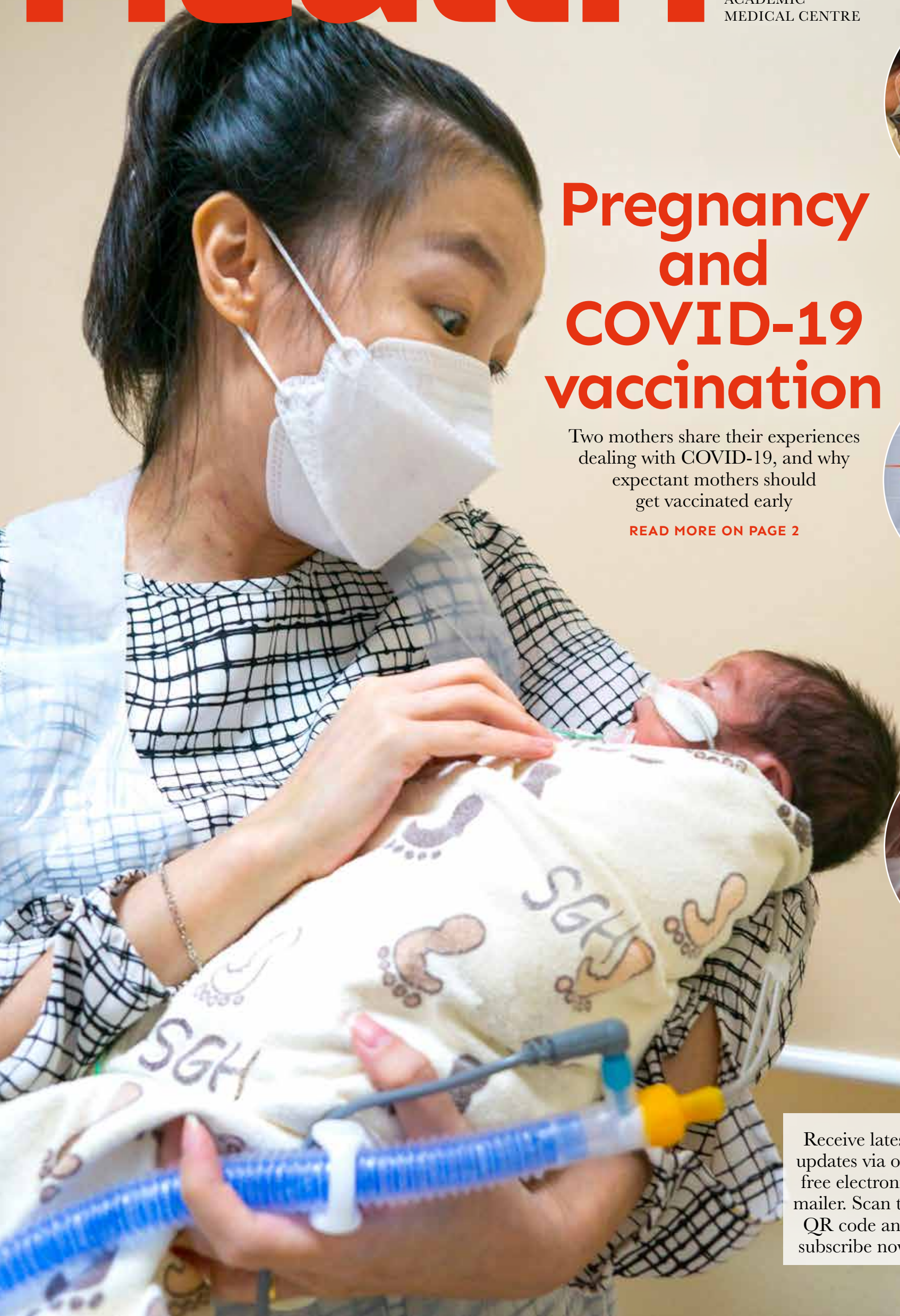


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## Pregnancy and COVID-19 vaccination

Two mothers share their experiences dealing with COVID-19, and why expectant mothers should get vaccinated early

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# Two pregnant women and COVID-19

Pregnant women who postpone their COVID-19 vaccination risk complications to themselves and their unborn foetuses if they catch the virus before delivery, as the experience of these two mothers show.

by Annie Tan and Goh Bee Lian

**M**s Yvonne Khoo nearly lost her life when she caught the COVID-19 virus in her 25th week of pregnancy. Unvaccinated, Ms Khoo had severe respiratory failure when she was admitted to Singapore General Hospital (SGH) in late October last year.

At SGH's intensive care unit (ICU), she immediately had a breathing tube connected to a machine to help her breathe. Even with the ventilator, "her oxygen level was very, very low," said Dr Sewa Duu Wen, Senior Consultant, Department of Respiratory and Critical Care Medicine, SGH. He is also Director, Medical ICU.

Ms Khoo's oxygen level had plunged to 70 per cent from the normal 95 to 100 per cent. Oxygen levels of under 90 per cent are considered a clinical emergency. "Her condition was precarious. Our consideration was how to save the mother, even as we also wanted to save the baby," Dr Sewa said.

Meanwhile, a large team of specialists — respiratory, obstetrics, anaesthesiology, intensive care, infectious diseases, neonatal care — was quickly assembled, and put on standby and on high alert. "Everyone had to come together literally at the snap of the finger," said Dr Tan Wei Ching, Senior Consultant, Department of Obstetrics & Gynaecology (O&G), SGH.

One option the team considered was to deliver the baby immediately to improve Ms Khoo's chances of survival. For Dr Tan, a key consideration was the baby's prematurity. "Should we deliver baby at just 25 weeks?" she said, noting that issues like safe transfer of Ms Khoo to the operating theatre (OT) with equipment necessary for a caesarean section and other emergencies, or delivery at the ICU, also had to be addressed.

Ms Khoo's condition was deteriorating rapidly. Her COVID-19 infection was complicated not just by her pregnancy, but also an underlying kidney condition. Compared to other people, pregnant women have a greater chance of developing severe complications if they are infected with the virus.

Treatment for Ms Khoo's kidney disease had also weakened her immune system. She was thus more prone to a very severe form of COVID-19 infection, said Dr Sewa.

Still, the team decided to let Ms Khoo's baby develop further in the womb. To give mother and baby the best chance of survival, Ms Khoo was deeply sedated and put on extracorporeal membrane oxygenation (ECMO) therapy.

ECMO takes over the function of the patient's lungs and heart, allowing the infected lungs time to recover. Blood is taken out through the big veins, passed through the artificial ECMO lung, where carbon dioxide is taken out and oxygen added before being pumped back into the patient for circulation through the body. For Ms Khoo, getting enough oxygen would also help prevent her foetus from suffering oxygen deprivation.

Ms Khoo spent six days supported by ECMO, and another day on the ventilator before she was able to breathe well on her own. Not long into her recovery, Ms Khoo began to have labour pains and delivered her son at 27 weeks. Although still very early, the extra weeks spent in the womb to develop naturally increased the baby's survival odds, said Dr Tan.

Although baby Yohanne weighed just 789g at birth, he was unaffected by his mother's COVID-19 infection and ECMO

Her condition was precarious. Our consideration was how to save the mother, even as we also wanted to save the baby.



**Dr Sewa Duu Wen**  
Senior Consultant, Department of Respiratory and Critical Care Medicine, and Director, Medical Intensive Care Unit, Singapore General Hospital





» (Above and right file photos) Dr Sewa Duu Wen (with Nurse Clinician Anwen Chan Shi) demonstrates on a mannequin the setting up of the ECMO machine, which takes over the functions of a patient's lungs and heart to allow the infected lungs to recover.

therapy, and was cared for at SGH's neonatal high-dependency ward. Ms Khoo, however, experienced chest pains, difficulty in breathing, and trembling hands even after recovery. She also needed physical and occupational therapy to relearn daily activities like walking, writing and getting out of bed.

"I don't think pregnant mothers would want to go through what I did. I had no choice but to birth my baby three months early and let my baby suffer," said Ms Khoo. The 37-year-old described her one-month stay in isolation at SGH without her family by her side as "not an easy road". During her illness, the now-mother of four worried about dying and leaving her children behind.

Looking back, she wished she had been inoculated early, instead of considering having one

only during her second trimester of pregnancy. "If I had been vaccinated, I think my body would have been able to fight the virus," Ms Khoo said.

Like Ms Khoo, Ms Vanessa Rickard also became infected with COVID-19 during her pregnancy. Her experience was not as harrowing, but the loneliness and fears she experienced in hospital isolation made her determined to encourage other pregnant women about early vaccination. Her family was not able to visit her; furthermore, her husband, elder son and helper also contracted the coronavirus.

When Ms Rickard, then 36, became pregnant during the early days of the pandemic, little information was available about

## Greater risks

Pregnancy already poses a risk for expectant women. They can develop blood clot or thromboembolism in the leg, diabetes (which may or may not go away after delivery), high blood pressure and increased body weight.

