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05

HPV, Pap smear tests improve cervical cancer detection



06

A new quick and painless glaucoma injection with slow-release medication



10

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11

Beaming a blue light on sleep problems

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*Where lifelong learning begins*

# A ray of light in a dark, dark place

A breakthrough discovery offers hope to halt the dangerous muscle and strength loss in terminally ill cancer patients.

By Thava Rani

**A**FIFTH OF ALL CANCER DEATHS in Singapore are related to a muscle wasting complication called cachexia. Doctors do not fully understand why and how it happens and there are limited treatment options for the condition.

But, this may be about to change.

A multi-disciplinary team of scientists and clinicians in Singapore has identified the reason cachexia develops in some cancer patients.

In a study they co-led, they made the important discovery – that one of the causes of cachexia is the excessive burning of fatty acids by the body. This overturns the long-held assumption that hyperactive fatty acid oxidation is just a by-product of cachexia.

The discovery opens up numerous possibilities for treatment, and offers newfound hope to terminally ill patients.

The three-member team consists of Dr Iain Tan, Senior Consultant, Division of Medical Oncology, National Cancer Centre Singapore (NCCS); Dr Ng Shyh Chang, Genome Institute of Singapore, A\*STAR, the principal investigator; and Professor Teh Bin Tean, NCCS and Duke-NUS Medical School, a co-investigator.



## About the study



PHOTOS: 123RF / GETTY IMAGES / ROGER CHUA

Published online in *Nature Medicine*, the study involved lab experiments, which were followed by exposing human muscle cells to the effects of cancer cells.

Using the latest “Omics” technologies, including genomics and metabolomics, the team analysed the source of muscle stem cells and made the discovery – that the excessive burning of fatty acids by muscle cells (fatty acid oxidation) was the major cause of cachexia.

They then tested the effects of etomoxir, a very potent drug that inhibits fatty acid oxidation. It proved effective in preventing further muscle loss.

But etomoxir is considered too toxic for humans, so the team is now designing clinical trials to find the most suitable cachexia treatment from among a few other existing drugs.

“We’re hoping to find the appropriate drug and dose. With that, we can try to catch patients early enough in their cancer journey to make the maximum difference,” said Dr Tan.



**WE’RE HOPING THIS WILL PREVENT OR REVERSE CACHEXIA, AND MAKE PATIENTS STRONGER. IF WE CAN KEEP THEM WELL ENOUGH TO TOLERATE CHEMO, THEY’LL HAVE A FIGHTING CHANCE OF OVERCOMING THEIR CANCER.**

DR IAIN TAN, SENIOR CONSULTANT, DIVISION OF MEDICAL ONCOLOGY, NCCS

## Why patients waste away

Cachexia (pronounced ke-kek-sia) is the wasting away of the body due to a severe chronic illness. It is caused by multiple unknown factors and characterised by irreversible weight loss, especially from loss of muscle and fat mass. This is one of the most lethal effects of cancer. It severely reduces patients’ quality of life, ability to tolerate cancer treatments like chemotherapy, and increases their risk of secondary illnesses and infections.

Cachexia is thought to contribute to approximately 30 per cent of all cancer deaths. However, little is known about how it develops.

“About a third to half of all advanced cancer patients experience cachexia at some point in their journey with cancer. It could set in at any point before or after diagnosis. In some, it is aggressive and progresses rapidly, while in others, it is more gradual,” said Dr Tan.

“Cancer produces a variety of molecules that can lead to cachexia, and we discovered that most of these molecules end up activating this common fatty acid pathway. So, we believe this is actually the common cause of cachexia,” said Dr Ng.

He said when fatty acid burning goes into overdrive, free radicals are released. The muscle cells see the free radicals as a stress situation and go into conservation

mode, which means they stop growing and start wasting away.

“We took it one step further and showed that controlling the excessive fatty acid burning with drugs can halt further muscle loss,” said Prof Teh.

> Continued from page 3

## A ray of light in a dark, dark place

There is a substantial impact on the quality of life of patients with cachexia. Muscle loss leads to reduced strength. They are unable to fight off illnesses or infections, or fully recover from the side effects of cancer treatments such as chemotherapy.

Day-to-day functioning also becomes harder as heart and lung muscles are affected. Patients eventually become bedridden, and both the quality and quantity of life become limited.

“Older patients seem to be more susceptible to it, which may be

attributed to their general health to start with. And while it may develop with any cancer, patients with digestive tract cancers seem to be at a higher risk,” said Dr Tan.

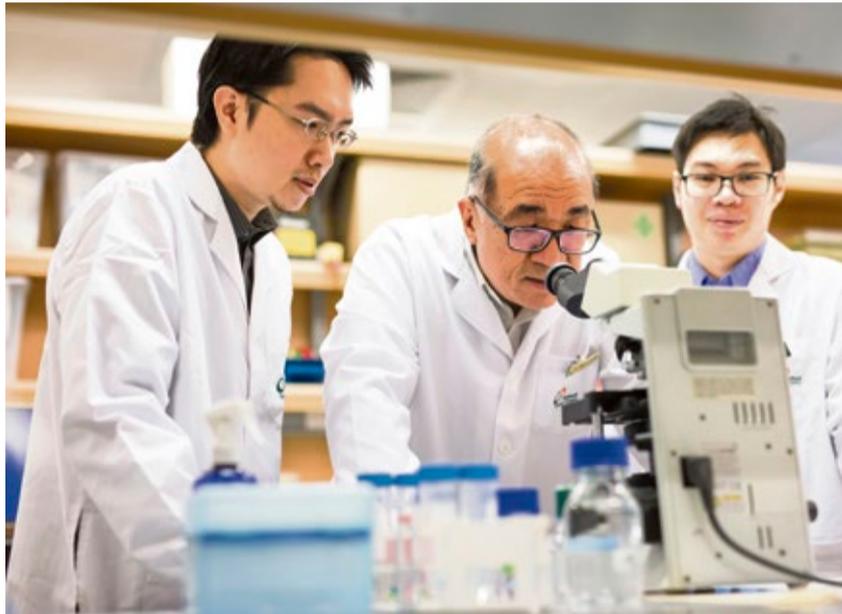
### There is hope now

Until now there were few drugs to prevent or treat cachexia. It's been managed by encouraging nutrition and stimulating the appetite. Eating can help restore some fat mass, but not muscle mass.

Chemotherapy to treat the underlying cancer also plays an important role in whether a patient can recover from cachexia. When the cancer responds to treatment and is under control, part of the cachexia can be reversed.

This breakthrough discovery can make a big difference to patients as there are readily-available drugs to halt the excessive burning of fatty acids.

“We're hoping this will prevent or reverse cachexia, and make patients stronger. If we can keep patients well enough to tolerate chemo, they'll have a fighting chance of overcoming their cancer,” said Dr Tan.



⤴ (From left) Dr Ng Shyh Chang, Prof Teh Bin Tean and Dr Iain Tan's collaborative work led to the breakthrough discovery that the excessive oxidation of fatty acids was causing cachexia in cancer patients.

## A chance meeting of minds

Their three-way meeting of minds was a chance collaboration, beginning about 12 years ago when Prof Teh Bin Tean and his then team were first researching cachexia in cancer.

The work had to be temporarily shelved because technology then was not advanced enough for the analysis. But Prof Teh always meant to come back to it eventually.

Three years ago, when Dr Ng Shyh Chang was giving a talk on his previous research into regeneration and muscle cells, Dr Iain Tan was in the audience. When the talk ended, he approached Dr Ng.

“He suggested that since I'd already been working on regenerating muscle cells, I could work on cachexia, a very critical muscle problem in cancer patients,” said Dr Ng.

They went to a cafe to discuss it, and later, while walking back to the car park, they bumped into Prof Teh. He surprised them with the story of his past attempts and offered them his findings.

And so the collaboration was born, one resulting in a major discovery that could impact the world and save many lives.

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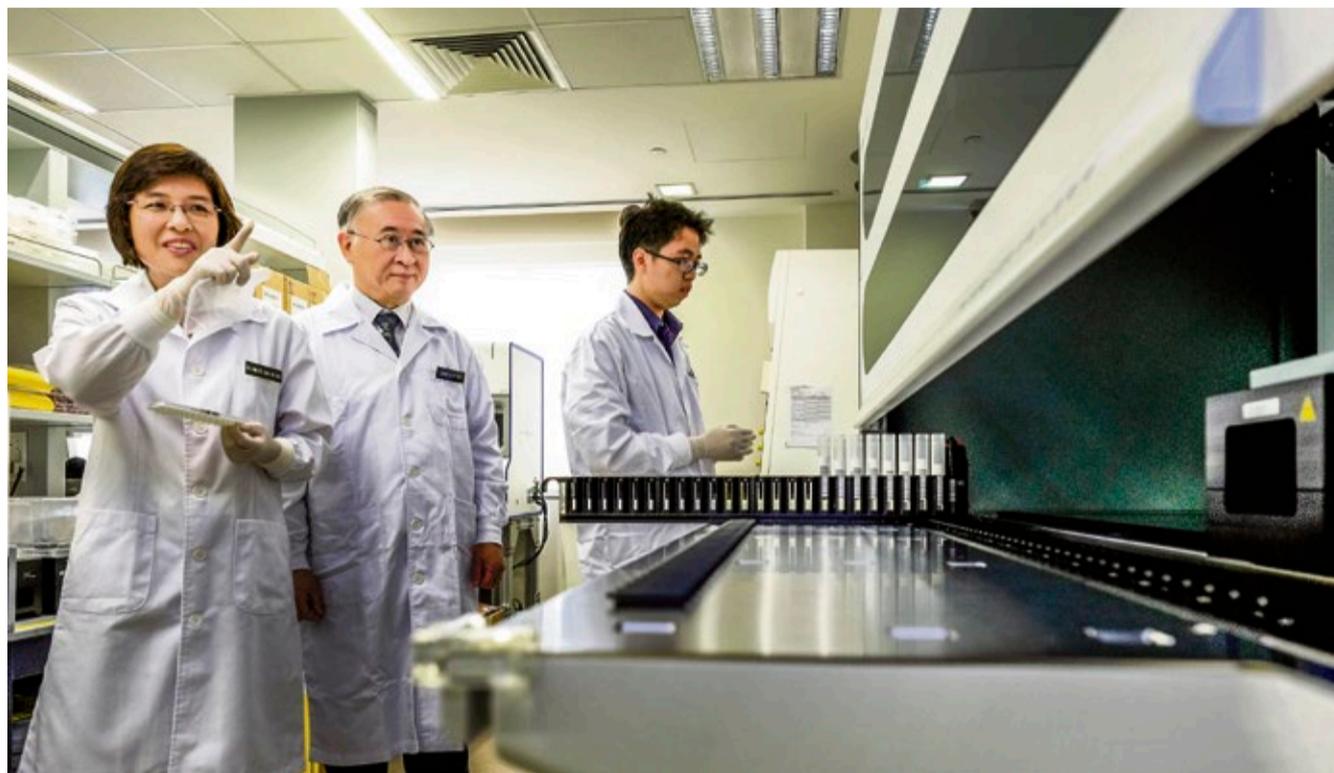


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Using a lab technique known as polymerase chain reaction or PCR, a piece of DNA is extracted from the cell samples. Many copies are then made to allow various tests to be applied to identify the HPV virus, said Dr Lynette Oon, Senior Consultant and Head, Department of Molecular Pathology, SGH (left), with Prof Tay Sun Kuie (middle).

# Making doubly sure

The HPV DNA test, paired with routine Pap smears, increases the chances of detecting cervical cancer at an early stage. *By Desmond Ng*

**T**HE PAPER SMEAR HAS BEEN USED to test for cervical cancer in women for nearly a century.

While effective, the Pap test isn't fool-proof. Women who tested negative for signs of the disease, like cell changes or abnormal cells, have been found to have the cancer later, while others with positive results have been found to have no cancer upon further testing.

A new screening tool has recently become available, which when used together with the Pap smear – known as co-testing – raises the chances of detecting the cancer substantially. The two tests showed higher sensitivity in detecting smaller numbers of cancerous or abnormal cells. This means that

women found to be at low risk of the cancer no longer need to be tested as often as with the Pap smear alone.

"It is important to detect the disease accurately in the first round of tests so that treatment can be started. If the first test misses signs of the disease, it may be another three years before the next test is taken. Some women may have developed cancer by then," said Professor Tay Sun Kuie, Senior Consultant, Department of Obstetrics and Gynaecology, Singapore General Hospital (SGH).

Cervical cancer is highly preventable and curable. Indeed, since the Pap smear started becoming more widely available in Singapore in the last few decades, cervical cancer incidence has dropped

dramatically. It is no longer the top most common cancer among women nor the commonest cancer killer as early signs of the disease, such as abnormal or pre-cancerous cells, are quickly treated to prevent the cancer from developing or spreading.

Nearly all cervical cancer cases are caused by the human papilloma virus or HPV. But just 14 of the more than 120 strains of the virus are associated with pre-cervical or cervical cancer. And of this number, the two most common and aggressive types are HPV 16 and 18. Together, they are responsible for about 70 per cent of cervical cancer cases.

The new tool, an HPV DNA test, is able to detect the presence of all 14

HPV strains and to single out HPV 16 and HPV 18. Also, it is able to pick out the presence of squamous cell carcinoma, a common cancer which has a pre-malignant phase. The test is also able to detect adenocarcinoma of the cervix, an aggressive cancer that is on the rise and which often strikes younger women, much earlier than the Pap smear. Unlike squamous cell carcinoma, adenocarcinoma doesn't have a warning stage, making early identification crucial.



