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Serious games open up new opportunities in healthcare training and education



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Not just for fun

Serious games have opened up new opportunities in healthcare learning.

by Sol E Solomon

Gamification, personalised learning and virtual reality (VR)-based experiences are charting new paths for teaching and education. In healthcare, a new facility will take this to new heights by providing realistic simulated environments and employ the use of serious games — games that are designed for a purpose beyond entertainment — where healthcare learners can hone their clinical skills in safe and supervised virtual domains.

The SingHealth Duke-NUS Institute of Medical Simulation (SIMS) i3 (inspire, innovate and incubate) Hub may span only 60 square metres, but it houses myriad state-of-the-art equipment, such as extended reality (XR) headsets, gaming computers and tablets, and a haptic floor that can create an immersive environment for participants.

It also leverages serious games to educate a spectrum of healthcare learners. They include doctors, nurses, pharmacists and allied health professionals from across SingHealth institutions and Duke-NUS Medical School, as well as medical students who are posted to the SingHealth Duke-NUS Academic Medical Centre for training.

Currently, the SIMS i3 Hub offers 18 game modules — seven VR-based and 11 browser-based. Some of these games may also be deployed (via web browser or mobile app) for use at other institutions. This allows learners to access them at their convenience.

A key benefit of incorporating serious games in healthcare training is the ability to simulate challenging scenarios for learners to practise critical thinking and decision-



Dr Koh Poh Koon, Senior Minister of State, Ministry of Health and Ministry of Manpower, at the launch of the SIMS i3 Hub, trying out the gaming computers and tablets that are available for both group- and individual-based learning.

making in a safe learning environment, while fuelling high levels of engagement through immersive game play, resulting in prolonged retention of knowledge, said Professor Chan Choong Meng, Group Chief Education Officer, SingHealth.

What makes serious games in the SIMS i3 Hub especially unique is that every game is developed and carefully curated by SingHealth educators who are themselves experienced healthcare professionals. Each customised game incorporates scenarios that are developed from rich personal insights, extensive clinical know-how and deep expertise that aim to expose learners





....
The SIMS i3 Hub aims to inspire collaborations and innovations in healthcare simulation by gathering like-minded healthcare professionals, while spurring the incubation of new ideas to advance patient safety.

....
A variety of state-of-the-art equipment, such as extended reality headsets, provide an immersive experience and complement training needs.



Each customised game incorporates scenarios that are developed from rich personal insights, extensive clinical know-how and deep expertise that aim to expose learners to potential real-life situations that they may face in the course of their career.

....
Professor Fatimah Lateef

Co-Director (SingHealth),
SingHealth Duke-NUS Institute of
Medical Simulation

to potential real-life situations that they may face in the course of their career, said Professor Fatimah Lateef, Co-Director (SingHealth), SIMS.

By incorporating these games in teaching, healthcare professionals are exposed to more engaging and interactive learning aimed at improving patient care.

“The games and simulation practices allow the learner to practise repetitively — what we call ‘deliberate practice’ — so they can hone their skills and familiarise themselves with the steps and equipment involved. With VR, they can see exactly what you would see in an emergency resuscitation room, for example,” Prof Lateef said.

When learners enter the clinical environment, their repetitive practices will help them adapt quickly and reduce the risk of errors when they perform procedures on patients in real life.

For example, a serious game, developed in collaboration with SingHealth nurses, is designed to teach the setting up of infusions for emergency cases. Patients arriving at the emergency department with chest pains and symptoms of cardiac arrest are classified as critical cases. Nurses familiarise themselves with the dilution of the drug used for infusions through the game and are guided by supervisors during their practices. The steps in the game are designed based on real-life scenarios.



....
(From left) Cigy Manesh, Nurse Educator, SingHealth Alice Lee Institute of Advanced Nursing; Prof Ian Curran, Vice-Dean, Education, Duke-NUS Medical School; Assoc Prof Ruban Poopalalingam, Chairman, Medical Board & Senior Consultant, Department of Anaesthesiology, Singapore General Hospital (SGH); Prof Fernando Bello, Co-Director (Duke-NUS), SIMS; Dr Yee Yucai, Consultant, SGH; Prof Chan Choong Meng, Group Chief Education Officer, SingHealth; Prof Fatimah Lateef, Co-Director (SingHealth), SIMS.



...
(Left) The Energise Room hosts multi-player games that teach skills like management of acute care patients and responding to cardiac arrests.

...
(Below) Single-player games, which hone skills such as resuscitation and managing pharmacy prescriptions, are conducted in The Inspire Room.



After the training sessions, game data can be extracted to provide educators with useful insights into areas that the learners can improve on. Debrief sessions can also be carried out in the SIMS i3 Hub so that key learning points are captured immediately.

Increased learning efficiency

One important benefit of serious games is that training can now be conducted more efficiently and cost-effectively, as new technologies remove the need for face-to-face sessions. For instance, SingHealth's e-learning modules on simulation allow users to log on to a virtual platform to read articles and watch videos at their own convenience.

Another example is the Basic Cardiac Life Support (BCLS) game, which enables healthcare professionals to refresh their cardiopulmonary resuscitation (CPR) knowledge and skills remotely. With the

BCLS game, learners now only need to attend a physical session for two to three hours and complete an online test, instead of typically spending an entire day in class previously.

Developed by the SingHealth Alice Lee Institute of Advanced Nursing, this game is projected to reduce the duration of in-person training by 25 per cent. It will also be integrated as part of the official BCLS certification training across SingHealth this year, and will train up to 5,000 healthcare professionals every year.

As serious games are able to facilitate remote and virtual learning, they have become especially pertinent in reducing physical contact amid the COVID-19 pandemic. At the same time, they offer healthcare professionals greater flexibility to train at their own time, without having to compromise or reschedule their clinical commitments.



...
(From left) Prof Ivy Ng, Group Chief Executive Officer, SingHealth; Mr Cheng Wai Keung, Chairman, SingHealth; Dr Koh Poh Koon, Senior Minister of State, Ministry of Health and Ministry of Manpower; Mr Goh Yew Lin, Chairman, Governing Board, Duke-NUS Medical School; and Prof Thomas Coffman, Dean, Duke-NUS Medical School at the launch of the SIMS i3 Hub on 18 January 2022.

More opportunities

Currently, SIMS has a comprehensive library of serious games developed in-house. These cover a wide range of skills, from proper dispensing of medicines in the pharmacy to disaster response protocols, among others.

The launch of the SIMS i3 Hub and development of serious games are opening up new opportunities in healthcare learning. This approach and pedagogy fit in well with the new generation of healthcare professionals, who are well-versed in various digital technologies.

Through the Hub, SIMS aims to inspire collaborations across disciplines and specialties, not just within the various healthcare professions, but also with partners from engineering, computer sciences and serious games associations. In addition, the Hub will also serve as the incubation ground for new ideas and innovations to improve efficiency and enhance patient safety.



Mr Halim Anuwar, an SGH patient who had type 1 diabetes and renal failure, was the first to undergo a simultaneous pancreas-kidney transplant under the national programme in July 2021. The eight-hour surgery was led by NUH's Associate Professor Tiong Ho Yee, and performed with NUH's Associate Professor Glenn Bonney and SGH's Dr Valerie Gan (right).

A change for the better

Singapore's National Pancreas Transplant Programme, the only one in Southeast Asia, is set to help more diabetes patients on insulin and dialysis.

by Desmond Ng

Mr Halim Anuwar underwent a simultaneous kidney and pancreas transplant in June 2021, the first person to do so after the National Pancreas Transplant Programme (NPTP) was set up two months earlier.

With the double transplant, the Singapore General Hospital (SGH) patient recovered well and was discharged nine days after. The ambulance driver has returned to work.

"Mr Halim had immediate graft function following surgery, meaning that he did not require a single session of dialysis or insulin post-operatively," said Dr Valerie Gan, Senior Consultant, Department of Urology, SGH.

Mr Halim had to inject himself with insulin every day



(From left) Dr Valerie Gan, Mr Halim Anuwar, Transplant Coordinator Shannon Baey, and Dr Kanagasabapathy Kamaraj, Consultant, Department of Renal Medicine, SGH.

for 20 years after he was diagnosed with type 1 diabetes at the age of 18. He later had to have regular dialysis when he developed end-stage kidney failure as a result of his diabetes.