A COVID-19 infection raises further the risk of illness and complications such as thromboembolism and respiratory-related problems. Severe COVID-related pneumonia can set in and the patient then needs oxygen support, which can range from intranasal oxygen to incubation, or even mechanical ventilation.

Mothers with severe infections may need to deliver their babies early. Premature birth comes with complications, such as problems with breathing and the heart, brain and other organs because their immune, respiratory and other systems are not fully developed. Premature babies may need intensive care, breathing support, intravenous therapy, and lengthy hospitalisation.

Pregnant women who get very sick from COVID-19 may experience miscarriage, stillbirth or preterm labour.





“

I don't think pregnant mothers would want to go through what I did. I had no choice but to birth my baby three months early and let my baby suffer.

**Ms Yvonne Khoo**  
Patient, Singapore General Hospital

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Photo: Ms Yvonne Khoo

the efficacy and safety of the vaccine on the unborn foetus. Mothers are understandably concerned about how the vaccine might affect their foetus, such as the potential risks of infection, foetal abnormalities or preterm labour, said O&G's Dr Tan.

Indeed, Ms Rickard had many of these concerns. "I thought I would just wait till I gave birth and get vaccinated after that. I wasn't sure what effects the vaccine would have on my baby," she said.

It was only in the second half of 2021 that studies started becoming available showing that vaccination was safe for pregnant women, and that it does not increase the risks of miscarriage, preterm labour, or small, growth-retarded babies. "In fact, it is COVID-19 itself that will increase the risk of pregnancy-related complications if the mother gets very sick," said Dr Tan.

Ms Rickard tested positive for COVID-19 and was admitted to SGH's isolation ward in mid-August. Although her symptoms were relatively mild — runny nose, dry cough, fatigue and loss of smell — she was already in her ninth month of pregnancy. A week later, she felt labour pains and delivered her baby son. She was the first patient to give birth in an SGH isolation ward.

At the time, Singapore had begun seeing a marked increase in community COVID-19 cases. At SGH, the number of pregnant women infected with COVID-19 rose in tandem — from none in July to more than 10 in August and September, said Dr Benjamin Cherng, Senior Consultant, Department of Infectious Diseases, SGH.

"Almost all were unvaccinated, and a few were partially vaccinated. Vaccination rates among this cohort of pregnant women who came

through SGH then were extremely low," said Dr Cherng.

The vaccine has since been shown to be safe for both mother and foetus. "The benefits [of vaccination] certainly outweigh the risks of COVID-19 and its complications," said Dr Cherng.

Interaction between newborn babies and COVID-positive mothers has not been shown to cause an increase in the incidence of neonatal COVID-19 infection, but Ms Rickard chose to be separated from her son for two-and-a-half weeks after delivery. She saw him only via video call.

As with new mothers who have had their vaccination, the breast milk of COVID-positive mothers is also safe and beneficial for babies. Moreover, the Ministry of Health (MOH) said the breast milk of vaccinated mothers may help protect babies from COVID-19 due

to antibodies in the breast milk.

"Initially, when the pandemic started, breast milk was not given to babies, but now, the evidence is pretty clear that breast milk is the best and gives protection for the baby," said Dr Sridhar Arunachalam, Consultant, Department of Neonatal and Developmental Medicine, SGH. The hospital has also been encouraging mothers to breastfeed their babies.

MOH added that no vaccine-related side effects have been reported in the babies breastfed by mothers who received the vaccine while breastfeeding.

As infections in Singapore and elsewhere are climbing again with the advent of the Omicron variant, the need to be vaccinated is ever more urgent.

"Even one dose [of a vaccine] before delivery is better than nothing," said Dr Tan.



Photo: Ms Vanessa Rickard



## Preparing the COVID-19 delivery ward

SGH has been conducting simulations for COVID-positive deliveries since 2020. So when Ms Vanessa Rickard was wheeled into the isolation ward for delivery in August, the team was ready.

Establishing the necessary equipment in the isolation ward was understandably a challenge. The delivery ward — with delivery trolley, medication for emergencies and resuscitator — was essentially brought into the isolation room.

Once labour started, Ms Rickard received midwifery care, with a doctor and nurse present to assess her progress. In case of an emergency caesarean section, an operating room for COVID-positive patients was on standby. A separate isolation ward was also prepared for the baby. Ms Rickard's safe and smooth delivery required collaboration from all departments.

“

I thought I would just wait till I gave birth and get vaccinated after that. I wasn't sure what effects the vaccine would have on my baby.

**Ms Vanessa Rickard**  
Patient, Singapore General Hospital

”





# Overcoming iron deficiency in heart failure patients

At the National Heart Centre Singapore, these patients are now treated with intravenous iron therapy.

by Desmond Ng

An estimated 4.5 per cent of Singaporeans have heart failure — partly due to the higher incidences of diabetes, which leads to ischaemic heart disease — compared to 1 to 2 per cent in the United States and Europe. Ischaemic heart disease, one of the most common causes of heart failure, accounted for about 20.5 per cent of all deaths in Singapore in 2020.

Among heart failure patients here, more than 50 per cent of them are iron-deficient, and this can negatively impact their functional capacity, quality of life and life expectancy, said

Assistant Professor Ng Choon Ta, Consultant, Department of Cardiology, National Heart Centre Singapore (NHCS).

Iron is required to manufacture red blood cells, so a deficiency can lead to symptoms such as lethargy and shortness of breath.

## Treatment available

Intravenous (IV) iron therapy, where iron compounds are delivered to the body through a needle or tube inserted into a vein, can significantly reduce re-hospitalisation and mortality of heart failure patients, according to a global study on iron deficiency in these patients.

The Affirm-AHF (acute heart failure) trial was jointly conducted by researchers from the NHCS and partners in Europe, the Middle East and South America from March 2017 to July 2020.

"The goal was to evaluate IV iron therapy among patients hospitalised for acute heart failure and iron deficiency compared with a placebo," said Dr Ng, who was also co-principal investigator for the trial.

"The primary outcome was a reduction in total heart

failure hospitalisations and cardiovascular death."

As a result of the findings, heart failure patients with iron deficiency admitted to NHCS since last year have been given iron infusion. "IV iron therapy has become part of the recognised therapy. There is definitely an increase in inpatient administration of IV iron treatment," Dr Ng said.

A single dose of IV iron takes about 15 minutes to administer and can last patients a few months.

## Benefits of IV iron

In the Affirm-AHF trial, IV iron and placebos were randomly administered to 1,100 iron-deficient heart failure patients aged 18 years and above from 121 hospitals. These patients were monitored for a year.

Singapore is the only Asian country to take part in the trial, which was the first randomised clinical trial to study the efficacy, safety and outcomes of iron therapy involving the administration of IV iron in patients with iron deficiency and acute heart failure.

The study found that 26 per cent of patients treated with IV iron were less likely to be re-admitted to the hospital or succumb to heart failure, compared to those who were not given the therapy. "This could be due to the improvement in their functions — they feel less lethargic and breathless," Dr Ng said, adding that other studies have shown that oral iron supplements are not as effective as IV iron therapy.

When iron is administered intravenously, it bypasses the gut, and is directly circulated throughout and absorbed into the body to help in the manufacture of red blood cells.



Assistant Professor Ng Choon Ta is the co-principal investigator of a trial that evaluated the efficacy of intravenous iron therapy for acute heart failure patients who are iron-deficient.



## Diagnosing iron deficiency

Iron deficiency is common in patients with heart failure partly due to poor appetite and diet (insufficient intake of iron-rich foods). These patients are also prone to gut wall oedema, which reduces the absorption of iron.

Symptoms of severe iron-deficiency anaemia include fatigue and breathlessness. It can be hard to diagnose mild or moderate iron-deficiency anaemia, as there may not be any signs or symptoms. A regular blood test can identify patients with such deficiencies.

# Don't forget the flu jab



» (Clockwise from top) Dr Matthias G Maiwald, Dr Esther Tan and Dr Wan Wei Yee encourage the public to get a yearly or seasonal flu vaccination to protect against co-infections between common respiratory viruses.

Even though the seasonal flu and common cold were overshadowed by the COVID-19 pandemic in the past two years, it is still important to get the seasonal flu jab to prevent co-infections and complications.

by Patricia Wong

Singapore's seasonal flu, common cold, and other respiratory viral infections saw a significant reduction in the past two years, even as the COVID-19 virus infected thousands and killed hundreds.

While the much lower numbers might make the flu jab now seem redundant, it is still needed, according to a study by Singapore General Hospital (SGH) and KK Women's and Children's Hospital (KKH) microbiologists.

"The response measures aimed at reducing COVID-19 transmission, such as mask-wearing, hand-hygiene practices, working from home and border restrictions, had inadvertently lowered Singapore's number of unrelated respiratory virus infections, including influenza (flu) A or B, and the common cold viruses," said Dr Wan Wei Yee, Senior Consultant, Department of Microbiology, SGH.