**OUR PRIMARY INTEREST IN USING THE HPV DNA TEST IS NOT TO DETECT WHETHER A WOMAN HAS HPV BUT TO CORRELATE HPV TO THE PRESENCE OF A PRE-CANCER.**

PROF TAY SUN KUIE, SENIOR CONSULTANT, DEPARTMENT OF OBSTETRICS AND GYNAECOLOGY, SGH

HPV is the most common sexually transmitted infection worldwide, but most infections are harmless and will clear on their own within months. In this regard, women who test negative with both the Pap smear and HPV DNA test need not be tested again for the next five years. A Pap smear test is recommended every three years; high-risk individuals are encouraged to get tested more often.

"Our primary interest in using the HPV DNA test is not to detect whether a woman has HPV but to correlate HPV to the presence of a pre-cancer," Prof Tay said.

SGH began offering co-testing in November 2013 for women above 25 years old. So far, around half of the 10,000 women screened at SGH for cervical cancer have opted for co-testing. According to the hospital's data of 1,900 women who underwent both tests between November 2013 and August 2014, almost 100 per cent of cervical cases were picked up, versus the 70 per cent that would have been if just the Pap smear was done.

Cervical cancer is the

8<sup>th</sup>

highest cause of cancer deaths among women.

Between 2010 and 2014,

998

women were diagnosed with cervical cancer.

357

deaths from cervical cancer were reported with majority of cases diagnosed at stage I and II.

Chinese women were at the highest risk with

817

cases as against their Malay (119) and Indian (33) counterparts.

Nearly

48%

of the new cases diagnosed were women aged 54 years and younger.

# Implant versus eye drops

A new glaucoma injection with slow-release medication that lasts for a few months is being researched in clinical trials here and worldwide. *By Suki Lor*



📍 Dr Rahat Husain demonstrates how a tiny biodegradable sustained-release pellet is injected into the anterior chamber of the eye between the cornea and the iris, where it slowly releases its medication over three to six months.

Many people with glaucoma find it a hassle to use eye drops daily, and as a result, sometimes forget to apply them. If this happens too often, they risk worsening their vision or even irreversible blindness.

To address this and other problems with the long-term use of conventional eye drops, some slow-release formulations are being tested in Singapore and around the world.

One of them is a sustained-release, biodegradable implant, or pellet, injected into the eye. It contains bimatoprost, a drug which is commonly used to treat glaucoma. It is inserted into the anterior chamber of the eye between the cornea and the iris, where it slowly releases its medication over three to six months.

In Singapore, the Phase 3 clinical trials of this injection are being carried out at the Singapore National Eye Centre (SNEC), the Singapore Eye Research Institute (SERI), the National University Hospital, Khoo Teck Puat Hospital, and Changi General Hospital.

In Singapore, 3-4 per cent of people over 50, almost 10 per cent over 70, and more than 10 per cent over 80 have glaucoma, said Professor Aung Tin, Senior Consultant and Head, Glaucoma

Department, SNEC, and Executive Director, SERI.

Worldwide and here, it is the leading cause of irreversible blindness. It occurs when the optic nerve is damaged by high fluid pressure in the eye.

The use of topical eye drops can curb this increase in pressure and slow the progression of the disease, but it's not a cure.

"The majority of people are treated with eye drops. Some need to use two or three different ones, so after a while it becomes difficult. Five to six out of 10 glaucoma patients here and worldwide fail to stick to the daily eye drop regimen," said Prof Aung.

"Eye drops work but there are two problems," said Dr Rahat Husain, Senior Consultant, Glaucoma Service, SNEC, and also an Adjunct Associate Professor, Duke-NUS Medical School: "People forget or get lazy to use them. And eye drops can irritate the eye's surface, causing red or itchy eyes. Potentially, this intraocular implant will solve both these issues."

The pellets treat open angle glaucoma, the most common form of the illness, but they are unsuitable for closed angle glaucoma. The injection is simple, painless and done in seconds.

After applying anaesthetic drops to numb the eye, doctors use a handheld device to inject the less-than-1mm implant into the eye. No stitches are needed because the area the needle enters is self-sealing.

"One injection lasts at least three to four months. Over time, the pellet slowly biodegrades and disappears," said Prof Aung.

No infections have occurred so far in the trials, said Dr Shamira Perera, Senior

Consultant, Glaucoma Service, SNEC, and Co-Head of Bioengineering and Devices, SERI.

Local trial patients have taken easily to the new treatment. A 60-year-old senior customer service officer, who's had glaucoma for more than a decade, favours the implant over daily eye drops and has no issues with it.

"The procedure is fast and painless. Before the trial, I had to put eye drops in every night. I found it troublesome and would occasionally forget to use them," she said.

The bimatoprost implant is one of several methods being studied. These include other implants with slow release drugs for glaucoma, laser therapy, a punctal plug placed into the tear duct, and injecting a solution of the prescribed drug under the surface layer (sclera) of the eyeball.

Dr Perera, who is also an Adjunct Associate Professor with Duke-NUS Medical School, said that all these open up exciting possibilities to help glaucoma patients in future.

"It would be interesting to see if the different implants can work together. Perhaps eye drops could be used together with an implant in some cases, or two implants could be deployed in different parts of the eye."

Prof Aung said that in 10 to 15 years there may come a day when glaucoma patients can choose their preferred method of treatment – eye drops, a punctal plug in the tear duct, or an implant injected into the eye. "This could happen in the future. Maybe all the different technologies will be used."



📍 (From left) Dr Shamira Perera, one of the senior consultants in the team, and Prof Aung Tin, who is leading the clinical trial.



➤ New mothers who are at risk of developing urinary incontinence are recommended follow-up care at SGH's Postnatal Assessment Service. They will be given a thorough examination and a treatment plan, according to the Service's Dr Jason Lim Shau Khng (left) and Ms Yip Wan Hui (standing).

PHOTO: ALVIN LIM

progresses, hormones are also released to prepare the body for delivery, with effects such as the loosening of the ligaments and joints.

Although pregnancy and childbirth are huge risk factors to pelvic floor weakening, not all women will develop postnatal pelvic floor dysfunction. Those who do tend to be older, heavier, have carried larger babies, or have experienced prolonged or assisted vaginal delivery.

Women who pay scant attention to weakened pelvic floor muscles post-delivery may go on to develop more serious and complex conditions later in life. They may then need more invasive treatments, including surgery.

Patients with serious disorders, including pelvic organ prolapse (where the uterus, bladder or bowel drops through the vagina), urinary and faecal incontinence, or even a combination of all three problems, will be seen by SGH's Pelvic Floor Disorders Service, a full and multi-disciplinary service staffed by specialists from the Departments of Colorectal Surgery, Urology and Obstetrics and Gynaecology.

"But at the Postnatal Assessment Service, our work is preventive," said Dr Lim.

# Stop that leak

New Postnatal Assessment Service teaches mums how to deal with potential post-delivery symptoms. *By Thava Rani*

**A** WEAK BLADDER THAT causes embarrassing leaks is a problem that new mums may get.

But at Singapore General Hospital (SGH), a new Postnatal Assessment Service is making sure that women understand the changes that can occur in their bodies during pregnancy and after delivery, and the steps they can take to minimise the risks of developing urinary incontinence later on in life.

"Our aim is to educate, promote awareness, and get mothers to do relevant exercises so that they will not develop full-blown pelvic floor disorders," said Dr Jason Lim Shau Khng, Consultant, Department of Obstetrics and Gynaecology, SGH. He is the one who kick-started the service with the hospital's Physiotherapy Department.

"We also want them to know that it's not a problem that you just accept. There is actually a solution," he said.

The service, which started in January 2015, sees women who are most at risk of developing urinary incontinence. They are the ones who have needed assistance in delivery, especially with the use of forceps, or who have suffered serious tearing of the perineum area, said Ms Yip Wan Hui, Physiotherapist, SGH.

Physiotherapists visit new mothers at the wards to teach them pelvic floor exercises as part of their postnatal education and care, Ms Yip said. But the high-risk group will be recommended follow-up care with the Postnatal Assessment Service, which will give each patient a more thorough examination and propose a treatment plan.

Others who are likely to be referred to the service include women who already suffer from poor bladder control, as they are likely to experience a worsening of the condition after delivery. Then there are women who don't fall into the high-risk category nor suffer any symptoms during pregnancy, but develop weak bladder control after delivery.

Dr Lim said that about 10 per cent of pregnant women experience poor bladder control as a result of their pregnancy or delivery. Such women will experience urine leaks when pressure is exerted on the bladder – when they cough, sneeze, laugh, exercise or lift heavy things. Regular pelvic floor exercises can help treat this. "Generally, people with these issues do recover. And pretty quickly, too," said Dr Lim.

The pelvic floor includes the muscles, ligaments and connective tissue in the



**OUR AIM IS TO EDUCATE, PROMOTE AWARENESS, AND GET MOTHERS TO DO RELEVANT EXERCISES SO THAT THEY WILL NOT DEVELOP FULL-BLOWN PELVIC FLOOR DISORDERS.**

DR JASON LIM SHAU KHNG, CONSULTANT,  
DEPARTMENT OF OBSTETRICS AND  
GYNAECOLOGY, SGH

lowest part of the abdomen. It supports the bladder, bowel, rectum, as well as the uterus and vagina in women and the prostate in men. Weakened pelvic muscles or tears in the connective tissue hurt the ability of the pelvic floor to support these organs.

"The pelvic floor acts like a trampoline to absorb shock. During pregnancy, the weight of the baby sits on the pelvic floor and that stretches the muscles. Stretching can cause the muscles to weaken," said Ms Yip. As the pregnancy

## Fact or Myth C-sections help protect the pelvic floor

That childbirth is a risk to the pelvic floor is beyond doubt. The injury imposed on the sling-shaped area of muscles and tissues at the lowest part of the abdomen is much less for a woman who undergoes a shorter period of labour.

Given the damaging effects on the pelvic floor muscles, does choosing a caesarean section help in avoiding the weakening and tearing of the muscles in the short term, and possible incontinence later in life?

According to Dr Lim, studies in more recent years have quashed this idea. In the first place, to ensure that a caesarean surgery has a protective effect, the woman must not already have started labour before undergoing the procedure. All subsequent deliveries must also be via C-section.

"Studies have shown that even when these two strict criteria were met, other factors can contribute to pelvic floor weakness – age is a big factor, as are increasing BMI (body mass index), carrying heavy weights, and other types of surgery that traumatise the pelvic floor," said Dr Lim.

# Going to the dentist just got easier

A dental clinic exclusively for the elderly and those with special needs is making visiting the dentist a more comfortable experience. *By Sol E Solomon*

**A**T THE Geriatric Special Care Dentistry Clinic (GSDC), frail elderly patients and those with special needs can now have access to a full range of dental care. There, they will also be cared for by a multi-disciplinary team of dental specialists and allied health professionals.

The clinic has seen over 4,000 patients since it opened in late 2015. At full capacity, it can handle about 12,000.

Located at the National Dental Centre Singapore (NDCS), it was set up for the following groups of patients:

- Elderly patients aged 65 and above with physical, functional or cognitive impairment, who need special care. They include those with dementia, Alzheimer's Disease, Parkinson's Disease, muscular dystrophy and debilitating disabilities from a previous stroke.
- Special needs patients aged 13 years and above.
- Medically compromised patients who need dental clearance before medical intervention such as radiation therapy, oncologic

treatment, a transplant, cardiac surgery or general anaesthetic.

• Patients who have had radiation therapy on their head and neck and need longer-term follow-up before their oral health conditions are stable and they can be discharged.

Previously, these patients were treated in regular dental clinics, and were seeing a different dentist each time. This led to confusion and poor compliance.

Now, they are under the charge of a primary care dentist, who is either a general dentist or a specialist in geriatrics and special needs dentistry. The primary care dentist also coordinates their appointments with other medical and dental specialists.

"Seeing the same face helps reduce their anxieties," said Dr Tan Ching Ching, Consultant, Periodontic Unit, Department of Restorative Dentistry and Head, GSDC, NDCS. "If they require more complex treatment other than general dentistry, for example, a root canal or gum treatment, dentures, crowns, bridges or implants, they can be referred to in-house endodontists,

periodontists, prosthodontists and oral surgeons for further management within the clinic."

The clinic is equipped for and customised to patients' needs. Those with walking difficulties can be easily transferred to dental chairs, while those in wheelchairs can be wheeled onto a wheelchair recliner system, so that they can remain seated in their wheelchairs during dental procedures.

Every room has an intra-oral x-ray machine. There is also a minor operating suite. General dental radiography and surgical procedures under local anaesthesia can be done in the clinic.

The drop-off point for ambulances is just outside the clinic so that bed-bound patients can get direct access. The clinic will work with nursing homes and eldercare centres to better improve oral health care for the elderly.

"Nurses will be educated on how oral health impacts general health and how maintaining a healthy set of teeth lets patients stay pain free, eat



📍 (From top) The clinic is a one-stop facility for the elderly and those with special needs; the team comprises (from left) Ms Tiffany Kong, Radiographer; Ms Low Hong Fong, Patient Services Clerk; Dr Jason Huang, Dental Officer; Dr Tan Ching Ching, Head, Geriatric Special Care Dentistry Clinic; Ms Nurul Haziqah, Dental Surgery Assistant.



