SMA news

For Doctors, For Patients

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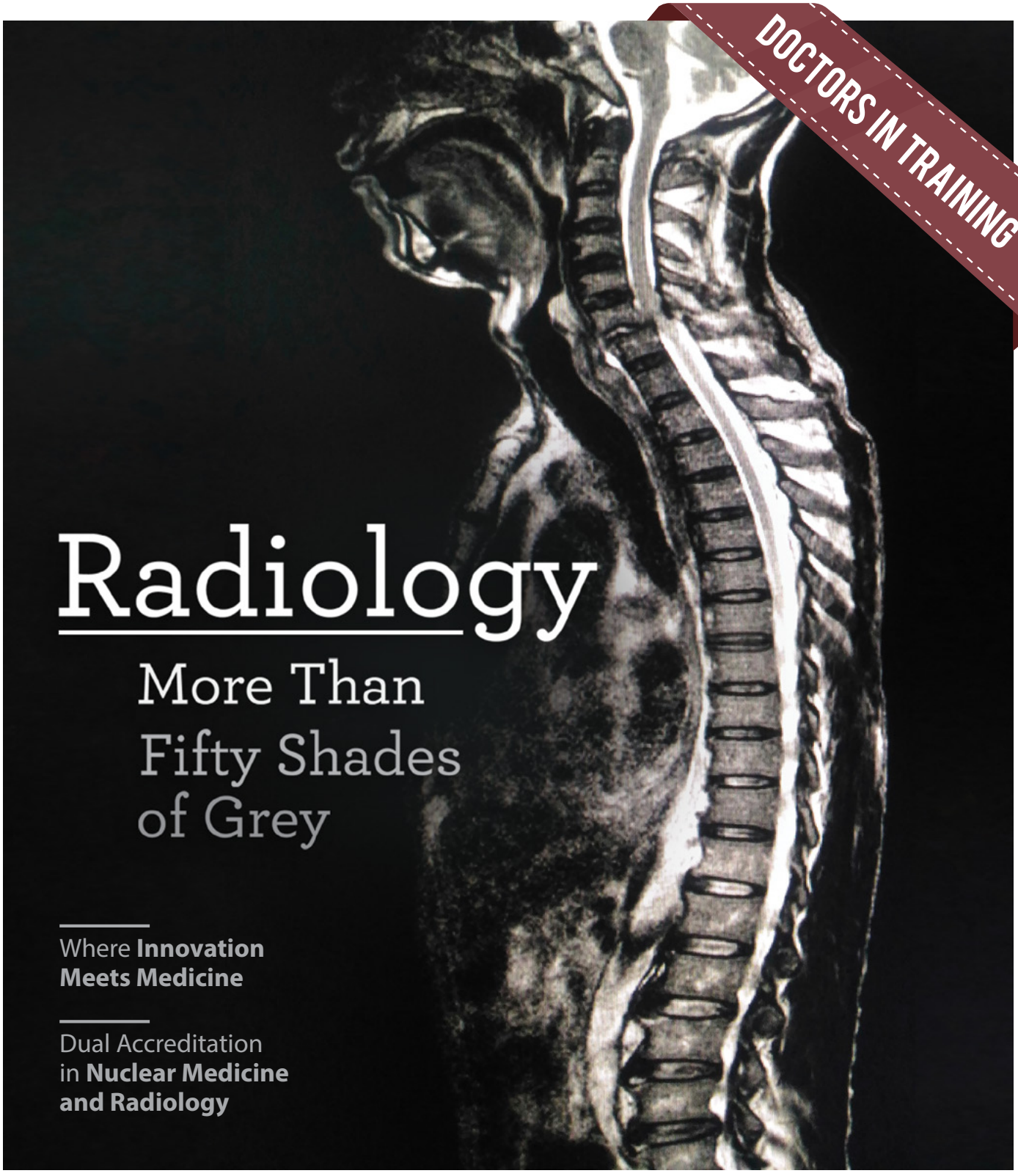

DOCTORS IN TRAINING

Radiology

More Than Fifty Shades of Grey

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JurongHealth Campus is a part of the National University Health System (NUHS) group, serving the community in the western region.

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We regret that only shortlisted candidates will be notified.

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Jurong Community Hospital
Jurong Medical Centre

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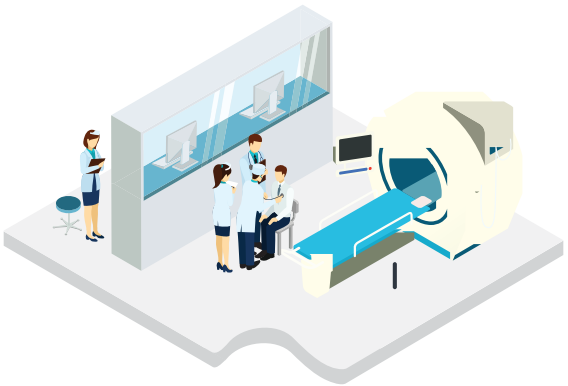
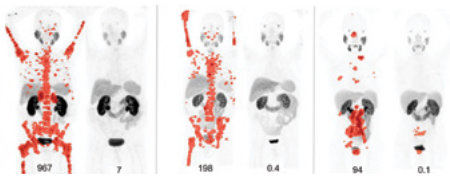
CONTENTS





The EDITORS' MUSINGS

Tan Yia Swam

Editor

Dr Tan is learning new skills and stretching new boundaries in her private practice. Meanwhile, she still juggles the commitments of being a doctor, a wife, the *SMA News* Editor, the Vice-President of the SMA and a mother of three. She also tries to keep time aside for herself and friends, both old and new.

My surgical work is closely intertwined with radiology. During the training years, one learnt how to read CT scans and arrange urgent vascular interventions. Being able to have valuable discussions with like-minded radiologists to truly "correlate clinically" was a joy. What do we make of the non-enhancement? How about these tiny locules of air?

Now, doing pure breast work, being able to work with dedicated breast radiologists is another great joy. We'd review mammograms together (which cluster of microcalcifications should we aim for?), decide on which modality to use next (if necessary, supplementary ultrasound or MRI?), and discuss the technique and accuracy of localisation and peri-operative marking; such joint management gives patients a better outcome.

It is, therefore, my pleasure to focus this July issue on radiology. We have invited various writers across different institutions and subspecialties to share the recent developments and progress in radiology, as well as the training woes and rewards. Enjoy!

For this special "Doctors in Training" issue, we feature the field of roentgenology – better known as radiology these days. In 1895, Wilhelm Conrad Roentgen was a professor of physics at the University of Würzburg when he made his greatest discovery: X-rays (also known as Roentgen rays). He noticed that, as a cathode-ray tube was being operated in a darkened room, paper lined with barium platinocyanide lying some distance from the tube "lit up with brilliant fluorescence".

Rontgen theorised that unknown radiation was formed when electrons struck the wall of the cathode-ray tube, giving rise to a fluorescent chemical reaction. He found that it affected photographic plates and he took the first photographs of metal objects and the bones in his wife's hand. Unsurprisingly, the study of physics and radiation has always featured prominently in the training of a roentgenologist.

Another radiologist, Sven Ivar Seldinger, introduced the eponymous Seldinger technique, a key procedural innovation for the insertion of chest drains, central venous catheters, pacemaker leads, etc. The groundbreaking technique revolutionised angiography, which had a high rate of complications back then, and set the foundations for interventional radiography.

Ian Donald, Professor of Midwifery, published an important paper on obstetrical and gynaecological sonography. It contained illustrations of B-mode sonograms of various normal and pathological abdominal conditions, while also discussing the safety of diagnostic ultrasound. The diagnostic ultrasound has since become an indispensable tool for obstetricians, surgeons and emergency physicians, facilitating more accurate and efficient management of patients.

Jipson Quah

Guest Editor

Dr Quah is in private practice as a GP with a special interest in pathology. He enjoys discussing pathology reports with patients, music-making, fitness and editorial work.

The dynamic field of radiology has been largely defined by technological innovations combined with groundbreaking clinical applications; this has given rise to rapidly advancing subspecialties, such as interventional radiology, nuclear medicine and now, even artificial intelligence. I believe that all of us will agree that it is impossible to practise medicine without the fine services of our radiology colleagues and we are delighted to have senior and junior radiologists from the various healthcare institutions share their insights in this issue. I trust that the rest of the medical fraternity will have a fascinating read. ◆

RADIOLOGY IN SINGAPORE

WHERE INNOVATION MEETS MEDICINE

Text by Dr Lim Chee Yeong, Dr Xie Wan Ying and Dr Tan Bien Soo
Photo by SingHealth Diagnostic Radiology Residency Programme

Technological advancements are relentless in the modern era and few medical specialties have embraced innovations quite like radiology. From the emergence of MRI to early ventures towards artificial intelligence (AI), continual disruptive evolution renders the specialty abstruse to patients and professional contemporaries alike. To understand the essence amid such vicissitudes, we will have to connect the dots of recent key advances along the journey towards the cutting edge. This article will focus on the ongoing transformation of clinical practice in radiology, the growth of interventional radiology and nuclear medicine, as well as opportunities in digital informatics.

Transformation of clinical practice

Since the first X-ray department began in the new Singapore General Hospital (SGH) within the historic Bowyer Block in 1926, radiology has grown tremendously in scope and clinical impact.[1] Within a century, that nascent single modality general practice has metamorphosed into today's multi-modality subspecialty-based practice in all hospitals in Singapore.

The radiology departments today provide a wide variety of imaging techniques such as radiography, CT, MRI, ultrasound and nuclear medicine imaging under one roof. Local data from 2015 revealed 106 units of CT scanners and 78 units of MRI scanners in Singapore, translating to 19.4 and 14.3 units per million population, respectively. The ratios are mid-range when compared to developed nations in the Asia-Pacific, Europe and North America, which ranges from 7.4 to 97.3 CT units and 5.6 to 43.1 MRI units per million population.[2] The modalities may work in union too; for example, fusion of real time ultrasound with CT for hepatic interventions or combining anatomical information from CT or MRI with functional analysis in positron emission tomography (PET) CT/MRI. 3D printing has also recently created much excitement in the field due to technical breakthroughs and decreasing cost. The models generated from radiology images are used to optimise pre-operative planning across many disciplines, such as orthopaedics and vascular surgery.

Most radiology centres in Singapore now provide subspecialised services, employing consultant radiologists specialising in specific interest domains such as cardiothoracic, abdominal, neurology, head and neck, musculoskeletal, breast, emergency, vascular, intervention and nuclear medicine. The conventional imagery of a solo radiologist enclosed in the dark reading room churning out endless radiology reports in front of a blue screen has become irrelevant and superseded by progressive radiologist clinician teams. Globally, radiology has pivoted towards a value-driven ethos, departing from the traditional volume-based model. In 2013, the American College of Radiology published their influential strategic blueprint, *Imaging 3.0*, setting the stage for the next phase of radiology targeting optimal imaging care.[3] This initiative comprises active radiology involvement in managing imaging appropriateness, clinical decision support, safety, quality and providing patient-centric care. The goal is to acquire the right, personalised and best imaging for each individual.

These paradigm shifts in mindset have brought forth changes to the daily practice of a typical radiologist. A typical workday begins with a clinical radiology round where radiologists and other clinicians from various disciplines get the opportunity to work together by reviewing images and pertinent clinical information to optimise patient management. Strides are being made in enhancing the effectiveness of the radiology report, trending towards standardised structured reporting. Scoring systems such as BI-RADS (Breast Imaging-Reporting and Data Systems) and LI-RADS (Liver Imaging-Reporting and Data Systems) are now in practical application, using consistent terminology to reduce imaging interpretation variability and errors, enhancing communication with fellow clinicians and facilitating quality assurance and research. Many centres have concurrently introduced new-wave integrated multimedia reports, enabling educated patients of today to better understand their own radiology report findings.

Growth of interventional radiology

Interventional radiology is a specialty well positioned to lead radiology towards value-centric goals, extending our roles beyond diagnostics. It involves utilising minimally invasive image-guided procedures to diagnose and treat diseases in every organ system. By using the least invasive techniques available, risk to patients is minimised and health outcomes are improved. These procedures have less risk, pain and recovery time in comparison to open surgery.

The story of interventional radiology in Singapore began as early as 1959 when Dr Chow Khuen Wai introduced the Seldinger technique of vascular catheterisation after returning from advanced training in the UK.[4] Today, every radiology department within local academic centres and most major private imaging practices provide dedicated interventional radiology services around the clock. For example, the largest interventional radiology service within SGH developed into a full-fledged clinical department in 2017. Armed with eight interventional radiology suites and 17 interventional radiologists, it performs more than 10,000 procedures per year.