However, the study noted that each time some measures were eased, flu and other viral infections returned. "Singapore may see a re-emergence of respiratory virus infections, including influenza, with the easing of travel restrictions and other pandemic control measures," said Dr Matthias G Maiwald, Senior Consultant and Head, Microbiology Service, Department of Pathology and Laboratory Medicine, KKH.

Singapore started allowing vaccinated travel lanes (VTLs), or quarantine-free travel, in September 2021, in a cautious reopening to the outside world.

The study examined data of 42,558 polymerase chain reaction (PCR) tests from SGH, KKH and the National University Hospital in 2019 and 2020. It found that as in previous years, flu and other respiratory virus infections were common in 2019, peaking in December 2019 and January 2020, before starting to decline during the DORSCON Orange and Circuit Breaker periods in the first half of 2020.

Data for 2021, which were outside the study, indicated a similar pattern of the viruses emerging and waning according to Singapore's stringency measures. "In 2021, influenza was basically non-existent in SGH. The pandemic measures pretty much kept the levels of flu very, very low," said Dr Wan.

Some common cold viruses came back during the reopening phases in the second half of 2021, but "flu A and B (two of four influenza strains that cause Singapore's seasonal flu infections) remained near absent in 2021", said Dr Maiwald, adding that with greater travel and relaxation of measures, the flu virus will also likely return.

He pointed out that the spike in infections in December 2019 and January 2020 was typical of the pattern seen yearly (before

the COVID-19 pandemic), which coincided with the school holidays when families travelled overseas.

Vaccination against the flu virus is important and necessary, especially as the dearth of flu infections in the past two years has made our immune systems less prepared for the return of infections, said Dr Maiwald. "Common cold infections keep our immunity trained," he added.

Moreover, it is possible to be infected with both COVID-19 and the flu virus, which is known as co-infection. In studies conducted in other countries, common viruses occurring in COVID-19 patients included the flu A virus, followed distantly by flu B, said Dr Esther Tan, Consultant, Department of Respiratory and Critical Care Medicine, SGH.

No such cases have been detected so far in Singapore, but as the symptoms for both the flu and COVID-19 infections are similar, co-infections might have escaped detection, she said. "The concern with co-infection is that the symptoms may be aggravated, while complications may be more profound, resulting in poorer outcomes."

Co-infections can lead to a higher number of hospital admissions, longer hospital stays, the need for oxygen support and mechanical ventilation in intensive care, and even death. After recovering from a viral infection, such as flu or COVID-19, the patient risks getting a secondary bacterial infection (bacteria superinfection), which again can lead to greater complications and poorer recovery outcomes.

Dr Tan, who is not a member of the study team, reiterated the government's recommendation for the elderly, those with chronic medical conditions or on long-term care, as well as women at any stage of pregnancy, to get a yearly or seasonal flu vaccination.

A 14-day interval between the flu and COVID-19 vaccinations is necessary to avoid potential interactions.

Dr Wan and Dr Maiwald are respectively the lead author and co-author of *Trends in Respiratory Virus Infections during the COVID-19 Pandemic in Singapore 2020*, which was published in the *JAMA Network Open* journal in June 2021.

For more information on the flu and Singapore's vaccination programmes, visit

[www.moh.gov.sg/covid-19/vaccination](http://www.moh.gov.sg/covid-19/vaccination)

[www.healthhub.sg/a-z/diseases-and-conditions/103/topics\\_influenza](http://www.healthhub.sg/a-z/diseases-and-conditions/103/topics_influenza)

[www.moh.gov.sg/resources-statistics/nationally-recommended-vaccines](http://www.moh.gov.sg/resources-statistics/nationally-recommended-vaccines)



# Fuss-free cholesterol tests

Fasting for a blood test to check your cholesterol levels may soon become a thing of the past.

by Sol E Solomon

To determine cholesterol levels, patients typically fast for eight to 12 hours before a blood test. Tests are usually done in the early morning to avoid or minimise causing low blood sugar or dehydration. As SingHealth Polyclinics (SHP) sees more than 100,000 patients with dyslipidemia (cholesterol level that is too high), it is challenging to cater to large numbers of patients in the early morning. The good news is, many patients may no longer need to fast before their tests in the near future.

A study in Denmark found that in a select pool of patients, the cholesterol levels from their tests were similar regardless whether they fasted. Due to the growing number of people with dyslipidemia in Singapore, SHP conducted its own research to evaluate the effects of non-fasting cholesterol tests on Asians.

## A paradigm shift

The study compared the fasting and non-fasting cholesterol levels of 470 patients with high cholesterol and type 2 diabetes who were on statins, a class of cholesterol-reducing drugs. It

showed little difference in the total cholesterol, high-density lipoprotein (HDL) and low-density lipoprotein (LDL) levels between the non-fasting and fasting results, though there was a slight increase in the triglycerides component for most of the non-fasting tests.

"This changes the paradigm and the thinking that patients must fast for a cholesterol test," said Dr Ian Phoon, Consultant, Clinical Lead, Cardiovascular Health Workgroup, SHP, and the main author of this research paper.

"HDL is the 'good' cholesterol that absorbs cholesterol from the blood and sends it to the liver for excretion, whereas high LDL levels indicate higher risk of heart disease or stroke, as excessive LDL can lead to a build-up of plaque in the arteries and cause narrowing of or clotting in the blood vessels," said Clinical Associate Professor Tan Ngiap Chuan, Director of Research, SHP, and Vice-Chair, Research, SingHealth-Duke NUS Family Medicine Academic Clinical Programme.

Triglycerides are a type of fat (lipid) in the blood. When a person eats, the body converts calories

that it does not immediately need into triglycerides, which are stored in the fat cells. In between meals, hormones release the triglycerides for energy.

## Some exceptions

SHP is in the midst of implementing non-fasting cholesterol tests in all its polyclinics.

Despite the research findings, there will still be a small group of patients who are required to fast before their cholesterol blood tests. Six of these subjects (1.28 per cent) had very high triglyceride when they did not fast, causing their LDL to be unmeasurable.

"If a patient is known to have a fasting triglyceride of more than 4.0 mmol/l, he or she should not be offered a non-fasting test, as there is a risk that the triglyceride will rise too high for the LDL to be measurable," Dr Phoon said.

In the coming months, most patients can have a meal before going for their cholesterol test. "Even though there is no need to fast, patients should avoid having a heavy meal. Patients should eat a well-balanced meal before doing the test," Dr Phoon said.



»» High levels of 'bad' cholesterol can lead to clogged arteries and narrowing of blood vessels, which increase the risk of heart disease or stroke, says Clinical Associate Professor Tan Ngiap Chuan (above).



»» Dr Ian Phoon (above and right) is the main author of a research paper, which found that certain patients with high cholesterol may no longer need to fast before their blood tests.





# Transforming healthcare with artificial intelligence

The SingHealth-SGInnovate partnership will advance health science innovations.

by Thava Rani

**H**ealthcare in Singapore will get a technological boost through a partnership inked between SingHealth and SGInnovate in November last year.

The three-year collaboration will leverage artificial intelligence (AI) as well as other emerging technologies to advance health science innovations and further deep technology adoption in healthcare.

"Globally, AI has penetrated many industries. With Singapore having set its sights on becoming a world-class, technology-driven Smart Nation, this collaboration will accelerate the growth of healthcare in the innovation and technological space," said Associate Professor Daniel Ting, Director, AI Programme, SingHealth. He is also a Consultant in the Surgical Retina Department at Singapore National Eye Centre (SNEC).

Prof Ting has been an avid advocate of AI adoption to improve healthcare systems. He has been actively involved in successful healthcare innovation projects, such as the Singapore Eye Lesion Analyser (SELENA+), an AI-powered image reader used to analyse eye scans and identify signs of diabetic eye diseases.

This system was jointly developed by a research team from SNEC's Singapore Eye Research Institute (SERI) and the National University of

Singapore's School of Computing, and alleviates the manpower needed to tackle diabetes, which is currently the world's fastest growing chronic disease.

Recognising the need for healthcare to adapt and leverage the benefits of technology, Prof Ting emphasised the urgency for AI adoption. "The digital revolution is upon us. If we do not keep up, as a small nation, we run the risk of being left behind, to the detriment of our future generations," he said.

## Benefits of partnership

In a nutshell, the tie-up between SingHealth and SGInnovate brings together healthcare professionals who have the clinical and research expertise with companies who have the technological proficiency and resources, and eventually with commercial partners who have the business know-how to catalyse the process of translating novel ideas from bench to bedside.

The partnership will focus on three main areas. Firstly, it aims to advance AI thought leadership in healthcare and innovation communities.

To shape mindsets and promote knowledge and awareness, quarterly AI and digital innovation journal clubs will be organised – with the first held in January this year – where SingHealth's clinicians and innovators can meet up with SGInnovate's public and



Associate Professor Daniel Ting is an avid advocate of adopting artificial intelligence to improve healthcare systems and is actively involved in innovation projects.

private sector partners in the health science and innovation communities. Annually, a workshop will also be held to educate industry partners, healthcare professionals and the public on regulations, research findings and the adoption of various AI systems in healthcare.