**SEEING THE SAME FACE HELPS REDUCE THEIR ANXIETIES. IF THEY NEED MORE COMPLEX TREATMENT, THEY CAN BE REFERRED TO IN-HOUSE SPECIALISTS FOR FURTHER MANAGEMENT WITHIN THE CLINIC.**

DR TAN CHING CHING, CONSULTANT, PERIODONTIC UNIT, DEPARTMENT OF RESTORATIVE DENTISTRY AND HEAD, GSDC, NDCS



📍 Patients can be wheeled seamlessly onto the wheelchair recliner system, which allows them to remain seated in their wheelchairs during dental treatment.

well, sleep well and therefore have better quality of life," said Dr Tan.

The clinic will also work with private dental clinics and polyclinics to co-manage some of these patients when their medical conditions are more stable.

"If they can see their own general dental practitioners regularly in the early stages of disease, they will be able to keep their oral health in an optimum condition, and so reduce the risk of developing more complicated dental conditions later on, when their health declines," said Dr Tan.

# Better handgrip test for locals

With new data from a local study, Singapore doctors can now better interpret readings from handgrip strength tests which assess frailty in the old. *By Suki Lor*

**D**OCTORS HERE PREVIOUSLY interpreted handgrip strength in Asians using Western reference measurements. But this is not ideal because handgrip strength varies between countries and peoples.

Now, a study by Duke-NUS Medical School (Duke-NUS) has come up with data especially for the Singapore population.

The first of its kind here, the study involved taking handgrip strength measurements of thousands of healthy people aged 60 to 89. This test examines the extent of frailty in the old due to loss of muscle strength.

For the test, subjects had to squeeze a dynamometer as hard as they could, with one hand, while standing. Their

gender (because women have lower grip strength than men) and the hand they used (dominant or non-dominant) were also taken into account. The results were published in the *Journal Of The American Medical Directors Association*. The data is now available as simple charts for doctors, and may soon be available as an online calculator, pending approval.

Readings from local data are more accurate because factors influencing grip strength vary between countries and populations, said Dr Rahul Malhotra, Assistant Professor, Head of Research, Centre for Ageing Research and Education (CARE), Duke-NUS, and the study's lead author. "Using the same dynamometer and measurement protocols, doctors can

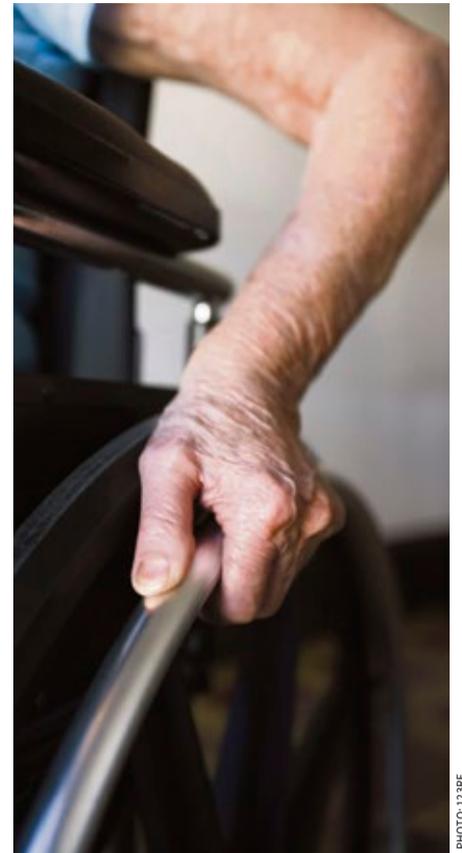
monitor changes in patients' handgrip strength levels and easily see where a patient stands for his age and gender," said Dr Malhotra.

He said previous studies have shown how handgrip strength can also point to a patient's future health. Lower grip strength could lead to various other serious health issues.

However, frailty cannot be calculated based on low handgrip strength alone. Other indicators are unintentional weight loss, self-reported exhaustion, slow walking speed, and low physical activity. If three or more of the criteria are present, the person is identified as frail.

"But it can alert doctors to more closely evaluate patients if their measurements improve, stabilise or worsen over time. Worsening measurements can be cause for concern," Dr Malhotra said. The next step is identifying handgrip strength thresholds that can predict adverse health outcomes, he said.

The team is currently gathering data from a new batch of elderly participants and comparing it to data from a 2009 study. This is necessary because of the rapid changes the old have been through living here compared to the West. These include dramatic shifts in occupation, better nutrition, and a sharp decline in disease incidence.



Readings from local data are more accurate because factors influencing grip strength vary between countries and populations.



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# Meet your "Admissions Buddy"

SingHealth patients due for hospital admission can now go online to do their own paperwork and check estimated charges. *By Suki Lor*

**A**DMISSIONS BUDDY, SingHealth's new online portal, is making hospital admissions quicker, easier and safer for patients.

Instead of queuing at the Admissions Office, this user-friendly portal – the first of its kind in Singapore – lets patients make decisions and do financial checks online. They can access the important information they need, such as their pre-admission data and estimated bill size, including what's funded by government subsidies, Medisave, and MediShield Life deductibles.

Like on hotel booking sites, patients can easily view the different ward types, prices and features. They can then make a booking and pay a deposit. Patients are even able to make changes to the room type or request a different admission date.

Unlike the face-to-face admission experience, portal users can take their time to review the information before making any decisions.

"Being able to look at the information in detail and review it at leisure gives them peace of mind," said Ms Lee Chen Ee, Director, Office for Service Transformation, SingHealth and Chief Operating Officer, National Dental Centre Singapore.

"We wanted to offer patients the option of doing it from the comfort and convenience of their homes so that they won't have to wait, and can review details with their caregivers, many of whom would be the ones paying the hospital bills," said Ms Lee, who was one of the co-chairs who led the project team in developing the portal.

The team, comprising doctors, nurses, IT specialists and administrative personnel, surveyed 340 patients and Admissions Office staff to find ways of improving the admission experience. They found that patients wanted less paperwork and were overwhelmed by the whole financial counselling process.

Admissions Buddy was launched as a pilot project in KK Women's and Children's Hospital (KKH) in Nov 2015 for patients of its women's services and two children's specialities. KKH patients due for surgery are given a postcard after their clinic visit, telling them how to log on to the portal using a valid SingPass. It also reminds them of items to bring on the day of admission.

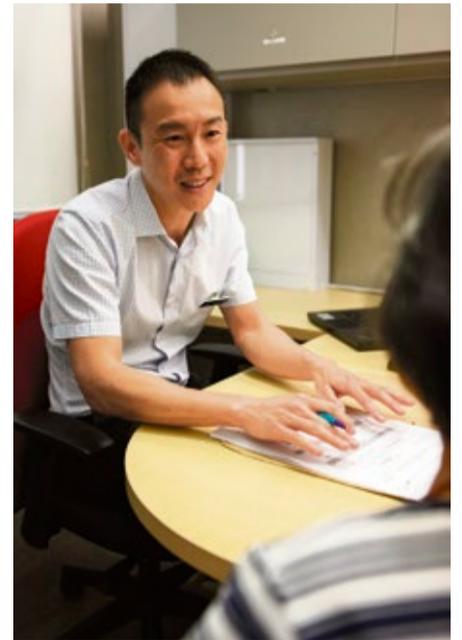
At the Singapore General Hospital (SGH) Admissions Buddy was launched in January 2016 to a select group of patients, and is expected to be opened to others pending further enhancements to the portal. These include allowing patients to provide online consent for data sharing, and online authorisation for Medisave deductions.

By mid-2017, SingHealth patients will also be able to access Admissions Buddy via HealthHub, the national mobile and electronic portal for patients.

## Only one form to fill

"With initiatives such as Admissions Buddy, we can further empower our patients by placing information on their health care needs at their fingertips," said Ms Grace Lim, Chief Financial Officer, KKH, who co-chaired the project team with Ms Lee.

So far, nearly nine out of 10 patients who have used Admissions Buddy have rated it positively. They find it convenient because they no longer need to wait at the hospital for financial counselling. This translates to a saving of up to 40 minutes, including 20 minutes queuing at the admissions office during off-peak periods, and longer if the place is busy.



📍 The Admissions Office is still available for those who prefer to register and get financial counselling face to face.

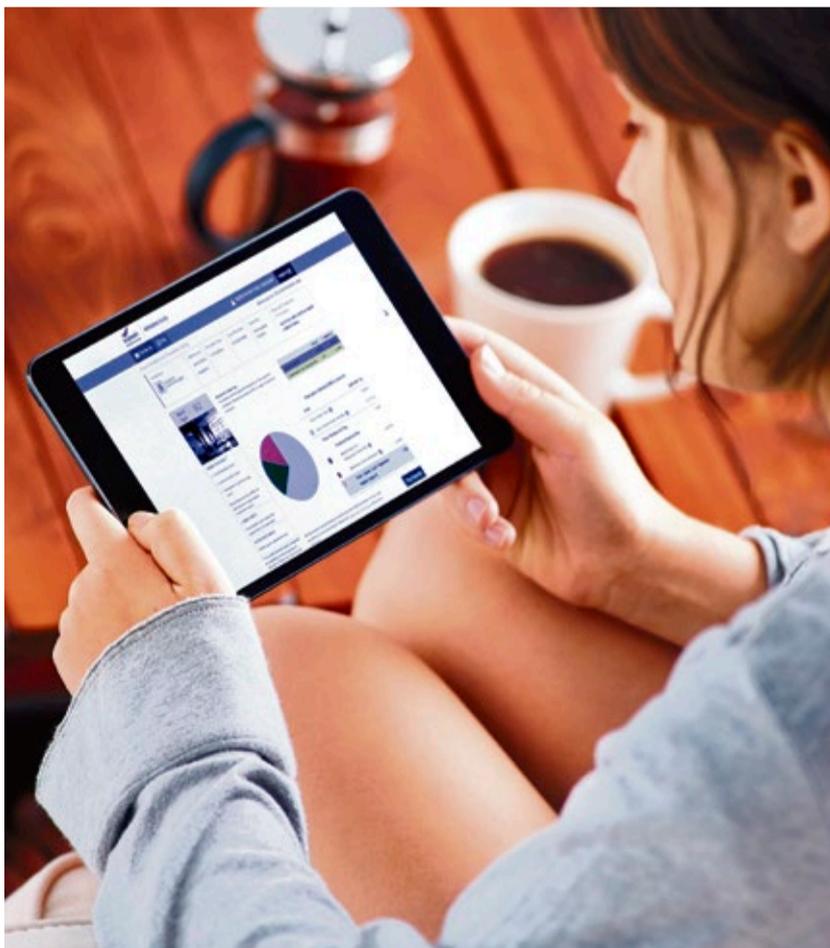
In redesigning the admission process for Admissions Buddy, an electronic admission form system was developed to harmonise and eliminate the different hardcopy forms used by each SingHealth institution. Doctors and staff now only need to fill up one form, which contains details about the admission and surgery.

The information is electronically linked to the portal so that users can do their own financial counselling accurately online. The electronic form is now used across SingHealth institutions, improving patient safety as it eliminates illegible handwriting and errors in transcription.