Kidney damage occurs over time with diabetes. In type 1 diabetes, the pancreas does not make or makes very little insulin. In type 2 diabetes, patients become resistant to insulin.

The NPTP is an SGH-National University Hospital (NUH) collaboration following a pancreas transplant service pilot that began in 2012. During the pilot, five simultaneous pancreas-kidney transplants were performed on patients with type 1 or type 2 diabetes.

"Having been involved in the development and growth of the pancreas transplant service, I am glad to see it become a national programme. This is a timely addition to the range of transplant services that patients have access to. Patients in need of such a transplant will benefit greatly from the combined knowledge, skills and experience of the teams at NUH and SGH," said Dr Gan, who is also Deputy Director of the NPTP.

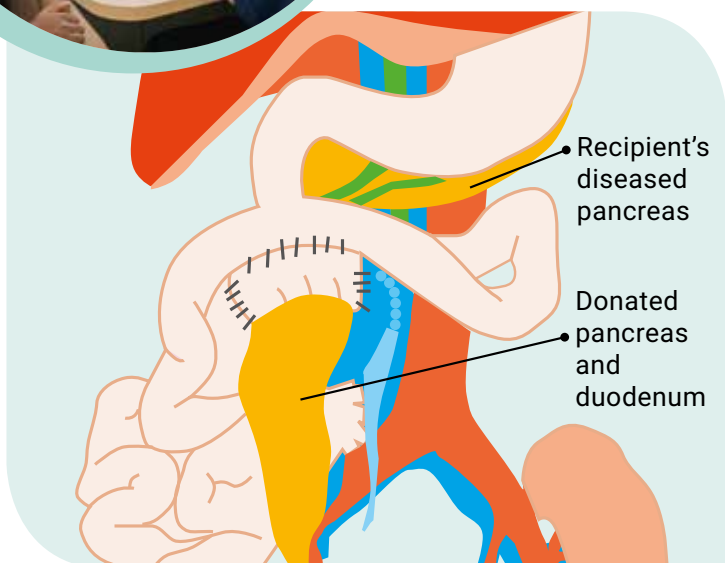
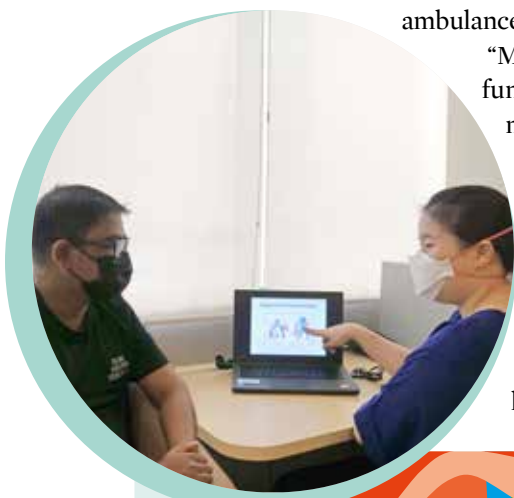
Three types of pancreas transplants are available under the NPTP — pancreas

alone, pancreas after a kidney transplant and simultaneous pancreas-kidney transplant. A simultaneous pancreas-kidney transplant is the only treatment to establish normal sugar levels in patients with diabetes, without the need for external insulin injections.

"It is now widely acknowledged that a simultaneous pancreas-kidney transplant improves quality of life and long-term survival, compared to current available medical treatment in patients with type 1 or certain type 2 diabetes and who are on dialysis," said NUH's Associate Professor Tiong Ho Yee, Director of the NPTP.

With the NPTP, potential patients from all public hospitals can be identified and screened for pancreas transplant suitability. At the same time, the team will work on improving organ availability for transplant. Those on the wait list can expect to wait one to two years to receive a new pancreas, and only Singaporeans and permanent residents are eligible for subsidies under this programme.

Every year, some 19,000 people in Singapore are diagnosed with type 1 or type 2 diabetes. Diabetes is the number one cause of kidney dialysis in Singapore, accounting for about two-in-three new cases.



After the pancreas is transplanted, it does not have to be placed in its original position (behind the stomach). It is usually put on the right side of the tummy and next to the transplanted kidney.

No more uncomfortable self-testing

This saliva antigen COVID-19 test will be an even more convenient option compared to nasal swabs.

by Annie Tan

A saliva-based COVID-19 antigen rapid test (ART) technology co-developed by the SingHealth Duke-NUS Academic Medical Centre and the National University of Singapore (NUS) will offer a more pleasant alternative to nasal swabs.

Officially known as PASPORT (Parallel Amplified Saliva rapid POint-of-caRe Test), this easy-to-use and painless test is highly accurate. Compared to the gold standard Polymerase Chain Reaction (PCR) test, PASPORT's sensitivity in detecting the SARS-CoV-2 virus is 97 per cent, and its specificity (to detect a true negative result) is 90.6 per cent. These results are comparable to ART nasal swabs available in Singapore.

While PASPORT is not the first test that can be used for saliva testing, it vastly outperforms the handful of existing options, which have not been accurate enough to be rolled out at large scale.

One of the major limitations of existing saliva tests is that they are accurate only after prolonged fasting, such as in the morning after waking up. "Should participants eat, drink or brush their teeth, the concentration of viral particles in the saliva drops too drastically for an accurate result. A comparison against two other existing test kits showed that sensitivity dropped to approximately 60 per cent and 20 per cent respectively after food," said Dr Danny Tng, Medical Officer, Department of Infectious Diseases, Singapore General Hospital (SGH). He is also an adjunct Research Fellow at Duke-NUS's Emerging Infectious Diseases (EID) Programme and one of the key inventors of PASPORT.

The other inventors include Associate Professor Melvin Chua from National Cancer Centre Singapore (NCCS) and Duke-NUS Medical School, Professor Jenny Low from SGH and Duke-NUS Medical School, Professor Ooi Eng Eong from Duke-NUS Medical School, Professor Soo Khee Chee from NCCS and Duke-NUS Medical School, and Professor Zhang Yong from NUS.

PASPORT can be used at any time of the day, even after meals. Like other ARTs, it uses nanoparticles to bind the virus. In addition, it adds a second type of nanoparticle that binds the first set of nanoparticles to amplify the signal,

allowing it to be more sensitive than other lateral flow tests. Using its unique viral capture system with ACE2 proteins, it is also able to pick up COVID-19 variants, including Delta.

This new kit looks similar to a regular ART kit. The main difference is that instead of a nasal swab, users will collect a small amount of saliva in a funnel, drop some saliva in the first channel of the test kit, and wait for up to 15 minutes for results. If results are negative, they will drop more saliva into the second channel of the test kit and wait for another 15 minutes for amplified results. Therefore, this self-administered test can be completed in as soon as 15 to 30 minutes.

Dr Tng noted that globally, there is a high demand for ART over PCR testing. This is because the latter requires specially trained personnel for sample collection, processing and interpretation of results, is costlier (\$150 per test on average), and takes up to a day to get results.

"With new COVID-19 anti-viral oral medications like Molnupiravir, it is very important to administer these drugs within the first few days of illness to achieve the best outcomes. As PCR takes a longer time, you could miss a critical window for treatment," he explained.

Furthermore, saliva antigen tests reduce the margin of error that occurs when the nasal swab is not done properly — for instance, when it is not inserted deep enough into the nasal cavity. "Some studies have shown a 10 per cent difference in accuracy when a professional does the nasal swab compared to when users do it on their own," Dr Tng said.

The saliva test may also be easier to administer on children who may find nasal swabs uncomfortable. This convenient testing method is also important since there is currently no vaccination available for very young children.

"A test like PASPORT that can be self-administered or used on-site at the primary care setting may mitigate the need for cases to be managed at the hospitals," said Prof Ooi.

Manufactured by Singapore-based company Digital Life Line Pte Ltd, PASPORT is expected to be available for consumer use by the end of 2022.



...

Dr Danny Tng (above) is one of the key inventors of a new saliva-based ART test for COVID-19, which has shown greater accuracy than existing options.

...