Secondly, the partnership provides resources and opportunities for start-ups to grow and create products that will address gaps in healthcare delivery.

"Previously, collaboration opportunities were more ad hoc. We are now streamlining these processes. The partnership will allow us to create an AI Sandbox (refer to sidebar) between the institution and the companies, and establish the processes to move forward systematically," said Prof Ting.

There is also potential for reverse pitching to occur, where the clinician identifies a problem and requests for a technological solution. In this case, SGInnovate's diverse network of companies and innovators will be invited to give ear to clinicians from SingHealth and the other two healthcare clusters, and subsequently develop a suitable solution to address the unmet clinical needs.

"Any technological solution that is created can be further scaled to national or even international levels through SGInnovate's network. Similarly, a technological solution created overseas may be brought to us. There is a possibility then that we may

## Creating an AI Sandbox

An AI Sandbox between the institution and the technological companies may come in two forms:

### Clinical Sandbox

**Situation:** AI algorithms are created by technological companies locally or overseas, but not tested in the local population.

**Solution:** Through SGInnovate, these start-ups or companies are linked to SingHealth, which can provide anonymised relevant data sets from the various research work done by its clinician scientists. The AI algorithms can then be tested to see if they are applicable and generalisable to the Singapore population.

### Technical Sandbox

**Situation:** An AI algorithm is developed and tested in the Asian population in other countries, and is found to be usable. However, it is not tested in SingHealth's digital ecosystem.

**Solution:** A digitally simulated environment is thus created, where testing can occur to ensure compatibility between the two systems.

become the first in Asia to try a certain new solution and test its feasibility and suitability with the Asian population," said Prof Ting.

The third objective is to grow the health innovation talent pool in Singapore. Prof Ting believes that nurturing the younger generation of clinicians and equipping them with the right skill sets will be necessary, in view of the rapid pace of development in this area.

SingHealth and SGInnovate will tap on venture capitalists and multinational companies for on-the-job training opportunities for those with biomedical training or Deep Tech skills to empower them to become globally competitive.

"Over the next three years, we are looking forward to exciting AI and digital innovations to come to fruition with this partnership. These innovations will ultimately benefit patient care – through the improvement of clinical outcomes, enhancement of the patient experience or making processes more cost-effective," said Prof Ting.



The Singapore Eye Lesion Analyser (SELENA+) is an AI-powered image reader used to analyse eye scans and identify signs of diabetic eye diseases.



# Stopping sepsis in its track

A new technique using an electrocardiogram can predict the severity of deadly sepsis quickly and effectively, allowing for more timely treatment.

by Annie Tan

**S**ome simple infections can rapidly turn into a life-threatening medical emergency known as sepsis. Its early symptoms are often not obvious; if not detected and treated quickly, the condition can quickly develop into severe sepsis and septic shock. The death rate can be as high as 50 per cent.

To determine the risk of sepsis-related death quickly and ensure timely treatment, researchers at Singapore General Hospital (SGH) and Duke-NUS Medical School have developed a technique to predict the severity of sepsis in five minutes.

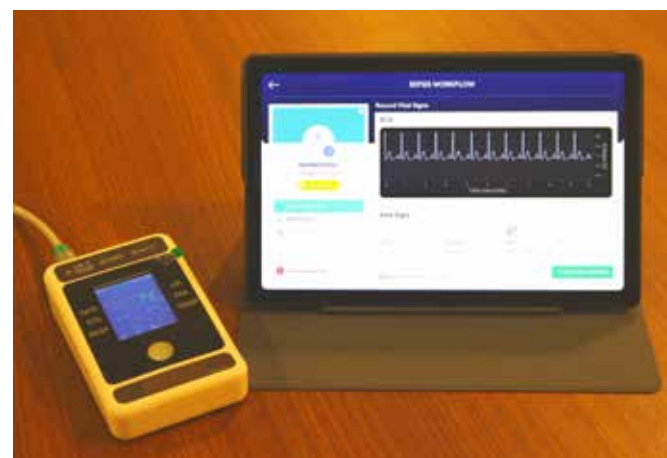
"Our emergency department sees more than 1,000 patients a year who present with sepsis. In a busy environment, it helps to be able to quickly stratify them according to severity and mortality risk so that the department can efficiently redirect necessary resources and care to prevent patients with a higher risk from going into septic shock," said Professor Marcus Ong, Senior Consultant, Department of Emergency Medicine (DEM), SGH, and the study's senior author.

With the new technique, vulnerable patients like the elderly and the young, who may

not be able to easily describe their symptoms, can be treated more quickly and monitored more closely, while those at lower risk can avoid unnecessary hospital admission, care and treatment, added Prof Ong.

Currently, a blood test is used to accurately assess a sepsis patient's risk of dying. However, the test results can take two to four hours, which delays treatment. The team looked at expanding the use of a test known as heart rate variability (HRV) for its quick results.

"Traditional Chinese medicine has known for thousands of years that the pattern of the pulse contains important medical information. Heart rate should accelerate or decelerate according to stimulation. If there is a loss in HRV, it means that there is some severe disease in the autonomic nervous system," said Prof Ong, who is also Director, Health Services and Systems Research (Signature Research Programme),



▶▶▶ A normal heart rate will respond by quickening or slowing according to stimulation, says Professor Marcus Ong. When heart-rate variability drops, it can mean the body is experiencing some severe infection, such as sepsis.

Duke-NUS Medical School.

The team's Heart Rate n Variability (HRnV) model uses an electrocardiogram (ECG), with three electrodes attached to the patient's chest to record his heartbeat. The time interval between heartbeats is analysed using an algorithm. Other variables include age, respiratory rate, blood oxygen levels, and other vital signs. The artificial intelligence (AI)-based tool is able to predict the severity of sepsis with an accuracy of more than 90 per cent, outperforming other established sepsis risk-scoring models.

HRV analysis is a useful tool for assessing sepsis patients' mortality risk, but the amount of information that can be extracted is limited, said Associate Professor Liu Nan, the study's corresponding author.

"HRnV, on the other hand, provides us with additional information to improve prediction. With the availability of more biomarkers derived from HRnV analysis, advanced AI approaches can be used for accurate and reliable patient risk

assessment," said Prof Liu, a data scientist from Duke-NUS's Centre for Quantitative Medicine and Programme in Health Services and Systems Research.

During the course of their research, he said they found that "HRV may change even before other symptoms appear".

The HRnV model used the data of 342 sepsis patients who were seen at SGH's DEM between September 2014 and April 2017. To further validate its effectiveness, the team is conducting a larger study involving 1,000 patients at SGH and the National University Hospital. Another study involves infants at KK Women's and Children's Hospital. The team also wants to determine whether the technology can be developed into bedside devices for other uses in the DEM, clinics and even in homes for monitoring purposes.

Every year, sepsis kills more than five million people worldwide. In Singapore, close to 5,000 deaths were attributed to sepsis from pneumonia and urinary tract infection in 2019.



▶▶▶ Professor Marcus Ong (left) and Associate Professor Liu Nan (right) are respectively the senior author and corresponding author of a study to develop an artificial intelligence-based tool to predict the risk of sepsis.





# Walking on sunshine

Vitamin D deficiency is common among hip fracture patients, and associated with poorer recovery of function and quality of life after surgery.

by Desmond Ng

**D**on't underestimate the importance of sunlight. Exposure to the sun's ultraviolet B rays helps the body make vitamin D, or the 'sunshine' vitamin, which is needed to keep bones and muscles healthy.

Indeed, patients who severely lacked vitamin D did not recover as well after their hip fracture surgery procedure, a Singapore General Hospital (SGH) study of elderly patients has found.

"Our study shows that there is poorer recovery of function after hip fracture surgery in patients with severe vitamin D deficiency. This represents a risk factor that should alert the clinician to design more focused rehabilitation protocols and manage the bone health of the patient," said Associate Professor Joyce Koh, Senior Consultant, Department of Orthopaedic Surgery, SGH, and the study's senior author.

The study, *Preoperative severe vitamin D deficiency is a significant independent risk factor for poorer functional outcome and quality of life 6 months after surgery for fragility hip fractures*, also includes contributions by lead author Dr David Sim, a medical officer on attachment at SGH's Orthopaedics Department. The study was

published in the medical journal *Osteoporosis International* in May 2021.

The team aimed to find out the link, if any, between vitamin D levels and how well patients with hip fractures recover after hip surgery, as such data are limited. They assessed 664 patients for their vitamin D levels, general health, and mobility and physical functions. The patients had undergone hip surgery, including replacements, in SGH between January 2012 and December 2016. They were assessed again after six months, when they were expected to have recovered from the effects of hospitalisation and surgery.

The participants had an average age of 77 years. More than two-thirds of them were women. The study found that of the 664 patients, 48 per cent suffered from vitamin D deficiency, including 9 per cent who were severely lacking in vitamin D.