The indications, frequency and variety of procedures performed in the interventional suite increase steadily year after year. Procedures are broadly divided into endovascular and non-vascular methods, but interventional radiologists in Singapore are slowly but surely moving into super subspecialisation based on systems. Neurointervention has, over the last decade, evolved into the first treatment of choice for hyperacute strokes and cerebral aneurysms, improving patient prognosis through intravascular thrombectomy and coil embolisation, respectively. Similarly, in appropriate patients, vascular intervention has enabled definitive treatment of aortic aneurysms and peripheral vascular disease through endovascular stenting and angioplasty. Percutaneous biopsies, radiofrequency ablations and radioembolisation of visceral neoplasms by abdominal intervention increased treatment permutations and improved quality of life in many oncologic patients. Vertebroplasties for spine fractures, ultrasound-guided articular injections and bone tumour cementoplasty under musculoskeletal intervention, as well as breast biopsy with wire localisation under breast intervention, also play integral roles in various clinical pathways.

The impact of interventional radiology in medicine today cannot be understated. For example, 24-hour emergency embolisation for management of pelvic trauma-related haemorrhage is now standard of care within all our major trauma centres. Interventional radiology residency has become one of the most competitive medical specialties in the US and is poised to remain so in the near future. While local residency programmes currently do not offer a dedicated interventional track at the moment, we have definitely noticed its increasing popularity among our graduating radiology senior residents as their eventual choice of specialisation.

Nuclear medicine, molecular imaging and theragnostics

Nuclear medicine, as a specialty, grew out of the Therapeutic Radiology Department and became an independent Department of Nuclear Medicine, SGH, in 1980. Over the years, nuclear medicine centres have also been set up in other public hospitals and private institutions to meet the increasing demand for nuclear medicine services.

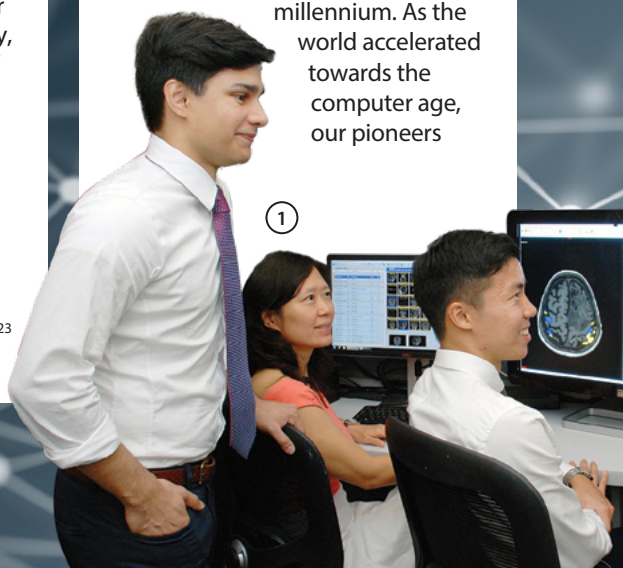
From the 1980s to 1990s, majority of the imaging work centred on Technetium-99m (Tc-99m) radiopharmaceuticals and radioiodine (I-131) therapy for thyroid conditions. The discovery of accumulation of 18F-fluorodeoxyglucose (^{18}F-FDG) in tumours revolutionised PET imaging in 1980. ^{18}F-FDG PET was soon established as a routine imaging tracer in neuroimaging and cancer diagnosis and management. Today, ^{18}F-FDG remains the workhorse of PET imaging, although there are newer, more specific radiotracers which have gained interest due to their clinical applications in neurology, neuro-oncology and oncology. For example, ^{18}F-fluoroethyl-L-tyrosine (^{18}F-FET) is a promising biomarker for response assessment in gliomas; ^{123}I-ioflupane and 18F-Flutemetamol are now used as diagnostic criteria biomarkers in dementia with Lewy bodies and amyloid.

The growth in theragnostics has been exponential in the past decade with the advent of personalised medicine and therapy. Some of these newer therapies include ^{90}Y selective internal radiation therapy (SIRT) for hepatic malignancies, peptide receptor radionuclide therapy (PRRT) for neuroendocrine cancers and prostate specific membrane antigen radioligand therapy (PSMA RLT) for metastatic castrate resistant prostate cancers. In ^{90}Y SIRT treatment of hepatomas, super-selective intra-arterial targeting improves tumoricidal radiation doses delivered to the tumour within a minimally invasive procedure, significantly improving patient outcomes. SGH is also one of the pioneers in introducing PRRT and PSMA RLT in South East Asia, attracting up to 40 referrals annually from neighbouring countries, as well as China and Taiwan for PRRT alone.

Given the unique position of nuclear medicine straddling expertise between imaging and medical therapeutics, its main local specialist training programme is now a senior residency programme under the Joint Committee on Specialist Training, accepting trainees from both internal medicine and diagnostic radiology residency tracks. The specialty also has training pathways for dual accreditation in nuclear medicine and radiology, equipping residents with essential skills required for the exciting future in functional imaging and targeted molecular therapy.

Digital informatics

A major inflection point for radiology was the introduction of picture archiving and communication system (PACS) before the turn of the millennium. As the world accelerated towards the computer age, our pioneers



readily embraced new technology, transiting images away from printed form onto digital screens. The impact was exponential. Rapid scrolling of multiple images in digital form enabled more complex cross-sectional imaging to be obtained and optimised with innumerable post-processing techniques. Easy access to prior imaging data improved reporting standards and efficiency. Most significantly, the ability to review high-quality images anywhere in the wards and consultation rooms on demand contributed to ubiquitous application of medical imaging in clinical workflows today.

Fast forward to the 21st century, rapid progress in AI and machine learning (ML) research arising from advances in computing infrastructure and deep learning techniques, such as convoluted neural networks, promises a Fourth Industrial Revolution. It is no surprise that radiology is one of the first medical specialties to take the leap of faith by incorporating AI into our practice.

AI is the branch of computer science devoted to creating systems to perform tasks that ordinarily require human intelligence. ML is the subfield of AI in which algorithms are trained to perform tasks by learning patterns from data rather than by explicit programming. Image recognition within scans is of particular interest in research, translating to clinical applications such as automated fracture and bone age classification from radiographs, pulmonary nodule detection on CT and cartilage defect detection on MRI. Furthermore, AI applications are not confined to automated image detection – these algorithms are starting to extend into other operational domains such as decreasing scan acquisition times, automated clinical decision support and scan triaging.[5]

As true clinical applications of AI applications have continued to grow beyond the computer laboratory over the last few years, facile fears of machines replacing human radiologists have shifted towards a more sanguine view of AI-augmented radiology practice. The lamentable regret from the introduction of PACS is the unwanted effect of radiologists retreating deeper into the dark room, losing invaluable rapport with other clinical colleagues and patients. In an ironic twist, thought leaders now believe that as AI/ML algorithms are trained to perform repetitive mundane diagnostic tasks, radiologists will finally be able to concentrate on adding value, improving inter-human communications and managing patients beyond mere diagnostics. There is concurrently potential for radiology to venture further into precision medicine, with many researchers reporting early results of combining avant-garde techniques in radiogenomics and AI.

In Singapore, efforts towards developing our radiology AI capabilities are rapidly picking up pace. The Radiology Artificial Intelligence Machine Learning Imaging Informatics committee under the Singapore Radiological Society was formally formed in 2017 to facilitate development of this domain within Singapore. It has been working closely with different radiology departments, as well as domain experts, such as the Agency for Science, Technology and Research, to explore novel methods harnessing this exciting technology clinically. The College of Radiologists, Singapore, and the local radiology residency programmes have also made progressive steps to insert informatics and data science into the standard training curriculum, preparing the future generation of radiologists for our next iteration.

Change is the only constant

Radiology is a specialty that continues to improve patient care by challenging established mindsets, inventing new diagnostic and therapeutic techniques, and assimilating the latest advancements in digital technology. As a medical discipline that is neither considered new nor old, she has chosen to advert mid-life crisis though relentless reinvention. Although her face is ever-changing, her immutable spirit of innovation will always remain the pillar of strength, the northern star and the guiding light. Like the city we live in, work in progress is always status quo since we know no other way. ◆

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Legend

1. Modern collaborative approach to add value into medical imaging

Dr Lim is a consultant radiologist in SGH Department of Diagnostic Radiology specialising in musculoskeletal imaging and interventions. He is also the associate programme director of the SingHealth Diagnostic Radiology Residency Programme and Secretary of Singapore Radiological Society Musculoskeletal Imaging Subsection.

Dr Xie is a consultant nuclear medicine physician with the Department of Nuclear Medicine and Molecular Imaging, SGH, and has an interest in molecular imaging in oncology and neurology. She is also the programme director of the SingHealth Nuclear Medicine Senior Residency Programme.

Dr Tan is senior consultant at the Department of Vascular and Interventional Radiology, SGH. He is the academic chair of the Radiological Sciences Academic Clinical Programme at the SingHealth Duke-NUS Academic Centre and Chair of the Division of Radiological Sciences at SGH.

Dreams and Ruminations

Text by Dr Lee Yik Voon

Moving onward! All I want to do when I wake up every morning is to take a look through my patient's eyes.

Do we prefer to look at healthcare through our patients' eyes or bow to our fraternity's approval so that we may see eye to eye with our colleagues? It's a delicate balance, but one we have to tread as we are trying to make healthcare more patient-centric.

Understanding patients

Does this mean that we have to know what different patients want? Do we have to know their likes and dislikes, their preferences on how they receive advice and are informed on treatment choices? When we have an established patient-doctor relationship that spans a decade or more, will we always know what is material to that patient? Our patients want their right to be heard yet they know they are at a disadvantage as they lack domain knowledge. Will this information asymmetry influence them to change their minds as to what is material to them when things don't turn out well?

Some patients come in and quote "Dr Google", but you will find that the context is often missing. When your patients do this, it may ruffle your feathers. However, a good doctor will need to be patient and spend time on the patient sitting in front of them to make a relevant analysis in the right context.

What can patients do when they encounter alarming medical news that appear seemingly true (eg, that vaccinations cause autism)? Many laymen will choose to believe the fake news and use them to challenge our best effort to be true to our profession. When fake news spreads like wildfire in the public domain, it becomes very real to our patients who may choose to believe what they hear and read. We should strive to dispel the myths.

I believe that our patients have to trust their personal or family doctor whom they have chosen because that doctor will do his/her best for the patients. That doctor of choice would have stood the reasonable test of time and possess qualities that the patients like and prefer. These qualities may be the way he/she explains various medical conditions and steps that the patient needs to undertake to be on the road to recovery. Some patients may prefer certain doctors by the way they break bad news and their use of the right comforting demeanor.

Thinking of the future

We have to do our part but what happens if we only see this as a day job or an occupation to bring home the bacon? I believe that once you are a medical doctor, you will always be one till you retire. However, in this day and age, how many would share my view? I hear through the grapevine that many would disagree with me, and that our younger generation of doctors may only see medicine as an occupation and not as a profession. At the opposite end, while we try our best, our patients need to

reciprocate and understand that we too are humans with bodily and psychological needs.

As I move into the later part of my life with my cohort, I often wonder who will look after the older generation of doctors when they succumb to sickness. How will the older generation of doctors manage their expectations of the younger generation of doctors and vice versa?

Perhaps we need to work harder to groom our children, students and interns early on in life. We should instill values that physicians are expected to hold steadfast throughout our lifetimes. We would need to select those who have the heart and inspire them at a tender age so that they may seek that calling when the time comes. We will need to set good role models for them to follow.

The threat of AI

What we endeavour to do may come to naught if society changes and expects all doctors to behave similarly or be replaced by robots with artificial intelligence (AI) and deep learning. Perhaps one day AI may even simulate compassion and empathy instead of merely having the superhuman capability of processing mountains of data and quoting them accordingly.

How many of our colleagues can see this problem and attempt to make a change? How many can see the problem but will only whine repeatedly? How many are oblivious and will only worry when the machines start to appear at our front doors to take our jobs away?

I am up now, having just woken up from a nightmare. We need to really wake up and get out of our comfort zone. While the Ministry of Health plans the next step with a focus on the sustainability of healthcare, and monitoring and managing the health of the population, our medical community should seriously think not only about our future but beyond that. I look forward to your support in the coming months. ◆

Dr Lee is a GP practising in Macpherson. He is also a member of the current National General Practitioner Advisory Panel. He is a pet lover at heart who is the proud owner of a dog, and regularly feeds neighbourhood community cats. He also enjoys playing online war games and thinks that playing Pokemon Go is a good form of exercise.

HIGHLIGHTS

FROM THE HONORARY SECRETARY

Report by Dr Lim Kheng Choon

Dr Lim is the Honorary Secretary of the 60th SMA Council. He is currently an associate consultant at Singapore General Hospital.

Supporting student-led initiatives

On 22 April 2019, SMA supported the workshop "Called to See Patients" by providing refreshments for participants. The workshop was organised by Dr Ivan Low, who was the past president of the 68th National University of Singapore Yong Loo Lin School of Medicine's Medical Society, and his peers. It was conceived shortly after they received requests from their M5 juniors for essential tips on how to approach and manage important situations as house officers (HOs).

SMA, through the SMA Doctors in Training (DIT) Committee, actively supports student-led initiatives that promote education and collegiality. Interested parties with good ideas may approach the SMA DIT Committee at dit@sma.org.sg for assistance and support.