**BEING ABLE TO LOOK AT THE INFORMATION IN DETAIL AND REVIEW IT AT LEISURE, GIVES THEM PEACE OF MIND.**

MS LEE CHEN EE, DIRECTOR, OFFICE FOR SERVICE TRANSFORMATION, SINGHEALTH

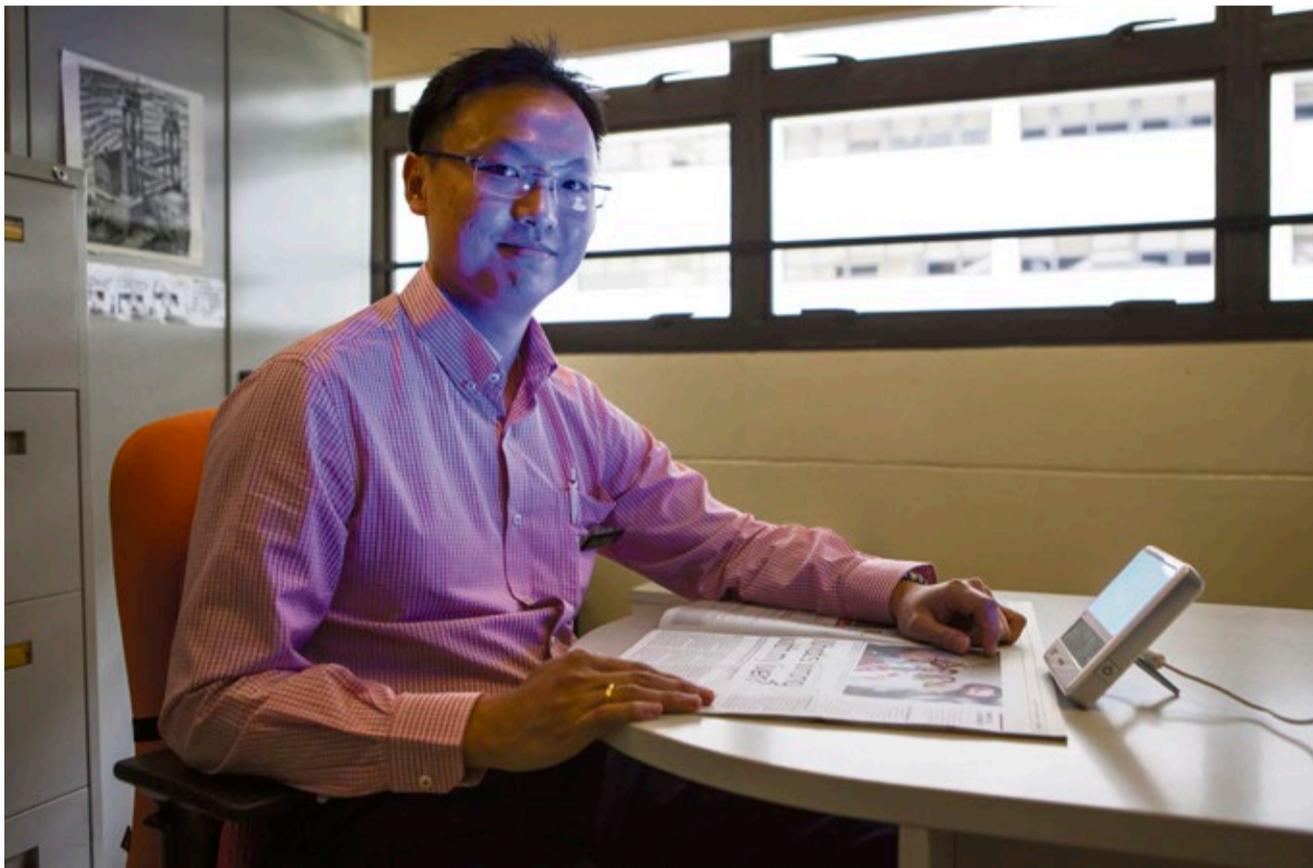


## Using Admissions Buddy

- You can access the portal by logging on to <https://admissionsbuddy.singhealth.com.sg> three working days after your clinic visit using your SingPass. By mid-2017 the waiting time will be shorter.
- You can view the estimated bill size of your upcoming hospital stay, a breakdown of the costs, and how much can be funded by government subsidies, Medisave, MediShield Life, and your Integrated Shield Plan, if you have one. Only the deductible amount will be reflected.
- From mid-2017, you can provide online consent for data sharing, and authorisation for deductions, for multiple admissions, from your Medisave account.
- You can compare the cost of different ward types, pick one, request a change, and pay an initial deposit online.

Associate Professor Ong Hock Soo, Deputy Chairman, Division of Surgery, SGH, who led the Clinician Workgroup for the electronic admission form, said, "The success of the electronic admission form was the result of close collaboration between doctors and administrators, to create a user-friendly form that reduces the risk of errors and improves patient safety. It also improves the efficiency of nurses and admissions office staff."

The Admissions Office is still available for those who prefer registering and getting financial counselling face to face. Such patients will also, most likely, enjoy shorter waiting times there, as other patients move to the online portal. This lets staff spend more time with patients who need further explanations due to the complex nature of their procedures.



➤ Reading the papers in the morning, with a blue-light-emitting light box close by, gradually brings forward a night owl's sleep and wake times. Eventually, said Dr Leow Leong Chai (above), he will feel sleepy earlier, naturally.

# Beating bedtime woes with blue light

Blue light therapy resets sleep-wake cycle for night owls and morning larks.

By Desmond Ng

**T**HE BODY'S INTERNAL CLOCK has a roughly 24-hour cycle that governs waking, sleeping and other physiological processes. It relies on daily environmental cues known as zeitgebers – the most important of which is exposure to morning light – to keep it in sync with the normal 24-hour day.

In people living in the polar regions, where the sky can stay dark for as long as six months at a stretch, the so-called circadian clock goes haywire because it doesn't receive its natural cue – daily sunlight – to prompt them to wake or sleep, creating a sort of perpetual jet lag effect. As a result, people tend to go to bed roughly an hour later each day.

Similarly, teens who use smart devices such as computers to play games late into the night might find it increasingly difficult to nod off despite the lateness of the hour, as do those who work night shifts.

"The body's intrinsic biological clock regulates what time we wake up and

when we feel sleepy. That clock is partly reset every day by external cues, the most important of which is morning light shining into our eyes," said Dr Leow Leong Chai, Consultant, Department of Respiratory and Critical Care Medicine, and Sleep Disorders Unit, Singapore General Hospital (SGH).

Although it is not clear why, light of blue wavelengths is the most important factor in keeping the body clock ticking accurately. Blue light, said Dr Leow, activates the melanopsin receptors behind the retina, whose only purpose is to regulate the body clock.

"When blue light from the morning sun hits the melanopsin receptors, it inhibits melatonin release during the day and increases melatonin release in the evening, promoting normal restful sleep," said Dr Leow. Melatonin is a sleep-promoting hormone secreted by a gland in the brain that maintains the body's circadian rhythm and helps regulate other hormones.

Smart phones, TV screens and computer monitors emit large amounts of blue light. Using them late at night deceives the brain into thinking it is still day, which delays the secretion of melatonin and keeps users bright-eyed and awake.

To reset the body clock in individuals whose circadian rhythm is out of whack, a light box can be helpful. This device emits very bright blue light at 10,000 lux, an intensity similar to that of full morning sunlight. Night owls who have trouble sleeping and waking early must use the light box for 30 minutes every morning for about a fortnight.

"This form of morning light or phototherapy brings forward an affected person's sleep and wake times by a small duration each day. He will feel sleepy earlier, naturally," said Dr Leow. The patient also needs to develop new habits, such as avoiding artificial blue light sources (like smartphones and computers) late at night, not drinking

caffeinated beverages excessively, and sleeping and waking at fixed times every day, even on weekends.

"Over time, the person will rely less on the light box as his body clock resets. But he has to maintain good sleep hygiene," Dr Leow said.



**THIS FORM OF MORNING LIGHT OR PHOTOTHERAPY BRINGS FORWARD AN AFFECTED PERSON'S SLEEP AND WAKE TIMES BY A SMALL DURATION EACH DAY. HE WILL FEEL SLEEPY EARLIER, NATURALLY.**

DR LEOW LEONG CHAI, CONSULTANT, DEPARTMENT OF RESPIRATORY AND CRITICAL CARE MEDICINE, AND SLEEP DISORDERS UNIT, SGH

Phototherapy has been available at the Sleep Disorders Unit since late 2014. The unit sees about 50 patients for circadian problems a year. The majority – 70 per cent – of patients with circadian rhythm disorders seen at SGH are teenagers and young adults who suffer from what is known as delayed sleep phase syndrome, noted Dr Leow. The youngest has been a secondary four student who had difficulties waking up in time for school. Indeed, he often missed school.

For the elderly, who tend to sleep and wake early – a syndrome known as advanced sleep phase disorder or "morning larks" – but who want to have more "normal" hours, a light box is used for half an hour from around 7pm, to prompt them to sleep later.

Going to bed and waking up early may be part of ageing, but this can be a problem for some. They may disturb their families when they wake at 4am. They also may not get to see their families often since the latter are already asleep when they reach home later at night, said Dr Leow.

Older people, he added, tend to have lighter and more fragmented sleep. It is not clear why this happens, but it could be because they tend to wake up more often to go to the toilet, have aches and pains that keep them from sleeping well, or are on medications (for illnesses like hypertension) that affect their sleep.

The consequences of poor sleep can be more serious than just daytime sleepiness or poor school or work performance. Insufficient sleep can affect one's health, such as by increasing blood pressure, and contributing to cardiovascular problems, poor blood sugar control in diabetics, and lowered immunity.

# Healing hands

Fixing broken bones is a calling for Principal Enrolled Nurse Sozhalavan. *By Suki Lor*

**W**HEN MR SOZHALAVAN Govindasamy Pillai Suppayan was a National Serviceman decades ago, he fortuitously reported to an army sergeant who urged him to consider nursing as a career.

He pooh-poohed it initially. After all, male nurses were few and far between then. “I asked her if she was joking. ‘I am a man. How can I go into nursing?’” he said.

But the sergeant, impressed by Mr Sozhalavan’s kind and helpful nature, was confident that he would be great as a nurse. He often rushed to perform simple first aid for his fellow NSmen and cheerily helped with heavy loads.

Spurred on by her conviction

and adopting a can-do spirit, Mr Sozhalavan decided to give nursing a shot. He completed the course at the School of Nursing and joined a medical ward at Singapore General Hospital (SGH) as an Enrolled Nurse in 1989.

Now Mr Sozhalavan, 49, is a Principal Enrolled Nurse, a role he was promoted to a few years ago. For the past two decades, he has been working at Specialist Outpatient Clinic H, where he applies plaster casts to fix patients’ fractures or to realign bones.

On busy days, he sees as many as 35 patients.

He credits his mentors, orthopaedic technicians Yap Seet Yoong and Ng Puey Kwan, with kindling and fueling



PHOTO: ALVINN LIM

Thankful for the guidance he has had in his career, Mr Sozhalavan is keen to nurture the next generation in plastering.

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his interest in plastering casts. Mr Ng, now in his early 80s, retired only recently while Mr Yap, who is past the official retirement age, continues to serve patients on yearly contracts.

With the invaluable guidance he has received from the two, Mr Sozhalavan is keen to pay it forward by nurturing a new generation proficient in the art of plastering. “I am happy to share my knowledge. I always tell my colleagues or any students that ‘today is my day for you,’” he said.

Solan, as friends and family affectionately call him, also makes sure to give patients detailed explanations about their treatments and the choice of plastering material for their fractures, and offers advice on how to take care of themselves for a smooth recovery.

“All these years, it’s been my motivation to help patients to heal, to see them walk again or be able to eat by themselves. When they return and say – ‘Solan, thank you very much for helping me’ – I’m satisfied!” said the bubbly and energetic Mr Sozhalavan.

But it’s talking about his wife and two children that makes his eyes light up. His son, Suriya, is 25 and is studying to be a nurse – not at his behest – while his daughter, Shahera, 20, has set her sights on teaching. He credits his wife, Gulzar Begam, a family educator who works with school counsellors, for his well brought-up children and happy family life.

A keen sportsman, he also has a soft side. Mr Sozhalavan is a music lover and plays traditional Indian drums.



**ALL THESE YEARS, IT'S BEEN MY MOTIVATION TO HELP PATIENTS, TO SEE THEM WALK AGAIN OR BE ABLE TO EAT BY THEMSELVES. WHEN THEY RETURN AND SAY – ‘SOLAN, THANK YOU VERY MUCH FOR HELPING ME’ – I'M SATISFIED!**

SOZHALAVAN GOVINDASAMY PILLAI SUPPAYAN, PRINCIPAL ENROLLED NURSE, SGH

After 27 years as a nurse, Mr Sozhalavan remains passionate about his work. His commitment and willingness to go the extra mile have earned him a string of accolades, the latest being the Singapore Public Service’s PS21 Star Service Award and the Tan Chin Tuan Nursing Award for Enrolled Nurses, both won in 2015. He attributes his awards to the teamwork and camaraderie that he enjoys with his colleagues.

He readily recommends that others join the nursing profession. For a newly-minted nurse, the first few months can be rough, but he said: “Don’t give up easily. Try and stay on. Not everybody has the chance to be a nurse.”

# A lifelong bond

For Dr Tan Shu Yun, family medicine is not a career, it's a way of life. *By Desmond Ng*

**W**HILE IN EDINBURGH FOR an elective posting, Dr Tan Shu Yun witnessed the special bond between family doctor and patient. The doctor-patient relationships were so strong that often, a doctor could tell what ailed a patient before being told.

But then, GPs or general practitioners formed the backbone of the UK health care system. They looked after patients in their neighbourhood, literally from the cradle to the grave. Moreover, they were extremely well trained in dealing with the gamut of bread-and-butter medical problems, such that specialists were only referred to for the most difficult cases, she said. Dr Tan is Consultant, Department of Family Medicine and Continuing Care, Singapore General Hospital (SGH).

She decided to stay in this discipline although initially, she didn't have a preference for any and liked every posting that she was given. In fact, after her A levels, Dr Tan was torn between becoming an ecologist, a water systems engineer and a doctor. She's glad she opted for medicine.

"This career has allowed me to stretch my potential to the fullest. In a

way, I'm now an ecologist studying our health system, an engineer who tries to improve it, and a healer to the suffering patients I encounter."

Dr Tan has been practising family medicine for 11 years, seven of them at SGH. She leads SGH's Transitional Home Care programme, a national initiative to ensure that patients with complex



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DR TAN SHU YUN, CONSULTANT, DEPARTMENT OF FAMILY MEDICINE AND CONTINUING CARE, SGH

needs receive post-discharge care so that they don't fall ill again quickly and get re-admitted to hospital. The department's doctors are also rostered to care for both in- and outpatients, and at Bright Vision Community Hospital.

"We rotate between the different service areas of our department so that we maintain and sharpen our generalist skills in all areas," said Dr Tan, noting that within this discipline, doctors can also further specialise in areas like sports, geriatric, and palliative medicine.

She doesn't see herself moving to the private sector as she likes the support and resources – medical social services, subsidised drugs, IT, administration – that a big hospital offers. For the same

reason, she believes that family medicine clinics – a hybrid of private and public health care facilities such as SingHealth's Family Medicine Clinic at Chinatown Point – will become more important. At such clinics, GP partners have access to pharmacies, electronic records, and other services offered by a large hospital group. Patients with complex conditions can also be supported by well-trained family physicians.