Although this represents nearly half of the patients surveyed, the number is still "significantly lower than reported rates of vitamin D deficiency in other study populations (77 to 87 per cent)" overseas, according to the study.

"The likely reason is due to the tropical climate in Singapore with sunshine all year round. There is reasonable exposure to sunlight during outdoor activities, which

helps the body manufacture its own vitamin D," said Prof Koh.

"Nevertheless, there is still vitamin D deficiency observed in this cohort. Possibly, patients with hip fractures are less active, with reduced exposures to sunlight during outdoor activities. They may be more frail, and have higher fall rates and poorer bone strength," she added.

The study also found that patients with severe vitamin D deficiency have poorer mobility and physical function, and were likely to have a greater chance of falling.

More can be done to help patients who are at risk. Hip fracture is an important cause of disability in the elderly, while vitamin D deficiency has been associated with more deaths, greater complications, and poorer cognitive status in such patients.

"The prolonged COVID-19 situation may have an impact on outdoor exposures among frail elderly patients, and this can have unknown downstream effects," said Prof Koh.

So, an important first step would be to ensure the elderly patients stay active and take part in outdoor activities regularly. While supplements can be taken to boost vitamin D levels, the effects are controversial and deserve further investigations, she said.



» More focused rehabilitation and bone health management are needed for vitamin D-deficient patients after hip fracture surgery, says Associate Professor Joyce Koh.



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### What should I look for when buying alcohol-based hand rub (ABHR)?

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» Before the COVID-19 pandemic, the Department of Medical Social Services would organise events to engage the seniors (above), as well as quarterly memorial services (left) for bereaved families whose loved ones had passed on in Bright Vision Hospital.

Therapy sessions that Ms Chin and her colleagues used to run before the pandemic hit. During these sessions, Medical Social Workers would engage the elderly patients by displaying and showing pictures of vintage collectibles to evoke their memories and nostalgia, and spark conversations.

"This encourages patients to take a walk down memory lane, and allows us to better connect with them when they share their stories with us," Ms Chin said.

Ms Chin and her team also ran quarterly memorial services for bereaved families whose loved ones had passed on in BVH. "We want to let them know that their loved ones are remembered while also bringing some closure for the family," she explained.

"These memorial services are always very emotional and meaningful for family members. For the team, it is also meaningful and gratifying knowing that we can make a difference to both patients and their families," she said.

### Overcoming challenges

Ms Chin has been working at BVH for 10 years, during which she has been through her fair share of challenges.

When the hospital was converted into a COVID-19 Care Facility in April 2020, Ms Chin and the other Medical Social Workers were part of the team of frontliners who were tasked to care for COVID-19 patients. During that period, many of the patients were migrant workers. It was especially challenging due to the language barrier, as some did not understand English.

"We had to find creative ways to work around this situation. For example, we used Google Translate when translators were not available. Colleagues who could speak the respective languages also stepped forward to help. With time, a rapport was built with the patients, and we were able to connect better with them during that difficult period."

Despite these challenges, Ms Chin is passionate about helping patients. She credits her team for supporting her through both good and tough times. "I am thankful to my team. We believe in working hard and helping one another. With this spirit, we can achieve more."

# Bringing comfort to patients and caregivers

Medical  
Social Worker  
Ms Eunice Chin

supports patients and caregivers emotionally, and links them to resources for social, financial and other care-related assistance.

by Elena Owyong

Before the COVID-19 pandemic, Ms Eunice Chin and her team of Medical Social Workers would visit patients and their family members at the wards to interact with them and build rapport. She is the Team Lead and Manager of the Department of Medical Social Services at Bright Vision Hospital (BVH), which is managed under SingHealth Community Hospitals.

"Before the COVID-19 pandemic, we made it a point to meet with every patient because some of them might have problems that they might not have shared with the clinical staff," she said.

Before the COVID-19 pandemic, we made it a point to meet with every patient because some of them might have problems that they might not have shared with the clinical staff.



**Ms Eunice Chin**  
Team Lead and Manager, Department of  
Medical Social Services, Bright Vision Hospital

Ms Chin and her team also conduct psychosocial assessments to better understand how to assist these patients.

"For example, with patients who had suffered a stroke, we would find out how their family is coping, and if they are struggling to reconcile with losses of sorts, including the loss in mobility and functions. Sometimes, patients may also have other underlying issues that can affect his or her psychological well-being," Ms Chin said.

Some of these issues may include parenting, marital or financial difficulties, which Ms Chin would then refer to social services agencies for better management.

### A team effort

Ms Chin likens her work to the "social arm" in patient care, where she works alongside a multidisciplinary team comprising doctors, nurses and allied health professionals to care for patients.

The multidisciplinary team meets regularly to communicate information such as patients' discharge plans so that all members have a holistic understanding of patients' needs and condition.

To improve the emotional well-being of patients and their caregivers, Ms Chin would conduct regular group sessions to engage them in fun activities.

One example is the Reminiscence





»»» Dr John Loh manages a diverse range of conditions affecting the head and neck region.

# Helping patients live and sleep better

From treating tonsillitis to sleep disorders, it's all in a day's work for Dr John Loh.

by Thava Rani

One of the most basic surgical skills that ear, nose and throat (ENT) specialists are trained to perform is a tonsillectomy, or the removal of the tonsils.

At Changi General Hospital (CGH), Dr John Loh and other ENT surgeons go through about 100 cases of adult tonsillectomies every year, making up about a third of the nation's total cases.

"A viral or bacterial infection may cause the tonsils to get inflamed, which is a condition known as tonsillitis. When patients have chronic or recurrent tonsillitis, a tonsillectomy is recommended," said Dr Loh, Associate Consultant, Department of Otorhinolaryngology – Head and Neck Surgery, CGH.

Tonsils are a pair of oval-shaped pads found at the back of the throat and are part of the body's defence system to prevent infections. A patient with tonsillitis may experience severe sore throat, high fever, or enlarged lymph nodes that feel like lumps along the neck.

Although tonsillitis is a common condition, Dr Loh cautions against taking it lightly.

"Sometimes, the inflammation can be serious enough to cause airway obstruction or form abscesses. We look out for danger signs like difficulty in swallowing,

poor food and fluid intake, dehydration, and difficult or noisy breathing," said Dr Loh.

He is also wary of asymmetrical enlargement of one tonsil, a non-healing ulcer, or enlarged neck lymph nodes, which could be signs of tonsil cancer.

Apart from tonsillitis, Dr Loh manages a diverse range of conditions affecting the head and neck region, such as allergic rhinitis, and cancers of the thyroid, head and neck.

"I find the head and neck region fascinating because of the complex anatomy and close proximity to many sensory organs. I also have a particular interest in sleep medicine and surgery, as the effects of sleep disorders are far-reaching."

In the course of his work, he has seen how sleep disorders, such as snoring, upper airway resistance syndrome and obstructive sleep apnoea (OSA), not only affect the quality of a person's sleep, but also cause tiredness and fatigue during daytime, and in some cases even lead to higher risk of heart disease and stroke.

Most people sleep for a third of their life, and yet sleep disorders tend to be under-diagnosed.

An especially challenging and complex condition to treat is OSA,

as patients usually have several co-existing medical problems requiring the help of a multidisciplinary team. Dr Loh works with specialists from the respiratory, psychiatry, psychology and neurology departments to ensure that the care plan is individualised, while taking into consideration the patient's anatomy and lifestyle needs.

"This way, we can achieve optimised outcomes for the patient," said Dr Loh.

He once had a patient who was barely getting an hour of quality sleep every night due to OSA. A home sleep study revealed that

he experienced severe drops in oxygen levels caused by frequent and repeated pauses in breathing during sleep. While the levels generally returned to normal once regular breathing restarted, Dr Loh knew frequent breathing gaps can pose serious health concerns. He then started the patient on continuous positive airway pressure (CPAP) treatment.

"After the treatment, the patient felt energised with eight hours of quality sleep, compared to previously where he felt lethargic even with more than 10 hours of sleep," said Dr Loh.

It is moments like these that give Dr Loh a sense of satisfaction, knowing that he has helped improve and resolve patients' problems.

On working days, Dr Loh is in the hospital by 8am to do his ward rounds, during which he follows up on patients who have been admitted for ENT conditions. Once a week, he is in the operating theatre to perform ENT-related surgeries.

Other than clinical duties, he teaches medical students from the National University of Singapore's Yong Loo Lin School of Medicine and Nanyang Technological University's Lee Kong Chian School of Medicine. He also mentors junior doctors.

"As a beneficiary of countless hours of mentorship, I feel it is now my responsibility to guide the next generation of doctors and students along their journey," he said.

To unwind, Dr Loh enjoys regular exercise and an occasional glass of wine. While not quite an adrenaline junkie, he used to look forward to regular diving and snowboarding trips overseas before the COVID-19 pandemic.

These days, he has found a different outlet in the form of monthly jamming sessions with a hobby band called 'Haphazards', with whom he plays the drums.