Connecting with local medical graduates

On 22 April 2019, SMA 1st Vice President Dr Tan Yia Swam spoke to HOs posted to Tan Tock Seng Hospital (TTSH). She shared with them her personal journey of being on the editorial board of *SMA News* and later on, the SMA Council, emphasising the benefits that members would gain from an open feedback channel and avenue for practice resources. In addition, Dr Tan also mentioned that the SMA Council's advocacy work in light of the recent medico-legal cases can only continue with the strong support of our membership.

On 31 May 2019, SMA Honorary Secretary Dr Lim Kheng Choon addressed graduating students from Duke-NUS Medical School (Duke-NUS). Like Dr Tan, Dr Lim shared about his personal journey as part of the pioneer batch of Duke-NUS and the important role SMA plays in advocating for doctors and patients. SMA's advocacy efforts in the recent medico-legal cases regarding consent taking and communication of confidential medical information were also highlighted.

SMA thanks TTSH, MOH Holdings and Duke-NUS for the opportunity to address their HOs and graduates to showcase our work. ◆

We Have A Winner!

A big thank you to all our readers who took part in the "Play and Win: How Well Do You Know Your SMA" pop quiz published in the May issue of *SMA News*. Congratulations to Dr Yong Wei Sean for winning the lucky draw prize – A 3M LED P1610 Polarizing Task Light (worth $299).

SMA 60 Years
For Doctors For Patients

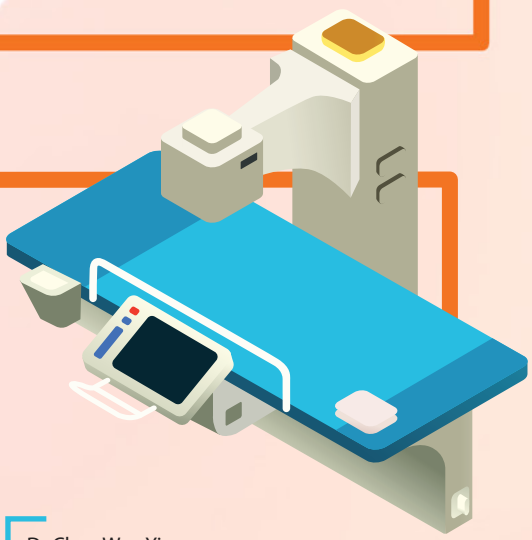
Dr Yong Wei Sean
SMA Member since 1995

An Insider's Take on RADIOLOGY

Text by Dr Chan Wan Ying, Dr Jonathan Sng and Dr Sonia Lee

Is the transformative age of radiology already here or has it not yet arrived? Do radiologists really dislike people? Do radiology trainees trod a lonely life of examinations in isolation?

Many, including aspiring medical students, may hold certain misconceptions about this dynamic and ever-advancing specialty. *SMA News* has thus asked three radiologists to each share with us a short snippet on their thoughts and experiences. Read on to find out more.



I believe that we are witnessing the transformative era of radiology. The specialty has come a long way since Roentgen's famous hand X-ray in 1895. My radiology training is very different from my mentor's, and his generation practically wrote the textbooks of radiology as we know today. Especially in the last few decades, the scope of our practice has been expanding as rapidly as the advancements in medical technology.

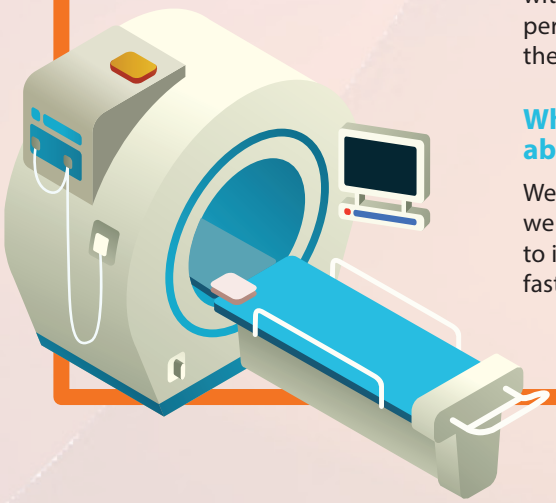
In my first year, X-rays were taught as the foundation of radiology. Yet during my entire medical school training, I have read more microscope slides than X-ray films. This is how I remember reading my first X-ray: standing on shaky ground, with sweaty palms and casting a suspicious glare… on the normal film. The dark reading room ended up hiding my flushed face more than once.

I have come a long way since that first film, with more than 10,000 films under my belt in the span of my residency. A wise person once said: To struggle is to grow. When I reflect on my residency, the person who has emerged is not the same as the one before.

With artificial intelligence looking to be the next frontier of radiology, perhaps my juniors' residencies will also be vastly different from mine. The transformative era of radiology is, to me, already here.

Dr Chan Wan Ying is a fifth-year senior resident from the SingHealth Residency Diagnostic Radiology Programme. Her interests are in body and oncologic imaging. She can be found in a dark reporting room or under a pile of non-fiction books.

Dr Jonathan Sng is a senior resident in his fourth year of radiology training in the National University Health System. He is happily married and enjoys the depth and breadth of his work.



What do I like about radiology?

I enjoy the rapid pace of work, being involved in the care of many patients with diverse conditions and interacting with the doctors caring for them. For example, it is challenging and exciting to switch to discussing neuroimaging with a neurologist shortly after performing an ultrasound with the paediatric surgeons.

What do I dislike about radiology?

We can never have an "off" day. If we are tired or pushing ourselves to interpret examinations faster, the mistakes we make are captured for posterity as imaging is stored forever.

Are there any misconceptions?

Some stereotypes about radiologists include us disliking people and having a relaxed work day. While it is true that our day is not physically intense (apart from interventional radiology), there is almost never a time in which we stop thinking or are not mentally engaged with the scans. While all specialties have a variety of personalities, radiologists as a whole are quite friendly, although it may be true that many prefer to talk to doctors rather than patients.

One of the many special things about training in radiology is the sheer number of examinations that we take over the course of five years. That's 17 to be exact. Our 14th examination, the FRCR 2B, is our most challenging hurdle. It is incredibly tedious and expensive to prepare for, and the overall pass rate averages 60% to 70%. That may seem pretty reasonable, but in an average cohort of 14 candidates, that translates to four friends staying behind.

A close-knit group of us who were studying together for this examination in 2017 agreed that we would pay it forward after clearing this hurdle. We created a comprehensive preparatory course simulating examination conditions, appropriately named the Little Red Dot Course, run by senior residents for junior residents. We aimed to provide our juniors with a fresh perspective on the most effective strategies in acing this exam in a non-threatening environment. By doing this, we hoped to not only improve the overall pass rate but also create a strong teaching culture among residents.

We have recently completed our second annual run of this course, which has been well received by our juniors and well supported by our residency programme. We are happy to report that the overall pass rate improved to 90.9% in 2018 and 100% in 2019, hopefully in part due to our efforts!

We are heartened to be able to make a positive impact in our juniors' training, and we seek to continue to improve this course and nurture educators of the next generation of radiologists. ◆

Dr Sonia Lee is the current chief resident at the SingHealth Residency Diagnostic Radiology Programme who is on hiatus for maternity leave. Life has acutely shifted from interpreting 256 shades of grey to satiating her very own eat-poop-sleep machine with her long-suffering husband.

SMA NATIONAL MEDICAL STUDENTS' CONVENTION

SAILING THE SEAS OF MEDICAL ETHICS AND LAW: NAVIGATING THE WINDS OF ETHICO-LEGAL CHANGES

31st August 2019 | Lee Kong Chian School of Medicine, Clinical Sciences Building

0830	**REGISTRATION & COLLECTION OF GOODIE BAGS**
0900	**WELCOME ADDRESS** *by Dr Lee Yik Voon, President, SMA*
0910	**OPENING ADDRESS** *by Ms Angela Tham, Chairperson, 3rd National Medical Students' Convention*
0915	**KEYNOTE ADDRESS** ***The Current Medico-Legal Climate – What Every Medical Student Needs to Understand*** *by Dr T Thirumoorthy, Founding Director, SMA Centre for Medical Ethics and Professionalism*
0945	**PANEL DISCUSSION** ***Professional Accountability of Doctors – Are We Getting It Right?*** *Moderator:* *Dr Norman Lin* *Panelists:* *Dr T Thirumoorthy* *A/Prof Chin Jing Jih, Chairman, Medical Board, Tan Tock Seng Hospital and Past President, SMA* *Dr Bertha Woon, Breast Surgeon in Private Practice and Associate, Medical Protection Society in Singapore* *Ms Kuah Boon Theng, Managing Director, Legal Clinic LLC*
1045	**TEA BREAK**
1100	**TEAM-BASED LEARNING ACTIVITY** *Facilitated by Ms Yang Lishan*
1200	**INTER-SCHOOL DEBATE** ***Burnout Among Medical Students is the Responsibility of the Individual*** *Debaters from the winning team will each receive a 3M™ Littmann® Cardiology IV™ Stethoscope, kindly sponsored by 3M Singapore.*
1300	**CLOSING CEREMONY AND LUNCH**

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For more information, please email **nmsc@sma.org.sg**

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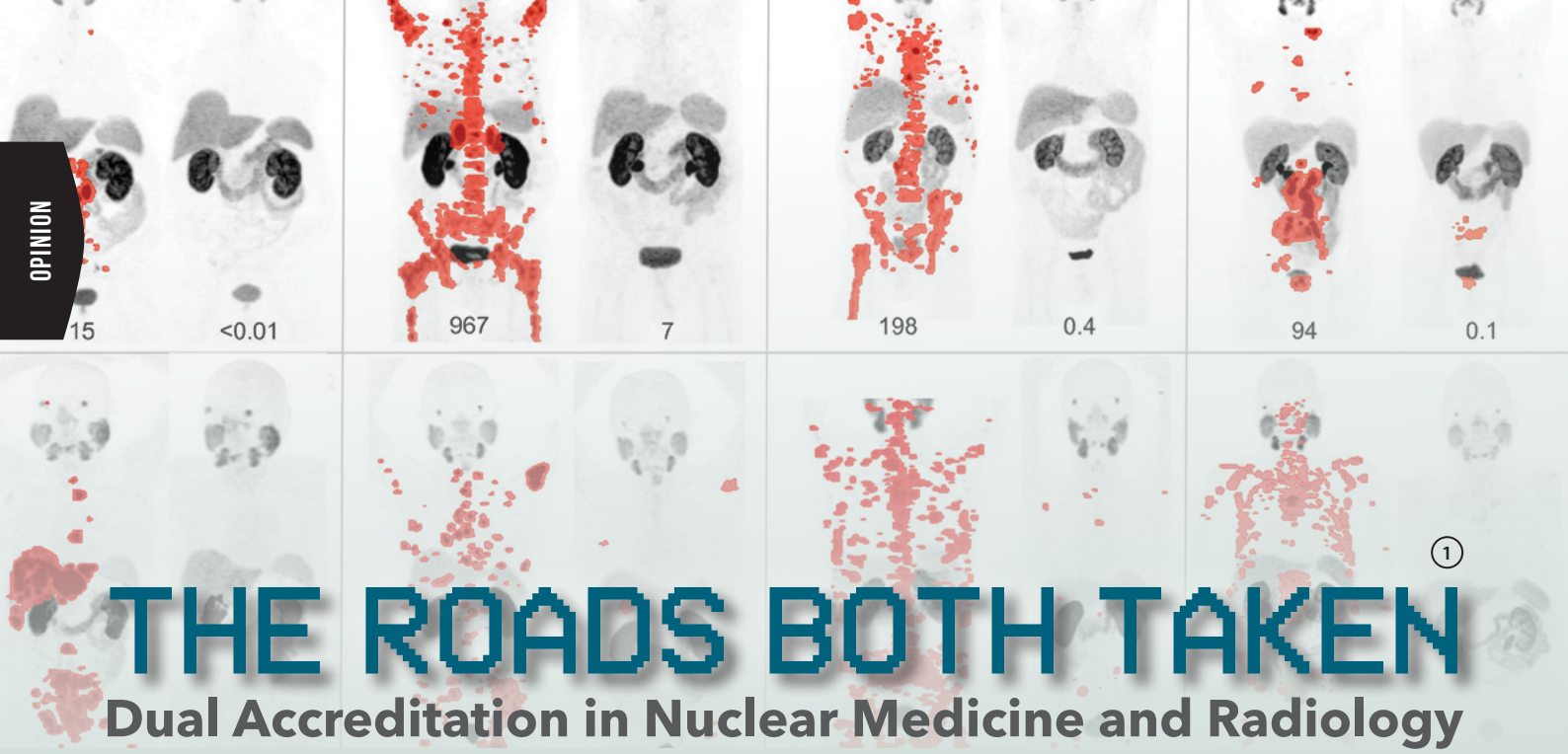


1

THE ROADS BOTH TAKEN

Dual Accreditation in Nuclear Medicine and Radiology

Text and photos by Dr Peh Wee Ming

My beginnings...