Users collect a small amount of saliva in a funnel, drop some of it in the first channel of the test kit, and wait for up to 15 minutes for results. If results are negative, drop more saliva into the second channel and wait for another 15 minutes for amplified results.

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Taking your meds right

A study by community nurses found that many older people take the wrong dose, forget or do not take their medications at all.

by Siam Lim

Older people are more likely to not follow their prescriptions: they either take the wrong dose, forget or do not take their medicine altogether.

In a Singapore General Hospital (SGH) study, it was found that 60 per cent of older people surveyed did not take their medications as prescribed by their doctors. This figure is higher than the average 50 per cent in international studies.

“Considering Singapore’s rapidly ageing population and increasing prevalence of chronic diseases, it is of utmost priority for our community nurses to address this issue,” said Dr Rachel Marie Towle, Advanced Practice Nurse, Regional Health System (Population Health and Integrated Care Office), SGH.

“Medication adherence is crucial for the optimal control of patient’s chronic diseases and health outcomes,” added Dr Towle, who co-led the *Prevalence and predictors of medication non-adherence among older community-dwelling people with chronic disease in Singapore* study with Research Nurse Chew Suet Mei.

The study, published in the *Journal of Advanced Nursing* in May 2021, recruited 400 participants who were at least 60 years of age and suffered from at least one chronic disease between May 2019 and December 2019. They were either under SGH’s Hospital-to-Home programme for discharged patients who were followed up by community nurses for six months at home, or the hospital’s Community Nursing Programme for residents in the southeast of Singapore.

Understanding the reasons behind medication non-adherence can help guide healthcare workers in improving compliance. In this respect, community nurses play an important role. In the course of their duties, they identify those at risk of not taking their medication correctly and help them manage their conditions by ensuring they take their medication according to the instructions given, providing health coaching and coordinating their care.

For instance, the study found an association between smokers and non-adherence, with people who smoke 2.9 times more likely than non-smokers to not follow their doctors’ medication instructions.

“Older people who smoke perceived their medication regime as being complicated. They felt dissatisfied with

their regime, did not know the purpose of their medications, and experienced side effects,” said Dr Towle.

The study also found that older people were more unlikely to take their medications correctly if they felt that their medication regime was complicated; if they were taking many different drugs; if they had to cut their tablets; if they did not understand the purpose of their medications; or if they suffered side effects from taking the medications.

The cost of medications was not a significant reason for medication non-adherence among participants of this study. This could be due to the various financial assistance schemes available to the elderly in Singapore.

Medication education is important, as the elderly patient would be more likely to continue to take a medication when he understands the reason for taking it.

“Such knowledge has enabled our team to strategise targeted interventions to improve medication adherence among our older patients with non-adherence issues, such as medication packing using a pill box, pill reminders and education leaflets. Future improvement plans include incorporating an assessment tool or a care pathway into the nurse’s daily workflow,” said Dr Towle.



PHOTO: VERNON WONG

Understanding the reasons behind medication non-adherence can guide healthcare workers in improving compliance, says Dr Rachel Towle.

Shielding dental professionals and patients

A device developed by the National Dental Research Institute Singapore provides protection from infection during treatment.

by Elena Owyong



... Clinical Associate Professor Goh Bee Tin is the Principal Investigator of the Aeroshield project.

Dental procedures, such as scaling and polishing, invariably generate aerosols — a mixture of water from dental equipment, the patient's blood and saliva. Aerosol exposure occurs most commonly on the dental professionals' faces and clothes, as well as the nasal area of the patient.

Dentists, especially, are at a high risk of getting infected with COVID-19 and other diseases through cross contamination because they work within close proximity to their patients' mouths.

Research has shown that aerosols can travel as far as 1m horizontally and 0.5m vertically from a patient's mouth. These aerosols can also remain in the air for up to 30 minutes after dental scaling, which can potentially expose the next patient to cross-infection.

When the aerosols settle on surfaces surrounding the treatment area, it can increase the risks of infection. The COVID-19 virus, for instance, has been known to stay on surfaces such as metal, glass or plastic for a few days.

To provide a safer setting for dentists and patients, a team from the National Dental Research Institute Singapore (NDRIS) developed Aeroshield, a device that uses air curtains as a barrier to prevent aerosols from splattering onto dental professionals. NDRIS was established in 2019 by the National Dental Centre Singapore (NDCS) as part of the SingHealth Duke-NUS Academic Medical Centre to meet oral health priorities in Singapore and globally.

"During the 'circuit breaker' period in 2020, patient attendances fell by 35 to 60 per cent, as dentists could only tend to emergency cases. Even with the gradual resumption of dental services later, many



... A working prototype of the Aeroshield attached to the dental chair headrest.

patients delayed their visits for fear of contracting COVID-19. These delays may result in deterioration of dental disease, and consequently, more complex and costly treatment," said Clinical Associate Professor Goh Bee Tin, Principal Investigator of the Aeroshield project and Director of NDRIS.

"As Aeroshield significantly reduces the amount of aerosol contamination, it will also protect against other diseases that spread via droplets. Patients can access dental care with greater assurance, and dentists can continue to treat patients safely and effectively beyond the pandemic."

A safe setting

In May 2020, Clin Assoc Prof Goh and her team began working on the idea of a biosafety air curtain in a dental setting.

They were inspired by the air curtains commonly installed in shopping malls and supermarkets. These invisible barriers effectively separate two environments on either side of the curtain to maintain a cool temperature in the mall while keeping dust particles out.

Similarly, Aeroshield uses air curtains that are directed as air jets to create a barrier over the patient's mouth, thereby preventing aerosols from reaching the dentist and dental assistant.

The aerosols generated at the patient's mouth are redirected by the air curtain and removed by a high-volume evacuator, which is used in routine dental practice. Aeroshield can be attached to a dental chair and an air compressor unit without any changes to the clinic's infrastructure.

After every dental procedure, a wipe-down will be done to disinfect the room, which is part of existing infection prevention and control measures.

The team found that the use of Aeroshield reduced aerosol spread by close to five times, especially on the dentist's and assistant's face shields.

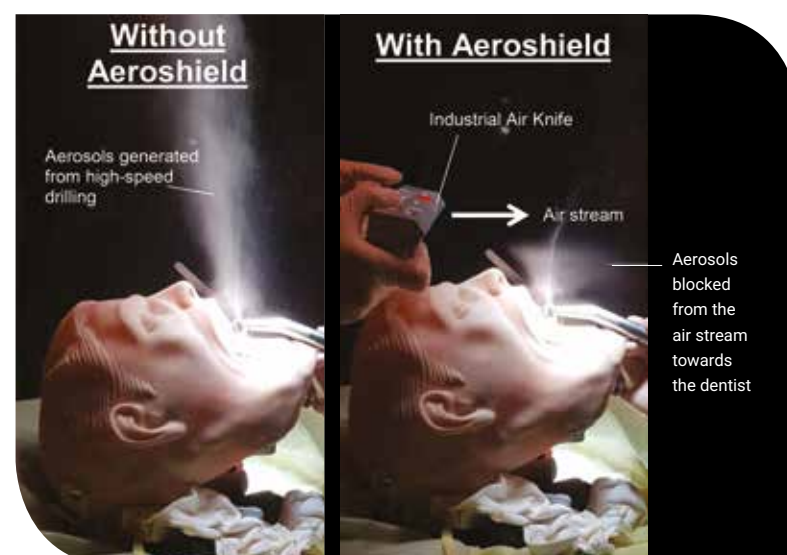
Future plans

Having designed a prototype for Aeroshield, Clin Assoc Prof Goh and her team are now working with the Agency for Science, Technology and Research (A*STAR) to refine its shape, so as to improve its efficacy.

The team will be piloting Aeroshield on five chairs in NDCS this year, with the potential of rolling it out to the rest of the Centre and other collaborating clinics, such as SingHealth Polyclinics.

"When commercialised, Aeroshield will be the first device that uses the air-curtain technology to prevent cross-infection in dental clinics. It is practical and easy to set up without causing any discomfort to the dentists and patients, and does not intrude into the dentists' work space since there is no physical barrier," said Clin Assoc Prof Goh.

