

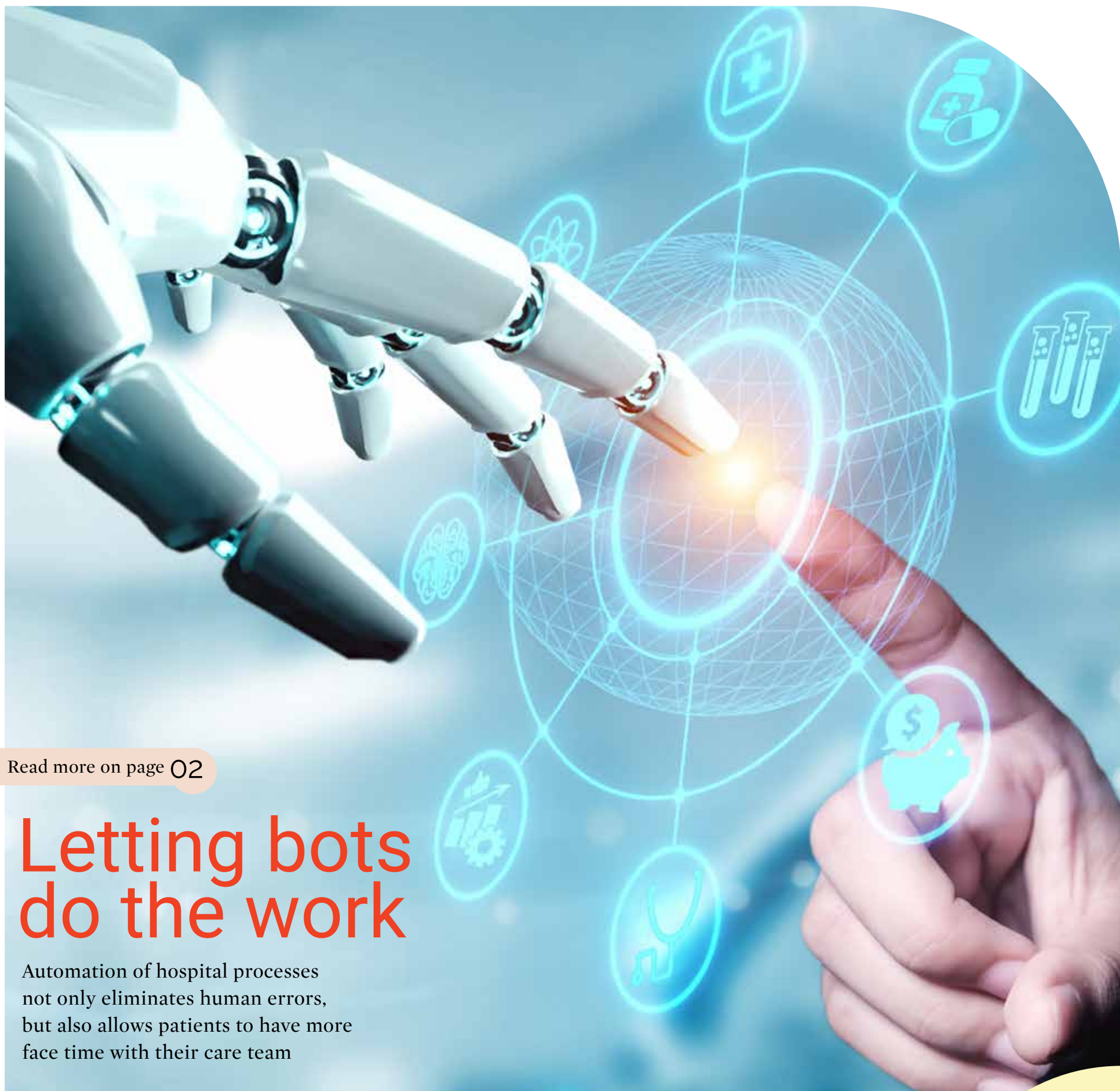
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Letting bots do the work

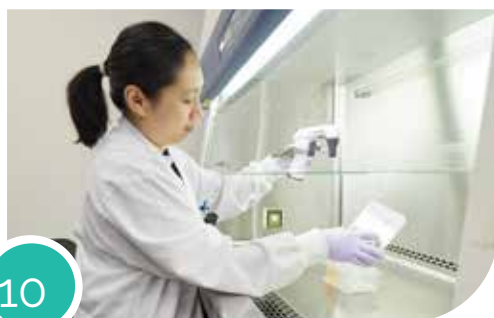
Automation of hospital processes not only eliminates human errors, but also allows patients to have more face time with their care team



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Enhancing patient care operations

Automating hospital processes benefits patients, who now receive increased face time and care with medical teams.

by Sol E. Solomon



We anticipate that RPA bots will become a crucial component in enhancing the healthcare experience, streamlining services such as appointment scheduling, medication dispensing, and the management of financial transactions and post-care follow-ups.

Mr Geoffrey Gui
Director, Future Health System,
Singapore General Hospital



...

"We use the time saved to provide the patient-centric quality care that SGH is known for," says Adj Asst Prof Philip Cheong.

financial transactions and post-care follow-ups. In addition, RPA is set to play a key role in the background, optimising data analytics, automating data entry, and significantly improving the hospital's operational efficiency."

The FHS's Artificial Intelligence and Automation Unit (AIA) is the main driver of RPA. It works closely with different departments to automate their time-intensive processes. "Bots can be programmed to autonomously execute high-volume, repetitive and monotonous tasks by seamlessly interfacing with various systems and applications," said Ms Chan Wai Ching, Assistant Manager, AIA, and RPA Lead, SGH. RPA is very "low-code", she added, and so requires only simple IT knowledge and skills to use.

SGH started exploring RPA use in late 2020, with the hospital's Call Centre and Telecommunications Services being the first to adopt it. Since then, more than 36 projects have been automated. For instance, the human resources (HR) division has been harnessing the power of bot technology for mass communication tasks, including the personalisation of staff emails and HR notices through SMS texts. "Looking ahead, RPA shows immense promise in revolutionising clinical settings, with potential applications spanning from clinical workflow management and data transcription to analytical assessments and reporting," said Ms Chan.

Besides saving time, RPA also helps reduce costs. Manpower cost alone accounts for at least 60 per cent of healthcare costs



...

No time is wasted at physiotherapy consultations, with the RPA sending a questionnaire to patients to complete before their appointments, instead of manually at the clinic. The bot then processes the data to derive a score that gives physiotherapists an understanding of their patients' condition. More time is then spent with patients to provide quality care, says Adj Asst Prof Cheong.

in Singapore. Yet, traditional processes, especially in hospital operations, comprise huge amounts of rules-based, repetitive and manual tasks that can be more efficiently undertaken by a bot. Automation also reduces the pressure on hospitals to recruit new staff in a tight labour market, while enabling current staff to focus on meaningful and purposeful work that boosts their job satisfaction.

More physiotherapy time

At the Physiotherapy Department, patients with musculoskeletal problems are asked to complete a health assessment questionnaire before their consultation to find out whether their pain, mobility and quality of life have worsened or improved so that it can quickly offer treatments to the patients.



There is potential to enhance the RPA bot to alert us to patients with low scores so that greater care can be given to them quickly.

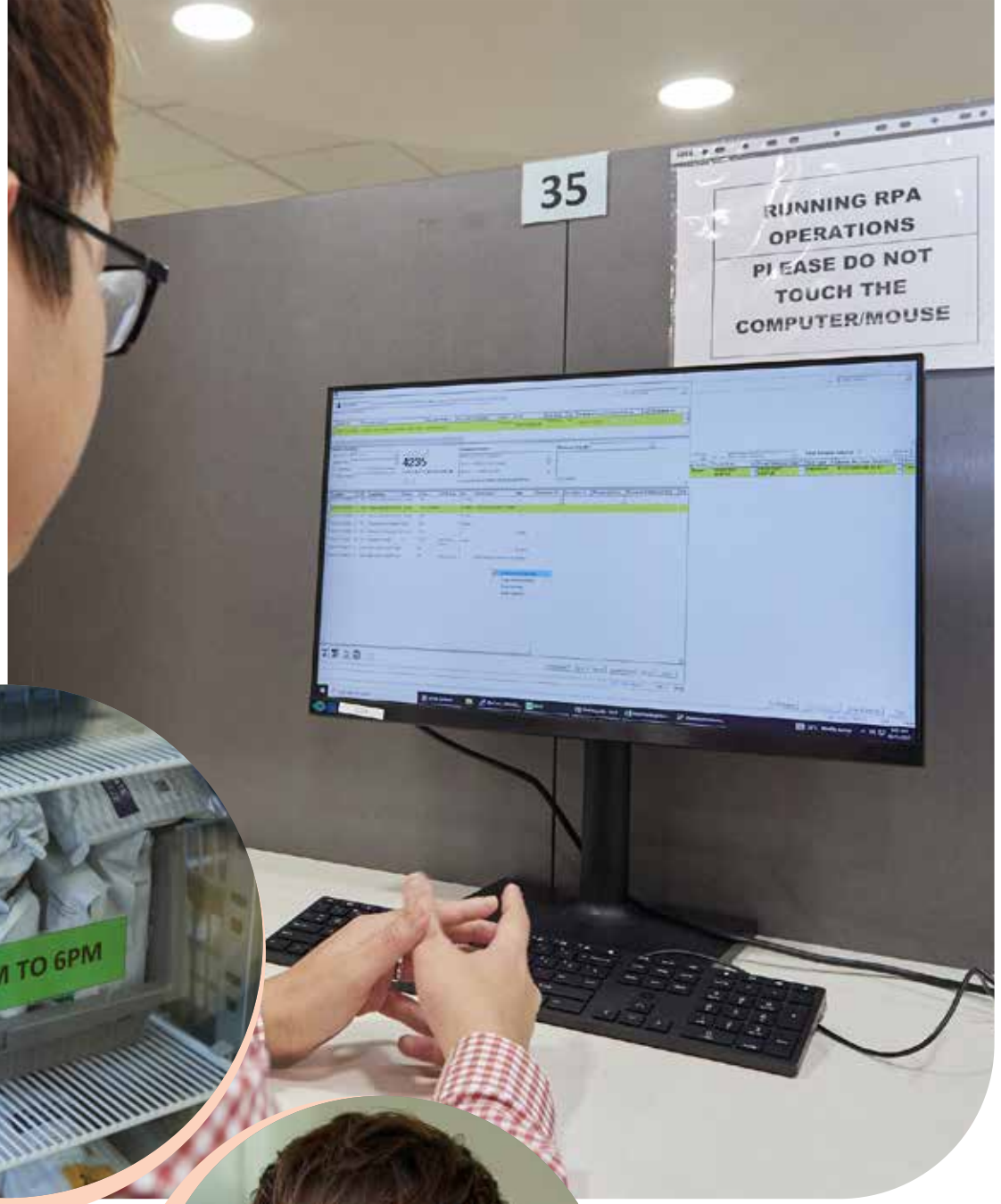
Adj Asst Prof Philip Cheong
Senior Principal Physiotherapist,
Physiotherapy Department
Singapore General Hospital