A typical Singaporean, Dr Tan counts hawker centre- and cafe-hopping among her favourite pastimes. She also practises pilates and reads. Married, with a seven-year-old son, Dr Tan and her anaesthetist husband get lots of questions about medical conditions at family events.



PHOTO: ALVIN LIM

Family medicine is a calling for Dr Tan Shu Yun, who revels in the special bond that she has been able to form with her patients.

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## Nuts for health



How often have people encouraged you to eat nuts whenever you felt the urge to snack? Rich in unsaturated fatty acids and loaded with minerals and vitamins, nuts have gained superfood status in recent years. Now, it seems that eating them might be a lifesaver in more ways than one. Researchers from Imperial College London and the Norwegian University of Science and Technology found this after analysing 29 published studies involving more than 819,000 people from different parts of the world, over a few years. Participants included people who suffered from a range of diseases, from cardiovascular problems to stroke, and even cancer. Overall, those who habitually ate at least 20g of raw nuts every day were found to have a lower risk of such diseases. So, why not give chips a rest and stock up on hard shell nuts? Your body will thank you for it.

Source: Imperial College London

## Look on the bright side

A study by Harvard University has found that optimistic people enjoy better health than pessimists.

Researchers collected behavioural data on 70,000 women who enrolled in a nationwide Nurse's Health Study over eight years. The women answered questions on their health and mental state during this period, while the researchers noted their general outlook on life, and monitored their mental states with as much control as they had on the causes and effects.

The study revealed that the women who were moderately to highly optimistic had a much lower risk of dying from infections, heart diseases or cancer, compared to their pessimistic counterparts. It was previously proven that an optimistic state of mind helps control cholesterol, develops stronger immunity, and slows the rate of cellular ageing.

Source: Harvard University



PHOTOS: I2RF

### EVENT CALENDAR

#### Baby Weaning Workshop\*

**DATE** 22 Apr 2017

**TIME** 10am-12pm (Pre-registration starts at 9.45am)

**VENUE** Patient Education Centre, Room 1  
**REGISTRATION** Call 6394-1268 (Monday to Friday, 10am-5pm)

**COST** \$10 per person (KKJC members), \$15 per person (Non-KKJC members)

A dietitian and a speech therapist will share essential information on weaning. This will be followed by a demonstration on cooking baby food.

\*Suitable for parents with babies aged six months and above.

#### "Better Sleep, Better Health" Public and GP Forum

**DATE** 18 March 2017

**TIME** 9.30am-12pm (public session); 2pm-4.30pm (GP session)

**VENUE** Singapore General Hospital, Learning Space L4/5 (Block 6, Level 1)

**REGISTRATION** Call 6326-6621 or 6326-6217 to secure a space

Learn about various sleep disorders and how to cope with them at this forum organised by the SGH Sleep Disorders Unit and KKH Sleep Laboratory. Separate sessions will be held for members of the public and GPs.

Visit [www.singhealth.com.sg/events](http://www.singhealth.com.sg/events) or the websites of respective institutions for any changes, more information and other listings.



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**T**HE FIRST SURGEONS may have been mediaeval barbers wielding nothing more than clean, sharp razors. But surgeons today use highly sophisticated instruments, state-of-the-art operating systems, and imaging devices to perform highly complex and intricate procedures.

In surgery to remove colorectal cancer, surgeons aim for the best patient outcomes by offering smaller wounds and rapid recovery after surgery with minimal complications, while achieving complete cancer clearance with low recurrence rates.

With modern medicine, these ideals are possible, and most planned procedures in this field are safe and effective. The quality of life of a colorectal cancer patient has vastly improved over the past two decades, and this has largely been due to technological advancements in the medical field.

Over the last few decades, the management of colorectal cancer, especially rectal cancer, has evolved, with treatment and surgery no longer a one-size-fits-all approach. The treatment of colorectal cancer is individualised to each patient, based on the stage, location and extent of spread of each cancer, as well as patient factors.

#### Accurate staging

For the right treatment to be prescribed, it is critical to determine the stage of the cancer correctly. The current use of 3D high-resolution ultrasound and high-resolution magnetic resonance imaging (MRI) allows surgeons to identify how deep the tumour has penetrated, and whether the disease has spread to the lymph nodes and adjacent organs.

#### Surgical staplers

The surgical stapler – another milestone in the development of colorectal surgery – allows surgeons to perform secure anastomoses (joining the cut ends of the intestine after the cancer has been removed) with fewer complications. Previously, anastomoses were hand-sewn and difficult to perform. With surgical staplers, colorectal anastomoses are consistent, safe, and heal well with fewer complications such as leaks. Modern staplers are constantly being improved, resulting in powered devices, adjustable heights and graduated compression. These enhance patient safety and surgical outcomes.

#### Minimally invasive surgery

The increasing use of minimally invasive surgery in treating colorectal cancer can be attributed to revolutionary advances in surgical optics, operating platforms, laparoscopic equipment and energy devices. Features like autofocus cameras, anti-fog lenses, flexible 3D and 4K or ultra-high definition laparoscopes provide clear views of the abdominal cavity and pelvis,

allowing surgeons to perform more precise surgery.

New operating platforms are also available, such as robotic-assisted surgery where the surgeon sits comfortably at a console, controlling high-definition 3D cameras and fine, highly dexterous cutting instruments, to perform difficult and complex procedures like lateral pelvic node dissections.

Meanwhile, transanal platforms and single port devices allow minimally invasive colorectal resections to be performed using smaller and fewer incisions. The use of these platforms

# Modern colorectal cancer care shaped by technological advances

Colorectal cancer surgery no longer takes a one-size-fits-all approach as advances in technology in recent years have led to a sea change in the way the disease is managed and treated.

By Dr Cherylin Fu

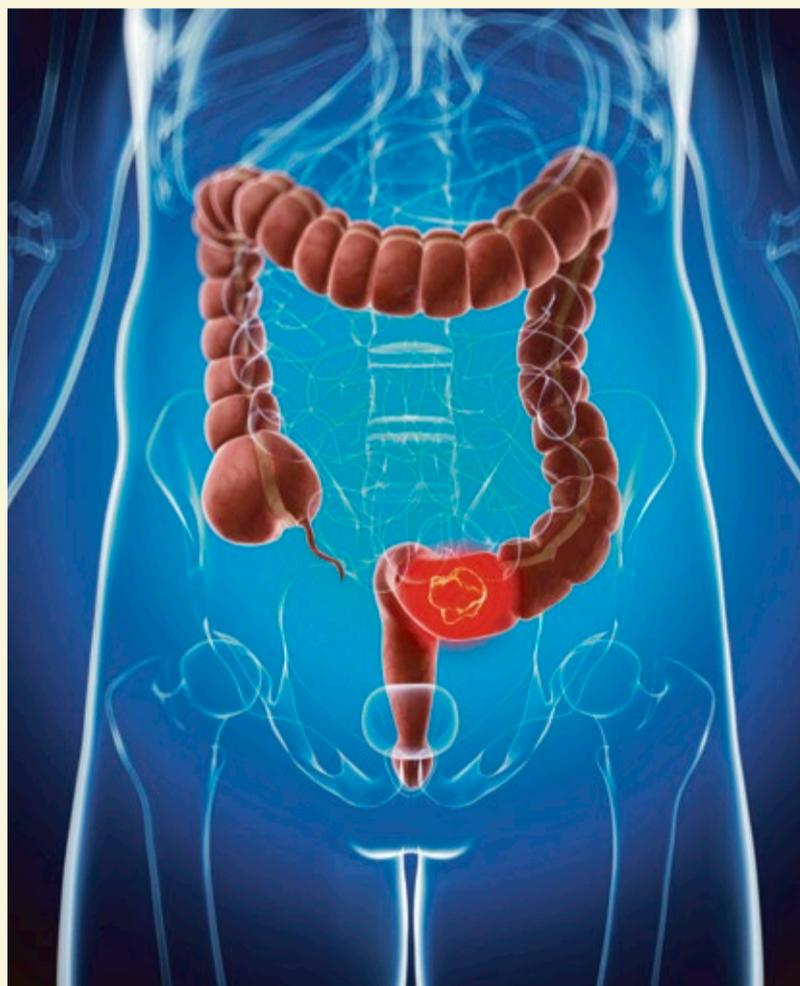


ILLUSTRATION: IZBRF

being of surgeons in terms of better ergonomics and less surgeon fatigue.

#### Energy devices

Surgical instruments and energy devices are important tools in the colorectal surgeon's practice. Increasingly, laparoscopic instruments are being developed with more ergonomic and other advanced features to make work easier for surgeons. Energy devices, which are used to cut and dissect tissue, have features such as improved vessel sealing functions to reduce bleeding while minimising thermal injury to adjacent tissues.

#### Radiotherapy

Technology has also had an impact on radiotherapy, an important component in the multi-disciplinary treatment of colorectal cancer. Whole pelvic radiotherapy used to be associated with significant adverse reactions such as rectal inflammation and bleeding. However, with targeted radiotherapy techniques, such complications have reduced significantly in the last two to three decades.

Advanced radiation strategies with novel radiosensitisers, intensity-modulated radiotherapy, and high-dose-rate brachytherapy, are likely to be the next step in improving treatment while simultaneously reducing radiotherapy related toxicity.

#### Early Diagnosis Saves lives

Find out from Singapore General Hospital's colorectal surgeons about colorectal cancer and its prevention, diagnosis and treatment, at the bilingual Colorectal Cancer Awareness Carnival\*, organised to mark Colorectal Cancer Awareness Month in March.

**Saturday, 18 March 2017**  
**10am–11.30am (English)**  
**2pm–3.30pm (Mandarin)**  
**Academia, Level 1 (SGH Campus, opposite Singapore National Eye Centre)**

\*Admission is free. To reserve a place, email [SGHCCAM@gmail.com](mailto:SGHCCAM@gmail.com) or SMS 9895-7051 with: **your full name/NRIC/English or Mandarin session/number of people attending** by 16 March 2017. Shuttle bus service from Outram Park MRT Station will be provided.



Dr Cherylin Fu is Consultant, Department of Colorectal Surgery, Singapore General Hospital. She did her fellowship in Australia from 2013 to 2014 in pelvic floor disorders and advanced laparoscopic

colorectal surgery. She has trained in various sub-specialised procedures such as sacral nerve stimulation and laparoscopic ventral rectopexy among other operations for faecal incontinence and pelvic floor prolapse. She is also heavily involved in organising various public outreach and public awareness campaigns on colorectal and pelvic floor disorders in Singapore.

has become increasingly popular, and has paved the way for NOTES (Natural Orifice Transluminal Endoscopic Surgery) and NOSE (Natural Orifice Specimen Extraction) to become a reality. Such techniques, where operations are performed through the body's natural openings, were deemed dangerous and experimental not too long ago.

These new technologies not only benefit patients in terms of less pain, smaller wounds, less bleeding, faster return to normal function, and fewer adhesion-related complications, but also take into consideration the well-

# Donating body for research

**I am in my teens and keen to donate my body for medical research after death. Am I eligible and what should I do? How do I ensure my body is treated properly after death?**

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To pledge your body or organs, complete and sign the Organ Donation Pledge Form before sending it to the

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Whole body donations allow doctors and medical students to research new life-saving medical and surgical procedures and techniques. Every donation is treated with care and dignity.

During lessons, students learn about the structures of the human body close up, such as the position of organs and blood vessels, and which major arteries should not be punctured during medical procedures.

For more information, go to the page on policies on and issues concerning organ transplants at [www.moh.gov.sg](http://www.moh.gov.sg), or call NOTU at 6321-4390.

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**I recently retired and am looking to do voluntary work as a way of giving back to society. I have received good care at SGH before, so am interested in helping out at the hospital. How do I go about it?**

**SGH SAYS** The hospital has a volunteers' programme known as "Friends of SGH", which provides opportunities for members of the public to volunteer and share a personal touch and compassion with our patients. To volunteer or for more information, call 6326-5158 or email [mumtaj.ibrahim@sgh.com.sg](mailto:mumtaj.ibrahim@sgh.com.sg).

## To say "thank you"

**I am grateful to the care I recently received at SGH, and would like to offer a token of appreciation. How do I find out about giving to the hospital?**

**SGH SAYS** We welcome donations and bequests from individuals and companies as these help fund programmes for our patients, clinical research and postgraduate education. For more information on how to donate, go to [www.sgh.com.sg/subsites/fundraising/Pages/MakeaGift.aspx](http://www.sgh.com.sg/subsites/fundraising/Pages/MakeaGift.aspx).

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SINGAPORE POLYTECHNIC **SP**

# Ease the build-up

Massage can help reduce swelling in lymphoedema patients. By Desmond Ng

**W**OMEN WHO undergo surgery to remove cancerous tumours of the breast can sometimes later find one arm to be larger than the other.

It's not a procedure gone wrong. Rather, when surrounding lymph nodes are removed as part of treatment, normal lymphatic fluid drainage is interrupted. This then leads to fluid build-up, causing the affected area to swell over time.

However, the condition known as lymphoedema can be reversed easily when treated in its early stages, said Ms Kou Seow Wei, Principal Physiotherapist, Singapore General Hospital (SGH).