I have a particular interest in sleep medicine and surgery, as the effects of sleep disorders are far-reaching.

Dr John Loh

Associate Consultant, Department of Otorhinolaryngology – Head and Neck Surgery, Changi General Hospital

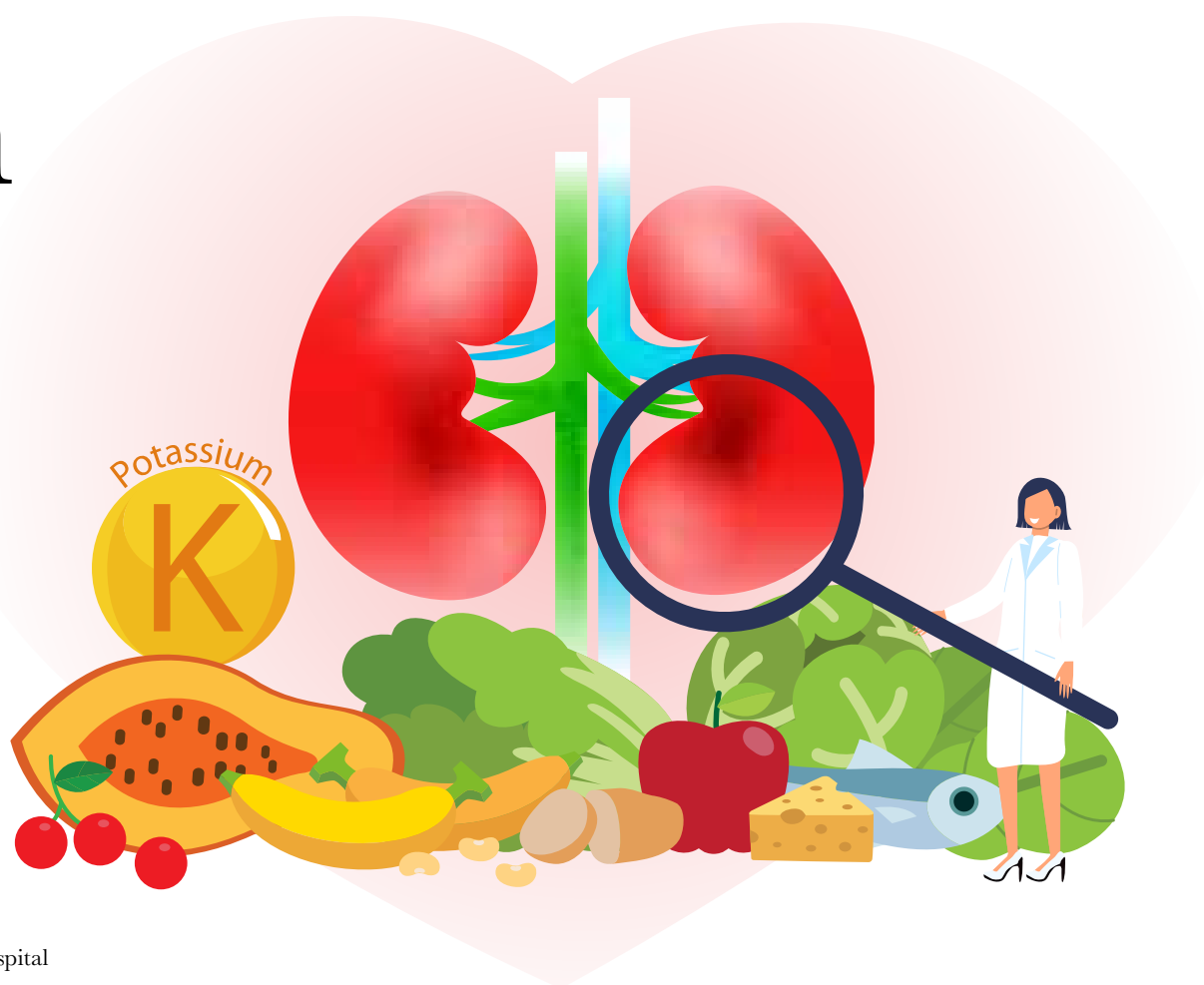




# Potassium and your kidneys

People with poor kidney function tend to have potassium imbalance, where too much can be just as dangerous as not getting enough. March is World Kidney Awareness month.

Information provided by **Dr Kwek Jia Liang**,  
Consultant, Department of Renal Medicine, Singapore General Hospital



## Potassium and your body

Potassium regulates our blood pressure, muscle and nerve movements, and normal functioning of cells.

## Where do we get potassium?

Food like fruits and vegetables, as our body does not naturally produce potassium.

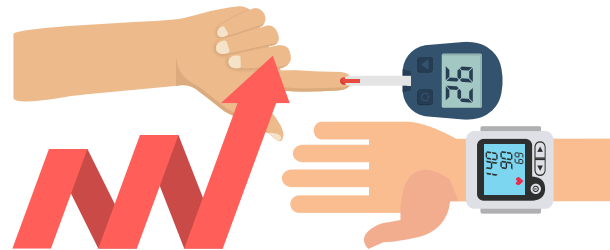
## I eat lot of bananas. Will I get hyperkalaemia?

Usually no, unless you have kidney problems.



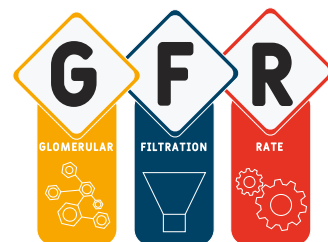
## Kidney disease in Singapore

- Singapore tops the world for diabetes-induced kidney failure.
  - An average of 5.5 new patients are diagnosed with kidney failure in Singapore every day.
  - Long-term kidney disease in Singapore is projected to rise from 16% in 2007 to 24% by 2035 due to the rising incidence of diabetes and high blood pressure, and an ageing population.
- (Source: The National Kidney Foundation)



## A healthy kidney has ...

- a GFR of at least 60, preferably more than 90. A GFR of under 60 suggests kidney disease, and 15 or under suggests kidney failure. GFR, or glomerular filtration rate, measures how well the kidneys filter blood.
- an albumin (a protein found in the blood) level of under 30. A level of above 30 suggests kidney disease.



## What happens if our potassium levels are too high or too low?



MEDICATIONS



POOR DIET



VOMITING



DIARRHOEA



HEART FUNCTION



MUSCLE FUNCTION

The kidneys maintain potassium balance in the body, using what it needs and excreting the excess in stools or sweat, but mainly through the urine.

Potassium levels can fall out of the normal range of between 3.6 ml per litre (ml/l) and 5 ml/l because of the effects of some medications, poor diet, or after a bad bout of diarrhoea or vomiting.

In people with chronic kidney disease, abnormal potassium levels can result in hyperkalaemia (overly high levels) or hypokalaemia (overly low). If untreated, either condition can affect the functioning of the heart or muscles. Very severe hyperkalaemia or hypokalaemia can be life-threatening. Mild hyperkalaemia and hypokalaemia usually have no symptoms, and are detected through blood tests.

Hyperkalaemia is common among kidney transplant patients because of the medications they take or if their new organ does not function well immediately. These patients are generally on blood pressure medications, antibiotics and strong immunosuppressants, all of which affect potassium levels. They can also suffer from hypokalaemia, although this is less common.

When the newly transplanted kidney is recovering in the body, it can excrete a lot of urine, which then pushes potassium levels down.





# Medication management for Parkinson's disease is key

Patients with Parkinson's disease must remember to stick with their complicated medication regimen to better manage their condition.

by Elena Owyong

## Digital aid

To remind patients to take their medications on time and monitor their symptoms, NNI has developed Parkinson's Care, a new feature on the SingHealth Health Buddy app. Users can make use of the following functions:

- **Symptom trackers** — monitors and records symptoms, such as when the effects of medication wear off, body discomfort (aches, cramps), bowel movements and sleep patterns
- **My Goals** — allows patients to set simple goals, such as doing three short exercises a day
- **My Exercise Diary** — contains videos and guides demonstrating exercises useful for patients with PD
- **Medicines Reminder** — patients can key in medicine timings to receive timely reminders
- **Appointment Reminder**

**M**edication plays an important role in the treatment of Parkinson's disease (PD). It is common for patients with PD to take a variety of medications as frequently as five to eight times a day, with some at strict and specific time intervals.

Associate Professor Prakash Kumar, Head of Neurology, Sengkang General Hospital, and Senior Consultant, Department of Neurology, National Neuroscience Institute (NNI), estimates that at least one out of three patients with PD have problems taking their medicine on time. This can pose serious issues, as symptoms can re-emerge within 30 minutes of a missed dose, affecting the patients' daily activities.

## A progressive disease

PD is caused by the degeneration of brain cells that produce important neurochemicals like dopamine.

Dopamine transmits messages from the brain to control movements. This is why patients with PD commonly experience movement-related issues, such as uncontrollable shaking in their limbs when they are resting, unnaturally slow movement, stiffness, and difficulty balancing when they walk or stand. Some patients also have problems swallowing and suffer from sleep issues, depression and constipation.