The physiotherapists take an average of eight minutes to process the responses to get a score. That amounts to 1,070 times, or 143 hours, each month. The physiotherapists began using the RPA to send a questionnaire via SMS for patients to complete prior to their appointments. The RPA also extracts and analyses patients' responses to derive a score, which is then ready for the physiotherapist to use when the patients visit the next day.

"Between 13 March 2022 (when automation was rolled out) and the end of last year, we saved 81,488 minutes simply by eliminating the need to manually calculate and document the data," said Adjunct Assistant Professor Philip Cheong, Senior Principal Physiotherapist, Physiotherapy Department, SGH. "We use the time saved to provide the patient-centric quality care that SGH is known for."

The physiotherapists worked with AIA on the project, which makes use of a standardised, validated questionnaire known as Patient-Reported Outcome Measures (PROMs) to measure the patient's health status and monitor his progress. "PROMs is very important as it allows therapists to hear from the patients themselves about their symptoms, their functional status, and their

... The RPA bot retrieves orders electronically and transcribes them to the pharmacy systems. Medications are then packed and sorted according to delivery times.



PHOTOS: VERNON WONG



The bot had no transcribing errors when processing the almost 600 orders every day since RPA was implemented in September 2021. The results were impressive.

...
Mr Hwang Yi Kun
Senior Pharmacist,
Pharmacy Department,
Singapore General Hospital

health-related quality of life. It also allows healthcare professionals to track what types of intervention work well for each patient. Each patient is different, so it's important for us to tailor their management plan or intervention based on their own perceived needs as well as their functional goals," said Adj Asst Prof Cheong.

Before automation was used, PROMs was given to patients to complete during their consultations. This time-consuming

process is still being used as, within the Physiotherapy Department, the RPA bot is only used to automate repetitive, high-volume tasks for musculoskeletal (MSK) disorders like arthritis and lower back pain. For now, the department is working to increase the response rate among MSK patients from the initial 25 per cent. It is planning to enhance the forms to include other languages, and roll out RPA PROMs collection to patients with non-MSK conditions like amputees

and those undergoing rehabilitation. There is also potential to enhance the RPA bot to flag patients with low scores so that greater care can be given to them quickly.

Faster med deliveries

Hospital pharmacy services also benefit from digitalisation and automation.

Currently, patients are encouraged to have their medications delivered instead of waiting at the hospital's pharmacies to collect their prescriptions after consultations. Those on repeat medications can ask for their prescription to be delivered at home or to be picked up at nearby Guardian pharmacies.

For the Pharmacy Department, improving and refining processes to reduce waiting time for patients while enhancing accuracy and work processes for staff has been ongoing. The medication delivery service (MDS) for patients was meant to ease long queues and waiting times.

However, COVID-19 threw things into disarray as demand for MDS increased seven-fold, placing heavy pressure on manpower and other resources. Transcribing the orders and delivery schedule manually into the system for processing led to delays and inefficiencies, said Mr Hwang Yi Kun, Senior Pharmacist, Pharmacy Department, SGH. With less physical patient interactions, there is also a greater risk of making errors when executing the laborious, repetitive work, such as packing the wrong medications, labelling the wrong address, and scheduling the wrong delivery time.

The pharmacists worked with the AIA team on using the RPA bot to retrieve orders electronically and transcribe them to the pharmacy systems. "The results were impressive," said Mr Hwang, noting that the bot had no transcribing errors when processing almost 600 orders every day — or about 74 per cent of the daily MDS daily workload — since RPA was implemented in September 2021. The bot was also able to alert the team when an urgent delivery such as for antibiotics was required.

Assuming 2.5 minutes are required to schedule delivery and related processes, the time saved on this backroom procedure is 25.6 hours a day or 128 hours a week. For pharmacy staff, nearly 80 per cent felt automation made their job easier.

Bill accuracy

Another department that benefited from the use of RPA bot is the hospital's Pre-Admission Centre (PAC).

According to Ms Thirvchelvi PK, Executive, Pre-Operative and Admitting Services, SGH, each patient typically undergoes several investigations as part of their pre-surgery examinations. "Each patient is billed for five to eight tests, or more than 500 services to bill each day," she said.

The Centre sees an average of 90 patients a day, and an administrative clerk used to check and key in the patients' charges after



... The RPA has taken over the more repetitive tasks done by clerical or administrative staff, who are then reassigned to more meaningful duties like frontline work at the Pre-Admission Centre (left). Meanwhile at the Pharmacy Department (far left), the software runs automatically to process medication orders for delivery, including those that need to be kept at lower temperatures.



Each patient typically undergoes several investigations as part of their pre-surgery examinations. As we have to bill each patient for five to eight tests, that means we have more than 500 services to bill each day.

...
Ms Thirvchelvi PK
Executive, Pre-Operative
and Admitting Services,
Singapore General Hospital

each visit. For example, the clerk had to ensure the forms received are correct and valid (that patients have indeed undergone the blood tests ordered, for instance) and check whether any forms are missing (patients underwent three tests but only two forms are received). The process relied heavily on paper forms and took three hours every day to complete. Working with AIA to digitalise and automate the charging process has resulted in a 66 per cent reduction in time taken.

The RPA now generates a daily report of tests performed the day before, checks for missed or double billing, posts the charges to the patients' accounts, and indicates which bills cannot be posted — which are then manually checked and posted. The bot takes about an hour each day to do this. The clerk who used to perform this task has been reassigned to cover frontline duties, said Mr Goh Ze Wei, Assistant Director, Pre-Operative and Admitting Services, SGH. "She's happy with her new assignment," he said.

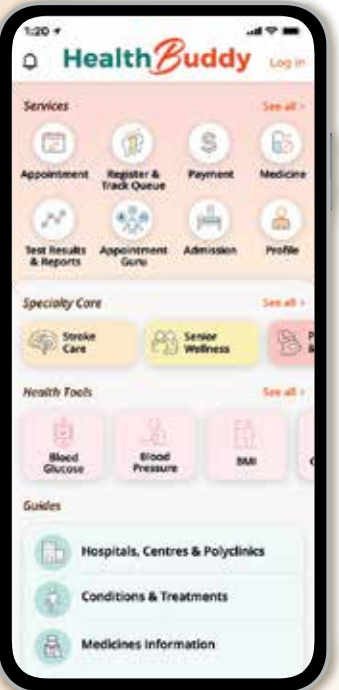
The move towards automation involved discussions with other departments such as Finance. More importantly, it was a chance for staff rethink their processes and to envision a new and improved workflow. "The entire process was smooth as the benefits were clear to other departments, and they came on board the project quickly. However, it was time-consuming as we had to understand everyone's role in the charging process, and how best to change and consolidate the procedures involved," said Mr Goh.

No errors have been reported with the move to automation, versus about 15 unbilled services daily before automation.

Describing the bot as having "amazing potential", Ms Thirvchelvi said the department is looking to complete other finance-related processes, like form completion and generating insurance letters of guarantee ahead of patients' visit to the PAC.



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Exceptional leadership

Professor Ivy Ng's transformative decade at the helm has shaped SingHealth to be the dynamic, innovative and vibrant public healthcare system it is today.



After seeing her father suffer a massive haemorrhage from a bleeding stomach ulcer when she was just ten years old, Professor Ivy Ng was moved by the dedication and competence of the nurses and doctors at Singapore General Hospital (SGH), where her father was ward for over a month then. This cemented Prof Ivy's decision to pursue a career in healthcare, so she could have the opportunity to help others.

Fast forward to 2024, after an illustrious 12-year tenure as the Group Chief Executive Officer (GCEO) of SingHealth, Prof Ivy will pass the torch to Professor Ng Wai Hoe. Her stalwart leadership has set the cornerstone for SingHealth to trailblaze healthcare transformation for the future.