There are also plans to extend this technology to other specialties such as Anaesthesiology, Otorhinolaryngology and Ophthalmology, as medical professionals in these fields are also at risk of exposure to aerosols.



...
Maintaining a zero-waste lifestyle has made Ms Wendy Phng more aware of how small actions can make a significant difference on consumption and the environment. She uses organic fertiliser produced from wastes (right), and has an upcycling corner in her office (far right).



Small steps, big changes

On the journey to zero waste, little bits add up to make a real impact.

by Goh Bee Lian



When you become aware of what you use and throw away every day, you also become aware of what you actually consume. Then you start to minimise what you use.

...
Ms Wendy Phng

Senior Operations Executive,
Environmental Services Department,
Singapore General Hospital

Ms Wendy Phng has a little upcycling corner near her desk where anyone who needs reusable items is welcome to them. These include paper bags and plastic containers that are usually binned, which may be of use to others.

The Senior Operations Executive in the Environmental Services Department at Singapore General Hospital (SGH) walks the talk.

"I try not to have any bins. When you become aware of what you use and throw away every day, you also become aware of what you actually consume. Then you start to minimise what you use," said Ms Phng.

"I have become more conscious of my surroundings, the things that I do, the things that I consume, and how I can contribute to sustainability."

Her passion for the 5Rs of zero waste (refuse, reduce, reuse, recycle, rot) is deeply entrenched in her job, which spans a broad range of tasks. Fittingly, she sits on the hospital's sustainability movement work group to bring SGH closer towards zero waste in food, plastic and emissions, and to encourage staff and the public to reduce waste in various ways.

During the COVID-19 pandemic, for instance, fewer people were returning to SGH offices to work. The team found that as a result, fewer waste bins were needed, and initiated the Share-a-Bin drive.

"With fewer bins, staff is encouraged to dispose and recycle properly. Food waste is

thrown into pantry bins, which are covered to prevent odour and pests. Paper waste is dropped into separate bins for recycling," said Ms Phng.

Before COVID-19, Ms Phng's everyday job involved keeping the hospital and its environment clean and safe for patients, visitors and staff alike. She ensures that hospital beds, bed linen and curtains in the wards are kept fresh and in good condition. The floors must be clean and non-slippery. Her department is also responsible for the hospital's overall environment, so pest control and landscaping also come under their purview.

Landscaping, she said, must not only look good, but also play the important role of enhancing the patient experience. A pleasant and soothing environment helps patients relax, taking their minds off their illness.

"We also want to enhance staff and visitors' experience and understanding of plants and trees. QR codes tagged to the trees and plants provide links to general information such as their name, species and height," she said, noting that non-dangerous plants are specially chosen to be featured. Plants with sharp thorns and those whose leaves are poisonous are not used.

Little pockets of green oases have sprouted up on SGH Campus, notably the Bicentennial Garden, which sits in front of the SGH Museum. Some 39 tree and 57 plant species, including local fruit trees, were carefully chosen and planted. The site has also attracted a flock of wild chickens. However, no fruit or chicken can be removed from the Garden.

Recycling and other green efforts are also evident in the Garden. Food waste is saved and used to feed earthworms to produce vermicompost, a nutrient-rich organic fertiliser.

Ms Phng, who spends her free time taking her two young children cycling and hiking to explore different places in Singapore, is glad that more hospital staff have jumped onto the green bandwagon. Staff has started thinking of ways to recycle plastic packaging, used batteries, surgical instruments and disposable chopsticks, as well as making processes more energy-efficient.

"Individually, the changes we make may be quite small. But ever since I joined the sustainability work group, I have been trying to persuade everyone to do their bit. I hope to broaden my knowledge on climate change, and I want to continue my studies in environmental management and see how I can contribute better," she said.



Always curious

Associate Professor Aw Swee Eng's keenness for research and curiosity about how things work led to his appointment as the first head of SGH's nuclear medicine unit.



I was not trained as a nuclear medicine person. But I like challenges.

Associate Professor Aw Swee Eng

Emeritus Consultant, Department of Nuclear Medicine and Molecular Imaging, Singapore General Hospital

He was fond of “blowing things up” and experimented with self-made gunpowder, with shop-bought everyday materials. The young boy went to a concrete bridge in his hometown of Kampar, in Malaysia's Perak province, to see how well it worked.

When lit, his explosive powder did not quite go off with a bang but gave off a subdued “voom!”.

Recalling that he was “crafty” enough not to get caught, the now-84-year-old Associate Professor Aw Swee Eng, Emeritus Consultant, Department of Nuclear Medicine and Molecular Imaging, Singapore General Hospital (SGH), noted that it was his keen interest in biochemistry and strong sense of curiosity to find out how things work that led to the episode of boyhood mischief.

Many years later, those qualities would stand him in good stead. His reputation for teaching biochemistry to medical students in an engaging and relevant manner, and interest in research, reached the ears of the late Dr Kwa Soon Bee, then charged with transforming and modernising the healthcare sector. Dr Kwa convinced Assoc Prof Aw to start and head Singapore's first nuclear medicine unit at SGH.

“I was not trained as a nuclear medicine person. But I like challenges,” said Assoc Prof Aw.

It would be a specialised unit that takes Singapore medicine a step further, using sophisticated radioimmunoassay (RIA) equipment to analyse blood samples.

Established as the Department of Nuclear Medicine in 1980, the department

grew quickly, with increasingly complex procedures added to its range of activities. It started with 40 types of RIA tests and a few technetium-99 scans, as well as radioactive iodine to treat hyperthyroidism.

Today, even more kinds of various radioactive materials are used for diagnosis and therapy. Injected into the blood, they emit very fine rays captured on state-of-the-art SPECT (single-photon emission computed tomography) or PET (positron emission tomography) machines to measure the cells' metabolic activity. Besides diagnosis, nuclear medicine procedures also offer targeted radionuclide therapy for difficult-to-treat and advanced cancers. Radioactive drugs seek out and bind themselves to cancer cells, before delivering a high-dose of radiation to kill the malignant cells and sparing healthy ones.

To date, the avid researcher has published close to 80 papers in local and international refereed journals. “I was interested in antigen, antibody reaction and immunology,” said Assoc Prof Aw.

He also promoted the research culture in SGH in the early days, and served as the hospital's first Director of the Department of Clinical Research from 1989 to 2009. This became an early platform to kick-start the research careers and achievements of many doctors and staff, including Singapore's leading clinician-scientists, who have gone on to receive many prestigious accolades and achieve national and international recognition for their research.

Assoc Prof Aw was Chairman of the SGH Institutional Review Board (IRB) from 1993 to 2009 and subsequently the SingHealth Centralised IRB for another six years, as well as Chairman of A*STAR IRB since 2017.

He is well loved and respected by his staff, not least for his keen sense of humour, but also his humility and concern for others. Some of the work of his department and that of Pathology were similarly concerned with diagnosis of blood samples, and he envisaged that some RIA tests would eventually be moved to Pathology. Over the years since then, the department has continued to grow and develop new areas of radionuclide imaging and therapy for patient care, and is currently one of the most recognised centres for nuclear medicine and theranostics (therapeutics and diagnostics) in the region.

The spunky boy matured into a deeply religious man, conducting and recording bible studies and courses at his church. The father of two — both in healthcare — and grandfather of three wanted to teach at one time. But his interest in the broader questions about life pulled him in a different direction. Lauded for his life's work in the specialty, and possibly deemed as Singapore's Father of Nuclear Medicine, Assoc Prof Aw was bestowed the esteemed title of Emeritus Consultant this year.

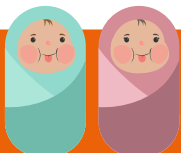








Associate Professor Aw Swee Eng enjoying a holiday in Australia with his wife, whom he met in university.