In Singapore, three in 1,000 people above 50 years old suffer from PD. This is set to increase by 2030 due to the ageing population and increased life expectancy.



» The effectiveness of PD medications are significantly impacted if patients do not adhere closely to their medicine schedule, says Associate Professor Prakash Kumar.

PD can affect individuals of any age, although it is more commonly diagnosed in those aged 50 years and above.

According to Prof Prakash, about five per cent of patients with PD in Singapore are below 50 years old — a condition known as young-onset Parkinson's disease. Currently, there are no conclusive tests to diagnose this condition, and a detailed examination by a neurologist is required to confirm the diagnosis.

Generally, the disease progresses in five stages. At the first stage, symptoms are mild and patients can carry out their daily activities with minimal difficulty. As the condition progresses into the second stage, tremors and stiffness may affect both sides of the body, and patients may take longer to perform their activities.

At the third stage, patients experience balance and gait issues, and may even suddenly find themselves being unable to move while walking. They may also

fall more easily due to balance issues. By the fourth stage, most individuals will rely on mobility devices to get around. At the fifth stage, patients become bed- or wheelchair-bound.

"On average, the disease takes eight to 10 years to progress from early to advanced stage. Some patients may remain active for up to 20 years even after diagnosis, while some may experience a faster deterioration," Prof Prakash said.

## Timely medications

The medicine for PD patients can be broadly classified into two categories — levodopa-containing agents and levodopa-sparing agents.

Levodopa-containing agents, including medicines like Madopar and Sinemet, are known to be effective in improving patients' symptoms, such as stiffness in the neck, limbs and body, and slowness of movement.

On the other hand, levodopa-sparing agents, such as Selegiline and Ropinirole, are usually used to treat younger patients in the early stages of the condition.

"As the disease progresses, patients may require a higher dosage, more frequent doses, or a combination of medications to help them manage the condition," Prof Prakash said.

Levodopa-containing medications are to be taken one hour before meals. If patients choose to have their meals first, they must wait for at least two hours before they take their next dose of medication.

Explaining the reason for the complex medication regimens, Prof Prakash said, "If the medicine is taken together or very close to mealtimes, the food, which contains protein, drastically affects the absorption of medicine in the intestines. This significantly reduces the efficacy of the medicine, and consequently its effects on the brain cells."

There is currently no cure for PD; medication can only help alleviate symptoms. Patients may also be prescribed physiotherapy, occupational therapy and speech therapy to help them cope with their daily activities.

By adhering closely to the medicine schedule and prescribed exercises, caregivers and patients can better control the symptoms and disease progression to make living with PD more manageable.



# When life-limiting illness strikes

With Singapore's ageing population, the need for palliative care has been on the rise.

by Suki Lor

»» Palliative care is aimed at improving quality of life, and can be given at any point following diagnosis of a life-threatening illness and not only in a patient's final days, says Dr Ong Wah Ying.



**T**hink palliative care, and oftentimes, the stigma deters patients and their caregivers from seeking this form of help because they perceive it as giving up on life or losing hope.

Dr Ong Wah Ying, Senior Consultant, Division of Supportive and Palliative Care, National Cancer Centre Singapore (NCCS), is keen to dispel this misconception.

"Palliative care is a core part of basic care. It is really to improve the patients' quality of life and help them live life to the fullest. This includes enabling them to spend time with their loved ones meaningfully. I hope that these negative perceptions will change with a greater sense of awareness through education," Dr Ong said.

## Not only for final days

Patients with life-threatening conditions such as advanced cancer can turn to palliative care for support throughout their journey.

The holistic care is provided by a team of medical professionals comprising doctors, nurses, medical social workers and allied health professionals such as physiotherapists, occupational

therapists, speech therapists, music and art therapists, and pharmacists.

## Care for caregivers

"We do not just care for the patient; we also care for their caregivers or loved ones," Dr Ong said.

Family members tend to be the main caregivers who provide both physical and emotional care for the patient. This can be a very challenging task.

"We make sure that their needs are also being attended to. Usually, the medical social workers will reach out, but various members of the team can also support them as and when needed," she said.

## Availability of care

Palliative care can be given in a variety of settings, such as at home, day care centres, nursing homes, hospices, specialist clinics, and acute and community hospitals.

Some patients may be admitted to inpatient hospices if they lack a full-time caregiver or have symptoms such as pain or breathlessness that require close monitoring.

"In such instances, it is not safe for them to stay at home. Being at a hospice ensures that

holistic care is provided by the palliative care team who can offer the necessary support needed," said Dr Ong.

With the right environment and support, the burden of illness on the patients and their families can be lightened, allowing the journey in the face of disease and imminent death to be one of grace and dignity.

Indeed, some patients have left an indelible impression on Dr Ong, who has been involved in palliative care for more than a decade.

She remembers a patient who came from a musically inclined family. Her family members set up a gathering and played music in celebration of her life until she took her last breath. "It was their way of saying goodbye to her, in the way she wanted," Dr Ong said.

## New centre

In Singapore, the population continues to age rapidly, with 15.2 per cent aged 65 years and above in 2020, compared to 14.4 per cent in 2019. By 2030, one in four Singaporeans will be aged 65 and above.

In a study conducted by Duke-NUS Medical School, it was found that the proportion of

older adults (aged 60 and above) in Singapore with three or more chronic diseases rose from 19.8 per cent in 2009 to 37 per cent in 2017. As a result, the need for palliative care has been on the rise over the years, Dr Ong said.

"The demand is also increasing due to better understanding that palliative care can be sought earlier rather than later," she said.

Singapore has come a long way in the field of palliative care, with courses for healthcare workers and new services offered today. Nevertheless, more needs to be done to raise awareness of the importance of palliative care in managing a patient's healthcare journey.

The SingHealth Duke-NUS Supportive and Palliative Care Centre, launched in March 2021, aims to meet these rising needs of Singapore's ageing population, with a focus on clinical service, education, research, and community partnership. It also integrates existing specialist palliative care services within SingHealth, and fosters strategic collaboration with community partners, such as Assisi Hospice, HCA Hospice Care and St. Andrew's Community Hospital, to achieve coordinated care.





»»» Type 1 diabetes is a life-changing condition whose management needs to fit in with various aspects of a patient's life, says Dr Daphne Gardner.



# A round-the-clock challenge

Dealing with type 1 diabetes is not easy, but it can be done with understanding and empathy from loved ones.

by Thava Rani

Living with type 1 diabetes (T1D) takes a lot more than just watching food intake and injecting insulin. Unlike type 2 diabetes, it needs constant attention — a 24-hour job that the patient did not sign up for. “It is a life-changing condition that has many lifelong implications. Once diagnosed, management of T1D needs to fit in with life, whether it is studying, forming relationships or pursuing careers,” said Dr Daphne Gardner, Senior Consultant, Department of Endocrinology, Singapore General Hospital (SGH).

T1D is a big challenge that needs understanding and support from family and friends, she added. In Singapore, one in nine people have diabetes, of which under five per cent have T1D. It is important to know that T1D is different from the more common and better understood T2D. In T1D, insulin replacement is most important in its management, aiming to mimic the body's production to keep glucose levels within a healthy range, and to minimise sudden dips (hypoglycaemia) or spikes (hyperglycaemia). Our body cells need glucose for energy production, and the insulin hormone acts like a key to open the door for glucose to enter the cells. In T1D, the pancreas no longer produces insulin. Without insulin, glucose levels in T1D patients rise in the bloodstream. Insulin replacement is therefore needed to keep blood glucose levels in check. Some amount of insulin is always present in the body. During meals, more insulin is produced to react to the carbohydrates (which contain glucose) consumed. T1D patients need to inject background or basal insulin once or twice a day, and three quick-acting insulin to cater to the three meals. “The patient has to learn how to calculate the bolus, or mealtime insulin, dose based on the amount and type of carbs being eaten. They also have to take into account the amount of insulin pre-existing in the body. So, they have to pick up skills like carbs-counting and blood

glucose self-monitoring,” said Ms Lim Huee Boon, Diabetes Nurse Educator, SGH. Further fine-tuning of the doses is needed when exercise, sick days, menstruation, alcohol intake, and stress come into the picture, noted Dr Suresh Rama Chandran, Consultant, Department of Endocrinology, SGH. Mastering insulin use takes time, requiring the patient to stay the course. Participating in SGH's five-day diabetes education programme (DAFNE), as well as using insulin pumps, continuous glucose monitoring devices and other aids can help. “As patients get better and become more confident in their self-care, T1D will become less restrictive, allowing patients some normalcy in their lives,” Dr Suresh said. Managing T1D is demanding, and can put emotional and psychological pressures on patients who feel anxious and helpless. Setting realistic targets and celebrating small successes can encourage patients. Social stigma concerns can also lead many to hide their condition from others, such as skipping their injections when in public. “These are all very real concerns. Some patients may find comfort in online or physical peer support groups. Having friends and family who understand the condition and are empathetic to their situation can go a long way, too, in helping them better navigate the challenges,” said Dr Suresh. Dr Gardner, Dr Suresh and Ms Lim spoke at a webinar on diabetes.