For many SingHealth staff, Prof Ivy's personal touch and exceptional leadership leave an indelible mark.

Her compassionate leadership has also steered SingHealth towards the common purpose of always putting patients at the heart of all we do, while setting new standards for excellence and innovation. As Prof Ivy relinquishes her role as GCEO, she will continue to lend her wisdom and leadership through her appointment as Senior Advisor, SingHealth Board.



Championing research since her early career

Prof Ivy was determined to improve the lives of her patients who suffer from thalassaemia, an inherited blood disorder. As a young doctor, she headed a team of researchers to study the condition and to develop better patient care and prenatal diagnosis techniques. She founded and became the Director of the National Thalassaemia Registry in 1992. In 2021, Prof Ivy's stellar efforts in advancing science, research and innovation earned her the President's Science and Technology Medal.



Propelling enhanced services through infrastructure rejuvenation

One of the major areas of Prof Ivy's contributions was to oversee the ambitious 20-year SGH Campus Masterplan that will transform Singapore's largest medical campus into an integrated, vibrant healthcare eco-system.



A respected and inspiring leader

Beyond her many accomplishments, Prof Ivy's leadership is distinguished by her personal touch and unwavering care for staff across all levels and professional domain groups. Her strong belief in talent management, staff engagement and well-being has been the driving force behind synergies created across SingHealth's spectrum of healthcare services for greater efficiencies. These have significantly enhanced staff wellness and workforce resilience at all levels.



Driving transformation through academic medicine

Prof Ivy is a tireless champion and driver for the pursuit of academic medicine. An advocate of harnessing the synergies in medical research, innovation and education to positively impact patient care, her vision and strategic prowess have raised the bar on clinical care, education, research and innovation, fostering collaborations that transcend domain, institutional and even geographical boundaries. This almost two-decade-long journey has propelled SingHealth onto the global stage as part of a world-class Academic Medical Centre.



Embracing change through good and tough times

Prof Ivy's hands-on and decisive leadership steered SingHealth through the peaks and troughs of the COVID-19 pandemic, transforming to adopt new technologies and innovating to reimagine new ways to deliver care. She never failed to demonstrate exemplary compassion for staff, even enlisting senior leaders to donate to the Resilience in Crisis Fund. Today, this initiative has evolved to become the Joy@Work programme, focusing on various aspects to better organisational culture and staff welfare.

Neurosurgeon to helm SingHealth

Stepping into Professor Ivy Ng's shoes as SingHealth's next Group CEO is Professor Ng Wai Hoe. *Singapore Health* had a chat with the neurosurgeon to get to know him better.

by Chua Kim Beng

Professor Ng Wai Hoe has been with SingHealth for close to two decades.

In 2004, the newly qualified neurosurgeon joined the National Neuroscience Institute as an associate consultant, rising in 2015 to Medical Director, a position he held for close to six years. His next post, CEO of Changi General Hospital, came in 2020, in the middle of the COVID-19 pandemic. He also became SingHealth's Deputy Group CEO (Strategy & Planning). This role involved thinking about the future, formulating plans, and coming up with strategies that would position SingHealth well over the next five to ten years.

In November last year, he was awarded 'Most People-Focused CEO' at the Human Resources Excellence Awards 2023, a testament to his commitment to staff and the organisation. "Healthcare is essentially about our people. Our work is to heal and comfort; the role of a healthcare leader therefore is to care for our people so they can do their best to care for our patients and the community," he said.

As he is about to plunge into his next mission at SingHealth as Group CEO — "no rest for the weary," he quipped — we caught up with the busy man one Monday afternoon last October and had a very pleasant time peeling back the layers to unveil a man who loves reading, long-distance running and hawker food.

Share with us your journey to become a doctor

Of all the subjects in school, I enjoyed biology the most, especially articles from *Scientific American*. I would pull out all the articles on neuroscience as I got very interested in that. At the medical school interview, I was asked what specialty I would like to pursue; I told them I was keen on neuroscience.

As a child, I was always tinkering with my hands. I would dismantle TVs, radios and watches, and try to reassemble them. While doing my medical and surgical postings in medical school, I realised that I enjoyed the surgical ones more. So, becoming a neurosurgeon seemed to be a natural fit for me, as it married my love for

tinkering on mechanical things with my interest in neuroscience.

What are some challenges in neurosurgery?

The brain is arguably one of the most intricate structures in the human body. Neurosurgeons operate through very small surgical corridors, on structures that are minute, where there's little room for error in surgical technique and approach. This process is often nuanced due to the unique differences from patient to patient. This need for precision and clinical judgement is quite challenging and exciting for me as a surgeon.

At the same time, neurosurgery is very cognitive. The surgeon must have an in-depth understanding of the principles of neurology and physiology, and balance that knowledge with the unique anatomy and technical challenges of each patient, making it a mixture of art and science.

I think some people would also say it's a challenge to one's bladder, because surgeries last a long time, and you'll need to hold your bladder for several hours! [laughs] Five to six hours would be quite a common duration for a neurosurgical operation. While neurosurgeons need not be world-class athletes, the job does call for a certain level of fitness as it is physically demanding and requires a certain degree of cognitive reasoning and resilience.

Is that why you're a voracious reader and keen jogger?

There's this thing in the rumour mill that I read a lot. I probably read more in the past, and I should read more than what I do currently. My all-time favourite writer is JRR

Tolkien — I first read *Lord of the Rings* when I was 11; I've probably read the entire series about three times. I've been leaning towards non-fiction these days. For example, John C Maxwell's *Leadership* is about the mind-shifts that people need to make as they assume leadership positions.

I like going for long runs; they give me time to reflect and think while helping me to burn calories for the next big meal!

Why is brain surgery sometimes done on an awake patient?

The procedure is called 'awake craniotomy' or 'awake brain surgery'. When we are operating on parts of the brain that control critical body functions — for example, the areas that control our language and speech abilities — we want the patient to be awake so that we can assess them. If the patient can speak normally, it means that there is no damage to the language centre.

Patients are very informed nowadays. I have had patients who request for awake surgery because they've read that it gives them the best chance to preserve certain functions.

Any tip or advice for enhancing brain health?

For a long time, it was believed that neurogenesis, where the brain can regenerate and form new brain cells, did not exist beyond childhood. However, studies have shown that regular exercise, particularly aerobic exercise, can promote the formation of new brain cells. So I recommend regular exercise for about 30 minutes per session. What I do not recommend is binge drinking or excessive alcohol intake.



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"Neurosurgery is very cognitive. The surgeon must have an in-depth understanding of the principles of neurology and physiology, making it a mixture of arts and science," says Prof Ng.



“I don't think I've done anything particularly brave. If anything, it's my patients who are the brave ones; they inspire me.”

...
Professor Ng Wai Hoe
Group CEO, SingHealth

Growing young 'warriors' to fight cancer

SGH team develops platform to manufacture special T-cells to fight a variety of cancers, with early study showing promise.

A type of white blood cell, gamma delta T-cells (GDT-cells), derived from cord blood, may be able to prevent or delay some cancer relapses, early studies by a team of Singapore General Hospital (SGH) researchers have shown. The team also found that a platform they developed was able to generate these cells on a large scale.

The team is looking to put their findings to further test in a phase 1 clinical trial for leukaemia and lymphoma treatments. "We are working closely with the Advanced Cell Therapy and Research Institute (the national cell therapy facility, ACTRIS) to validate and finalise Good Manufacturing Practices workflows," said Dr Alice Cheung, Junior Principal Investigator, Department of Haematology, SGH, and senior author of the study. The findings of the study were published in a peer-reviewed journal, *Science Advances*, in June 2023, she added.

T-cells are a type of white blood cells that help the body's immune system fight germs and protect it from disease. GDT-cells, a sub-type T-cell useful in cancer immunotherapy, have antiviral and antitumour properties that allow them to keep a look out for signs of

biological stress, like cancerous or infected cells in the body, and are one of the first lines of defence against disease. GDT-cells can be found in the blood of an adult. However, umbilical cord blood has greater enrichment of specific, more cytotoxic, subsets of GDT-cells, said Dr Cheung.

"Most initial efforts have been focused on exploring the use of GDT-cells in adults as cancer treatment. Unfortunately, response rates in early clinical trials were generally low and treatment efficacies were sub-optimal. This was why we decided to turn our attention to umbilical cord blood instead," said Dr Cheung.

The team from the Haematology and Molecular Pathology departments used more than 20 clinical grade umbilical cord blood samples from the Singapore Cord Blood Bank to produce and validate the GDT-cells on the platform, she said.

According to Associate Professor Goh Yeow Tee, Senior Consultant, Department of Haematology, SGH, "Umbilical cord blood-derived GDT-cells are akin to young warriors, potentially having longer-lasting effects and being more adaptable to take on additional functions." However, Assoc Prof Goh, also an author of the study, noted

that the cord blood cells "are currently under-utilised, with the main concern that there may not be enough of these T-cells for clinical application, but our study has shown that it is potentially feasible".

The study found that the cord blood GDT-cells that were manufactured on the platform were "potent cancer killers that were able to target a variety of solid and liquid cancers", said Dr Cheung. "These cell products are highly versatile, and can be combined with different existing cancer drugs such as small molecule drugs and antibodies to induce much higher cancer cell kill," she added.

The platform, which uses the team's proprietary technology, is able to produce massive amounts of various cancer-targeting GDT-cells quickly — in under two weeks. The cell products can then be frozen for storage, and thawed when needed for cancer treatment. "Such cost-efficient production of off-the-shelf cancer immunotherapeutic cell products has the potential to deliver effective and affordable cancer treatment to patients in a timely manner," added Dr Cheung.