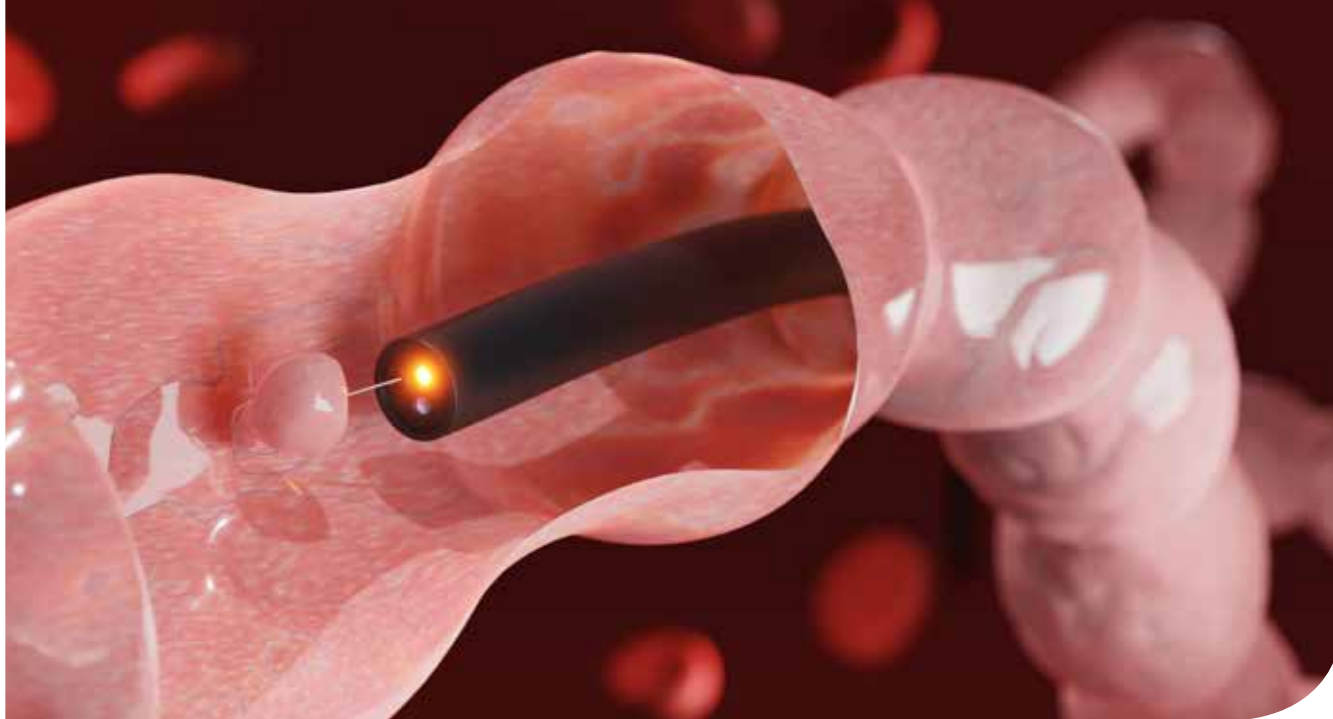
Activity guidelines for children seven years and below

The guidelines are aimed at laying a strong foundation for healthy lifestyle behaviours and good long-term health outcomes in young children.

Information provided by Dr Benny Loo, Consultant, Sport and Exercise Medicine Service, KK Women's and Children's Hospital, and Chairperson of the Workgroup for the guidelines

	 Recommendations for infants (0 to <1 year)	 Recommendations for toddlers (1 to <3 years)	 Recommendations for preschoolers (3 to <7 years)
Physical activity 	<ul style="list-style-type: none"> Take part in various forms of physical activities throughout the day, and in a safe and supervised environment Activities should include non screen-based, interactive floor-based play and tummy time. For those not yet mobile, tummy time should start soon after birth, building up towards at least 30 minutes spread throughout the day 	<ul style="list-style-type: none"> Accumulate at least 180 minutes in a variety of physical activities at any intensity throughout the day and within a safe environment. Daily outdoor play for toddlers is highly encouraged Caregivers should actively participate in all forms of physical play with toddlers 	<ul style="list-style-type: none"> Accumulate at least 180 minutes of various physical activities at any intensity throughout the day and within a safe environment. At least 60 minutes should be of moderate to vigorous intensity Older preschoolers (5- to 6-year-olds) should be exposed to a variety of age-appropriate vigorous-intensity play, and engage in muscle- and bone-strengthening activities several times a week. Daily outdoor active play among preschoolers is highly encouraged Caregivers should participate actively with preschoolers during all forms of active play
Sedentary behaviour 	<ul style="list-style-type: none"> Avoid restraining and leaving infants unattended for more than 1 hour at a time Any form of screen time, including background screen time, is not recommended. When the infant is seated, reclined or lying down, caregivers are encouraged to engage the infant in singing, reading, storytelling and imaginative play A daily routine for activities, sleep and meals may be useful in reducing the amount of sedentary behaviour 	<ul style="list-style-type: none"> Avoid restraining toddlers on a seat for more than 1 hour at a time Screen time, regardless of the type of device, is not recommended for toddlers younger than 18 months of age, and should be limited to less than 1 hour per day for toddlers who are aged 18 months and above When sitting or lying down, engage the toddler in singing, reading, storytelling or imaginative play 	<ul style="list-style-type: none"> Limit the total daily amount of sedentary behaviour, and take breaks during extended periods of time spent being sedentary Recreational screen time, regardless of the type of screen device, should be limited to less than 1 hour per day
Sleep 	<ul style="list-style-type: none"> Have a daily total of 14 to 17 hours (for 0 to 3 months) and 12 to 15 hours (for 4 to 11 months) of sleep, including naps It is recommended for infants to sleep on their back in a cot placed in the same room as their caregivers to ensure sleep safety Develop a regular sleep time routine to help infants fall asleep with ease 	<ul style="list-style-type: none"> Have a daily total of 11 to 14 hours of sleep with regular sleep and wake-up times. Develop a bedtime routine and keep to a consistent bedtime Provide a conducive sleep environment and avoid screen time 30 minutes before night-time sleep 	<ul style="list-style-type: none"> Have a daily total of 10 to 13 hours (for 3- to 5-year-olds) or 9 to 11 hours (for 6-year-olds) sleep. Older preschoolers may not need to nap if they have sufficient sleep at night. Develop a bedtime routine, and keep to a consistent bed and wake-up time Provide a conducive sleep environment and avoid screen time 30 minutes before bed
Eating habits and diet 	<ul style="list-style-type: none"> Breastfeeding is recommended for infants. From 4 to 6 months of age, introduce a variety of solid foods of various textures and flavours that are prepared with no added salt and sugar Provide a daily routine of having meals spaced 2 to 3 hours apart in the daytime to avoid overfeeding 	<ul style="list-style-type: none"> Continue to increase the variety of foods offered to your toddler and wean off milk as the main source of nutrition. Introduce healthy family meals and offer whole milk and water, while establishing a structured routine for meal and snack times Avoid screen time during meal times. Using food to soothe your toddler or as a reward is discouraged 	<ul style="list-style-type: none"> Encourage healthy eating habits as a family, with caregivers as role models. Limit the amount and frequency of sugar-sweetened beverage consumption Provide a structured routine for meal and snack times in appropriate portions that support growth and development Avoid screen time during meal times. Teach your preschooler to recognise hunger and satiety cues

Singapore's first set of integrated activity guidelines for early childhood (above), and children and adolescents were developed by KKH-led Integrated Platform for Research in Advancing Metabolic Health Outcomes of Women and Children (IPRAMHO), one of the main programmes by SingHealth Duke-NUS Maternal and Child Health Research Institute. For more details on the guidelines for children from 7 to 18 years old, visit tinyurl.com/ynpjnas6.



Get them out, cancer or not

Polyps in the colon can be detected and removed during regular colonoscopy.

by Thava Rani

Colonic polyps are mostly harmless. Some, however, can turn malignant and develop into colorectal cancer over time.

“That is why it is necessary to get a colonoscopy done every five to 10 years. Any polyp detected is then removed, whether it is malignant or not,” said Associate Professor Emile Tan, Senior Consultant and Head, Department of Colorectal Surgery, Singapore General Hospital (SGH).

Polyps are abnormal growths that appear in the colon (large intestines) or rectum. Healthy new cells in the bowel replace old ones on a daily basis. In some people, the new cells grow excessively, resulting in polyps forming. These can occur anywhere on the inner lining of the colon and are usually less than 1cm in diameter.

Most individuals have one to two polyps. But due to genetic conditions, some patients may have a “carpet of polyps”, where the number of polyps may go into the hundreds.