What is the difference?		
	Type 1 diabetes (T1D)	Type 2 diabetes (T2D)
What it is	No insulin produced by pancreas	Cells do not respond to the insulin present
What causes it	<ul style="list-style-type: none"><li>Immune system regards insulin-producing cells as foreign, and produces antibodies against them</li><li>Unknown cause, especially in Asians, with most testing negative for antibodies</li></ul>	<ul style="list-style-type: none"><li>Often related to weight gain, although this is not a common reason among Asians</li></ul>
Who gets it	<ul style="list-style-type: none"><li>Children, usually under the age of 10 years</li><li>Adolescents, usually during puberty</li><li>Young adults</li></ul>	<ul style="list-style-type: none"><li>Mostly adults</li><li>Increasingly, children and adolescents</li></ul>
Treatment	Multiple insulin injections daily	<ul style="list-style-type: none"><li>Weight loss can help reverse disease for some</li><li>Oral medications</li><li>Daily insulin injections eventually needed for 10 to 15 per cent of patients</li></ul>



## Q&amp;A

HealthXchange.sg

## Care tips for breast cancer survivors



**How can I maintain good health after recovering from breast cancer?**



Breast cancer survivors are advised to continue life-long surveillance with their surgeon and/or oncologist. Annual mammography and clinical evaluation every three to six months for three years, six to 12 months for the following two years, and annually thereafter are recommended.

I believe the best advice one can give to all cancer survivors is to stay healthy and happy! Exercise and maintain a healthy weight and diet, while keeping ahead of any other medical issues.

The Health Promotion Board recommends 150 minutes of moderate aerobic activity or 75 minutes of vigorous activity each week. Research has shown that physical activity can reduce the risk of breast cancer by 25 to 30 per cent. While the reasons for this are still unknown, this could be related to the general positive impact of physical activity on our immune system and improved body composition, with reduced fat accumulating around the abdominal organs (visceral adipose tissue).

For cancer survivors, exercise can also reduce treatment-related fatigue syndrome, potential onset of depression, help regain a sense of self, and improve quality of life.

**ASSISTANT PROFESSOR SABRINA NGASERIN**  
Breast Surgical Oncologist and Consultant, Breast Service,  
Sengkang General Hospital

## Taking a shower the right way



**Some celebrities like Mila Kunis, Ashton Kutcher and Brad Pitt are touting the benefits of not bathing, as they believe not washing regularly maintains the skin, which cleans itself naturally. Is this true and will it benefit people who have sensitive skin? Is this habit suitable considering Singapore's hot and humid climate? For people who do not have skin problems, is it a good idea to bathe in hot or cold tubs? Should we use antibacterial soap instead of regular soap, especially during the COVID-19 pandemic?**

The skin is not naturally capable of cleaning itself. During the current pandemic, it is advisable to shower after returning home every day but it is not necessary to use antibacterial soaps.

While showering with only water will remove sweat, cleansers like soap are needed to remove dirt, oil, germs and dead skin cells. A mild commercial cleanser, such as those sold in supermarkets and pharmacies, is adequate for people with no skin problems and patients with skin conditions like eczema and psoriasis. Similarly, children can use mild cleansers to wash, even after vigorous exercise. Long showers are not necessary.

Excessive washing can make the skin dry. Elderly people are prone to dry skin and those with eczema should take short showers once a day. They should use a mild cleanser to wash the armpits and private parts, then rinse the whole body before patting dry and applying a moisturiser.

Scrubbing hard with a wash cloth or a sponge before soaking in a hot tub may be harmful to the skin. Even soaking in cold water, where water exposure increases trans-epidermal water loss (moisture evaporation through the skin barrier), may cause the skin to be more prone to chemical irritation. How hot or cold our shower is a personal preference, but we should bear in mind that it is harmful to scald the skin with very hot water, as some people do to relieve their itchy skin.



**DR PANG SHIU MING**  
Senior Consultant, Department of Dermatology, Singapore General Hospital

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DID YOU KNOW...



... **that** the Singapore General Hospital (SGH) Museum at the historic Bowyer Block was illuminated in different colours in the evenings during the past year? The lights commemorate different occasions, with the colours representing different events.

The light-up started in August 2021, when the building was bathed in red for the whole month to celebrate Singapore's National Day. Since then, the hospital has used red again for World Heart Day (29 September to 3 October), which is the symbol for heart health. Red also serves as a warning for cardiovascular disease.

The month after, the building was lit in pink for Breast Cancer Awareness Month (4 to 28 October), and blue for World Stroke Day (29 to 31 October). In November, it was blue again for World Diabetes Day (12 to 14 November), and purple for World Prematurity Day (15 to 19 November). While premature births are not as common in Singapore now, it is still the leading cause of death of children under the age of five years worldwide. About 15 million babies are born premature each year, or about one-in-10 globally.

On 26 November 2021, the building was illuminated for its official opening by President Halimah Yacob. For updates on the light-ups this year, go to SGH's Facebook page ([www.facebook.com/SingaporeGeneralHospital](https://www.facebook.com/SingaporeGeneralHospital)).

Scan the QR code to view the previous light-ups:



... **that** between 2014 to 2019, the GPFirst programme has benefitted more than 33,000 patients in the eastern region?

This initiative, spearheaded by Changi General Hospital (CGH) in 2014, encourages patients with mild to moderate conditions to visit a General Practitioner (GP) instead of going to the Accident & Emergency (A&E) services at first instance.

This resulted in a 14 per cent reduction of attendances at CGH A&E with mild and moderate conditions, and a 36.6 per cent reduction in walk-in attendances.

The reduction enhances the A&E's ability to better manage patient load and achieve greater streamlining of valuable resources to focus on emergency care.



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## GLUCOSAMINE: Not effective or not the right BRAND of glucosamine?

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ask yourself these questions:

1. How many clinical studies have proven that the brand works for painful joint conditions?
2. How many clinical studies have shown that the brand does not work?
3. How many long term, large-scale studies were conducted using the brand to prove its safety for long-term use?

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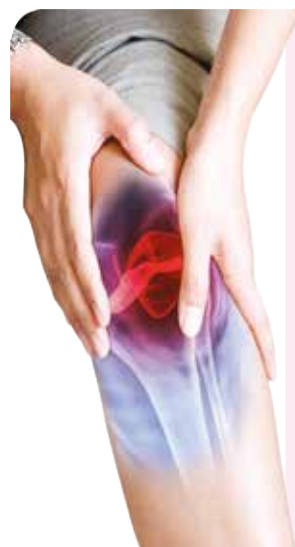
1. There are more than **100** clinical studies and all the studies have proven that Viartil-S works for painful joint condition.
2. No clinical studies have shown that Viartil-S does not work.
3. There are long-term studies using Viartil-S involving over 7000 patients proving its safety for long-term use. These include one 2-year, one 2.5-year & two 3-year studies with an 8-year follow-up study which has also shown that **Viartil-S reduces the risk of Total Knee Replacement surgery by 57%.**

*What about the glucosamine brand that you are taking?*

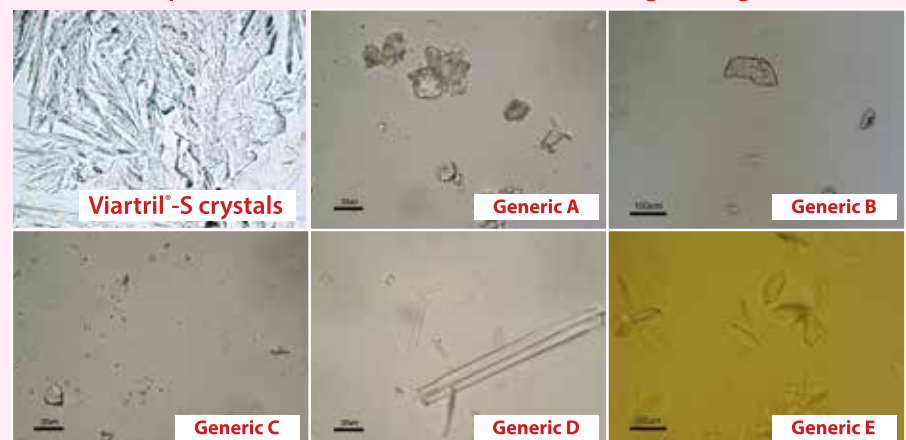


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The microscopic structure of Viartil-S is different from generic glucosamine:



1. Dario Gregori et al. JAMA. 2018;320(24):2564-2579 2. Olivier Bruyère et al. Seminars in Arthritis and Rheumatism 44(2014) 253-263 3. Bruyère O, Altman RD, Reginster JY. Semin Arthritis Rheum. 2016 Feb;45(4 Suppl):S12-7.



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