... Dr Cheung (left) uses a pipette to transfer cord blood cells into a culture container in the sterile biosafety cabinet. The cell container is then put into the incubator at 37°C (above). The wells of the culture container (inset) are filled with a nutrient-rich medium to help the cells grow.



... Samples of cord blood cells, which Assoc Prof Goh Yeow Tee likens to young warriors, from the Singapore Cord Blood Bank were used in the study.

Towards a more positive patient experience

Patients and their caregivers lend their weight to healthcare delivery and act as advocates for other patients.

by Sol E Solomon

Doctors and healthcare professionals may have the medical knowledge, but SingHealth is moving away from the 'doctor knows best' model of care to engage with patients on a deeper level for an improved patient experience, to better understand what is truly important to them so as to shape care accordingly. This is in line with SingHealth's aim of expanding the SingHealth Patient Advocacy Network (SPAN) across the cluster.

Patients are integral members of the healthcare team and, through SPAN, they are empowered to influence the care they receive. At the KK Women's and Children's Hospital (KKH), patients and their caregivers offer solutions for the hospital to design a healthcare system that is truly for patients, by patients. The patient-hospital partnership relies on various platforms, and engaging SPAN@KKH is one of them.

SPAN@KKH comprises staff who are Members, and any KKH staff may nominate a patient and/or caregiver as potential SPAN Advisors. Members then meet potential Advisors at an introductory session to explain the work SPAN does and invite them to join the team. Members and Advisors, who meet virtually once a month, work together to drive efforts towards safe, quality and compassionate care with the patients' perspectives in mind.

"This has enabled the healthcare team to look beyond medical treatment and recognise what truly matters to our patients and caregivers," shared SPAN@KKH.

SPAN@KKH provides input and feedback on issues such as policies, procedures, space planning and education materials. In fact, SPAN@KKH takes a two-way approach, with Advisors also providing suggestions to the healthcare team regarding service and care delivery.

Project achievements

SPAN@KKH has offered inputs and advice on over 30 project teams and topics. Among the first few projects was a relook at the hospital's *Patient and Family Rights* brochure. The previous version was too text-heavy so advisors suggested presenting it in a more reader- and patient-friendly style.

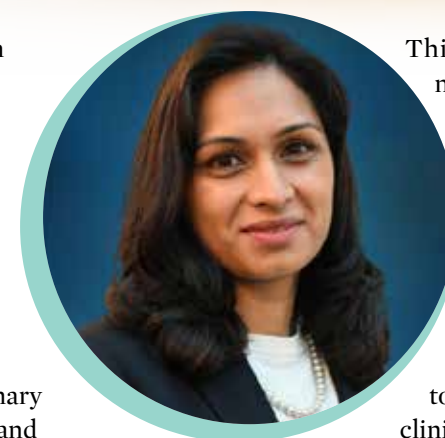
This resulted in the development of an infographic version of the brochure.

Another early project suggested by an Advisor who is caregiver to a child requiring complex care resulted in designated parking or drop-off points for patients with multiple medical equipment. Previously, caregivers felt rushed at the standard drop-off point due to its high usage by private-hire cars and shuttle buses. A multidisciplinary team comprising Children's Complex and Home Care Services, Office of Patient Experience, Security and Fire Safety/Car Park Management came together and implemented a designated drop-off point and parking lots to increase convenience and reduce stress for these caregivers.

Most recently, KKH received positive feedback from a caregiver, who shared: "I would like to express my appreciation for the SPAN@KKH parking lot scheme.



... SPAN@KKH's initiatives include setting up special drop-off points (above left) and parking lots (above right).



... "These initiatives have allowed us to have a deeper connection with our patients and their families, and offered a more embracing and conducive environment on top of the care we provide," says Dr Syeda Kashfi Qadri.

... KKH's *Patient and Family Rights* brochure was revamped to be less text-heavy, thanks to feedback from SPAN@KKH.

This has greatly benefited my special needs child and I as we are able to get to our appointment on time without being delayed."

Other projects that SPAN@KKH has been involved in include improving caregiver engagement at the CICU (Children's Intensive Care unit) Early Mobilisation Programme. This multidisciplinary programme aims to improve patient functional outcome, clinical outcome and family-centred care.

Feedback from SPAN@KKH meant that the initiatives under the CICU programme were crafted with the perspective of the patients and families in mind, and were catered to their emotional state, particularly for those whose children were not doing well, said Dr Syeda Kashfi Qadri, Consultant, CICU, KKH. Many patient- and family-centred initiatives were implemented by the CICU as part of its *Let's Move 'EM* programme, she added. These include the bedside flipchart, which has an 'All About Me' page to get to know the patients better through their likes, dislikes, favourite toys and activities, and a diary documenting their critical illness journey. A memory card is given to each patient as a memento when they are discharged. With encouragement from SPAN@KKH Advisor Mr Jonathan Tiong, CICU also received \$7,000 in funding from GIC to support the programme.

"We are heartened that, with input from SPAN, these initiatives have allowed us to have a deeper connection with our patients and their families, and offered a more embracing and conducive environment on top of the care we provide," said Dr Kashfi.

To find out more or be involved in SPAN@KKH, please reach out to Serene Pok at serene.pok.sh@kkh.com.sg.



... SPAN@KKH comprises Members (staff) and Advisors (patients and caregivers).





Laughing anxiety away

Visiting the dentist can trigger anxiety in some patients, making treatment difficult. A sedation service using nitrous oxide, also known as laughing gas, is now available to calm young patients with dental anxiety.

by Candice Cai

The mere thought of visiting the dentist is enough to make some people — adults or children — break out in cold sweat.

In fact, patients of all ages can suffer from mild to severe anxiety when it is time to see the dentist, even if it is for something as routine as their regular check-up, said Dr Bien Lai, Senior Consultant and Head, Paediatric Dentistry Unit, Department of Restorative Dentistry, National Dental Centre Singapore (NDCS).

One reason for this is patients associating dental procedures with pain. “Most people visit a dentist only when there are signs and symptoms of dental issues, such as decay. As such, most dental procedures are curative rather than preventive,” explained Dr Lai. Curative dental procedures can

range from the minimally invasive, such as simple fillings, to more invasive treatments involving extractions and extensive removal of tooth structure, such as crowns, for restorations. “When extensive dental procedures are involved and located near the nerve in the tooth, local anaesthesia is often needed to numb the area. The idea of administering local anaesthesia via an injection is frequently associated with pain,” Dr Lai said. She added that the sensory overload from the dental operator setup — for example, loud sounds from the suction tip and handpieces — can also induce anxiety.

“Patients with dental anxiety often clam up and tend to not open their mouths as wide. This hampers the procedure from being performed optimally as the dentist may be unable to have adequate access for dental procedures, resulting in lengthy treatments,” she said. In extreme cases,

the treatment may even have to be aborted or postponed.

The good news is that there is now help for children and adults who suffer from dental anxiety.

NDCS introduced its nitrous oxide sedation service for paediatric dental patients in June 2023. Commonly known as laughing gas, nitrous oxide is mixed with oxygen and breathed in through a rubber mask placed over patients’ nose. This helps patients relax and cope better with dental procedures while also providing some pain relief.

When properly used, nitrous oxide sedation is generally safer than general anaesthesia (GA) for complex dental procedures due to its milder nature. It also presents lower risk to the respiratory system and haemodynamics (blood flow through vessels), and allows for a shorter recovery time as the inhaled gas is eliminated quickly from the body.

“Nitrous oxide inhalation sedation is generally very safe. Some common

side effects include vomiting, nausea, dizziness, light-headedness, occasional hallucinations, and agitation,” Dr Lai shared. “Very rarely, a patient may experience blunting of the cough reflex that may increase the risk of saliva or vomitus being inhaled into the lungs and causing pneumonia. This will require further medical management,” she said.

There is no minimum age requirement for children to qualify for the procedure, but the patient “has to be relatively cooperative”, shared Dr Lai. They must be able to tolerate having a nasal hood placed on them.

As of end 2023, the sedation service has been performed on 24 paediatric patients.

The sedation procedure is unsuitable for pregnant patients, patients who are taking drugs, food or drinks that slow down brain activity (such as opioids, alcohol, etc.) or herbal remedies, and patients who are not feeling well, including those with an ongoing respiratory tract infection, and/or any contagious illnesses.

Prepare your child before visiting the dentist

Besides relying on nitrous oxide, Dr Lai recommends that parents exercise these good practices to calm their kids before a dental appointment:

- 1 Prepare them for their first dentist appointment by screening videos or reading storybooks depicting a pleasant visit to the dental clinic.
- 2 Share with them what to expect during a session to remove uncertainty, which contributes to anxiety, and refrain from using scare tactics or triggering words such as ‘pain’, ‘injection’, ‘pluck teeth’, etc.
- 3 Reinforce the message that dentists help keep their teeth strong and healthy.
- 4 If they have had unpleasant experiences before, it is best to let the attending dentist manage their anxiety on the day of consultation.



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Beyond ensuring cleanliness

Housekeeping Inpatient Team Leader Ms Nan Thidar Mon is happy to play a pivotal role in providing a safe and hygienic environment for patients.

by Candice Cai

As part of the housekeeping team at SingHealth Tower, which houses both Singapore General Hospital (SGH) and Outram Community Hospital (OCH) wards, Ms Nan Thidar Mon has to ensure that inpatient wards are disinfected, washrooms are checked at regular intervals, and beds of discharged patients are prepped and ready for their next occupants. She also ensures that waste and soiled linen are collected and disposed appropriately.