There are different types of polyps. Some, known as hyperplastic polyps, are merely overgrowths of normal cells and do not turn into cancer. “The most common type is called adenoma. While each adenoma has only a 1 per cent risk of becoming cancerous, nearly all malignant polyps start off as an adenoma,” said Assoc Prof Tan.

It takes a while before a polyp becomes cancerous, if at all. Assoc Prof Tan estimates that an adenoma takes about two to three years to grow 2 to 3cm in diameter, and another three to five years to transform into cancer.

“If the growth is faster than that, then we are dealing with a more aggressive cancer and prognosis will be much poorer. Generally, the bigger it grows, the higher the risk of it becoming cancerous,” he added.

Colonic polyps, even those up to 2cm in diameter, usually do not cause any symptoms and tend to be discovered only during routine colonoscopy screening. Patients with bigger polyps may experience symptoms, such as bloating or a change in bowel habit. If the polyp is in the rectum, there may be blood in the stools or a sensation of incomplete bowel emptying.

Once detected, the best treatment is a polypectomy, where the polyp is removed as completely as possible. This can be done during the colonoscopy. “It is important to remove polyps early, not only to prevent them from turning malignant, but also to ensure they do not grow too big because they can obstruct the bowel and affect its function,” said Assoc Prof Tan.

When the polyp is removed, it is sent to be assessed and graded for the level of dysplasia (cancerous change). High-grade dysplasia suggests mutations within the cells and a high chance of the polyp turning cancerous.

The level of dysplasia is a good indication of how regularly a colonoscopy should be done. If an individual has only one polyp of low-grade dysplasia, Prof Tan recommends a scope every three to five years. However, if there are more than five polyps, it is best to have a scope done every one to two years.

A polypectomy is, however, not an option when there are hundreds of polyps. As the condition has a genetic link, SGH tracks families with the condition through the Singapore Polyposis Registry. “These individuals undergo early screening and in some serious cases, they have prophylactic surgery done to remove the affected segment of the colon,” said Assoc Prof Tan.



It is important to remove polyps early not only to prevent them from turning malignant, but also to ensure that they do not grow to affect bowel function, says Associate Professor Emile Tan.



What you need to know about colonoscopy

A colonoscopy allows the doctor to see the insides of your colon. Clearing the bowel thoroughly ensures an unobstructed view.

Before the scope

- Cut down on fibre intake about three to five days before the scope. Some foods and vegetables tend to stick to the colon, and this makes getting a good view of the insides difficult.
- Drink lots of fluids.
- Take strong laxatives with 2 litres of water the night before a colonoscopy to purge the remaining stools.

During the scope

- Colonoscopy is a day procedure done under sedation, and usually takes 30 to 40 minutes.
- A long, thin and flexible tube with a small camera attached (endoscope) is inserted into the colon through the anus.

Polyp removal

- The endoscope is able to lift the polyp, snare and remove it.
- Stalked polyps (long stalk, narrow base) are easier to detect and remove.
- Small and flat polyps are easier to miss and harder to remove. A solution is injected to the base to lift the polyp and aid removal.
- If a polyp is fixed to the base, has irregular borders or bleeds on contact, it is potentially cancerous.
- Titanium clips are used to close the base to prevent bleeding. These clips need not be removed and will eventually fall off spontaneously.

Who is at risk?

About 15 per cent of people above 40 years old are likely to have colonic polyps. Other risk factors include:

- Aged 50 and above
- Chinese
- Genetic predisposition
- Relative with colorectal cancer before age 50
- Obesity
- Poorly controlled diabetes
- Excessive smoking or drinking

More frequent screening is recommended for these individuals.

Amputations and phantom limb sensation

Losing a limb can be debilitating, but occupational therapists help patients learn how to live independently and return to their daily activities.

by Desmond Ng

Having a foot or even a toe cut off is a traumatic and life-changing experience. The patient may experience phantom limb sensation — feeling pain or itching in a foot that is no longer there — and other more practical, everyday concerns like how to maintain his balance, walk and change his clothes.

Occupational therapists can help these patients return to everyday life, be it taking care of themselves with or without the help of a caregiver, enjoying their hobbies, or returning to work, said Ms Samantha Ong, Occupational Therapist, Occupational Therapy Department, Singapore General Hospital (SGH). “Activities that used to be done with ease become arduous. The home or work environment may now pose barriers to daily

tasks. Having an occupational therapist to journey alongside the patient during crucial moments greatly eases the transition to living with an amputation,” said Ms Ong.

Patients eager to walk again after losing a few toes may inadvertently put pressure on the amputation wound that has yet to heal. Should the wound not heal and recover well, there is a risk of infection and gangrene, which may require another amputation.

“A patient who had two toes taken out must remember to step down on the unaffected foot and on the heel (of the foot with the amputation) each time he gets out

Ms Samantha Ong shows how a patient with an amputation (role-played by SGH Communications Department’s Ms Brenda Ng) can be helped into a taxi from a wheelchair using a transfer board.



PHOTOS: VERNON WONG

of bed to sit on a chair or walk to the toilet,” said Ms Ong.

Those with amputations just below, at or above the knee are likely to face greater challenges such as pain, altered or phantom sensations, altered balance and altered self-image. Patients with phantom sensations need to learn desensitisation strategies early in their recovery to manage the phenomenon. To adapt to the changes in their balance, they have to strengthen their unaffected limbs and the trunk.

“If they have difficulty keeping their balance, how can they put on their trousers or stand and prepare their meals safely?” she said.

Occupational therapists can help identify patients’ needs, prescribe assistive devices or mobility aids, and train them in their use for greater independence.

Immediately after amputation, patients often need a walking aid or a wheelchair to move around. If prostheses are not suitable, patients can consider a personal mobility aid like a motorised scooter.

Patients or their families may not understand the different features of

wheelchairs and their importance. A heavy bag hung at the back of a wheelchair without anti-tippers raises the risk of the chair falling backwards when it is going over small humps or steps. Anti-tippers are small wheels attached to the rear to provide added support and balance for those with lower limb amputations.

The home environment often needs changes to make moving around easier and safer for amputees. Before the amputee returns home, the occupational therapist will assess and recommend changes to the home, such as installation of ramps and grab rails, and the use of non-slip mats in toilets.

Psychological help is also often needed to overcome issues of anxiety, altered self-image, and sense of helplessness. Occupational therapists can refer them to a psychologist or medical social worker, or encourage them to participate in peer groups like the SGH Amputee Support Group.

“We believe that a person’s ability to perform daily activities promotes health. The more they do things themselves, the easier it is for them to overcome feelings of anxiety or helplessness,” said Ms Ong.

Why diabetes can lead to amputations

High blood sugar levels damage nerves, so people living with diabetes may not feel heat, cold or pain in their toes, feet, fingers and hands. They are likely to also have poor blood circulation. When they get a cut, especially in their feet, people with diabetes may not realise they have an injury, which can lead to infection. If that injury is not treated and it progresses, the patient runs the risk of an amputation of the affected part.

Anti-tippers – the small wheels at the rear of the wheelchair – give added support and balance when going over humps, important for those with major lower limb amputations.



After an amputation, walking and other activities that used to be done easily become arduous, while the home can have accessibility issues, says Occupational Therapist Samantha Ong.



Dealing with back pain

Back pain is one of the most prevalent conditions that has seen a spike during the COVID-19 pandemic.

by Puvanes Balakrishnan



Long-term management of chronic back pain includes not only medications and interventions, but also physical, psychological and social support, says Dr Adeline Leong.

COVID-19 may be taking the top spot as the main health concern of current times, but other ailments are not lagging far behind. With a majority of the population working from home since the start of the pandemic, long hours in front of the computer, poor ergonomics and a lack of physical activity have contributed to an increase in the number of people with lower back pain.

“Lower back pain is a common pain condition that most of us encounter at least once in our lives. Thankfully, studies have shown that 80 to 90 per cent of patients with back pain recover within six weeks,” said Dr Adeline Leong, Consultant, Department of Anaesthesiology and Pain Medicine, Sengkang General Hospital and Singapore General Hospital.