Having spent four years in diagnostic radiology residency, deep within the dark corners of the west and away from people (as the running joke goes), my inner internist resurfaced and called me back to the wards. After some not-so-gentle cajoling by my friend and mentor Dr Khor Lih Kin, I decided to take the plunge and signed up for dual accreditation in radiology and nuclear medicine – then a new and relatively untrodden road with only three brave souls before me. In lieu of my fifth and final year in radiology, I crossed clusters to central Singapore to do two years of senior residency in nuclear medicine.

The practice of nuclear medicine is about the use of radioactive substances to diagnose and treat disease. It exists as a separate specialty from radiology and is often confused with sister specialty radiation oncology. Part of the confusion probably arose because half of what we do – the half in diagnosis – is almost exactly like that of a radiologist, while the other half in therapy is akin to that of an internist physician or radiation oncologist. In fact, a second and historically dominant pathway into nuclear medicine training exists and leads from internal medicine.

One half as clinician

Unbeknown to some, Singapore General Hospital (SGH) Nuclear Medicine sees a significant proportion of thyroid cancer and Graves' disease patients in Singapore for radioactive iodine (RAI) therapy. Armed with a measly year of HO-ship clinical experience, albeit one enhanced by toxic luck, I tried my best to be a physician again. This was not an easy transition. Instead of clearing scans and X-rays, I had to run full-day clinics. Scans do not holler at you after waiting for half an hour, while hyperthyroid patients (as any endocrinologist would attest to) do.

2

But this transition was made easier by the kindness of colleagues. I remember asking a senior, Dr Low Han Chung, to sit in my initial clinics to make sure I was not telling my patients nonsense. I remember the shining examples of classical internists like A/Prof David Ng and Dr Kelvin Loke, who showed me what it meant to do your best for patients. And of course, the sweet, sweet nurses who made everything better.

With time, I learnt to titrate thyroxine. I relearnt how to defuse explosive situations in clinic, how to feel necks and hard livers in the ward, how to convey the nuances of a single elevated cancer marker and how to hold the hand of a fellow human being to break bad news.

RAI has existed for decades and is the template "theranostic" compound – in the context of differentiated thyroid cancer, it tells you where the cancer is and treats it at the same time. This theranostic concept, a portmanteau of therapy and diagnostics, has become a buzzword in recent years and it is finding expanded scope in other cancers, eg, peptide receptor radionuclide therapy (PRRT) in neuroendocrine tumours and prostate-specific membrane antigen (PSMA) therapy in prostate cancer. These services at the cutting-edge have been started in SGH Nuclear Medicine and have injected a new vitality into the clinical practice. The potential for more receptors to target and more cancers to treat is compelling and awaiting realisation by the plucky.

One half as imager

The other part of nuclear medicine in imaging has many similarities to that of

diagnostic radiology. I often tell medical students that five main tools exist in the imaging toolbox: X-ray and related techniques, CT scan, ultrasound, MRI scan and nuclear medicine. In essence, the joy of the diagnostic imager is the same joy of diagnosis shared by the rest of medicine. Instead of using open ears and a patient heart to hunt for clues in the history, we use our eyes to look for clinical meaning on stacks of pictures.

Running the operations of the imaging service is common to the practice of both nuclear medicine and diagnostic radiology, and is a less visible aspect of our daily routine. We work closely with allied health professionals – nuclear medicine technologists, medical physicists and radiochemists – to acquire the best images and deliver radiopharmaceuticals safely.

Also common to all imaging services is the need for close communication with the rest of the clinical specialties. The parable of the blind men trying to identify an elephant is central to all aspects of the medical craft. Communication of what we know from our respective vantage points is required to approximate truth in each patient.

The classical dichotomy of nuclear medicine is that it images functional processes, as opposed to the structural detail yielded by the other radiologic modalities. This is a division that will likely blur both ways in the foreseeable future, as newer positron-emission tomography (PET) scanners yield improved spatial resolution and the other radiologic modalities gain improved functional capabilities.

Another dichotomy that arose in my training, one that was slightly jarring, coming from radiology, was that nuclear medicine imaging was an eclectic blend of the very old and very new. For instance, there is deep knowledge hidden behind the humble bone scan, stored in tomes and journals from the 1980s. On the other hand, the new PET tracers coming into mainstream use carry with them a rapidly metamorphosing body of knowledge. As illustration of the currency expected of us, my programme director and mentor Dr Winnie Lam would regularly quote papers hot off the press in her presentations. These new tracers have the potential to image hitherto inaccessible problems plaguing humanity (eg, in the field of dementia, we may one day image in vivo the key pathogenetic proteins of all major syndromes).

The depth of the nuclear medicine kung fu has also been far more profound than I had expected, with the fundamentals drawing from different branches of the basic sciences compared with radiology. Knowledge of how the tracers are chemically synthesised, how they move within the body, how they bind to target receptors, and how the receptors are normally expressed, are required for proper interpretation of the scan images.

The yin and yang – coming together

Just as PET-CT is a hybrid imaging option whose whole is more than the sum of its parts, I have found that this path of dual accreditation has been complementary to both my radiologist and nuclear medicine physician selves. On one hand, PET-CT is like radiology with cheat code on, highlighting morphologically subtle and barely perceptible lesions in brilliant hues of red. On the other, the specificity of the structural findings limits the false-positives that come with imaging ubiquitous biological processes. The added perspective is a means of immediate feedback for personal growth.

And of course, the great theranostic promise is that what we can see, we can also solve. How far this promise goes and how much of it can be applied to our Hippocratic Oaths, can be limited only by our imagination.

I am glad to be walking both roads in this yellow wood, even though it is a journey without end. ◆

Legend

1. Society of Nuclear Medicine & Molecular Imaging's Image of the Year 2018. Paired pre- and post-PSMA therapy scans showing marked imaging and prostate-specific antigen response in metastatic castration-resistant prostate cancer patients who have failed standard therapy

2. Simulated clinic encounter featuring fellow colleagues on the dual-accreditation pathway, Dr Gideon Ooi (left) and Dr Lenith Cheng (right)

3. Mini department lunch outing with rotating radiology residents of the SGH Department of Nuclear Medicine and Molecular Imaging

Title image and permission obtained from Prof Michael Hofman, Centre for Molecular Imaging, Peter MacCallum Cancer Centre, Australia

Dr Peh is currently an associate consultant with National University Hospital's (NUH) Department of Diagnostic Imaging, nuclear medicine section. He serves on several tumour boards and contributes to the diagnostic neuroradiology and nuclear cardiology services. He was formerly chief resident, NUH Diagnostic Radiology.

3

THE INVISIBLE FORCE

Text by Dr Siva Subramaniam

The X-ray that saved his life

Chest X-ray. "21/M, RTA." It was the second week of my first rotation in radiology. *I feel sorry for this young man*. I opened the electronic notes from the emergency department to find out more. He had gotten together with his buddies for one last night out before leaving for university in the UK. Despite having a few drinks too many, he decided to drive home. *Ah, the folly of youth*. Not noticing the lorry in his blind spot, he accelerated to overtake another car. His car hit the lorry and went into a tailspin before hitting the expressway divider. *He's lucky to be alive, really*. Fortunately, he walked out of the car relatively unscathed. A series of trauma X-rays was ordered to confirm that there were no broken bones. *What a shame – a black mark on his record for drunk driving!* On first glance, the chest X-ray looked normal. I methodically went through my review areas before I spotted the abnormality – a single subtle undisplaced rib fracture! *Good pick up!*

Just as I was about to click "next", something caught my eye. The

mediastinal contour appeared a little lobulated. *Mediastinal haematoma? Aortic injury?* The aortic contour was normal. There was no pulmonary contusion or haemothorax. *The findings don't add up – better ask for a CT scan*. That same afternoon, a CT chest scan was performed and revealed multiple enlarged mediastinal and hilar lymph nodes. The patient had lymphoma.

Moments like this are what radiologists live for – picking up an incidental early cancer and saving a life, putting disparate imaging findings together to clinch a rare diagnosis, or allaying the fears of an anxious patient by giving them a definite answer to what's ailing them.

The secret lives of radiologists

Many people think of radiologists as court stenographers or uninspired journalists who simply report what they see. It is not a glamorous job – radiologists are rarely consulted on *Grey's Anatomy* or *House*. Likewise, patients don't see the radiologist's role in their care – we don't get many thank-you cards or cookies. To me, being a great radiologist is really about being a great doctor. We need to have a working knowledge of every organ system, the mental agility of an internist and the keen instincts of a surgeon. In many ways, radiologists act as the invisible force that propels patient care across the gamut of specialties.

To equip us for this challenge, we undergo five years of rigorous training, which includes rotations in diagnostic and interventional radiology. Each study we report as a resident is discussed with and vetted by a consultant who guides and teaches us. Our skills are further honed and tested during weekly tutorials, multidisciplinary rounds and, of course, examinations – which are tough and numerous. We are examined on a broad range of subjects, including anatomy and physics. Our final FRCR examination includes a rapid reporting component, during which we have 35 minutes to diagnose 30 X-rays, with a passing mark of 90%!

Compassion and coffee

Apart from examinations, night calls are the toughest challenge for radiology residents. There is a constant tussle between radiology and other departments on call when it comes to urgent scan requests. The radiology resident has to approve every CT, MRI and ultrasound scan performed while on call. As the resident on call has to report all the scans for the entire hospital, he/she must be selective in accepting scans. We try to only accept scans that are likely to affect the patient's management overnight. Our clinical colleagues who request for urgent scans often interpret our detailed cross-examination over the phone as a bid to block the scan. In reality, we are trying to triage the scan's urgency and decide whether it can be performed during office hours, when there are more resources (CT and MRI scanners) and expertise (radiographers, sonographers and consultants) available to give the patient and referring team the best possible scan and report.

When we are inundated with non-urgent scans on call, we may only get to read scans with critical findings much later. Furthermore, the more scans we report, the less time we are able to spend on each, the more fatigued we become and overall, the more likely we are to miss important findings. Imagine putting all of your knowledge of anatomy, pathology, physics, pattern recognition and logical reasoning to the test multiple times a night, with only minutes to make a critical judgement call on each case. Though the physical demands of a night call in radiology are few (hey, it gets pretty cold sometimes), the mental stress on the resident is immense. On a busy call, a little compassion towards the radiologist can go a long way. (And a hand-delivered cup of hot coffee never hurts!)

Another way in which you can help us to help you is to provide relevant clinical information with each request. While there are no formal statistics on this, anecdotally the most common clinical indication for imaging across specialties is "". Clearly communicating the clinical picture and your differential diagnosis allows us to correctly protocol the scan, titrate our diagnostic sensitivity and tailor the report to the individual patient.

A new era of imaging

My hope is that radiologists and clinicians will continue to communicate with each other effectively to better understand our patients' stories and provide them with the best of care. The story of the young man with lymphoma piqued my budding interest in radiology – I was fascinated by how the humble chest X-ray eventually saved his life. With the advent of high-end scanners, new imaging techniques and artificial intelligence, radiology is at the forefront of innovation in medicine. However, I believe that these advances will augment our practice rather than replace us, and that radiologists will always remain at the heart of medical imaging.

Clinical correlation is advised. ◆

Dr Siva is Dad to a mischievous toddler. When not child rearing, he is a senior resident at the Department of Radiology, Changi General Hospital. He has a special interest in uninterrupted sleep, though it has been a while.

2 MONTHS IN FIJI

My WHO Internship

Text and photos by Dr Ivan Low

1

In medical school, we were given the liberty to fill our time with any "learning activity" and have it count toward our elective programme. Some of my friends milked cows on a farm in Japan, while others engaged in high-level research at Karolinska Institutet. But I knew I wanted to utilise the time to explore something closer to heart.

It all started with a text message to a public health mentor, Dr Clive Tan, who was at that time seconded to World Health Organization (WHO) Manila. He was immensely helpful in guiding me through the application process and thanks to him, I received an acceptance letter a couple of weeks later. That was how my two-month internship with WHO Fiji began in the summer of 2016.

Why Fiji? In the first place, *where* is Fiji?

Master "Obi-wan" Clive had it all thought out – Fiji serves as the headquarters for the Pacific Health Systems and Policies department of the Western Pacific Regional Office – one of WHO's six regional offices around the world. This meant that I would be able to experience both regional-level and country-level work, and get a better understanding of the organisation's roles and interactions with various stakeholders in the complex field that we call global health.

To answer the second question, Fiji is an archipelago-country in the South Pacific approximately 2,000 kilometres northeast of New Zealand. It has more than 330 islands, of which two-thirds are uninhabited!

Work begins

My first day at work was somewhat surreal. After a ten-hour flight, I headed over to the Tanoa Hotel where I met Ms Nilva, a consultant from my department, by the tranquil poolside. She pulled out a brown envelope (just like in the movies) and in it was my brief. WHO Fiji was hosting a conference on Pacific health information systems (HIS), and my first task as part of the Secretariat was to scribe for meetings, facilitate discussions, host an exhibition and take photographs with my trusty iPhone.