For Ms Thidar, 31, who has worked in Singapore for over six years, gaining employment here was an opportunity that she had hoped for, and was elated when she secured a job in 2017 under a recruitment exercise by ISS Facility Services Pte Ltd. Aside from the more competitive remuneration, working in Singapore was a draw because of its reputation as a clean and safe



Housekeeping is very challenging, especially in a hospital environment. There are protocols I have to adhere to, such as meeting infectious control standards.

Ms Nan Thidar Mon
Inpatient Team Leader,
SingHealth Tower



PHOTOS: VERNON WONG

When COVID-19 hit, Ms Thidar and her colleagues had to grapple with terminal cleaning — thorough disinfection of all surfaces, including floors and walls — and enhanced sanitisation protocol using strong disinfectant at an increased cleaning frequency.

country. “This opportunity has allowed me to support my family and save money as well,” said Ms Thidar, who has a degree in Chemistry from Hpa-an University. “I consider myself very lucky.”

Her first posting was to Changi General Hospital (CGH), where she was responsible for cleaning the inpatient ward. Although she had been briefed by a friend who worked in Singapore about the job and thought she was suitably prepared, she struggled with the tasks initially.

“Housekeeping is very challenging, especially in a hospital environment,” she said. Aside from following through with the entire workflow, there were protocols she had to adhere to, such as meeting infectious control standards within the hospital. “I needed to learn things like hand hygiene, handling of Personal Protective Equipment (PPE), different methods of disinfection, understanding the different kinds of infectious diseases, their mode of transmission, and the various cleaning methods to prevent spread,” she shared.

There were also communication issues to overcome. She gradually overcame the language barrier through frequent interactions with her colleagues.

In 2020, she was posted to SingHealth Tower. Ms Thidar then became part of the pioneer batch of frontline workers at inpatient wards when COVID-19 pandemic hit. It was a particularly trying time for Ms Thidar and her colleagues as they had to grapple with terminal cleaning — thorough disinfection of all surfaces, including floors and walls — and enhanced sanitisation protocol using strong disinfectant at an

increased cleaning frequency. “Due to the increase in the cases of infected patients, we were required to take extra measures, such as donning full PPE and working long hours while maintaining social distancing protocols at work to complete all cleaning tasks,” she said. “When our colleagues got infected, we also had to cover their duties due to lack of manpower.”

In hindsight, Ms Thidar reflected that the pandemic taught her an important lesson — teamwork is very important and everyone has a part to play in order to overcome challenging situations.

In 2021, Ms Thidar was promoted to Inpatient Team Leader. “It was one of my proudest moments,” she described. The new role allowed her to mentor new housekeeping staff. “It’s very challenging as I must mentor colleagues from different countries and cultures,” she said. Over the years, she has picked up basic Chinese and Malay phrases, which helps when giving instructions to her co-workers.

“I feel especially proud when patients and nurses leave positive feedback about our cleaning standards and hard work. It really makes our day,” she said.

Ms Thidar has developed a sense of belonging to Singapore. During her time off, she often cycles around Singapore with her friends — Coney Island is a favoured destination. The avid cook has also developed a taste for *mala* dishes. Career-wise, she is looking forward to progressing further in her role. “As long as there is an opportunity for me to work here, I will continue to stay in Singapore,” she said.

Investing early in heart health

Cardiologist Dr Koh Choong Hou wants to move the focus to prevention for a healthier Singapore.

by Thava Rani

The concept of saving money early and compounding more interest over the years is probably the furthest thing from the mind when one thinks about cardiovascular health. Yet, the two concepts have something in common, according to Dr Koh Choong Hou, Clinical Assistant Professor and Consultant, Department of Cardiology, National Heart Centre Singapore (NHCS).

“An early start is key in both cases,” explained the cardiac specialist. “You need to start saving early in your 20s so that you can reap the most benefit. It’s the same for your cardiovascular fitness. You need to invest in it from young. Exercising regularly and staying active from an early age is one of the best ways to ensure good heart health.”

Dr Koh believes the avenues have been provided in the form of exercise corners, park connector networks, and accessible gyms. But motivating people is a different matter altogether. “The only cost to exercise is time, but it is time well spent. How do we convince people of that? We need to find ways to motivate and educate them so they understand the importance of taking ownership of their own health.”

However, exercise is only one facet. As Singapore moves towards achieving a fitter population with its Healthier SG national initiative, preventive health is now in the spotlight. Singaporeans are encouraged to not just exercise, but to also take proactive steps to manage their health in order to prevent the onset of chronic diseases.

“When we talk about lifespan, we often forget to talk about health span — years of life spent living healthily, without ailments. We need to shift the focus from treating to preventing conditions, and preventive cardiology plays a big role in this,” said Dr Koh.

NHCS cardiologists like Dr Koh work closely with primary care physicians so that patient management can be optimised. For instance, in early screening and detection of underlying silent heart disease such as obstructive coronary disease or abnormal heart rhythms, Dr Koh recommends to primary care physicians the kind of cardiac tests patients need, and whether certain medications should be started early. “At times, primary care providers do not have access to certain cardiac tests. And that’s where we come in. We can advise them on

tests to be done and the actions they can take based on the results,” he said.

Dr Koh is also the Director of the Singapore Armed Forces (SAF) Cardiac Fitness Centre (SCFC) at NHCS. Operational since 2012, SCFC ensures National Service pre-enlistees have no underlying cardiac conditions and are fit for physical activities and combat training. It also screens the SAF active regulars for cardiac risk factors and monitors those who fall in the higher risk categories with tests such as stress exercise electrocardiogram. Since early 2022, SCFC has made progressive leaps in the digitalisation of healthcare communications, electronic medical records, and clinical workflow, ensuring that the entire process for SAF servicemen and pre-enlistees are seamless, convenient and readily accessible.

The SCFC team also worked with MINDEF SAF to sharpen referral criteria and clinical protocols for selected clinical conditions. “The referral patterns from the SAF medical centres have gotten more robust as a result, and we were able to reduce unnecessary tests and consultations, and improve patient turnaround time,” said Dr Koh.

In addition to these roles, Dr Koh specialises in echocardiography, the imaging of a moving heart. The modality assesses the structure and function of the heart. “We can tell if the heart is weak or strong, has stiffness or is ageing, and whether there are structural abnormalities like holes, valve issues, muscle-related issues, artery blockages, masses, growths or blood clots within the heart.”

About 1,000 patients have an echocardiogram done each week at NHCS. Most of them are referred for suspected cardiac conditions due to symptoms of chest pain or breathlessness. Other than the general population, a unique group of people who undergo echocardiograms are the elite footballers, who may require specific cardiac clearance for competitions, such as the ASEAN Club Championships.

“Previously, clinicians could only depend on bedside physical examinations or the basic ECG to pick up heart conditions, which may result in missed cases as some structural heart problems are subtle. With the echocardiogram, we now have much improved diagnostic sensitivity. It’s also a safe and cost-effective test for various clinical indications, such as in patients undergoing potentially cardiotoxic chemotherapy, or to monitor patients with known heart valve issues,” said Dr Koh.



“You need to invest in cardiovascular fitness from young. Exercising regularly and staying active from an early age is one of the best ways to do this,” says Dr Koh.



When we talk about lifespan, we often forget to talk about health span — years of life spent living healthily, without ailments. We need to shift the focus from treating to preventing conditions, and preventive cardiology plays a big role in this.

Dr Koh Choong Hou
Clinical Assistant Professor and
Consultant, Department of Cardiology,
National Heart Centre Singapore

Staff helping a patient enrol to the My Care Team programme at Punggol Polyclinic. "With MCT, after managing all the complex chronic problems during the consultation, doctors then entrust the care to their Care Managers and Health Pals who will continue conversations with patient on preventive care," says Dr Ng Lok Pui, the Programme Lead for MCT.



A healthy harmony

As part of the national Healthier SG initiative, patients of SingHealth Polyclinics have a care team of professionals called My Care Team to oversee and accompany them on each step of their journey towards better health and healing.

by Vicki Yang

For patients with multiple medical conditions, a routine visit to the doctor can uncover health issues beyond the scope of a single consultation. My Care Team (MCT) is a multidisciplinary healthcare team that oversees a patient's healthcare journey and provides integrated care to help the patient achieve his or her health goals.

Joining hands for holistic healthcare
From its inception as a pilot programme at Eunos and Punggol Polyclinics in July 2022, the strength of the MCT initiative lies in the formation of multidisciplinary care teams in the polyclinic setting. Each team consists of four doctors, two Care Managers or nurses, and two trained ancillary staff known as Health Pals.