Due to the complex nature of back pain, it is important to exclude serious causes to determine the appropriate treatment. Medical attention must be sought when one experiences infection (fever, chills, rigor), trauma (pain that occurs after a fall or accident), unintended and significant weight loss, uninvestigated back pain that has lasted more than six weeks, progressive weakness and numbness of the lower limbs, and onset of bladder and bowel incontinence.

“These symptoms are seen more frequently in at-risk individuals, including elderly persons above 70 years old, immunocompromised patients, and patients with osteoporosis or cancer,” Dr Leong noted.

Once these red flags have been ascertained and/or the cause of the lower back pain has been diagnosed, the management of back pain can then be tailored accordingly.

Chronic back pain

Frequent or continued pain exceeding three months would be generally defined as chronic back pain. In these cases, patients

will be recommended sustainable, long-term treatment that includes not only medication, but also multidisciplinary management including physical, psychological and social support.

“Medications and interventions are most beneficial when dealing with acute episodes of chronic back pain,” Dr Leong said, adding that short-acting painkillers such as paracetamol and anti-inflammatory medications should be taken only when needed, while nerve pain medications should be taken daily to target nerve-related pain or sensitised nerves.

Some patients may require interventions, such as injections containing local anaesthetics and steroids, to help reduce pain and inflammation.

In the event that response to conservative treatment is poor or if the cause of pain is amenable to surgery, surgical procedures may sometimes be recommended. These include spine decompression or stabilisation surgery.

Alternative treatments

Physiotherapy has been a mainstay of active self-management of chronic back pain. Regular and sustained periods of stretching and exercises improve and preserve function while preventing stiffness and weakness. Moderate exercises like swimming, aquatic therapy and stationary biking can be very useful for patients with chronic back pain.

Increasingly, acupuncture has also been recognised as an effective treatment for chronic back pain. A few sessions of acupuncture are usually required as part of a treatment course to determine its efficacy.

“Overall, managing chronic back pain requires a shift in perspective to focus on activity and function. Lifestyle modifications, good coping skills and mental well-being are crucial to sustaining the management of chronic back pain,” said Dr Leong.

For instance, activities should be paced such that there are adequate breaks in between to avoid triggering or exacerbation of the underlying back pain. Concomitant mental health issues like depression and anxiety must be addressed, as they can worsen chronic pain.

As chronic back pain can be taxing to manage on one’s own, social support plays an important role in helping patients cope. Some pain management centres offer group programmes that take a holistic approach to chronic back pain management. These incorporate physiotherapy, psychological strategies and support groups that help kick-start and maintain proper management of the condition.

Time to get moving

Regular exercise may improve the quality and duration of sleep, and reduce the risk of sleep disorders.

by Annie Tan

Globally, sleep disorders have been on the rise over the past two years, throughout the COVID-19 pandemic. According to Dr Gabriel Yee, Associate Consultant, Post-Acute & Continuing Care, SingHealth Community Hospitals (SCH), the number of cases of psychological disorders like depression and anxiety have been increasing as well.

While it is difficult to identify a specific reason, Dr Yee believes that sedentary behaviour may be one of the contributing factors. “At SCH, physical activity in older adults and healthcare workers decreased significantly during the pandemic, especially during the ‘circuit breaker’ period,” he said.

“Sedentary behaviour is associated with increased risk of insomnia and sleep disturbance. This can include difficulty initiating or maintaining sleep, increased snoring, waking up feeling tired, and even fragmented sleep with vivid dreams or nightmares. Chronic metabolic conditions can worsen and predispose patients to poorer sleep quality,” Dr Yee added.

The good news is, several studies have suggested that regular exercise may help advance the time of sleep and improve sleep efficiency. A 2020 study published in *Stichting European Society for Clinical Investigation Journal*

Foundation showed that 12 weeks of exercise, such as brisk walking, as recommended by the World Health Organization, improved sleep quality in sedentary middle-aged adults.

Occupational Therapist Douglas Lim from Outram Community Hospital (OCH) noted that a sedentary lifestyle may also

Bedtime exercises

These 7 simple relaxation exercises take 5 to 10 minutes, and can be done while seated.

Deep breathing

Place one hand on your chest and the other over your stomach. Inhale slowly, hold your breath for 3 to 5 seconds, and exhale slowly. While breathing deeply, ensure that your stomach is rising instead of your chest. Repeat this 5 to 10 times.



Head tilt

From a seated position, place your right hand over your left temple and gently tilt your head towards your right shoulder, holding the stretch for 10 seconds. Repeat this on the left side.



Body twist

From a seated position, rotate your trunk towards the right and look towards the back. Hold this for 10 seconds and relax. Repeat this on the left side.



Back stretch

Lie down on your back, bring both knees as close to your chest as possible. Hold this for 10 seconds.



Arm stretch

Flex your biceps. Then, extend arms to the side of your body. Do three sets of 8 to 12 repetitions.



Bicep curl

Hold a dumbbell in each hand, flex your elbows and relax. Do three sets of 8 to 12 repetitions.



Resistance band stretch

Hold one side of a resistance band in each hand and extend your hands straight in front of you at shoulder height. Stretch the band by opening up your arms towards your sides, then relax. Do three sets of 8 to 12 repetitions.



contribute to weight gain, which correlates to poorer sleep quality. As the body gains weight, increased fat distribution in the neck area and more tissue found on or around the throat lead to an increased risk of sleep disorders such as obstructive sleep apnoea, where the upper airway is blocked during sleep.

Exercising guidelines

Mr Lim suggested a combination of cardiovascular exercises like running, cycling and swimming, all of which increase the heart rate, and resistance training like weight-lifting or the use of a resistance band to build muscle strength. However, it is advisable to avoid strenuous exercises too close to bedtime, as that would accelerate the heart rate and stimulate the nervous system, making it hard for some to fall asleep.

“If you are unable to fall asleep, try getting out of the bed to do some deep breathing exercises and light body stretches. You could also try progressive muscle relaxation, where you tense individual muscles — of the ankles, thighs, biceps and face — for five seconds and then relax them,” he said.

These simple, low-intensity exercises help reduce muscle tension, relieve aches, and relax the body and mind for better sleep.

“The general guideline for adults and seniors is to engage in medium-intensity workout for 150 minutes per week, or high-intensity for 75 minutes per week,” said Mr Lim.

Nevertheless, any form or duration of exercise can be beneficial, even if it is just 10 minutes of walking each day. To enjoy better sleep and overall health, the key is to exercise consistently and make it a part of your lifestyle.



Regular exercise can alleviate sleep disorders and improve sleep quality, says Dr Gabriel Yee (top) and Occupational Therapist Douglas Lim.

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Implications of mask-wearing on a child's development

Q My one-year-old baby goes to infant care. I am worried about his speech development as the centre's teachers and staff are masked up. Will he be able to understand emotional cues as he grows older? At what age will he start talking?

A Health safety takes priority during the COVID-19 pandemic. Wearing a mask reduces transmission of the virus, but lowers the quality of sounds and eliminates most facial expressions.

For infants, sounds and facial expressions are important in developing communication skills. They learn non-verbal communication by looking, touching, hearing and imitating. They take cues from facial expressions, speech sounds, gestures and body language, acquiring language by one to one-and-a-half years old.

Although mask-wearing poses challenges for infants as they look to hearing and seeing cues, its impact on their development should not be a concern. Infants spend a substantial amount of time at home with their parents, who play an important role in their development. During feeding or playtime, parents and baby talk and bond with each other.

In the meantime, you can share your concerns with the care centre staff by suggesting that they reduce surrounding noise and distractions to get the child's attention before talking to him. They can speak slowly, audibly and reassuringly, and repeat words if necessary, with different intonations for emphasis. They can also maintain more eye contact and use body language to provide him with additional cues.

Some children acquire speech and language skills at a later age than their peers, irrespective of whether the people around them are masked. Developmental language disorders affecting young children are the most common concern for parents.

At one year of age, children follow a one-step command accompanied by a gesture, respond to their own name, and recognise their parents by saying "ma-ma" and "pa-pa". At two, children become sociable and enjoy playing alongside other children. They also learn to eat with a spoon. They can pronounce two-word phrases and should develop a vocabulary of about 50 words.