"We use a massage technique known as manual lymphatic drainage, in which very light, gentle strokes stretch the patient's skin to stimulate the lymphatic flows from the affected area," Kou said. "We try to redirect the flow to another area that's not affected, to other lymph nodes that can be drained."

Usually, this is accompanied by compression bandaging to apply external pressure to the swelling. New patients usually have to undergo two

weeks of daily therapy lasting an hour each time, after which follow-up therapy is arranged on a less frequent schedule such as fortnightly, monthly or longer. Patients will have to wear compression sleeves or arm stockings for life-long maintenance.

Lymphoedema can occur when the lymph vessels or nodes are poorly developed, in a rare, inherited condition known as primary lymphoedema. Most patients have the secondary form of the disease, which occurs when surgery, cancer treatments like radiotherapy, disease, or infection damage the nodes or vessels.

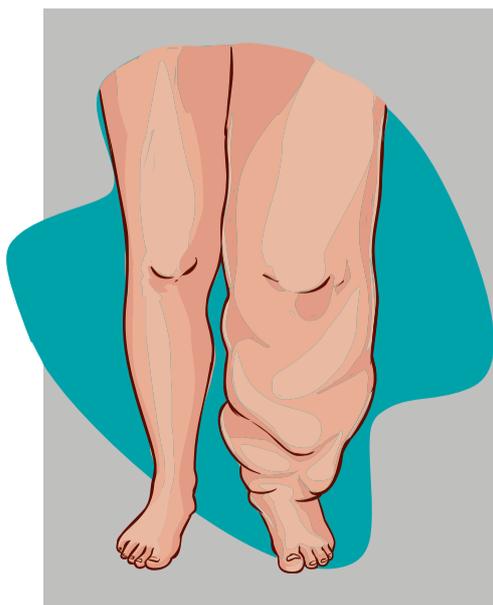
The lymphatic system circulates protein-rich lymphatic fluids throughout the body, collecting and filtering out bacteria, viruses and waste products from the body.

"It's a kind of a waste disposal system," said Ms Kou.

Patients who undergo cancer surgery are taught to recognise the signs of lymphoedema. But the condition has few other symptoms apart from swelling and a feeling of discomfort, so patients often



Manual lymphatic drainage uses light, gentle strokes to help drain lymphatic fluids from the affected limbs of lymphoedema patients, said Ms Kou Seow Wei (above).



## Symptoms of lymphoedema

- ▶ A feeling of heaviness or tightness
- ▶ Swelling of part or all of your leg or arm, including fingers or toes
- ▶ Difficulty moving
- ▶ Aching or discomfort
- ▶ Skin hardness and tightness
- ▶ Folds developing on the skin

don't realise they have it until friends or family members point the anomaly out to them. Also, lymphoedema can develop suddenly and very quickly.

The affected leg or arm of most of the patients that Ms Kou sees is usually twice the size of the other, although in extreme cases the condition can lead to swelling of monstrous proportions. Manual lymphatic drainage is effective in bringing the swelling down, after which excess tissue can be surgically removed if needed.

Patients are taught to clean and moisturise their skin properly to avoid inflammation and infection, and to do light exercise to improve lymph drainage.

"Elevation of the limb helps with the swelling, and so does exercise. You need to engage in activities where there's muscle contraction, to help with the lymphatic flow," said Ms Kou.

"The swelling can hinder your daily activities because your arms or legs

are bigger. You may not be able to walk for long, or be able to carry things. And you may get tired easily," she added.

Ms Kou said that SGH receives about 140 new lymphoedema cases a year. While the condition is not life threatening, it can lead to infections and complications, amputation of the affected limb, or even death.

For more severe cases, surgery is an option. Surgeons can create new channels for proper drainage through lymphatic-venous anastomosis or lymph node transplant.

Lymphoedema can occur anywhere, but it most commonly affects the legs and arms, as lymph nodes are removed during breast, prostate, gynaecological, and head and neck cancer surgeries, disrupting lymph drainage in these areas.

If the condition progresses without treatment, tissues in the affected area become increasingly swollen and thickened.

# More than just droopy eyelids

Myasthenia gravis is a little-known disease that can be serious, but can be treated effectively if diagnosed correctly. *By Suki Lor*



For most patients, the disease starts with droopy eyelids, and sometimes also double vision. In some cases, only the eyes will be affected, but for the majority, symptoms become generalised within two years.

**M**YASTHENIA GRAVIS, translated, means grave muscle weakness, and that is exactly what it is.

It begins with droopy eyelids, and can progress to weakness in voluntary muscles (not involuntary muscles such as those in organs) elsewhere in the body.

An acquired autoimmune disorder, the disease can be triggered by an infection or inflammation, or develop gradually without any trigger. It cannot be cured or prevented, but there is effective treatment. Patients can even go into remission, though relapses may occur, caused by stress, infection, pregnancy, extreme heat, and certain types of medication, among other factors.

Dr Kamal Verma, Senior Consultant, National Neuroscience Institute (NNI), said that the disease can be serious, but fortunately, most sufferers have less dire symptoms, and with treatment, can lead normal lives.

He said it occurs when nerves stop “talking” to muscles. Ordinarily, nerve impulses in the brain send signals through nerves to muscles by releasing the chemical acetylcholine. This chemical binds with receptors on muscle cell membranes at neuromuscular junctions. If the body produces antibodies which destroy these receptors, less acetylcholine will get through, causing signal failure and then muscle weakness.

For most patients, the disease starts with droopy eyelids, and sometimes also double vision. In some cases, only the eyes will be affected, but for the majority, symptoms become generalised within two years.

“Symptoms can progress to involve other parts of the body. Patients may develop weakness in swallowing, or speech – they may slur or become very soft after speaking for some time. They may also develop fatiguable weakness – which fluctuates – in their legs and arms. They feel worse in the evening, because as the day progresses, they get more tired, with less acetylcholine reaching the muscle membranes,” said Dr Kamal.

The disorder can strike people at any age and even those in the pink of health. It is more common in women in their 20s and 30s and men over 50. In the United States, it affects 20 out of 100,000 people. Dr Kamal himself sees about 30 to 35 patients on regular follow-up a month, and NNI’s neuromuscular clinic sees about two to four new cases a month.

Neurologists diagnose the disease by checking for droopy eyelids, other areas for fatiguable weakness, and anti-acetylcholine receptor (AChR) antibodies in the blood. These are present in 85 per cent of patients with generalised symptoms. Those who do not have these antibodies undergo more tests, including repetitive nerve stimulation, single fibre EMG, and other blood tests.

## How it’s treated

Treatment depends on a patient’s condition. Those with only eye symptoms and no antibodies are likely to remain as is for many years, and can be treated with drugs for symptomatic relief.

Others, especially those who are antibody positive and have generalised symptoms, may be given an immunosuppressant that suppresses mostly the “bad” immunity, along with the “good”.

“The benefit outweighs the risk,” said Dr Kamal, citing studies which show that early treatment with these drugs can sometimes prevent the disease from spreading. Dosages are reduced when symptoms ease, or if a patient goes into remission. During such periods, patients need close monitoring.

Another option is removing the thymus gland (thymectomy) because data suggests it may trigger or maintain the production of AChR antibodies.

“We generally advise all our young patients to do it because the beneficial effects of the surgery are not seen until later. Patients in the older age group are also so advised, only if a tumour is found within the thymus gland,” said Dr Kamal.

Patients with weakened lung muscles who have difficulty breathing may need to be intubated in an emergency. Here, additionally, a plasma exchange can clean the blood of the offending antibodies, much like dialysis.

Another rescue treatment is IVIG – giving a patient immunoglobulins intravenously to modulate the body’s immunity.

## Not a case for plastic surgery

Some patients with droopy eyes may mistakenly think it is age-related and undergo surgery to lift their eyelids at an eye clinic.

“The diagnosis can be missed if only the eye muscles are affected, especially in the older population,” said Dr Kamal, stressing that because it is a treatable illness, it is important not to ignore symptoms and get referred to a neurologist for an accurate diagnosis. “Symptoms can be reversed with proper treatment. That’s why awareness is so important.”

His advice to patients who have difficulty seeing, speaking, swallowing, breathing, biting, chewing, or with fluctuating tiredness in their limbs, especially late in the day is: “See a doctor!”

## The 5 grades of myasthenia gravis

**1. Ocular myasthenia:**  
One or both eyes are affected.

**2. Mild generalised myasthenia:**  
Fatigue sets in only on sustained exertion.

**3. Moderate myasthenia:**  
The patient starts to feel tired with a minimal amount of movement or action.

**4. Severe myasthenia:**  
The patient starts to feel tired even at rest, or has symptoms all the time.

**5. Myasthenia crisis:**  
Respiratory muscles have weakened so much that the patient is unable to breathe, putting his life at risk. He will need to be intubated and put on a ventilator in the intensive care unit.

# Read before you swallow

When prescribed medication, it's important to follow instructions to a T – there are good reasons behind every instruction found on medication labels. Read them closely. *By Thava Rani*

**M**EDICATIONS CAN INTERACT WITH FOOD AND OTHER DRUGS. Some can also cause side effects like stomach upset or sensitivity to sunlight. Some must be swallowed whole; some need to be discarded within a specified time after opening. Some come in different shapes and sizes, or go by different names, even though they are actually the same thing.

Welcome to the colourful, but complex world of medications.

Luckily for patients, medicine labels help take out the guesswork. Besides the drug name, drug strength and usage instructions, these labels usually also contain warnings about potential interactions with food or other drugs, storage, and expiry, said Dr Wang Aiwen, Senior Pharmacist, Pharmacy Department, Singapore General Hospital.

"It's important to highlight these so that patients are adequately cautioned," Dr Wang said.

For instance, some tablets cannot be cut because they are designed to release their active ingredient slowly in the stomach. Cutting the tablet releases the key chemical all at once, and the patient will not get the intended effect of having it released over a period of time, such as 12 to 24 hours, or may get too much of it at one go. However, some patients are not able to swallow a whole tablet because of its size. In such cases, they should ask their doctor or pharmacist if other options are available, said Dr Wang.

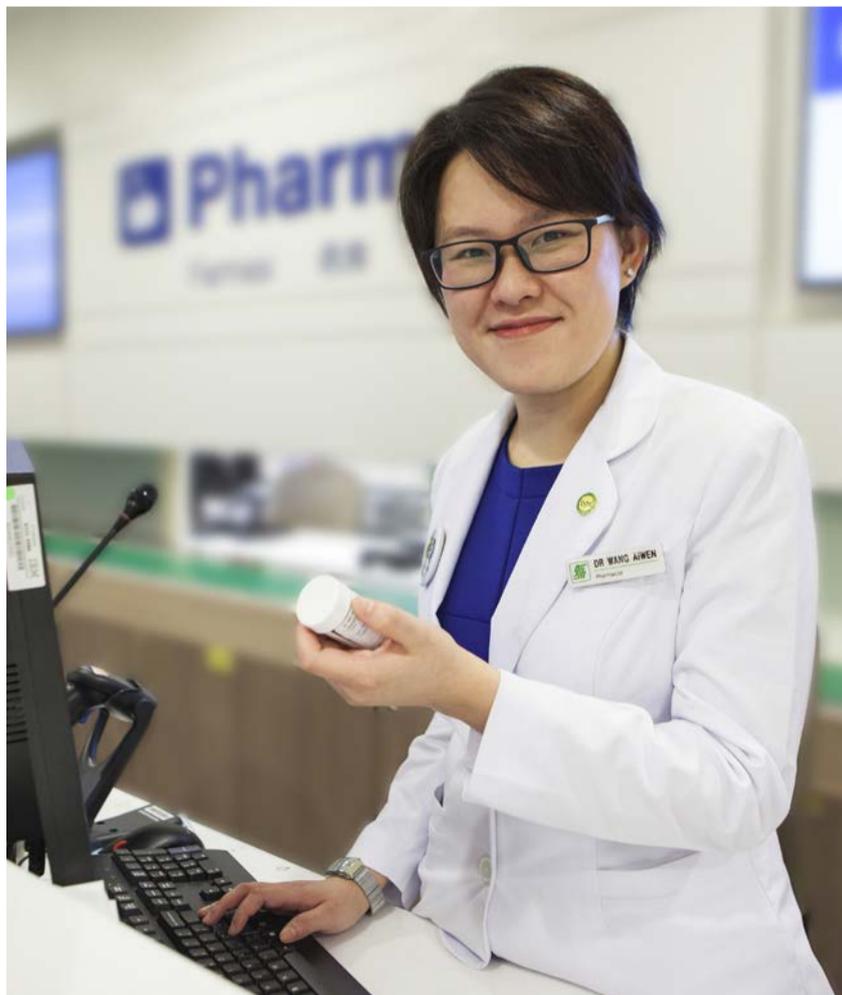


PHOTO: ALVIN LIM

Always read the fine print and check the active ingredients of OTC medications to understand important safety information and to help avoid an overdose of the drug, said Dr Wang Aiwen.

## What labels mean

21 TAB  
FERROUS FUMARATE\* 200MG TAB  
TAKE ONE TABLET EVERY MORNING  
**TAKE HALF TO ONE HOUR BEFORE FOOD.** MAY BE TAKEN WITH OR AFTER FOOD IF STOMACH UPSET OCCURS. MAY DARKEN YOUR STOOLS.  
XXX 16/02/2017

- Some medications have to be taken on an empty stomach for better or complete absorption of the drugs.
- Some have to be taken after a meal because the medications can irritate the stomach. Taking them after food helps minimise side effects such as nausea or tummy upset.