These teams care for patients enrolled in Healthier SG with whom they develop personalised care plans for better health outcomes. In this assembly of healthcare expertise, doctors take the lead in addressing patients' medical needs, while Care Managers conduct clinical assessments, provide health counselling and recommendation, and coordinate with community partners to address patients' social needs. Rounding up the care experience are the Health Pals, who go beyond appointment scheduling to provide recommendation on preventive care and close the care gaps by making such appointments for them as well. "With each member having distinct but complementary roles and responsibilities, the MCT initiative also supports the national Healthier SG's vision of 'one resident, one doctor' or 'one team'," said Dr Ng Lok Pui, Director of Regional Clinical Services (East), and the Programme Lead for MCT. This strategic alignment within the MCT supports the national shift in healthcare delivery to preventive care upstream. "With an ageing population and the increasing

Caring Carol
CARE that never quits, commit to be fit.
Care Manager

Wellness William
START to live well, live better we shall.
Doctor

Healthy Huda
HEALTH is wealth, take care of yourself.
Health Pal

- Conduct clinical assessment
- Share practical health tips
- Coordinate your social needs

- Take care of medical needs
- Lead the team to provide holistic care for you

- Coordinate appointments
- Coordinate your preventive care needs

complexity of our patients' care needs, it can be challenging to deliver comprehensive care, especially in the busy polyclinic context," explained Dr Ng. "With MCT, after managing all the complex chronic problems during the consultation, doctors then entrust the care to their Care Managers and Health Pals who will continue conversations with patient on preventive care."

Connections beyond check-ups
MCT also seeks to build enduring, long-term relationships and foster trust between patients and their care team. "Relationship building is critical to meet the intent of empowering and engaging patients to take charge of their health, which is the cornerstone to the national initiative of Healthier SG," said Dr Ng. "Recommendations of preventive care such as vaccinations and cancer screenings are healthcare information that are available to all patients. The key lies in empowering and activating our patients to take action. Our MCT members engage patients through their relationships, provide recommendations, address concerns, and close the last mile by coordinating such appointments for them." The mindsets that patients have when it comes to caring for their own health varies. While some patients may agree to treatments that resolve their issues directly, they may be sceptical or uncomfortable with taking further steps on their own

towards preventive care. Care Managers and Health Pals, in particular, bridge this gap by connecting with patients and encouraging steps towards preventive care. Ms Nur Zanaria Binte Zulkifli, Senior Patient Service Associate and a Health Pal at Marine Parade Polyclinic, recounted an encounter with a diabetic patient in her 50s who was diligent with her appointments but had reservations about screenings and vaccinations. After hearing the patient's concerns, Ms Nur Zanaria advised her on the importance of vaccinations in preventing infections and improving immunity, and explained the procedures in fuller detail to allay her concerns. "As her concerns and doubts were clarified, she thanked me for helping her to understand these procedures as she felt truly cared for," recalled Ms Nur Zanaria. "It was encouraging that I was able to directly contribute to the patient's health." MCT fosters stronger bonds not only between the team members and their patients, but also among the members themselves. Under this collaborative approach to better healthcare, a strong relationship and harmonious coordination between MCT members is emphasised so as to serve patients better. "My colleagues and I feel more involved in the care journey of our patients," said Ms Nur Zanaria. "Prior to being Health Pals, we were separated from the concept of caring for patients as our role was mostly about appointment bookings. Now, instead of having to refer patients to nurses and doctors



Each My Care Team consists of four doctors, two Care Managers or nurses, and two trained ancillary staff known as Health Pals. These teams care for enrolled patients with whom they develop personalised care plans for better health outcomes.

for everything medical-related, we can advise better on certain aspects using the medical knowledge that we have been given access to. We have now become stronger partners to doctors and nurses." As of December 2023, SingHealth Polyclinics has enrolled approximately 80,000 patients. Nevertheless, Dr Ng pointed out that both Healthier SG and MCT are still in their infancy stage, and it would be optimal for more to be enrolled in Healthier SG and thus MCT. "Enrolled patients can be looked after by a regular team of healthcare providers journeying with them in pursuit of their health, where care can not only be delivered by doctors but also by other trained MCT members," she said. Mr Ho is one patient who appreciates the integrated care offered by MCT. "The enrolment process was very fast. My doctor and I discussed and agreed on a set of health goals, which enables me to better manage my diet and lifestyle," shared Mr Ho, who also highlighted the enhanced communication and stronger rapport he enjoys with his assigned care team. "The Health Pals from my MCT also remind me of my required vaccinations and make sure I am always up-to-date with them," he added.



"With each member having distinct but complementary roles and responsibilities, the MCT initiative also supports the national Healthier SG's vision of 'one resident, one doctor' or 'one team,'" says Dr Ng.

Beware of worms and dogs!

by Chua Kim Beng, with information by Dr Thien Siew Yee, Consultant, Department of Infectious Diseases, Singapore General Hospital



In their quest for unusual travel experiences, adventurous Singaporeans are exposing themselves to so-called Neglected Tropical Diseases (NTDs). Most NTDs have been wiped out in more developed places, but persist, especially in poorer and isolated communities in warmer countries. Caused by viruses, bacteria, protozoa or single-cell organisms, and helminths or parasitic worms, NTDs are often linked to environmental conditions, have animal reservoirs, and are related to complex life cycles, making public health control challenging.



Food-borne flatworms

A class of flatworms or flukes known as trematodes can cause infections that result in severe liver and lung disease, disabilities and death worldwide every year. Examples are:

- *Clonorchis sinensis* (Chinese or Oriental liver fluke): endemic in Korea, China, Taiwan, Northern Vietnam, Japan; >35 million people infected
- *Opisthorchis viverrine* (Southeast Asian liver fluke): endemic in Cambodia, China, Laos, Thailand, Vietnam; >23 million people infected
- *Opisthorchis felineus* (cat liver fluke): endemic in Southeast Asia, Central and Eastern Europe; >16 million people infected
- *Fasciola hepatica/gigantica* (common liver fluke): endemic in China, Korea, Taiwan, Thailand, Vietnam, Central and South America, France, Portugal, Spain, Turkey; >17 million people infected
- *Paragonimus westermani* (Oriental lung fluke): endemic in China, Japan, Korea, India, Philippines, Taiwan; >20 million people infected

TRANSMISSION

Eating contaminated raw or undercooked fish, crustaceans or vegetables like watercress and other water plants.

SYMPTOMS

Depending on the organism, patients can have fever, lethargy, vomiting, abdominal pain, liver abscess, pancreatitis, or no symptom.

HOW TO AVOID

Ensure seafood and vegetables are well cooked before eating.

Parasitic worms

Parasitic worms can cause schistosomiasis, one of the most devastating of parasitic diseases, with an estimated 240 million people worldwide infected. Examples are:

- *Schistosoma mansoni*: endemic in Sub-Saharan Africa, South America, South Caribbean islands
- *Schistosoma japonicum*: endemic in China, Philippines, Sulawesi (Indonesia)
- *Schistosoma haematobium*: endemic in Sub-Saharan African, Middle East, Arabian peninsula
- *Schistosoma mekongi*: endemic in Cambodia, Laos
- *Schistosoma malayensis*: endemic in Malaysia
- *Schistosoma intercalatum*: endemic in Democratic Republic of Congo
- *Schistosoma guineensis*: endemic in West Africa

TRANSMISSION

Contact with fresh water contaminated with the parasites — swimming, wading, rafting, paddling, bathing and laundry. The parasite infects people by penetrating the skin.

SYMPTOMS

Depending on the organism, patients can have skin reaction, fever, cough, diarrhoea, abdominal pain, cough, blood in urine and stools, breathlessness, lesion in brain, spinal cord, liver, spleen, or no symptom.

HOW TO AVOID

Ensure safe drinking water and avoid contact with fresh water in endemic areas.

Rabies

An estimated 59,000 people die of rabies each year. The disease is caused by the rabies virus, which is present in many animals. Animals that host and spread the infection include dogs (99 per cent), bats, raccoons, skunks, foxes and coyotes. These animal reservoirs are found worldwide, most commonly in Africa and Asia.

Rabies has no known effective treatment once infected, and fatality is high once symptoms appear. Post-exposure options are prophylaxis treatment with vaccine and rabies immunoglobulin.

TRANSMISSION

Exposure to saliva of infected animal, usually via bite.

SYMPTOMS

Fever, malaise, nausea, vomiting, headache, numbness, weakness, pain at site of bite, hydrophobia (fear of water), aerophobia (fear of flying), paralysis, coma and death. Fatality is high once symptoms appear.

HOW TO AVOID

Rabies vaccine for high-risk adventure travellers, cave explorers.

When the sun goes down



For caregivers struggling to care for patients with sundown syndrome, resources and support are available from various agencies.

by Goh Bee Lian

When thunder and lightning strike, Mr A would become agitated, afraid and would run to hide under the bed. Although he suffered from dementia, he was normally docile and calm. His family could not understand his behaviour whenever there was a thunderstorm.

Mr A had worked onboard ships in his youth, and storms brought back painful memories of those times. When the family realised his past and the association with storms, thunder and lightning, they became aware that they needed to reassure and calm him when storms occurred. His behaviour improved.

Known as sundown syndrome, such symptoms of confusion and agitation occur mostly in people with dementia. “Sundown syndrome is a group of symptoms that occur at a specific time of the day. Some patients get anxious and agitated; others become aggressive, and shout or hit others,” said Dr Trina Arifin, Associate Consultant, Department of Geriatric Medicine, Singapore General Hospital (SGH). “This phenomenon of behavioural deterioration is seen usually in the late afternoon or evening. Basically, any unmet physical or psychological need can trigger the symptoms. Caregivers need to know what the triggers are and try to minimise them.”

In Singapore, one in 10 people above the age of 60 suffers from dementia, or about 82,000 people in 2018. The number is projected to rise to about 152,000 by

2030. Sundowning, as the syndrome is also called, is most commonly associated with dementia patients diagnosed with Alzheimer’s disease (about 60 per cent of Alzheimer patients experience sundowning), but is also found in people with other forms of dementia.

