos Tan)



Chi Kuen works with NUS Medicine's Department of Pathology

Imagine diving to the bottom of a pool with snorkels and fins, jostling with others as you try to push a heavy puck through the water into a goal at the other end, while having to catch the occasional breath above water.

One's mind might draw a blank when asked what underwater hockey is all about. Introduced to the Singapore sports scene only in 2004, many may not be familiar with the sport or how it is actually played. Also known as 'Octopush', underwater hockey is a sport invented by the British Naval Divers in the 1950s and made its recent Southeast Asian (SEA) Games debut in December 2019. Staring down strong competition from three other countries, Singapore's underwater hockey teams made history by bagging all four golds at the 30th SEA Games.

Lee Chi Kuen, an assistant laboratory manager from the Department of Pathology, was part of the women's team. She believed right from the beginning that their victory was possible. In preparation for the games, the team ramped up their training six months before the competition. Each member was required to clock in 11 training sessions each week. This meant hitting the pool for both underwater hockey and swim trainings, as well as the gym for weight trainings, twice on some days.

"Training was top priority, so I had to be very disciplined about my time management in order to set aside the required hours. I rejected all socials, and ensured I started and ended work on time," recollected Chi Kuen, who kept a strict record of the training hours and sleep she had each day leading up to the games. Chi Kuen had to maintain equal discipline about what she ate or drank, so that she had enough protein to build the strength required for the competition. Entering the games also meant she had to be especially careful to avoid supplements that contained prohibited ingredients, which could run her into doping issues.

For Chi Kuen, the journey had always been a challenging one. When she was first introduced to the sport in 2006, Chi Kuen was clueless about swimming and using snorkelling equipment. She shared, "My first time was a disaster and all I could do was swallow water! I told myself that would be my first and last session."

Despite a distressing first attempt, Chi Kuen was undaunted. Friends she knew from the sport encouraged her to overcome her fear of water. Chi Kuen drew strength from their support and on her own, poured in extra practise hours. She eventually exceeded her own expectations: not only did she pick up the sport, she also learnt to swim and even scuba-dive. Soon, she saw herself participating in underwater hockey tournaments and competitions with other countries. "There was a lot of catching up to do—in terms of my swimming skills, water confidence, stamina and breath hold. But I was very passionate about the sport, so I kept pushing myself to train harder in order to be better," recounted Chi Kuen.

When the team finally arrived in Philippines for the games, they had to remain focused and be kept from distractions. All of them had to comply with strict regulations and download a Global Positioning System (GPS) tracker on their mobile phones, so that the authorities had oversight of their location. Restricted from leaving the hotel, Chi Kuen and her team mates prepared beforehand all the food and snacks they would need to consume between games to last through the days of the competition. She joked, "It almost felt like we were in prison since we were not allowed to go anywhere we wanted, and all the food we had was from the hotel. At some point, I became a little too well-versed with the buffet and craved our local *hor fun* very badly."



Chi Kuen with her gold medals and SEA Games mascot (Photo credit: LCK)

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– Lee Chi Kuen  
Assistant Laboratory Manager

Leading up to the games, Chi Kuen faced a lot of pressure and anxiety as she thought about what might happen during the match. Besides counting on her cats and mobile games to de-stress, she remained focused on what was most important: keeping fit and ready for the games.

The discipline and tremendous hard work paid off: both the men's and women's teams beat their strongest contender, the Philippines, who upped their game in the final match. Chi Kuen recalled that the Philippines team devised a 'wall' formation, and placed themselves in strategic positions to lock her team in to shut down their defence. She elaborated, "We put up a very fierce fight, and kept to our agreed game plan—the 'open' formation which allowed us to strategically swim into open space, and spread our opponent players out. We practised this strategy quite a bit, and it helped us successfully penetrate their defences and win."



Chi Kuen and her team, as they emerged victorious at the SEA Games 2019 (Photo credit: Carlos Tan)

Being a non-professional athlete who has to train while working full-time, Chi Kuen is grateful for an understanding and supportive team at work. "The head of my department sent a congratulatory message to the whole department after we won the games, and my colleagues clipped all the newspaper articles about the games while I was away," shared Chi Kuen. Even as she enjoys a post-win glow and takes a breather from intense training, Chi Kuen and her team have plans to compete next in the Underwater Hockey World Championships 2020. There is truly no rest for the determined!

# A GIFT FOR THE NEXT GENERATION

As a gift to future doctors, NUS Medicine alumnus and donor **Dr Lim Hong Shen** established the Lim Lian Hock Medical Bursary in 2018, named in honour of his father. Dr Lim, who juggles different roles as a general practitioner, educator and health information specialist, reflects on what giving means to him and why he readily does so for the School.



Dr Lim performing a procedure during a medical relief trip supporting the aftermath of the 7.8 magnitude Gorkha Earthquake in Kathmandu, Nepal in 2015 (Photo credit: Lim Hong Shen)

“Why?” would often be the first response.

“Did something happen to your dad!?” would often follow.

“You must have too much money!” mostly punctuate the conversations.

The Oxford English Dictionary defines “giving” as to freely transfer the possession of something, to someone. There are often preconceived notions of people who establish bursaries or scholarships: you must be born with a silver spoon to be willing to give; you need to be comfortable and settled in life to think about benefiting others; or you need to be wealthy to give. These perceptions usually surround money.

## Yong Loo Lin School of Medicine A member of the NUHS

### BUILDING STRENGTH OF CHARACTER

More than just to support students financially, the Lim Lian Hock Medical Bursary seeks to provide a safe space for mentorship. Every student supported through the bursary will have an opportunity to be mentored and themselves, guide the juniors that come after them. The bursary requires each beneficiary to give back to the community, by getting involved with GoHelp projects<sup>1</sup> or participate in student-led Community Involvement Projects (CIP) that demonstrate a significant difference to healthcare outcomes in a sustainable manner. The bursary aims to bring together an increasingly socially-conscious community while inculcating the spirit of giving back.

It is expected for us as human beings to be kind to family, friends and peers. I know of many peers and friends, who have sacrificed a much more valuable commodity—their time, to guide and mentor students in the wards. My contribution with is but supplementary to the foundation of a good education. Every deserving student should be given an equal opportunity to receive quality education. We should all work together towards a society where it is just as expected to give, to be kind towards a stranger—a fellow human being.

<sup>1</sup> GoHelp, or the Global Health and Leadership Programme, focuses on student-led, overseas community outreach initiatives that challenge and prepare our students for the increasingly globalised and complex practice environment they will work in.

(Left) Dr Lim Hong Shen, alumnus and donor of the Lim Lian Hock Medical Bursary, with Gabriel Leow (right), Phase V medical student and bursary recipient



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