21 TAB  
CHLORPHENAMINE MALEATE\* 4MG TAB  
TAKE ONE TABLET THREE TIMES DAILY  
MAY BE TAKEN WITH OR WITHOUT FOOD. **MAY CAUSE DROWSINESS.** DO NOT DRIVE OR OPERATE MACHINERY. AVOID ALCOHOL.  
XXX 16/02/2017

- It is dangerous to drive or operate machinery after taking medications that cause drowsiness. Wait for the effects to wear off before doing so.
- Elderly patients need to take extra care, as many are prone to falling or have poor balance.

7 TAB  
SIMVASTATIN\* 20MG TAB  
TAKE ONE TABLET EVERY NIGHT  
MAY BE TAKEN WITH OR WITHOUT FOOD. **CONSULT DOCTOR IF MUSCLE WEAKNESS AND ACES OCCUR.**  
XXX 16/02/2017

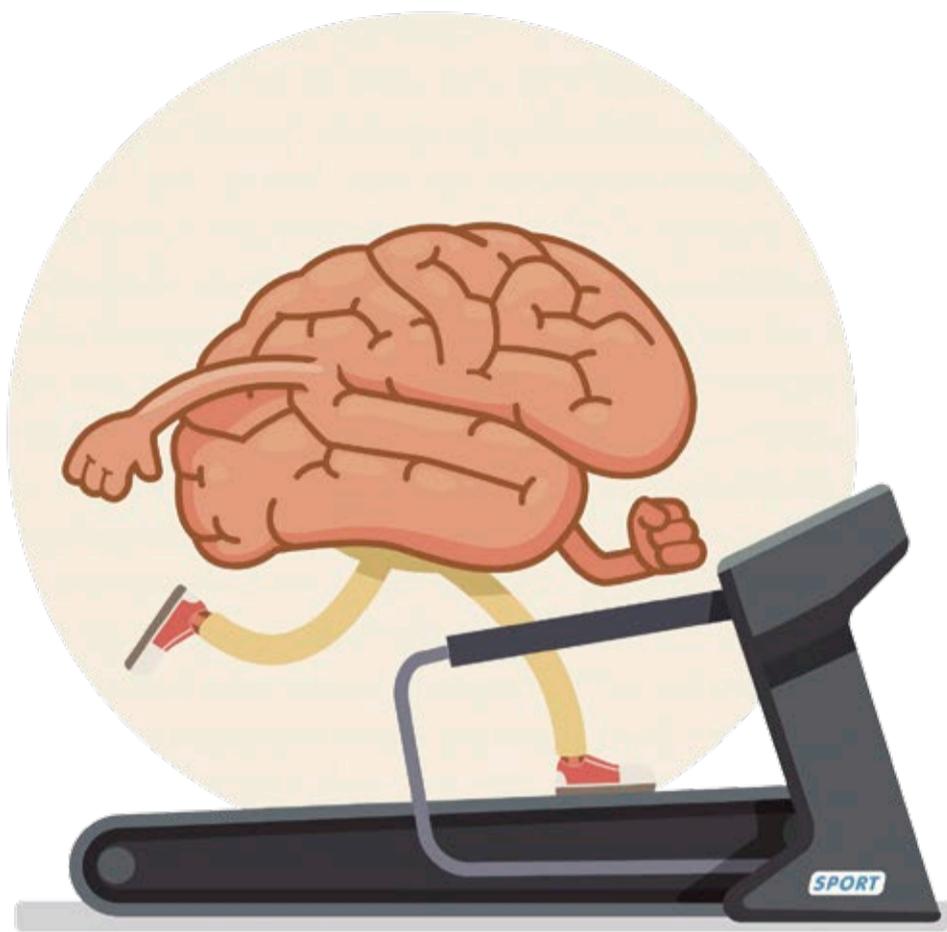
- Some cholesterol drugs can cause a rare side effect of muscle weakness or aches. If the effects are severe, they may indicate a more serious underlying problem that needs medical attention.

21 TAB  
NiFEdipine LA 30MG TAB  
TAKE ONE TABLET EVERY MORNING.  
MAY BE TAKEN WITH OR AFTER FOOD. **SWALLOW WHOLE. DO NOT CUT, CRUSH OR CHEW.**  
XXX 16/02/2017

- Cutting, crushing or chewing sustained-release, controlled-release or long-acting tablets will release the active ingredient at one go, and the patient will not get the desired long-lasting effect.
- Enteric-coated tablets are designed such that their active ingredient is only released after they reach the intestines. The coating protects the drug from stomach acids.

1 AMPVIA  
ACTRAPID HM 1000 IU/10ML INJ  
**STORE IN REFRIGERATOR.** DO NOT FREEZE. INJECT HALF AN HOUR BEFORE FOOD. DISCARD 6 WEEKS AFTER OPENING.  
XXX 16/02/2017

- Medicines should generally be stored in a cool and dry place, like a cupboard, and out of reach of children. Some medicines, like insulin, need to be stored in the refrigerator (between 2°C and 8°C) to remain effective.
- Medicines that need to be refrigerated should be kept in a designated area, away from the door, so that they don't face large temperature changes when the door opens and closes.
- Drugs can break down from exposure to air. Often, humid environments like Singapore's can speed this up.
- Some drugs have a short expiry after opening. For instance, multi-dose eye medications usually have a one-month expiry upon opening to minimise contamination.



Regular physical exercise not only benefits the body but improves the wellbeing of blood vessels in the brain, and in this way reduces the risk of blockages and strokes.

# A smart move

With exercise, what's good for the body is good for the brain. And science can prove it. *By Suki Lor*

**H**EARD OF NEUROPLASTICITY? That's what exercise helps the brain maintain. And according to science, it's a good thing.

Research shows that the brain is not static and does not stay the same way it was at birth. It is capable of plasticity and changes throughout life, generating new cells and new pathways.

"From a neurologist's point of view, the brain is a learning machine which needs stimulation on various fronts. It's a case of use it or lose it," said Dr Simon Ting, Senior Consultant, National Neuroscience Institute (NNI).

He said that when the brain is exposed to different tasks, it forms new connections between brain cells. Synapses (junctions between two nerve cells) can re-form and reconnect. "Exercise – both mental and physical – enhances this neuroplasticity."

However, he said that physical exercise, compared to just mental exercise, engages all five senses, and hence gives the brain more information to integrate. Here's how physical exercise benefits the brain, according to Dr Ting:

- **It boosts circulation:** Improved circulation brings more oxygen-rich blood to the brain. Although the brain only makes up about 2 per cent of the body's weight, more than 20 per cent of the body's blood supply circulates through it.

- **It improves mood:** It boosts levels of dopamine, the neurotransmitter that drives the reward pathway in the brain and imparts a feel-good state.

- **It keeps the brain busy:** "Exercise makes the brain more attentive, focused

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and busy because exercise requires an individual to be coordinated and [continuously] sensing his surroundings.”

• **It modulates blood pressure:** “It improves cardiovascular function, which in turn modulates blood pressure. It benefits the heart, and whatever benefits the heart benefits the brain. It also improves the general well-being of blood vessels in the brain, reducing the risk of blockages, and hence problems such as strokes. Even those with heart disease or who’ve had a stroke can exercise, but they should not overdo it.”



PHOTO: ALVINN LIM, ILLUSTRATION: JJ3RF

Dr Simon Ting says that while physical and mental activities are brain boosters, combining the two is more potent in keeping the brain shipshape.

## Exercises for mind-body health

Both physical and mental activities are brain-boosters. But what’s better is combining the physical with the mental. “This can be even more potent in keeping your grey matter shipshape,” said Dr Ting.

Here, he suggests some mind-body exercises to consider.

**Go dancing** Dancing, especially learning new steps, boosts both body and brain.

“For a person who’s not explored dancing before, learning even very simple dance steps can be mentally stimulating.”

This is supported by a pilot study by NNI a few years ago which involved a small number of patients with Alzheimer’s disease. The study, conducted in collaboration with a dance club, found that dancing improves well-being.

**Keep learning, keep busy**

Playing a game of Sudoku or learning a new language are brain

boosters. But if a task is repeated too many times, its positive effect on the brain can wear off because the brain has less to process. “So it’s important to cultivate a habit of continual learning and having multiple interests, along with exercise, to keep the brain active.”

**Encourage the hand-brain connection**

The human hand, in particular the thumb, impacts the brain’s primary motor cortex in a disproportionately large way compared to the rest of the body. “The primary motor cortex generates signals that control motor function, such as the movement of the arms and legs. This means that use of the hands can stimulate the brain and improve neuroplasticity.”

Writing by hand stimulates the brain. “I often advise patients with dementia or memory issues to write more, by perhaps keeping a diary. For the brain, writing is a very complicated

task, which keeps it busy as it has to assemble various motor, language and visual codes.”

**Make it regular** Dr Ting notes that in many clinical trials people are encouraged to do physical exercise at least three times a week if they are generally fit. Brisk walking and hitting the treadmill are some beneficial exercises which can also be easily done on a regular basis.

**Go outdoors** The elderly, people with dementia, and the less physically fit benefit from exercising outdoors.

“People who suffer from brain disease tend to remain at home most of the time, but the more they stay home, the fewer stimuli they get. This can be detrimental to their physical and mental health.” Family members or caregivers are encouraged to take them outdoors for walks or strolls around a garden for half an hour or so, every day.

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Since young, I’ve suffered from dry and itchy skin, commonly known as eczema. When the weather gets really hot and dry, my eczema will start to flare up. The itching can be so severe that after scratching, my skin becomes red and sore.

I usually avoid the use of harsh soap and skin products, and sometimes apply topical steroid creams to help reduce the itch. However, steroid creams can cause negative skin effects such as ‘skin thinning’ with prolonged use. So, it was to my joy when I was contacted by SEC to try out EZEQUE. EZEQUE soothes itchy skin without steroids; it’s made up of botanical ingredients. And I’m pleased to say that my skin is now much better because of it!

So, if you also suffer from dry and itchy skin, why not give EZEQUE a try? It does not contain steroids and is made of 100% natural ingredients. ;)

Marie Bernadette  
www.smittenbyangels.blogspot.com

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**A**QUIRED HEART VALVE DISEASE, as its name suggests, is acquired as a person gets older, and mostly affects people in their 60s to 80s.

It happens when heart valves wear out, hardening and restricting blood flow in the heart.

According to Associate Professor Yeo Khung Keong, Senior Consultant, Department of Cardiology, National Heart Centre Singapore (NHCS), it is quite different from congenital heart valve disease, which is present from birth and can be hereditary. Acquired heart valve disease takes a long time to show up, as the heart has the ability to work harder and compensate for the valves' reduced efficiency.

Symptoms include shortness of breath, tiredness, chest pain, fainting spells and swelling in the legs. "Initially, patients may find walking okay, but running more difficult. They may take longer to walk to the market and experience difficulty in climbing stairs," said Prof Yeo.

Doctors can detect the condition when listening to the heart with a stethoscope. "We can check for heart murmurs, but because murmurs can also occur in normal, healthy people, the definitive way to diagnose it is through echocardiography (ultrasound of the heart). It can tell us if the heart valve is opening and closing properly, and if it is calcified or damaged," said Prof Yeo.

However, although it is a condition that is predominantly age-related, heart valves can wear out due to other causes such as infection, heart attacks and high blood pressure as well.

### How heart valves work

The heart has four valves – the tricuspid, pulmonary, mitral, and aortic valves. They have tissue flaps that open and close as the heart beats. In doing so, they let blood flow in the right direction through the heart's four chambers and to the rest of the body.

Two main problems can crop up in heart valves as we age: regurgitation or backflow, and stenosis.