The causes of sundowning are unclear although it is known that changes to the brain — pharmacological, psychological, medical, environmental — can affect our biological clock, leading to confusion in sleep-wake cycles or the circadian rhythm.

The first choice of treatment, Dr Arifin said, is to keep patients in the comfort and familiarity of their own homes surrounded by family members. She added that it is important to set a routine so that patients know what they can expect to do for the day. Engaging them in simple activities, avoiding long afternoon naps, taking walks or going for lunch outside helps tire them out and prepare them for bed.

Dementia day care centres offer morning to afternoon cognitive involvement programmes to keep care recipients occupied with activities targeted at the stage of the dementia. Night respite care is an overnight option for care recipients who are active at night, offering their caregivers some time off from night-time duties. In cases where the caregiver is temporarily unavailable, such as when a foreign domestic worker goes on home leave, nursing respite care is available for the patient during the period.



“This phenomenon of behavioural deterioration is seen usually in the late afternoon or evening. Basically, any unmet physical or psychological need can trigger the symptoms. Caregivers need to know what the triggers are and try to minimise them,” says Dr Trina Arifin.

DO’S and DON’TS

- ✓ Get plenty of rest
- ✓ Set a routine for waking up, mealtime and bedtime
- ✓ Spend time outdoors in the sunlight
- ✓ Identify triggers of sundowning events
- ✓ Reduce stimulation like loud music and TV in the evening
- ✓ Eat heavier lunches and lighter dinners
- ✓ Keep the home well lit to reduce confusion
- ✓ Soothe patient’s mood by listening calming music, looking at photographs, or watching a film
- ✓ Take walks to reduce restlessness
- ✓ Limit daytime naps
- ✓ Reduce or avoid alcohol, caffeine and nicotine consumption

Help with sundown syndrome

The Agency for Integrated Care (AIC) website has comprehensive resources on understanding sundown syndrome, managing sundowning behaviour, facilities for care of patients as well as subsidies available for such services. Visit: <https://www.aic.sg/body-mind/dementia-brochures>

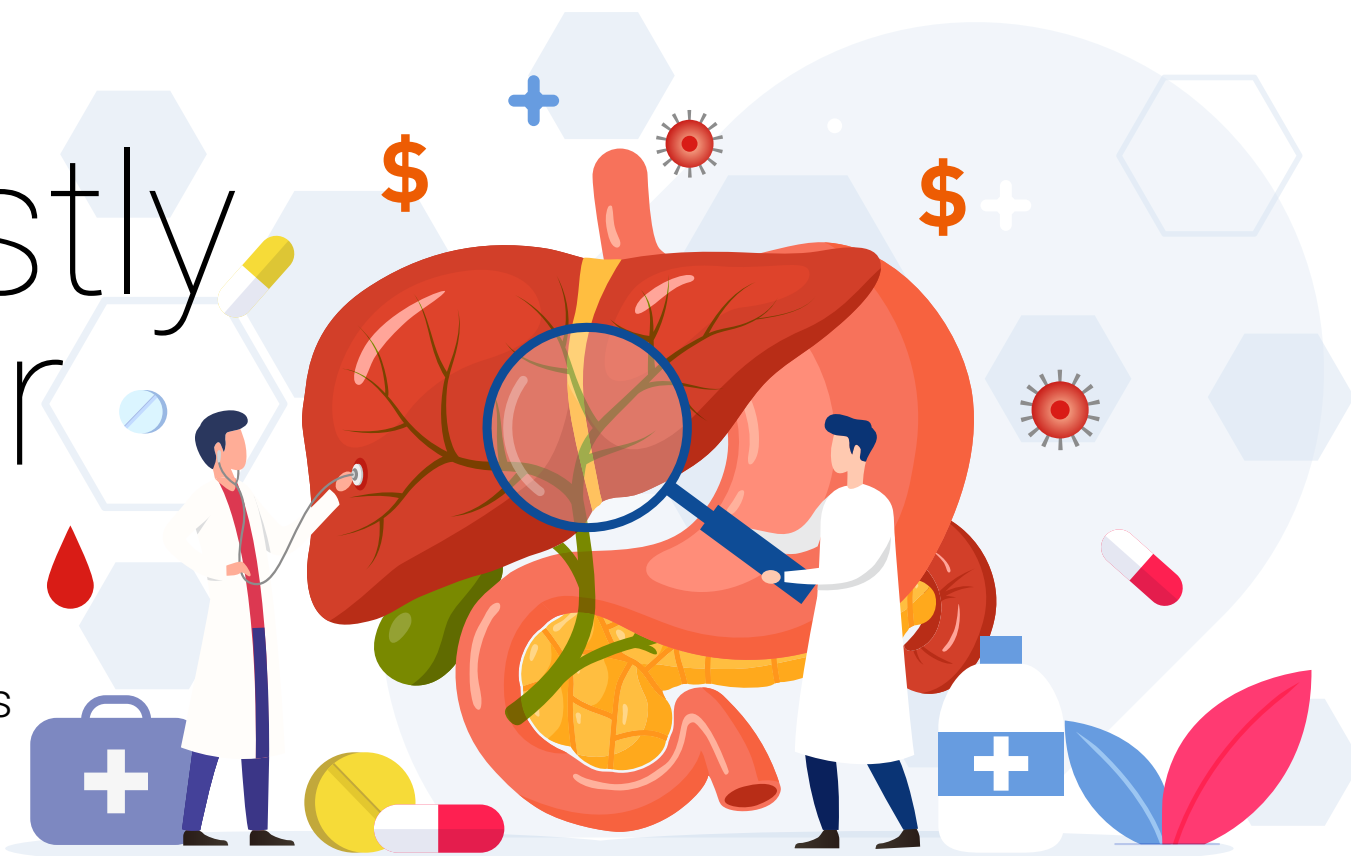
Dementia Singapore has a hotline for caregivers who need support in caring for their charges: **6377 0700**

Dementia Singapore Academy (DSA), the organisation’s training and consultancy arm, provides training programmes for professionals, family caregivers, foreign domestic workers and the general public. Visit: <https://dementia.org.sg/academy/>

A rare and costly disorder

A rare condition, bile acid synthesis disorder has only one treatment – oral cholic acid – which costs thousands of dollars a month due to its status as an ‘orphan’ drug.

by Candice Cai



Bile acid synthesis disorder (BASD) is a life-long condition for which there is no cure. The genetic disorder results in a defect in the production of bile acids and causes rapid progressive damage to the liver.

“These problems commonly manifest in children as jaundice, stunted growth, malabsorption of fat-soluble vitamins and bleeding tendencies. If left untreated or if treatment is started late when there is irreversible liver damage, patients may show signs of chronic liver disease and may require liver transplant in the future,” said Dr Veena Logarajah, Senior Consultant, Gastroenterology, Hepatology and Nutrition Service, Department of Paediatrics, KK Women’s and Children’s Hospital (KKH). This condition is extremely rare, with up to nine cases for every one million children.

“To date, there are fewer than 50 reported cases of BASD worldwide,” she said. There has only been one case of BASD in Singapore – a now six-year-old boy named Christopher (see box story).

The only treatment for BASD is through oral cholic acid, which patients have to take for the rest of their lives.

For children such as Christopher who respond well to the medication, there is no impact on life expectancy. “If treatment is started early before significant liver damage, there is normalisation of liver function, resolution of liver inflammation, correction of malabsorption of fat-soluble vitamins and improvement in the child’s growth,” said Dr Veena.

One drawback of the treatment is its prohibitive cost, which can come up to thousands of dollars a month for a child of Christopher’s age. The cost is expected to increase as Christopher grows older, since dosage needs to be increased to match growth. According to Dr Veena, the reason for the high cost is because cholic acid is an ‘orphan’ drug; this means that it is manufactured by only a handful of pharmaceutical companies.

“Although the hospital had obtained quotations from several vendors to ensure the most cost-efficient preparation, the challenge was in securing funding in view of the high medication costs,” explained Dr Veena. She added that approval was also required to import it from manufacturers specifically for Christopher’s use as the medication is not registered with the Health Sciences Authority.

Dr Veena shared that there are currently no new drugs that are being developed to treat the condition.

Christopher’s story

Christopher was about six months old when he was admitted to KKH in 2017 due to prolonged bleeding from a wound. An initial test of his liver function revealed abnormalities; he was also suspected to be jaundiced.

Dr Veena, the child’s primary physician, shared: “As this was my first case of BASD, the initial challenge was to confirm the diagnosis. First- and second-line investigations were done to rule out common conditions and we concluded early that this was a rare metabolic disorder.” The results of a genetic test, which arrived after six weeks, confirmed the diagnosis.

Christopher commenced on cholic acid in July 2017 and responded extremely well. His liver function tests became normal eight months after treatment and have remained normal since. He has no features of fat malabsorption and is growing and developing normally.

Understandably, Christopher’s diagnosis has left his parents extremely worried about not only his well-being, but also the financial costs involved. Initial attempts to obtain assisted funding had been unsuccessful, but the family’s stress was somewhat alleviated when they found out about the Rare Disease Fund (RDF), which provides long-term financial support for patients with rare diseases that require treatment with high-cost medicines. The amount of aid disbursed varies, depending on factors such as the family’s income, the patient’s age and required dosage.

About the Rare Disease Fund

The RDF is a charity jointly set up by the Ministry of Health and SingHealth Fund in 2019. It is managed by the KKH Health Fund (part of the SingHealth Fund). The financial support is only possible through public giving, where every \$1 is matched by \$3 from the Government to boost impact of the RDF. Visit <https://www.giving.sg/rare-disease-fund> or scan the QR code to find out more.