In the weeks to follow, I had an abundance of opportunities to work on some of WHO Fiji's projects in HIS and health service delivery. Regionally, I helped to fine-tune and launch the "Healthy Islands monitoring framework", assisted in the publication of a Pacific HIS report, and developed a questionnaire on health service role delineation policies for Pacific nations. Locally, I was part of a team that looked into mapping the healthcare needs of

Fiji's rural Northern Division through qualitative interviews and site visits.

Many people have asked me what a typical day as a WHO intern was like. Frankly, there was nothing sexy about it. The day would begin at 7 am, with a 45-minute crowded bus journey down to the business district. All morning I would be flipping references, crunching data or typing furiously, save for a couple of minutes spent walking to the pantry for rehydration and deep vein thrombosis prophylaxis. Lunch would be at the nearby mall with some fellow interns. After recharging, the afternoon will often be filled with meetings, sometimes held at the Ministry of Health's office down the road, till 6 pm.

Gradually, amid the routine buzz of work that surrounded me, I began to appreciate the "WHO method". The Organisation's strengths lie in being a neutral broker, having strong in-country presence, and being (relatively) well resourced. This enabled it to carry out its mission of providing leadership and setting standards for important health issues, providing tailored evidence-based technical support for capacity building, monitoring and assessing health outcomes across the board, and shaping the international research agenda.

Being an intern in the Organisation was indeed eye opening. The team entrusted me with critical responsibilities for important WHO projects that addressed emerging health trends. They encouraged independent thought and valued my contributions, yet there was always a comforting layer of supervision and gentle guidance. Furthermore, the team comprised individuals from a diverse range of backgrounds – there were nurses, pharmacists, physicians, statisticians, environmental scientists and administrators; every conversation broadened my perspective on what public health (and the profession that runs it) was, is, and can be.

Other than work

Apart from work itself, I spent a great deal of time exploring the capital Suva and the surrounding districts. I witnessed an environmental protection public campaign at the park, trekked through (and subsequently got lost in) a tropical rainforest that sat on the edge of the city, drank *kava* with the locals (and felt my tongue and mind go all tingly), partook in their massive meals with gargantuan portions of rice, and strolled down long stretches of idyllic coral-laden beaches (1-0 to me for steering clear of *Vibrio vulnificus*). I have come to realise that this too has strengthened my appreciation of sociocultural determinants of health in Fiji and the Pacific.

Needless to say, it was an incredibly illuminative experience. I think all medical students and junior doctors should immerse themselves in some form of public health exposure during their formative years of training. Whether as a full-time clinician/radiologist/pathologist/medical innovator, it is essential to understand how health issues affect our communities, and know our roles in our public strategy toward combating these challenges.

After all, public health is much more than just a professional career or a specialised field of practice. It is a mindset and a way of life. ◆

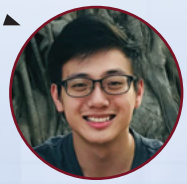
Legend

1. Colonial War Memorial Hospital – Fiji's flagship hospital

2. Kava *– locals drink it more often than water or wine*

3. Every Friday is Bula *Shirt Friday*

Dr Low is currently a medical officer in Singapore General Hospital, Block 1. He has a passion for public health, community outreach and medical education. In his spare time, he can be found relaxing at the park with his family and loved ones, his dog and a cup of *kopi c peng* (*siew siew dai*).



GROWTH AS A PHYSICIAN

Text by Dr Nigel Fong

A junior doctor's reflections on what he has learnt so far, and how much more he has to go.

I'm rarely sentimental, but recent conversations with starry-eyed 19-year-olds considering a career in medicine (or otherwise) has made me ruminate about "old times" as a pre-clinical student.

As a student, it often seemed that the journey as a physician was all about clearing the next hurdle – passing MBBS, entering a residency of choice, passing more exams, becoming a registrar, passing even more exams, before finally exiting.

As a house officer (HO), priorities changed. Most of us wanted to grow an extra pair of hands to cope with the never-ending admissions and incessant phone calls. We learnt how to keep sick patients alive till dawn and not get scolded the next morning.

But what truly is growth as a physician? I've come to realise that it is so much more than jumping through hoops or becoming battle-hardened.

Dr Fong is a SingHealth Internal Medicine resident. He enjoys teaching juniors and medical students, and hopes that his recent book *Algorithms in Differential Diagnosis* is helpful for future generations of medical students and house officers.

A physician grows by…

Developing clinical reasoning

Clinical reasoning – not knowledge – makes the difference between a student and a seasoned medical officer. When I teach students, I find that many can quote evidence-based treatment of heart failure, yet are stumped when given a breathless patient and told to "figure out what is wrong". Many can list differentials for a symptom, but struggle to interpret what the patient in front of them says.

One critical aspect of clinical reasoning is the ability to diagnose – if one can't diagnose, one can't treat. Suppose a 40-year-old lady presents with a three-month history of progressive quadriparesis. Examination finds symmetrical weakness with wasting, fasciculations, brisk reflexes and normal sensation. A student might connect wasting to nerve or muscle disease, or equate brisk reflexes to stroke. A resident might use an algorithm and localise the lesion to bilateral brain or motor neuron pathology. A registrar might immediately and intuitively recognise motor neuron disease. Finally, a consultant might think hard for treatable differentials, trying not to diagnose motor neuron disease, because it is such a terrible disease. So the process of diagnostic reasoning matures from guessing, hypothesis testing, to a combination of structured algorithms and unstructured intuition.

Algorithms can be learnt and I have put together some of these with the caveat that they are not a substitute for seeing real patients. That would be a tragedy, for an algorithmic framework without illness scripts is akin to a well-organised library with no books. Indeed, patients have proven to be my best teachers time and time again.

Another critical aspect of clinical reasoning is the ability to ask the right questions – going beyond "this patient has asthma" to "why is she having such frequent flares?" or "is this simply asthma, or something more?" This requires intellectual curiosity, plus the discipline of deliberate reflection to extract key lessons from patients seen, integrate new insights with existing knowledge and apply these takeaways to new patients.

Learning to manage uncertainty

Clinical reasoning is important, but sometimes not enough. Patient cases are increasingly complex and one often faces acutely unwell patients with no clear diagnosis. This makes many of us uncomfortable. But a physician grows by learning to manage uncertainty.

First is to have situational awareness. In a sick patient, stabilising physiology (airway, breathing and circulation) often requires little knowledge of the exact diagnosis. When there is little to lose, multiple possibilities must be pursued and even empirically treated in parallel. Conversely, in an elective setting, there ought to be some diagnostic certainty before starting higher-risk treatment.

Secondly, I have learnt to think ahead and strategise how to go forward. For example, in a patient with recent cerebral haemorrhage, a CT pulmonary angiogram is of little value, for even if a pulmonary embolism is diagnosed, treatment (ie, anticoagulation) would be contraindicated.

Thirdly, I have also learnt to engage the patient (and family) to have an honest conversation about treatment options and their risks and benefits, and also to make a shared decision.

Discerning when to pull back and when to push hard

My instinct is often to treat. Knowing when to pull back takes wisdom and courage. I remember a patient with end-stage motor neuron disease who presented with respiratory failure from pneumonia. Although she was bedbound with a power of 1 in all limbs, we intubated her because pneumonia was "reversible". She recovered from this pneumonia, but persistently failed extubation because of profound respiratory muscle weakness. She eventually communicated – by blinking eyes – that she had enough, and asked to be terminally extubated. I think I did her more harm than good.

Conversely, I've also learnt that I sometimes need to push hard. Another patient I vividly remember is a young gentleman who became dialysis dependent after sepsis-induced acute-on-chronic kidney injury. He had ischemic cardiomyopathy with an ejection fraction of only 17% and regularly complained of intra-dialytic chest pain with ECG changes. He required "gentle dialysis" – sustained low-efficiency dialysis (SLED), which meant that he could never go home, for he would not tolerate regular dialysis in the community. We pushed hard for him to have peritoneal dialysis – although tenckoff catheter insertion was high-risk, it was his best chance; indefinite inpatient SLED is not a viable plan. The operation went smoothly; he completed peritoneal dialysis training, and was due for discharge.

But that very last night before discharge, he suffered a massive myocardial infarction. As fate would have it, I signed his death certificate on call. As I did so, I was filled with doubt – why did it end this way? Did I cause more suffering by pushing hard? But I could not have known. It was his only way out then, and I could not have written him off. It was sobering indeed.

Remaining keenly aware of human fragility, despite seeing the wonder of modern medicine

Through many patients like him, I have often been put face- to-face with the brokenness of the human condition, the fragility of the human body and the transience of human life. It often makes me open my Bible and ask God, "why?" I don't have easy answers. Regardless of one's religious inclination, I'd dare say that a keen awareness of human fragility helps us better empathise with patients, better cherish life and become wiser, more compassionate physicians.

Conversely, I've also seen my share of miracles. Perhaps the most amazing experience was to administer thrombolysis to a comatose patient with total basilar artery occlusion, only to see him wake up before my eyes and eventually walk out of hospital. But not every patient does well.

Journeying with our patients, not simply treating the disease

As a student, my patients were "the hepatomegaly in Bed 5", and as a HO, it quickly became "the sickie in Bed 20 who is bleeding AGAIN". But I've learnt that my patient with a lipoma is seeing me not because he wants the lump removed, but because he wants to hear that it is not cancer. I've realised that in the same breath that I diagnose epilepsy, I destroy the livelihood of my patient who is a bus driver, and I shatter the hopes of a young female newlywed who wants to start a family – how is she going to do so now that I have told her of all the teratogenic effects of anti-epileptic drugs? I realise that communication is more than simply a set of core skills or templates (think S-P-I-K-E-S for breaking bad news), where one is marked based on saying the correct things. In all this, I cannot simply treat the disease and neglect the patient.

And I realise that I often get it wrong, and am still learning – learning to meet my patients in their need, learning to truly take an interest in their lives, and learning to journey with them through their hopes and fears.

Looking beyond immediate clinical management

Medicine is so much more than the immediate treatment of the patient in front of me. Suppose my patients with chronic obstructive pulmonary disease show zero desire to quit smoking, despite my painstaking counselling. I could become jaded and nag less – why waste my breath?

Or I could be inspired to study the barriers to smoking cessation so that they can be addressed. I could create a clinic ecosystem to promote smoking cessation – for instance, with smoking cessation counsellors and product demos of nicotine patches. At a public policy level, I could even work with behavioural scientists to craft nudges that persuade smokers to quit, or design regulatory responses to emerging trends like vaping. Whichever way I am inclined, there is a huge potential to benefit more than just one patient at a time.

Growing as a person

Personally, medicine has been a springboard for incredible personal growth. It is a privilege, for few other professions grant us this opportunity to meet people at their most vulnerable, to hear their stories and to journey with them. Few other professions put us face-to-face with hope and despair, joy and suffering, and the beginnings and ends of lives. Few other professions grant such opportunities to do so much good – or so much harm.

At the same time, this journey is one with many frustrations and temptations. While one can grow and blossom, it is also easy to become disillusioned or self-interested. In this, I've learnt that I can become a better physician only when I first grow as a person, and this takes disciplined reflection. I've learnt to know the principles by which I stand, and be careful of my wants and desires, for they can lead me astray. I've learnt to *learn* – and in this, I am immensely grateful to the many tutors and mentors who have trodden this path before me.

My journey has only just begun. In many ways, my reflections here are statements of aspiration, rather than declarations of achievement – things I am working on, rather than things that I have gotten right. But it has been a fulfilling journey thus far, and I have every faith that the road ahead will be equally meaningful. ◆

New Challenges Await NEW DOCTORS

Text by Dr Benny Loo and Dr Lee Pheng Soon

The month of May marked a new chapter of life for many colleagues graduating from the National University of Singapore Yong Loo Lin School of Medicine (NUS Medicine) and Nanyang Technological University Lee Kong Chian School of Medicine (LKCMedicine), as did July for their peers from Duke-NUS Medical School (Duke-NUS). No longer students, these young "padawans" started work as doctors in training who are legally and professionally responsible for the consequences of their everyday work. Any of them might now be queried by the Complaints Committee (CC) or even subsequently face a Disciplinary Tribunal (DT)! Although assured that MOH Holdings would cover legal costs and civil liability, each junior doctor will remain personally liable for any penalty dispensed, be it censure, fine or worse. To the more thoughtful, defensive medicine and survival medicine no longer seem theoretical concepts to be scoffed at.

It was therefore no surprise that the January 2019 case of Singapore Medical Council (SMC) vs Dr Lim Lian Arn (LLA) caused a stir among many young doctors. In short, Dr Lim pleaded guilty at the DT for failing to take informed consent before administering an H&L injection – a minor procedure. Though no serious complication or permanent harm resulted, he was fined $100,000 – approximately two years' worth of a junior doctor's basic salary.