Children with visual and hearing disabilities may take longer to develop speech and language skills. But with appropriate attention and time, they can acquire communication skills, and develop emotional and social relationships. In general, when a sense is absent, other senses are heightened to help infants pick up other cues to learn from.

If you are concerned about your child's language, personal or social skills, seek help from a certified specialist to evaluate him or her as soon as possible. Early intervention programmes are important and available in the community to support the development of children with special needs.

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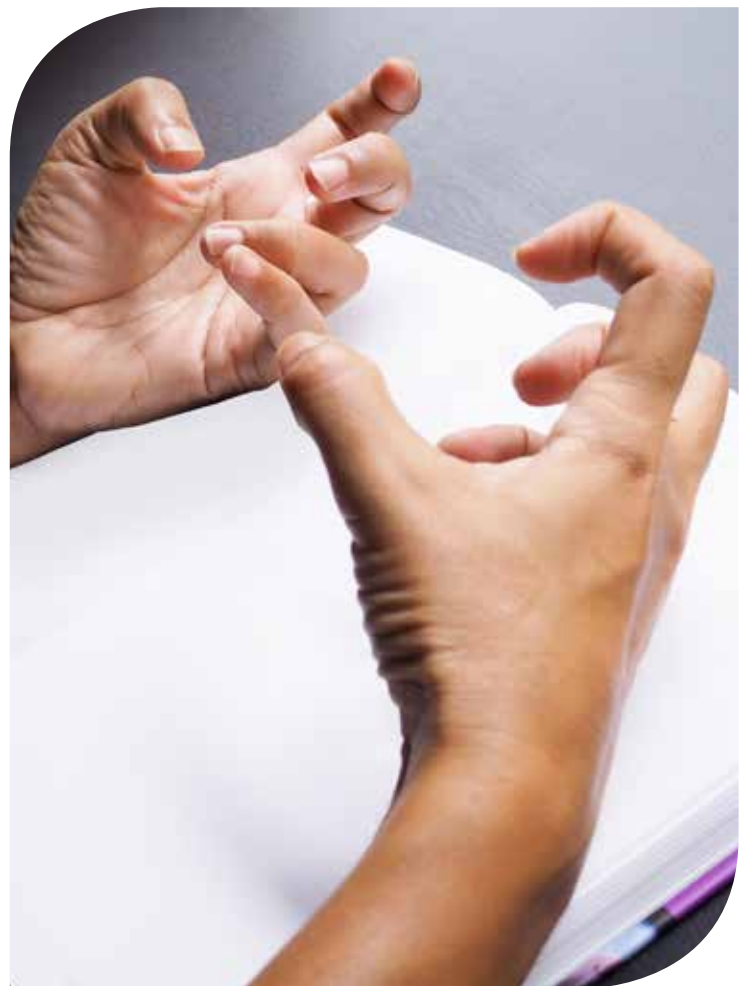
Professor Yeo Cheo Lian, Senior Consultant,
Department of Neonatal and Developmental Medicine, Singapore General Hospital

Question
& Answer

HealthXchange.sg

Managing seizures

Q What are the best ways to control or avoid seizures?



A The following are good ways to control or avoid seizures:

- Take anti-seizure medication regularly if prescribed and as advised by your physician.
- Do not skip the medication unless instructed to by your physician.
- Avoid undue stress, and treat illnesses and high fever early to reduce the risk of seizures.
- Discuss with your physician regarding any other medication or supplements you may wish to take, as some of these may trigger seizures or interact with anti-seizure medications.
- Have good sleep habits and avoid sleep deprivation.
- Avoid over-consumption of alcohol and binge drinking.

...

Dr Sheila Srinivasan, Senior Consultant,
Department of Neurology,
National Neuroscience Institute



... that hospitals are facing a bed crunch on a daily basis? To alleviate the situation, Sengkang General Hospital (SKH) developed a “pop and squeeze” model aimed at ensuring healthy patients who require simple surgeries, such as drainage of abscesses, do not need to be admitted the night before surgery.

With this new model, these patients who present at the Emergency Department (ED) will be sent home and return the following day for the day surgery.

This way, patients do not have to wait for admission at the ED or spend long periods in the hospital ward, which improves the patient experience. Since the launch of the initiative, the pre-operative duration has seen a significant reduction by 40 per cent, or four hours.

... that patients should not bring any valuables when coming to Singapore General Hospital (SGH) for surgery?

The hospital's staff will brief and encourage patients during their pre-admission consultation to leave their watches, jewellery, purses and other valuables at home. If patients are accompanied by a carer or next-of-kin (NOK) on the day of surgery, they will be asked to hand over their valuables to them.

If patients need to retain their belongings, the staff at the Same Day Admissions (SDA) Centre will provide a bag for the personal belongings, which will be secured with a serialised cable tie, in the presence of the patient or their NOK.

To avoid any disputes, the serial number will be recorded in the nurses' electronic care records, as well as on a form that the patient or their NOK will sign for. After surgery, the sealed bag will be delivered to the patient's assigned ward. Personal items like hearing aids, dentures, glasses and handphones are allowed, but patients must take care to prevent loss or misplacement.

Patients who are admitted after they are seen at the Emergency Department (ED) or Specialist Outpatient Clinics (SOCs) will similarly have their valuables placed inside a sealed bag for safekeeping, before it is handed to the wards. If the patient is unconscious, two senior nurses at the ED or SOC will check and record the valuables and other items for safekeeping in a sealed bag.



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MDIS



For Cough: Prospan® Bring Joy back into Your Life

For Adults

For Infants & Adults

- Dissolves mucus
- Relaxes airways
- Relieves cough



- alcohol-free • sugar-free • no colourings
- pleasant taste • non-drowsy

If you experience respiratory symptoms, please consult doctor.
*For infants and young children, please consult doctor.

MAHP2100105

Distributor: Pharmline Marketing Pte Ltd
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The #1 phyto-cough expectorant medicine worldwide†

† IQVIA, Global Market Insights, Category 'R5C (Expectorants)', MAT 12/2019 (units)



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

Before buying a glucosamine brand,
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?

For Viartil-S:

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?

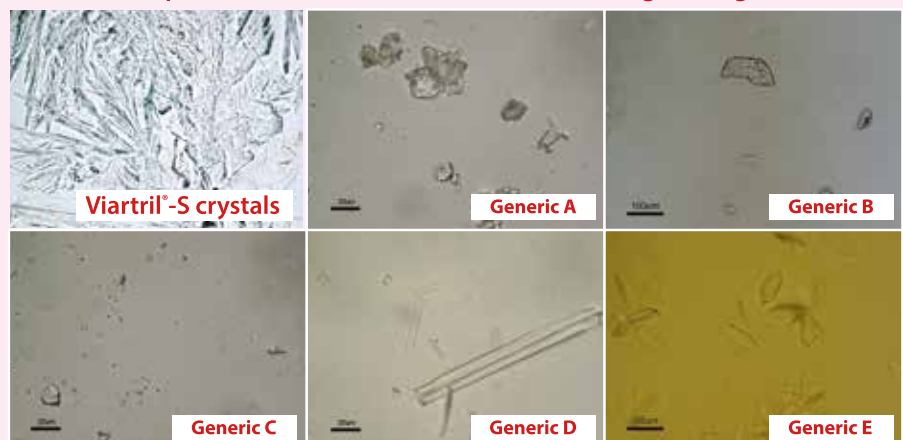


The Patented Prescription-Grade Crystalline Glucosamine Sulphate for Joint Health^{1,2}

In Singapore, glucosamine products are sold to public without the need for registration & approval by HSA. This means that even simple checks on purity are not required. So, the safety and efficacy of a brand can only be confirmed by lab & clinical studies.



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

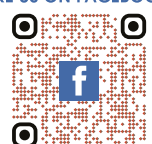


1. Dario Gregori et al. JAMA. 2018;320(24):2564-2579 2. Olivier Bruyère et al. Seminars in Arthritis and Rheumatism 44(2014) 253-263 3. Bruyère O, Altman RD, Reginster JY. Semin Arthritis Rheum. 2016 Feb;45(4 Suppl):S12-7.



The glucosamine brand used in
all successful clinical trials³

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