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Easing period symptoms

Q I am in my mid-20s but continue to suffer from mood swings when I get my period. I also feel bloated, have sore breasts and the occasional skin breakout. Why do these symptoms happen, and what can I do to ease these symptoms? I read that exercise and eating certain foods can help.

A Bloating, mood swings, sore breasts and skin breakouts are common symptoms when women are menstruating. Some women also suffer from cramps in the lower belly or back, and fatigue during this time.

They could be due to changes in the levels of female hormones (i.e. progesterone and oestrogen) during the menstrual cycle. Changes in brain chemicals like serotonin and that in the body like prostaglandins may also play a role in contributing to these symptoms.

To alleviate these symptoms, you can:

- Take warm baths or apply a heat pack over the lower abdomen, and massage to manage painful cramps and body ache. Over-the-counter medications like NSAIDs (non-steroidal anti-inflammatory drugs) can also help;
- Limit salty foods and keep well hydrated with water to help reduce bloating. To promote a good balance of fluids, avoid carbonated beverages, alcohol, spicy and oily food, and eat more protein-rich foods such as chicken and fish, as well as potassium-rich food such as bananas and tomatoes; and
- Drink plenty of water. Adopting a good skincare routine can help with skin breakouts that occur when hormonal changes lead to an increase in oil production and clogged pores.

A healthy lifestyle that includes regular exercise to help release serotonin, the so-called happy hormone, calming activities like massage, yoga and medication, and period-friendly food rich in fibre, magnesium, calcium and omega-3 can also help.

If pain or other symptoms are unbearable or are affecting your quality of life, seek medical advice.

...
Dr Lim Whui Whui
Consultant, Department of Obstetrics and Gynaecology,
Singapore General Hospital

Reducing dementia risk

Q If there is a family history of dementia, does it mean that descendants are more at risk of developing dementia? What can they do to reduce their risk? Are there foods and exercises to prevent dementia?

A A prominent family history of dementia, especially if dementia occurred at an early age, may be suggestive of an underlying genetic basis as the cause of dementia. If the culprit gene is inherited, a person may have an increased risk of developing dementia.

Making changes to one's lifestyle is a great way to optimise one's risk profile for dementia.

With regard to diet, while there is no specific diet that has been scientifically proven to reduce the risk of dementia, adopting a balanced diet — rich in fruits, vegetables and cereal; minimal red meat and sugar — is helpful.

Exercise, such as aerobics, is important as it has been shown to reduce the risk of dementia. While it would be good to achieve at least 150 minutes of exercise over a week, the important thing is to exercise regularly.

...
Dr Jinesh Mukesh Shah
Associate Consultant, Department of Neurology,
National Neuroscience Institute



... **that** exercise buddies at selected Singapore General Hospital (SGH) and Outram Community Hospital (OCH) wards befriend and motivate patients to start walking early while recovering from illnesses to avoid the risk of de-conditioning?

Patients are often encouraged to start moving as soon as possible to regain their mobility and prevent functional decline. Prolonged bed rest can lead to muscle weakness, joint stiffness, and poorer physical abilities. Starting exercise as soon as clinically safe can facilitate early recovery and discharge.

After assessment by physiotherapists, only patients who need minimal assistance with walking are eligible for the programme, known as Walking with a Star (identified by a gold star pasted at the bedside). The programme, which began with 14 volunteer exercise buddies in May 2023, has benefited more than 180 patients at the end of October 2023.

Patients who underwent the programme said the early interventions helped them rely less on diapers and toilet aids during their hospital stay, and they faced fewer complications such as risk of falls and incontinence post-discharge. Accompanied by their buddies, patients felt more confident and emotionally supported in getting up and walking around the wards.

Volunteers are trained by SGH physiotherapists to support patients with walking aids and gait belt. They are equipped with strategies to facilitate patients to walk safely. The volunteers, who walk with four to five patients in each session, also check patients' vital signs such as blood pressure, heart rate, and oxygen saturation to ensure patients are fit and well.

Following the success of the programme, the SGH Population Health and Integrated Care Office (PHICO) and Department of Physiotherapy are widening the scope of the programme to include patients who have had total knee replacement surgery. The aim is to recruit 30 volunteers to help patients perform simple exercises at the bedside.

PHICO works with community and local partners on empowering community care with the aim of getting Singaporeans to live and age well.



For more information or to volunteer for the programme, visit <https://www.sgh.com.sg/PHICO/Pages/walking-with-a-star.aspx> or scan the QR code.

... **that** there is a Lung Cancer Patient Support Group at the National Cancer Centre Singapore (NCCS)? It is a community that supports patients with lung cancer and their caregivers on their cancer journey. All patients with lung cancer and their caregivers are welcome to join, including those receiving care outside SingHealth institutions. The group currently has about 30 members, caregivers and patients, most of whom are in their 60s.

The support group meets on a bimonthly basis, alternating with an exercise interest group for patients with lung cancer called #lungcancerwillnotkeepmedown. NCCS medical social workers lead the sessions, which are filled with themed activities, such as communicating with caregivers, adopting a healthy and balanced lifestyle, managing mental well-being, and more! A patient advocate also works with the social workers to plan the sessions.

If you are interested to join, please email leap@nccs.com.sg.



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References: 1. 12-week trial of the efficacy and safety of Viartril-S (Crystalline Glucosamine Sulphate) compared with Celecoxib in patients with knee osteoarthritis. A randomised, double-blind, placebo-controlled trial. 2. Superior outcome on functional impairment. 3. Reduces the risk of total knee replacement. 4. Significant cost benefits. 5. Superior outcome on pain relief. 6. Superior outcome on functional impairment. 7. Superior outcome on total knee replacement. 8. Superior outcome on cost benefits. 9. Superior outcome on pain relief. 10. Superior outcome on functional impairment. 11. Superior outcome on total knee replacement. 12. Superior outcome on cost benefits. 13. Superior outcome on pain relief. 14. Superior outcome on functional impairment. 15. Superior outcome on total knee replacement. 16. Superior outcome on cost benefits. 17. Superior outcome on pain relief. 18. Superior outcome on functional impairment. 19. Superior outcome on total knee replacement. 20. Superior outcome on cost benefits. 21. Superior outcome on pain relief. 22. Superior outcome on functional impairment. 23. Superior outcome on total knee replacement. 24. Superior outcome on cost benefits. 25. Superior outcome on pain relief. 26. Superior outcome on functional impairment. 27. Superior outcome on total knee replacement. 28. Superior outcome on cost benefits. 29. Superior outcome on pain relief. 30. Superior outcome on functional impairment. 31. Superior outcome on total knee replacement. 32. Superior outcome on cost benefits. 33. Superior outcome on pain relief. 34. Superior outcome on functional impairment. 35. Superior outcome on total knee replacement. 36. Superior outcome on cost benefits. 37. Superior outcome on pain relief. 38. Superior outcome on functional impairment. 39. Superior outcome on total knee replacement. 40. Superior outcome on cost benefits. 41. Superior outcome on pain relief. 42. Superior outcome on functional impairment. 43. Superior outcome on total knee replacement. 44. Superior outcome on cost benefits. 45. Superior outcome on pain relief. 46. Superior outcome on functional impairment. 47. Superior outcome on total knee replacement. 48. Superior outcome on cost benefits. 49. Superior outcome on pain relief. 50. Superior outcome on functional impairment. 51. Superior outcome on total knee replacement. 52. Superior outcome on cost benefits. 53. Superior outcome on pain relief. 54. Superior outcome on functional impairment. 55. Superior outcome on total knee replacement. 56. Superior outcome on cost benefits. 57. Superior outcome on pain relief. 58. Superior outcome on functional impairment. 59. Superior outcome on total knee replacement. 60. Superior outcome on cost benefits. 61. Superior outcome on pain relief. 62. Superior outcome on functional impairment. 63. Superior outcome on total knee replacement. 64. Superior outcome on cost benefits. 65. Superior outcome on pain relief. 66. Superior outcome on functional impairment. 67. Superior outcome on total knee replacement. 68. Superior outcome on cost benefits. 69. Superior outcome on pain relief. 70. Superior outcome on functional impairment. 71. Superior outcome on total knee replacement. 72. Superior outcome on cost benefits. 73. Superior outcome on pain relief. 74. Superior outcome on functional impairment. 75. Superior outcome on total knee replacement. 76. Superior outcome on cost benefits. 77. Superior outcome on pain relief. 78. Superior outcome on functional impairment. 79. Superior outcome on total knee replacement. 80. Superior outcome on cost benefits. 81. Superior outcome on pain relief. 82. Superior outcome on functional impairment. 83. Superior outcome on total knee replacement. 84. Superior outcome on cost benefits. 85. Superior outcome on pain relief. 86. Superior outcome on functional impairment. 87. Superior outcome on total knee replacement. 88. Superior outcome on cost benefits. 89. Superior outcome on pain relief. 90. Superior outcome on functional impairment. 91. Superior outcome on total knee replacement. 92. Superior outcome on cost benefits. 93. Superior outcome on pain relief. 94. Superior outcome on functional impairment. 95. Superior outcome on total knee replacement. 96. Superior outcome on cost benefits. 97. Superior outcome on pain relief. 98. Superior outcome on functional impairment. 99. Superior outcome on total knee replacement. 100. Superior outcome on cost benefits.

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