Each day in the life of most young doctors is filled with multiple minor procedures on countless patients. Many might be unsure what would constitute taking an *adequate* informed consent, if that point ever came to judgement. For example, if implied consent had been inadequate for an H&L injection, would it also be considered inadequate for a venepuncture or the setting of an intravenous plug? Doctors work very well when there are clear definitions and classifications, such as with the staging of cancers. On the other hand, patients also expect doctors, even junior doctors, to be both knowledgeable in theory and confident in technique. Extensive discussion of previously unthought-of complications before a common procedure does not encourage patient confidence and therefore is avoided by many junior doctors.

In the SMC vs LLA case, the charge was for not taking informed consent **at all**, rather than it being *inadequately* taken. Thus, whatever the outcome of the current appeal may be, junior doctors will still need clarity on which procedures are simple enough to be covered by implied consent, and for those not so, how much discussion is necessary for informed consent to be successfully defended as having been adequately taken. This guidance must be specific and must come from an authority sufficient to assure concurrence by a future DT.

In the absence of such guidance, SMA swiftly wrote to the SMC to voice Members' concerns, highlight difficulties young doctors face and request clearer instructions to help them navigate this muddle. At the same time, the SMA Doctors in Training (DIT) Committee also wrote to the *Straits Times Forum* emphasising the need to resolve this matter urgently, as young doctors continue to perform minor procedures daily, even at personal risk of prosecution.[1] All doctors support both high ethical standards in medical practice and good doctor-patient communication, but the practical constraints when meeting specified rules and regulations need to be taken into account. To many junior doctors, the LLA judgement seemed to say that doctors need to explain all complications (including rare ones with potentially serious outcomes) before every minor procedure and, for defence, will need to have this documented in adequate detail. In reality, such a requirement is extremely difficult to achieve consistently, bearing in mind demanding clinical duties and the bolus nature of patient admissions.

On 15 March 2019, SMA organised the "Masterclass on Principles of Consent Taking", attended by representatives from SMA, College of Family Physicians Singapore, Academy of Medicine, Singapore and SMC, as well as Medical Protection Society experts and junior doctors from major institutions. Led by Dr Lee Pheng Soon, the discussion served as a platform to voice misgivings and also put on record recommendations from senior doctors in our community. In summary, all doctors were urged to use consent-taking before minor procedures as an opportunity to build the patient-doctor relationship, by sharing appropriate information especially relevant to the specific patient. If routinely practised in any unit, such communication and subsequent implied consent can be inferred from the management plans and case notes filed by the medical team (without needing an actual signed consent form). This conclusion was very comforting; it confirmed that current practice was consistent with recommendations of senior doctors present.

Another case emerges

Barely had the dust settled before the judgement of another relevant case was published: SMC vs Dr Soo Shuenn Chiang. In summary, at the request of someone claiming to be his patient's husband, Dr Soo interrupted his very busy clinic to help provide a memo

that included an urgent suicide risk assessment, so that his patient, reportedly unstable at home, could be admitted to the Institute of Mental Health. However, he did not verify the identity of the family member receiving the memo (the patient's brother claiming to be the patient's husband) and was thus charged with breaching patient confidentiality. He was fined $50,000.

This judgement also created much unease among young doctors, who are frequently tasked to write many of such memos, whether addressed to public institutions (eg, for patient transfers), to support applications for public assistance (eg, for subsidies) or for a patient's non-medical reasons (eg, to support an application to employ an extra domestic helper or to support an insurance claim). If the patient is unable to personally make such a request, knowing which family member has the right to request such a memo and which family member has a right to receive it currently remains uncertain. Also uncertain is the wisdom of demanding proof of relationship (eg, a long-filed-away marriage certificate) at a time of medical urgency. But the junior doctor knows deep down that another family member may file a formal complaint with the SMC at any time, disputing the right of the original requestor to the memo and its attendant information, and at quiet moments cannot help but draw parallels between his/her action and Dr Soo's case.

Once again, SMA promptly wrote to the SMC to seek advice on the rights of relatives and the correct procedure for identity verification. Other doctors also wrote to the *Straits Times Forum* to highlight the gravity of the implications and magnitude of penalty. We now hear that the SMC has asked for the DT's judgement to be overturned, because new evidence is now available. From the available details, it seems that the brother (to whom the memo had been handed) now confirms that the husband (who had requested the memo with the confidential details) had been with him all along. But even if it is found that Dr Soo had not violated medical confidentiality, two questions relevant to junior doctors' daily practice remain: (1) In the absence of a patient's expressed consent, which relatives are "close enough" to request and receive confidential information? (2) What effort to establish the relationship and the identity of the requestor will be ruled adequate by the DT?

This guidance is urgently required, especially by doctors of paediatric and geriatric patients. Patient consent may be impossible to obtain and, at the same time, the doctor's relationship with the family may be all that he is left to work with. Thus, the junior doctor may be reluctant to delay the memo. This matter is still a work in progress.

What you can do

In situations like these, what can the junior doctor do other than to feel helpless? Here are some suggestions:

1. When unsure, seek advice from your senior team leaders. Understand the basis of their advice, record it in your personal diary and follow it unless you know better.
2. Discuss it with your peers in the SMA DIT Committee. They are well-placed to obtain a second opinion from senior doctors within the SMA.
3. For issues that still remain unresolved, ask the SMA for help. Its senior members can frame the controversy and present it in its context to "wise persons" (eg, the Professional Bodies, SMC, the Ministry of Health [MOH] and our Honorary Legal Advisors) for their points of view. This will often be done behind the scenes, but resultant advice will be shared and will benefit all doctors.
4. Support the SMA. Get your friends to join, support and participate. Without this, we will have far less impact when it matters.

Looking forward

These two cases blew a chill wind across the medico-legal landscape and the chill was especially felt by junior doctors. However, awareness raised by the medical community to the MOH and the SMC has set waves of positive change in motion. The Workgroup tasked to evaluate the process of taking informed consent and the SMC disciplinary process, and MOH's requests made to the Court of Three Judges to review the DT's decisions in the above two cases, are perhaps unprecedented. Dare we hope that together, their outcomes will give doctors more confidence, and be enough to slow the drift towards defensive medicine, to the benefit of both doctors and patients?

Medicine is often referred to as both a science and an art, with communication a key element of this art. Much effort has been made in recent years to improve doctor-patient communication. The above two cases have demonstrated, not least to junior doctors, how we need to improve our **intra**-profession communication: between senior and junior doctors, professional bodies, practitioners and the MOH/SMC. Initially, there was poor communication to doctors on the charges made and the resulting penalties, and little feedback was sought from the practitioners who are directly impacted and their regulators, MOH and SMC.

Every day, we see the benefits of the advancements of science in medicine. Perhaps it is time to try to improve our art, especially in communicating within the profession. Clear expectations of how doctors should carry out their professional duties and clear feedback on the consequences of meeting new expectations on the ground will reduce unnecessary pain and encourage trust within our self-regulating profession. ◆

Reference

1. Loo B. Help young doctors by clearing up ambiguity. The Straits Times Forum. Available at: http://bit.ly/2DvdrBJ.

Dr Loo is an associate consultant in paediatric medicine at KK Women's and Children's Hospital. He looks forward to a morning dose of caffeine and plenty of patients' smiles every day. He is also the chairperson of the SMA DIT Committee.

Dr Lee is the Chairman of the Professional Indemnity Committee of SMA. Dr Lee has a Fellowship in Pharmaceutical Medicine from the UK Royal Colleges of Physicians and an MBA from Warwick University, UK. He works part-time as a consultant in industry and part-time as a GP.

Celebrating Our Little Fighters

Paediatric Brain and Solid Tumour Awareness Day 2019

Text by Lau Kin Mun and Candy Tan | Photos by Sim Xiangli and Harry Ng

If you were to ask anyone on the streets about cancer, few would be able to imagine what it means for a child to survive one.

Diagnosed with medulloblastoma at a tender age of six, 16-year-old Celeste struggled throughout her childhood. While other children of her age were enjoying school and play, she had to endure countless blood tests, hospital visits and surgeries, along with months of chemotherapy and radiotherapy. Even after her extensive course of treatment, her fight continues. Adjusting to school was particularly challenging; Celeste had to put in double the time and effort to catch up with the academic syllabus she had missed, while dealing with some of the psychomotor and cognitive side effects of treatment. Yet she never gave up. "My parents were there to pray for me and remind me to stay strong," she said, as she recounted her fears of going under the knife. She also shared that when school got overwhelming, her father told her, "It is always easy to give up when things get tough, but you will never find out how much tougher you really are until you overcome these obstacles". The love and support from her family was what kept her and will continue to keep her going.

Celeste, along with 34 other brave little fighters, was part of a group of paediatric brain and solid tumour survivors who participated in the fifth Paediatric Brain and Solid Tumour Awareness (PBSTA) Day held on 23 March 2019 at the Marina Barrage. The PBSTA Day is an annual event organised by Duke-NUS Medical School (Duke-NUS), in conjunction with KK Women's and Children's Hospital (KKH) and VIVA Foundation for Children with Cancer (VIVA Foundation).

In Singapore, brain tumour is the second most common childhood tumour. These tumours are associated with more rapid growth in childhood, which leads to long-term effects on growth and neurological development. Most of the tumours require aggressive treatment and some children face side effects, such as scars and hair loss, which they carry with them on their journeys. This makes the journey all the more difficult for our patients and their loved ones. Thus, our goal each year is to generate more awareness about paediatric brain and solid tumours, and to create an

1

avenue for affected patients and families to provide support for one another. For our fifth year, we brought the event out of KKH for the first time, and held a fun-filled carnival with games, food and performances at the Marina Barrage. This was a true game-changer for us – not only did we gather much positive feedback from the participants, but we also reached out to many members of the public to spread our message.

Pre-event series

This year, we also expanded our pre-event outreach to champion more public awareness and understanding of paediatric brain and solid tumours. We had booths set up at KKH and Duke-NUS where the public could pen words of encouragement for our little fighters. Some messages received include: "You are a warrior, fight on!", "Stay strong and happy", and "A solid rock is not shaken by storm, keep fighting!" In addition, we formed a contingent of 18 medical students to take part in National Cancer Centre's Run for Hope 2019 and had the privilege to run alongside two families and their little fighters. One of our classmates, Wong Xiang Yi (Class of 2021), even took part in a 100-km ultramarathon to help raise funds and awareness for our event.

Students from various tertiary institutions (Duke-NUS, Alice Lee Centre for Nursing Studies, Yale-NUS and NUS High School) were invited to join in our celebration and affirmation of the little fighters' efforts. Through our publicity efforts, including recruitment emails and an educational video on paediatric and solid brain tumours, we received an overwhelming 71 volunteer sign-ups. 46 volunteers were eventually selected to set up game booths and befriend our little heroes during the event. Through involving volunteers from various disciplines, including research and nursing, we hope to provide a platform for our volunteers to interact, and build rapport and lasting friendships among themselves.

Line-up for the day

With the stage overlooking the waterfront and the carnival decorated with colourful balloons and streamers, attendees gathered at the Marina Barrage for a series of sharing and performances. Prof David Low Chyi Yeu commenced the carnival with a welcome speech and an introduction on paediatric tumours, before Celeste went on stage to courageously share her personal story.

We also had the privilege of having Ms Ng Mei Ting, a budding local singer-songwriter, perform an amazing line-up of originals and covers, and a duo band, Natalie and William, from Nanyang Technological University (NTU) who played popular songs including Paramore's "Still Into You", Elvis Presley's "Can't Help Falling in Love" and Rachel Platten's "Fight Song", which embodied the resilience and fighting spirits of our little fighters. It was heart-warming to see the children and their families enjoying themselves and singing along to the performances.

Following the performances, the children and their families were welcomed to the carnival with goodie bags containing a DIY kite, thirst-quenching beverages and entertainment vouchers. They were also treated to delicious bento lunches, Milo drinks, Yakult beverages and Old Chang Kee snacks. The ever-familiar "Ice Cream Uncle" and his traditional ice-cream cart were also brought in for the event. With familiar Disney-themed tunes blasting from the AV system, the children were greeted with a variety of fun and engaging game booths, including activities like shooting quests and DIY handicraft magnets. Toys, donated by staff and students of Duke-NUS, could be redeemed by the children who participated in the games. Right next to the handicraft booth, we had our photo booth with friendly photographers who were ever ready to capture the bonds and friendships (along with wacky props!) formed during the activities via instant printouts. To top it all off, the children loved the balloon sculpting booth where they got to bring home their favourite lightsabres and balloon animals.

Porsche joy ride

At 1.30 pm, our Guest of Honour, Ms Shulamite Khoo, Board of Directors of VIVA Foundation, gave an inspirational speech encouraging our little fighters.

Participants and volunteers then gathered for a group photograph before the official flag-off for the convoy of Porsche cars. Our little fighters could hardly contain their excitement as they looked for their driving companions whom they had met and spent time with earlier at the carnival. The little fighters even decorated personalised thank-you cards for the drivers as a token of their appreciation.

The convoy of cars, labelled with car decals displaying the event's logo, soon rode off with joyful little riders who waved at us shyly through the car windows. The event ended on a blissful note and it was indeed a fun-filled day full of love and laughter.

During her sharing, Celeste had closed with a touching message of solidarity.

"We are not alone, some of us are still in the hospital fighting, some of us might be back in school but facing different sets of challenges and the path we are taking could be different from other children, but we can still lead a fulfilling life knowing that we are on the same path together. That motivates me the most."

There is indeed much to learn from our little fighters, and we are privileged to have shared part of the journey with them. Let us too keep this spirit of trudging through the toughest times to stand triumphant at the top of our little hills one day, with hope, smiles and friends by our side.

Our gratitude

We would like to thank our mentor, Prof David Low, who worked tirelessly with us to organise PBSTA Day 2019. We also thank the Guest of Honour, Ms Shulamite Khoo, and our little fighter Celeste for gracing the event with her family. Our thanks also go out to the volunteers who took time out of their busy schedules to support the morning's activities. Last but not least, a big thank you to our various partners and sponsors from Duke-NUS, KKH, SMA Charity Fund, Viva Foundation, Brain Tumour Society (Singapore), National Neuroscience Institute, Porsche Club Singapore, Pirelli, Exquisite Technique, Yakult, Science Centre Singapore and Gardens by the Bay for making PBSTA Day 2019 a truly meaningful and fulfilling event for our little fighters and their families. ◆

Did You Know?

- Brain and solid tumours make up 55% of paediatric cancers in Singapore.
- About 40 to 50 operations are carried out on children with brain tumours at restructured hospitals every year.
- Brain tumours are the leading cause of death in childhood cancers worldwide – 36.1% and 33.3% of cancer deaths respectively in male and female children in Singapore every year.
- The common types of solid tumours are neuroblastoma, rhabdomyosarcoma, retinoblastoma, Wilms' tumour, osteosarcoma and Ewing sarcoma.
- Treatment depends on the type, severity and symptoms of the tumour. Some options include chemotherapy, radiotherapy and surgery. However, research on brain and solid tumours has lagged behind, leading to lower success rates in their treatments compared to leukaemia.

To find out more

- VIVA Foundation is a Singapore-based charity which focuses on promoting research and medical care for children with cancer. Visit them at http://www.viva.sg.
- Brain Tumour Society (Singapore) is a non-profit society which provides moral and resource support to brain tumour patients and their caregivers. Check out their website at https://www.braintumoursociety.org.sg.
- You can also find out more about PBSTA Day on our Facebook page, https://www.facebook.com/pbsta2019.

Legend

1. Our contingent at the National Cancer Centre's Run for Hope

2. Little fighters taking part in a kite-making activity

3. Sharing a light-hearted moment at the event

4. The PBSTA Day 2019 organising committee

SMA and the SMA Charity Fund support volunteerism among our profession. *SMA News* provides charitable organisations with complimentary space to publicise their causes. To find out more, email news@sma.org.sg or visit the SMA Cares webpage at https://www.sma.org.sg/smacares.

Kin Mun and Candy are second year medical students from Duke-NUS Medical School Class of 2021 and are the co-heads of publicity for PBSTA Day 2019.

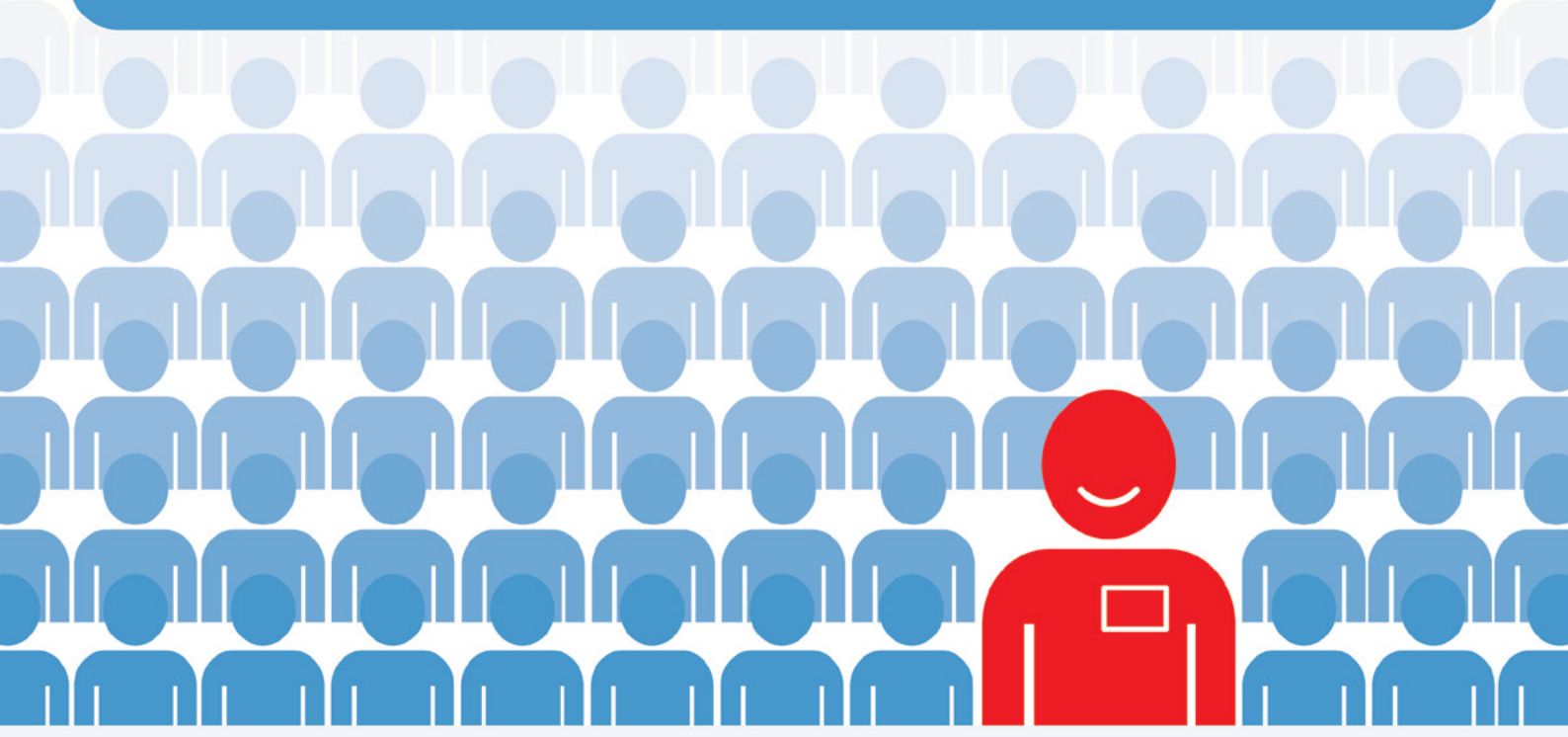
HAVE YOU FOUND THE PERFECT FIT FOR YOUR CLINIC?

There are more than 400 job seekers nationwide with access to the SMA Clinic Assistant Place and Train Programme's online portal.

We can't promise a *perfect* working relationship – only you can. However, we can provide a wide range of job seekers and regular outreach for your clinic's manpower needs. We hope to help you eventually find **The One** *(for your clinic)*!

Hired a clinic assistant with no prior experience?
Send your new staff for our training programme* in October 2019!
If you have any queries about the recruitment or training of clinic assistants, email us at **clinicassistant@sma.org.sg**.

**Funding for training fees and salary support is available*



Organised by: SMA 60 Years

Supported by: e2i Better Jobs For Life Employment and Employability Institute

AIC SAYS

PRACTISING SELF-CARE WITH RESPITE CARE

By Agency for Integrated Care

Caregiving is a long journey that is highly demanding, and many put their loved ones' needs ahead of theirs. You may have patients who are caregivers, and are showing signs of caregiver burnout. As their doctor, you are in a privileged position to remind them to take periodic breaks and practise self-care for their own well-being, so that they are able to continue supporting their loved ones to age in place. Respite care options are available to assist, providing short-term professional care in a safe environment so that caregivers can take a much needed break or get aid when their helper goes on home leave.

Today, there are two respite options:

A Respite option at a senior care centre

This is suitable if respite is only required during the day. Seniors can take part in activities ranging from simple exercises, art and craft, karaoke sessions, and tabletop games. Care staff will take care of seniors' custodial and medication needs, meals, and assistance with daily living activities such as dressing, toileting and feeding (including tube feeding). Seniors can make use of this option on an ad hoc basis, even for a day.

B Respite option at a nursing home

This is a stay-in service and suitable for seniors who have high level of care needs e.g. round-the-clock assistance for most of their daily living activities. This is also for seniors who have daily nursing care needs such as wound dressing, tube feeding, and stoma management. This option is available for a minimum of seven days per stay, and up to 30 days per year.

Pre-enrolment for respite: Faster access to respite care for caregivers

There are many considerations and administrative processes caregivers go through before they can use a respite option, and it can take up to a month to get things sorted out. To reduce the amount of time required to activate respite options when needed, caregivers should be encouraged to pre-enrol, plan for respite, identify preferred providers and settings, and complete administrative processes beforehand.

Why pre-enrolment?

1	2	3	4
Shorter time needed to get respite care when needed	Direct access to a service provider who understands the caregiver and senior's needs	Reduced hassle for caregiver	Minimised care disruption if caregiver is temporarily unavailable to care for the care recipient

How can caregivers pre-enrol?

Caregivers can visit any AICare Links located in restructured hospitals or log on to www.silverpages.sg/gettingrespite to obtain the pre-enrolment form and the list of centres and nursing homes offering pre-enrolment for respite care. Household means-test form is also available for seniors who are eligible and wish to utilise government subsidies for respite care.

For more information on respite care and pre-enrolment, please contact the AIC GP Engagement team at gp@aic.sg or 6632 1199, or visit Singapore Silver Pages (www.silverpages.sg/gettingrespite)

SMA EVENTS
AUG–OCT 2019

DATE	EVENT	VENUE	CME POINTS	WHO SHOULD ATTEND?	CONTACT
CME Activities					
3 Aug Sat	Understanding Ethics and Law	Novotel Singapore Clarke Quay	2	Medical Practitioners, Lawyers, Nurses, Allied Health Professionals and Healthcare Administrators	Jasmine 6540 9196 jasminesoo@sma.org.sg
24 Aug Thu	Mastering Adverse Outcomes	Novotel Singapore on Stevens	2	Family Medicine and All Specialties	Terry/Siti Athirah 6223 1264 mpsworkshops@sma.org.sg
29 Aug Thu	Building Resilience and Avoiding Burnout	Sheraton Towers	2	Family Medicine and All Specialties	Terry/Siti Athirah 6223 1264 mpsworkshops@sma.org.sg
3 Sep Tue	Mastering Professional Interactions	Sheraton Towers	2	Family Medicine and All Specialties	Terry/Siti Athirah 6223 1264 mpsworkshops@sma.org.sg
4 Sep Wed	Mastering Difficult Interactions with Patients	Sheraton Towers	2	Family Medicine and All Specialties	Terry/Siti Athirah 6223 1264 mpsworkshops@sma.org.sg
21 Sep Sat	Achieving Safer and Reliable Practice	Novotel Singapore on Stevens	2	Family Medicine and All Specialties	Terry/Siti Athirah 6223 1264 mpsworkshops@sma.org.sg
27 Sep Fri	Medical Succession and Will Planning	Pharmaceutical Society of Singapore Conference Room	1	GPs, Aspiring and Current Practice Owners	Jasmine 6540 9196 jasminesoo@sma.org.sg
3 Oct Thu	Building Resilience and Avoiding Burnout	Sheraton Towers	2	Family Medicine and All Specialties	Terry/Siti Athirah 6223 1264 mpsworkshops@sma.org.sg
5 and 6 Oct Sat & Sun	The Annual National Medico-Legal Seminar 2019	Furama Riverfront Singapore	6	Allied Health Professionals, Healthcare Professionals (Clinical and Non-Clinical), Hospital Administrators and Legal Professionals	Jasmine 6540 9196 jasminesoo@sma.org.sg
12 Oct Sat	Medico-Legal Seminar on Mental Capacity Assessment – Caring for Persons Lacking Mental Capacity	TBC	2	GPs, Paediatricians, Psychiatrists and Neurologists	Jasmine 6540 9196 jasminesoo@sma.org.sg
16 Oct Wed	Mastering Your Risk	Sheraton Towers	2	Family Medicine and All Specialties	Terry/Siti Athirah 6223 1264 mpsworkshops@sma.org.sg
30 Oct Wed	Mastering Adverse Outcomes	Sheraton Towers	2	Family Medicine and All Specialties	Terry/Siti Athirah 6223 1264 mpsworkshops@sma.org.sg
Non-CME Activities					
31 Aug Sat	3rd SMA National Medical Students' Convention	NTU Lee Kong Chian School of Medicine Learning Studio	NA	Medical Students	Priyah/Rita 6223 1264 nmsc@sma.org.sg

Guess The Flower

Text and photos by Dr Lynette Teo

Dr Teo is a retired programme director and is now enjoying the finer things in life.

"Guess the Flower" was borne out of necessity rather than boredom, especially when one was supposed to "pay back" to society after passing your FRCR examinations by being on the organising committee of the Singapore Radiological Society Annual Scientific Meeting (SRS ASM). As the most junior member with zero intellectual input (ie, not in highbrow scientific or sponsorship subcommittees), one had to serve in the social subcommittee (ie, literally no financial input but with the financial freedom to source for food, drinks and venue, as well as to plan the social programme).

The social programme was the crowning jewel of the SRS ASM and the pressure was on to keep the radiology seniors entertained. My mentor, Dr Chan Lai Peng, and I brainstormed ideas; I was doing my breast radiology posting then and we decided on a "Guess the Flower" quiz using the highest resolution X-ray imaging equipment which was (and still is) the mammography X-ray machine. If this machine could detect microcalcifications in breasts, it would surely be able to depict the fine anatomical detail in flowers.

In the mid-2000s, Singapore's population was 4.17 million[1] compared to a current population of 5.64 million,[2] and the relatively new Health Promotion Board BreastScreen Singapore programme[3] was in its infancy with machine utilisation rates not as high as today. Aunty Mui Ee, then principal breast radiographer at National University Hospital (NUH) Department of Diagnostic Imaging (DDI), was persuaded to be my

partner in crime and after the last patient left the breast centre, we started imaging flowers.

During that time, mammography X-ray machines still used cut film and we couldn't see the images immediately on a monitor. The X-ray film had to be processed and developed like photographic film. After the first flower that was X-rayed popped out of the film processor – we could barely make out its structure and realised that they could not be imaged "de novo". These flowers needed to be post-processed and since they were already sitting in a beaker of water, we decided to add a few drops of contrast (the standard CT contrast that is used) and use the principal of capillary effect.

The dose of contrast and time in which these flowers "sat" in the contrast medium needed to be titrated carefully – if the contrast dose was too high or if the flowers were "soaked" for too long, they would die a terrible wrinkled death. The X-ray machine settings had to be adjusted as well and we worked out the optimal kVp and mAs by viewing all X-rays of the same flower at different imaging parameters and choosing the parameters which gave the best image quality (bearing in mind that we did not need to adhere to "ALARA" – a radiation protection term for "as low as reasonably achievable" – given that our subjects were not humans). The images were hung on a mammogram viewer and directly captured with a Canon PowerShot digital camera.

For those who are more inclined to physics, "mAs" refers to milliampere-seconds – a measure of radiation produced (milliamperage) over a set amount of time (seconds) via an X-ray tube.[4] Kilovoltage peak (kVp) is the peak voltage applied to the X-ray tube. It determines the highest energy of X-ray photon.[5] Both mAs and kVp affect the radiation dose.

Please see here a truncated version of the X-ray flower quiz that was held at the Asian Civilisations Museum during the SRS ASM 2015, where the top three prizes were Apple products.

1 What is the name of this flower?

2
a. What is the name of this flower?
b. What abnormality can you see on this flower? If you can detect this, you are on your way to becoming a budding radiologist.

3 What is the name of this flower?

4 What is the name of this flower?

5 What is the name of this flower?

6 What is the name of this flower?

Flip over to see if you've guessed them all!

Answers

1 African Daisy (Osteospermum)

2
a. Tulip (Tulipa)
b. Fracture of the tip of the superiormost leaflet which lies immediate left lateral to the flower

3 Baby's Breath (Gypsophila)

4 Golden Phoenix (Phoenix Pusilla)

5 Rose (Rosa)

6 Anthurium

Afternote

"Saving Gaia" was unheard of in the mid-2000s and more than 100 stalks of flowers were sacrificed in this trial-and-error process. More than 100 mammographic films were utilised in this process and the main components of an X-ray film would be silver bromide, gelatin and cellulose triacetate.

Acknowledgements

I would like to thank Ms Ang Mui Ee, then principal radiographer of the breast unit, NUH DDI; Dr Loke Siu Cheng, then medical officer, NUH DDI; Dr Irene Lim, then radiologist in charge of breast, DDI NUH; Prof Wang Shih Chang, then head of department, NUH DDI; and Dr Chan Lai Peng, head of the social subcommittee of the SRS ASM organising committee 2015.

Disclaimers and support

The author does not claim to be a botanist or horticulturist and all flower names were provided by staff of the NUH flower shop. All flowers were bought using the author's own funds. Mammographic film and CT contrast were kindly provided by NUH DDI in support of the SRS ASM 2015. ◆

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5. Radiopaedia. Kilovoltage peak. Available at: http://bit.ly/2xGQv00.

INTER-PROFESSIONAL GAMES 2019

Bring Your A-Game and Let's Retain Our Championship Title at This Year's Inter-Professional Games (IPG) from August to October!

For more than two decades, SMA has joined forces with five other professional bodies, bringing together doctors, accountants, architects, engineers, lawyers and surveyors to organise the annual IPG.

Last year, SMA emerged victorious and won the IPG Championship title – the first in decades! If you wish to view the complete list of games and take part in IPG 2019, please visit **http://bit.ly/IPG2019.**

Dr Chia Yih Woei

CHAIRPERSON
SMA SPORTS & GAMES COMMITTEE

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The *Singapore Medical Journal (SMJ)* invites local and overseas authors to submit their quality research, reviews, commentaries, editorials, CME articles and short communications relating to all aspects of human health, to be considered for publication.

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To find out more about manuscript submission, visit
http://www.smj.org.sg/instructions-authors

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Clinic at Telok Blangah Street 32 Block 78B #01-20 for rent at $5,000 per month now available. Just renovated. No renovation needed. Good location at market. 66 sq meters. Call Dr Cheng 9623 0692.

Clinic in district 3 for takeover. Contact Mr Lo @ 9227 8597.

Two adjoining clinics each 900+ sq ft, at Farrer Park Hospital for rent. Interested, sms or call 8858 6735 for discussion.

• POSITION AVAILABLE/PARTNERSHIP •

(1) Resident/Permanent Locum GP needed at Fernvale/Punggol, incentive available. (2) Visiting Specialist especially O&G etc, etc. Call 9298 9824 or 8125 9850 Etern Medical.

We are a GP group looking for resident doctor in north-eastern part of Singapore. Attractive remuneration. Working hours 8am to 3pm with 2 weekday nights 6-9.30pm. Off on Sunday and Public Holiday. Please WhatsApp Dr Mok at 9765 1525 for more details.

Established medical aesthetic group in Singapore looking for committed & passionate doctors for expansion. Training provided. Full/part-time considered. JV partnerships are welcomed as well. Applicants must have COCs. Experience in medical aesthetics preferred. Kindly email detailed resume to: admin@wen-weng.sg.

Regular doctor wanted in mornings, Monday to Friday, 9am – 12pm @ $80 per hour with profit sharing. Must be able to do medical examination including for driving licence, simple procedures. Must liaise with Chinese speaking patients. Please sms 9622 8602.

Established GP clinic in town looking for motivated full/part-time doctors. Able to commit long term with desire to grow with company. Training provided. Applicants fully registered with SMC. An interest in skincare is a bonus. Email resume to: clinic@wen-weng.com.sg.

OneCare Medical

OneCare Medical is a Primary Healthcare Group that aims to provide holistic and accessible Acute and Chronic care in the community. We were founded in 2013 by a team of three Family Physicians, and have grown to a group of more than 20 clinics, mostly situated in the heartlands.

Our Patients mainly comprise of residents that live around the clinics, encompassing whole families - from babies to the elderly – and it is this breath of primary care that our doctors find rewarding.

Our Doctors are a close knit team from different backgrounds and experiences, so that we are able to help each other out when queries and difficulties arise.

GENERAL PRACTITIONERS AND FAMILY PHYSICIANS

Requirements
- Fully registered with SMC

Responsibilities
- Provide Acute and Chronic care consultations in the GP setting
- Health screenings and reviews
- Pre-employment checkups and other statutory examinations

Benefits
- To be part of a close knit team of GPs and FPs providing good support and learning opportunities
- Regular CMEs and support for Post-grad courses
- Competitive salary with annual leave and bonuses

Contact: Dr Kenneth Koh
drkennethkoh@onecaremedical.com.sg | www.onecaremedical.com.sg

SHEARES HMO PRIVATE LIMITED

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GENERAL PRACTITIONERS

Sheares HMO Pte Ltd Pte Ltd is a Health Maintenance Organization that provides corporate clients with one-stop healthcare solutions, focusing on convenience and sustainability. By incorporating modern technology with our 24/7 response team, prompt healthcare services are easily available. We have a presence throughout the Asia Pacific region, including China, Indonesia, Laos, Malaysia, the Philippines and Vietnam, where we work with reputable healthcare providers that have been hand-picked by the team.

Sheares HMO Pte Ltd Pte Ltd provides a comprehensive set of healthcare solutions, from health screening and telemedicine to corporate urgent care. In order to provide suitable healthcare solutions for everyone, Sheares HMO Pte Ltd streamlines workflow for all stakeholders, ensuring smooth healthcare delivery processes for overall increase in productivity.

At Sheares HMO Pte Ltd Pte Ltd, we recognize the importance of every stage in the healthcare delivery process, from early detection to treatment and finally, recovery. Hence, we provide Executive Health Screening packages for early detection; specialist and inpatient care for treatment; and rehabilitation care such as physiotherapy.

Our carefully selected healthcare providers are experts in their own fields and in providing the most appropriate advice and services for our clients.

Requirements

- Fully registered with the Singapore Medical Council
- Private practice experience preferred
- Able to commit long term, with a desire to grow with the company
- Innovative and adaptable

Responsibilities

- Provide virtual care services for patients with acute and chronic conditions through online video consultations
- Provide primary care services
- Conduct health screening, including tests, consultations and reviews

Benefits

- Profit-sharing

Contact Jenifer Goh
jenifer.goh@sheareshealth.com | 9022 8129 | 1 Pemimpin Drive #02-06 Singapore 576151

GP Forum 2019

LIVER, GALLBLADDER & PANCREAS DISORDERS:

Patient-Centric Good Clinical Practices

EVENT DETAILS

19 Oct 2019 (Saturday)
1pm to 4pm
TTSH Theatrette, Level 1

For Registration and Enquiries:
Please email **daphne_ly_loh@ttsh.com.sg** or call **6357 7782** during office hours.
Or scan the QR code to register.

- No registration fees required
- CME Points will be awarded
- Complimentary car park coupon will be provided on a first come first served basis
- Closing date for registration: **4 Oct 2019**

PROGRAMME

1.00PM	**Registration & Lunch**
2.00PM	**Welcome Address & Onward** Dr Vishal G Shelat Consultant, Hepatobiliary & Pancreatic Surgery, TTSH
2.10PM	**Gallstones/polyps:** **When to refer, when to operate and how to monitor** Dr Terence Huey, Consultant, Hepatobiliary & Pancreatic Surgery, TTSH
2.20PM	**HPB surgery in elderly – TTSH experience with ROSE program and Prehabilitation** Dr Low Jee Keem, Senior Consultant, Hepatobiliary & Pancreatic Surgery, TTSH
2.35PM	**HPB surgery – towards value driven outcomes** Dr Sameer Junnarkar, Senior Consultant, Hepatobiliary & Pancreatic Surgery, TTSH
2.50PM	**Panel Discussion** Dr Terence Huey, Dr Vishal Shelat, Dr Low Jee Keem and Dr Sameer Junnarkar *(Facilitated by Dr Vishal G Shelat)* *What is your approach for Jaundice* *Raised cancer markers what to do* *General surgery commitments of specialist HPB surgeon* *Robotic HPB surgical program* *Others*
3.50PM	**Closing Remarks**

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KK Women's and Children's Hospital
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KK Women's and Children's Hospital is an 830-bed hospital served by a dedicated team of over 4,000 staff. We are looking for individuals who are enthusiastic, service-oriented, dedicated, and who espouse our core values of compassion, integrity and collaboration. Our people enjoy many opportunities for career development in addition to the satisfaction of supporting women and children in their healthcare journey.

As an equal opportunity employer, KK Women's and Children's Hospital values people for their capability. We understand that people with disabilities are equally able to contribute to the workplace. KK Women's and Children's Hospital supports and hires persons with disabilities and is committed to enabling them to lead independent lives.

We are seeking a Senior Urogynaecologist to join our team of doctors and staff in the Department of Urogynaecology.

You will provide high standards of clinical care and service. In addition, you will also be involved in teaching and mentoring as well as support professional development and research activities of the hospital.

Job Requirements

You should be a qualified and experienced Medical Specialist with relevant qualifications registrable with the Singapore Medical Council. In addition, you should be a clinician who possesses exemplary professional and academic standards. You should also be an excellent communicator and a team player and be able to manage professional and administrative matters effectively with a proven track record of collaborative working relationships.

If you have the right qualities, come join us as we help the women and children of Singapore and beyond.

Please send your resume to Medical.HR@kkh.com.sg.

Closing date: 30 September 2019

For more information, visit www.kkh.com.sg

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