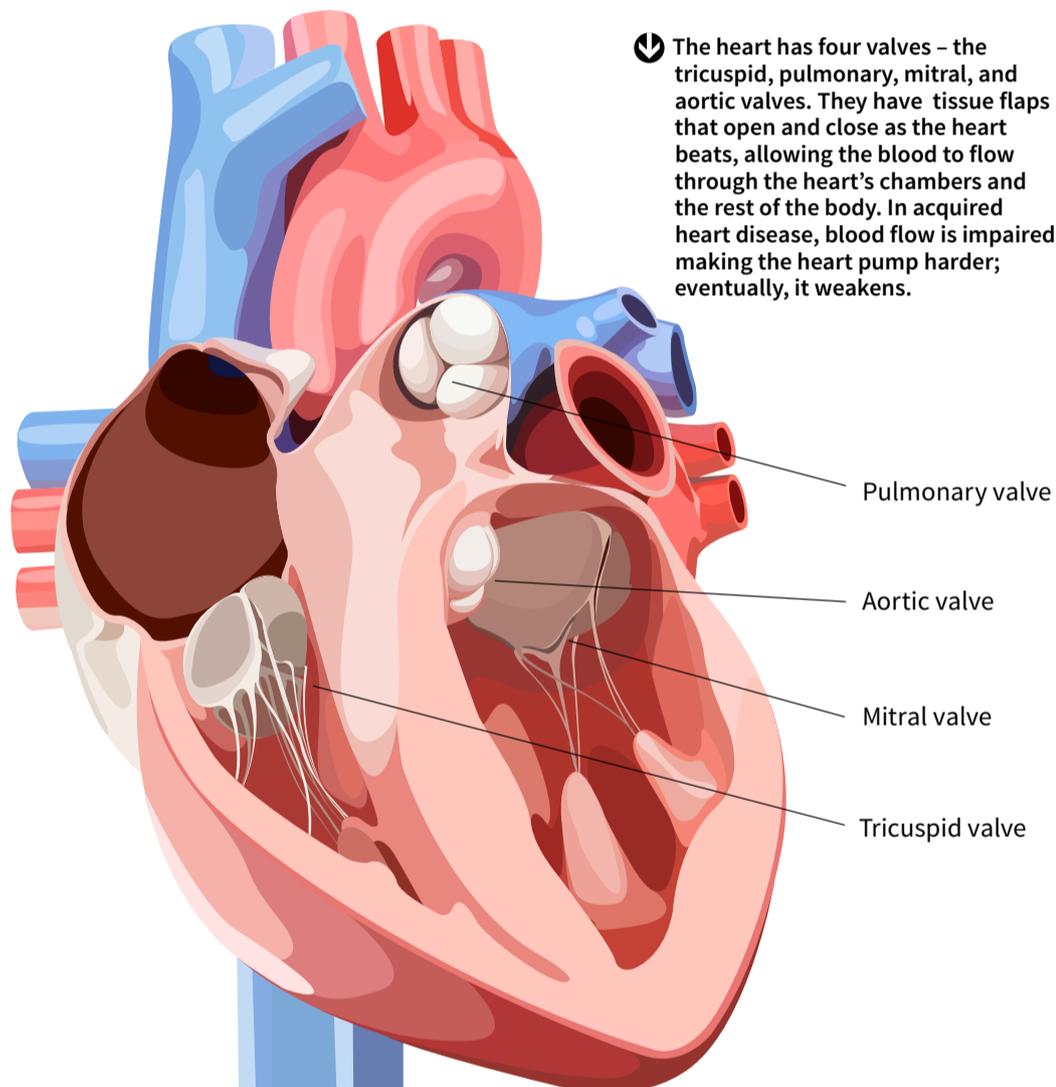


“We have to balance the need for treatment and the risk of complications,” said Prof Yeo Khung Keong.

PHOTO: ALVIN LIM, ILLUSTRATION: IZBE

# When the valves give way

Acquired heart valve disease occurs when heart valves get worn down with age or affected by disease. *By Tan Hwee Hwee*



The heart has four valves – the tricuspid, pulmonary, mitral, and aortic valves. They have tissue flaps that open and close as the heart beats, allowing the blood to flow through the heart's chambers and the rest of the body. In acquired heart disease, blood flow is impaired, making the heart pump harder; eventually, it weakens.

### Normal valve

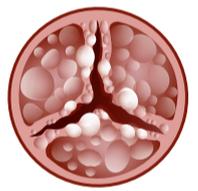


closed

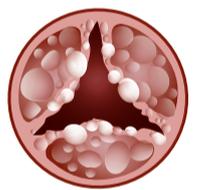


open

### Valve stenosis



closed



open

Regurgitation happens when the valve leaflets do not close completely, and blood flows back from the valve or leaks through the flaps. This makes the heart work harder to pump enough blood to meet the body's metabolic needs.

With stenosis, the valve flaps thicken, stiffen, or fuse together due to cholesterol and calcium deposits in the valve. They cannot open fully, so less blood flows through.

As the valves are now tight, blood has problems travelling through or exiting the heart chambers.

In aortic stenosis, the blood dams or cannot move forward. The heart has to pump harder and eventually weakens, causing the left lower chamber, also known as the left ventricle, to swell and eventually fail. This affects the blood flow returning from the lungs, and patients will experience breathlessness from water building up in their lungs.

In cases when the mitral valve (the heart valve between the left upper and lower chambers) is leaking, the left lower chamber of the heart keeps pumping harder to cope with the leakage of blood.

"It's like carrying a pail of water that's leaking; the heart chamber keeps leaking and the leaking valve makes it take longer for the heart to fill," said Prof Yeo. "So the heart will weaken and swell, and eventually fail."

### Treatments and prevention

The disease can be treated with surgery, but there are risks involved. "Doctors use medicines to help the heart initially. When the disease gets too severe, they can do open-heart surgery but there are risks of heart attack, infection or stroke, and even death. So, we have to balance the need for treatment and the risk of complications," said Prof Yeo.

Surgical options include valve replacement using valve leaflets harvested from pig or cow tissue, and implanting metal or plastic valves in the heart.

Prof Yeo said that, unfortunately, some types of acquired heart valve disease (e.g. aortic stenosis) are related to the natural progression of age.

"While we may be able to delay the onset of certain types of valvular disease, other types are more difficult to prevent."

He said the risk of getting some types of acquired heart valve disease (e.g. mitral regurgitation) can be reduced by treating conditions such as diabetes and high blood pressure, and by not smoking, to prevent heart attacks.

It is also important to pay attention to diet, and exercise regularly. Practicing good dental hygiene can also help since bad teeth can cause a heart infection, which can lead to valve damage.

## Pain after amputation is real, not imagined

**I was recently diagnosed with diabetes and heard from friends that I might suffer from pain and cramps later. Is pain and cramps inevitable for diabetics? Can I do anything to avoid them? Also, if someone has had his leg amputated as a result of diabetes complications, is it possible to still experience pain?**

Diabetes can damage nerves and cause pain throughout the body. Diabetic nerve pain can diminish quality of life, making it hard to walk, sleep and even sit as blood flow to the limbs gets cut off.

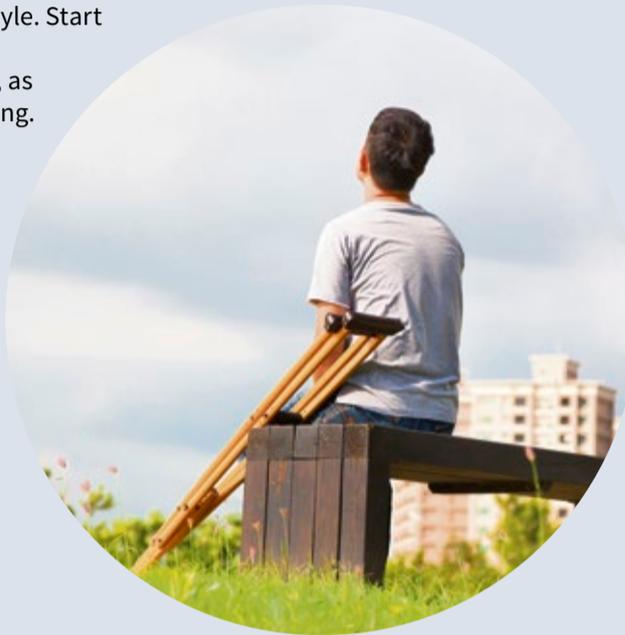
The chances of getting pain from diabetes can be greatly reduced if you control your blood sugar levels and maintain an active lifestyle. Start early and you may never have to suffer pain from diabetes!

Exercises that you can do to improve your overall health, as well as glucose level, include swimming and stationary cycling.

Feeling pain after a limb has been amputated is a phenomenon known as phantom limb pain. It is real and not imagined, and happens because of complex changes and interactions in the nerves, spine and brain. Medications can alleviate this symptom which can happen to patients who have pain in the amputated part of the limb.

According to Singapore's 2010 National Health Survey, more than 11 per cent of Singapore residents aged between 18 and 69 suffer from diabetes. If left untreated or poorly managed, diabetes can lead to complications such as blindness, kidney failure, heart attack, stroke, and amputations of limbs.

**Dr Tan Kian Hian, Senior Consultant, Department of Anaesthesiology; Director, Pain Management Centre, Singapore General Hospital**



## CONTEST

TEST YOUR MEMORY

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### QUESTION

- \* What is the name of the instrument used to measure hand grip strength?
- \* When is Colorectal Cancer Awareness Month?

Send your answers with your name, age, gender, address and telephone number to:

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Winners will be notified via phone or e-mail. Incomplete or multiple entries will not be considered.

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### WINNERS OF CONTEST 43

1. Choo Wee Jiang
2. Lee Sow Keng
3. Muhammad Iqbal Shaik Ismail Marican
4. Ong Lee Hoon
5. Yoon Tai Yaw

## Gear up for safety

**My son has just started riding a motorbike to college. Besides a helmet, will wearing any other kinds of protective gear protect him in an accident?**

In a traffic accident, a motorcyclist can be flung at high speed against the road, barriers or other vehicles. The human body cannot withstand such high speed impact with glass, steel and tarmac, and a biker can sustain injuries of varying degrees of severity and complications ranging from small cuts and bruises, to fractures, limb loss, and even death. Wearing protective riding gear helps reduce injuries. Riding jackets, gloves and boots are reinforced with thicker padding and harder material like Kevlar in key contact areas like the heel of the palm and outside of joints. These help absorb and deflect the force of an impact. They also help minimise lacerations and abrasions. Many local riders forego such gear, citing Singapore's warm weather, but cooler alternatives are available. Lastly, a well-fitting helmet with a clear visor provides comfort and good vision, lowering the risk of accidents.

**Dr Jackson Jiang, Associate Consultant, Department of Hand Surgery, Singapore General Hospital**



PHOTOS: 123RF



## Baby who doesn't like milk

**I am rather perturbed that my 17-month-old baby girl has only three teeth to date – two lower central incisors and one upper central incisor. She is on solids but doesn't drink much milk (we failed to wean her from breast milk to formula and have tried all brands, including goat and soya milk). On average, she drinks only 300ml of milk a day which is far below an average toddler's intake.**

Delayed eruption of primary teeth is common in infants, with large variations in the timing of eruptions even among siblings. Generally, the first lower teeth erupt when the child is about six months old, but it

is not rare for this to be delayed till the 18th month. It sounds like your child's teeth are now just erupting, so we would expect all her primary teeth to be out by the time she is three years old.

At 17 months, milk (whether breast or formula) alone cannot give a child all the nutritional requirements for growth, hence the need to progress to a balanced diet of solid food. Having done so, the child may require less milk, or milk in other forms like yogurt and cheese.

Your paediatrician is the best person to advise you on the dietary aspect of this. However, on-demand breastfeeding at 18 months places your daughter at a high risk of dental decay, since her first teeth are already present. To prevent this, only give her milk at fixed times through a sippy cup, and brush her teeth before bedtime after her last feed. Do not let her suckle through the night.

A visit to a paediatric dentist will allow a thorough evaluation of your child's dental status and risk of caries. During the visit, a customised preventive plan will be recommended to prevent the onset of dental caries in your child's teeth.

**Dr Sarah Lai Hiu Fong, Registrar, Paediatric Dentistry Unit, Department of Restorative Dentistry, National Dental Centre Singapore**

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Viartril-S® is the only patented crystalline glucosamine sulphate<sup>^</sup>:



Viartril-S® crystals

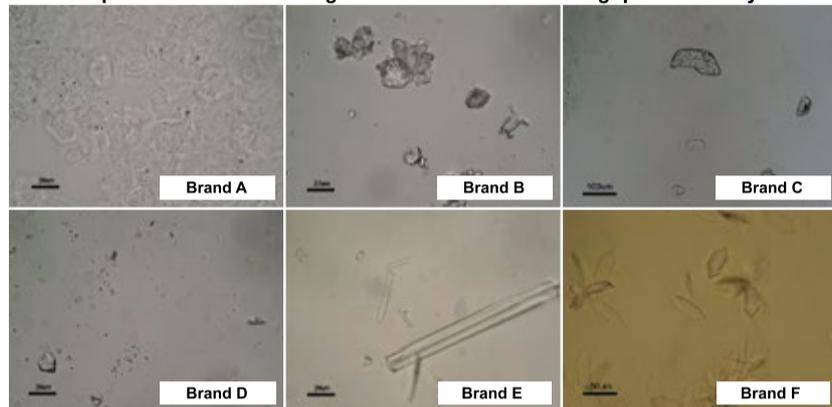
**Recommended by:**  
European Society for  
Clinical and Economic  
Aspects of Osteoporosis  
and Osteoarthritis  
(ESCEO)<sup>^</sup>\*

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<sup>^</sup>O. Bruyère, Roy D. Altman, J.Y. Reginster, Arthritis & Rheumatism, 2016, 45(4): S12-S17    <sup>^</sup>O. Bruyère et al. Semin Arthritis Rheum. 2014 Dec; 44(3): 253-63

### Microscopic structure of other glucosamine brands in Singapore & Malaysia:



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\* O. Bruyere et. al., Osteoarthritis and Cartilage (2008) 16, 254-260



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## Consumers to exercise caution when buying glucosamine

In Singapore, glucosamine is widely available as health / nutrition supplement and is not subject to even simple checks on purity.

**Not all glucosamine brands are effective!  
In fact, many are not up to standard.**

### Glucosamine can be sold without registration or approval

In Singapore, glucosamine can be imported and sold without a licence. They are not subject to pre-market approval by the Health Sciences Authority (HSA). This means that glucosamine products need not be approved before sale. They are also not assessed for their effectiveness by HSA. The responsibility in ensuring the safety and quality rests with the importer, manufacturer, distributor and seller. (information extracted from HSA website)

There were cases announced by HSA, in which dishonest manufacturers produce health supplements with undeclared or unlabelled potent medicinal ingredients. Taking such products can be extremely harmful and can lead to serious health problems.

In the US and Canada, the content of various glucosamine and/or chondroitin products were analysed by the University of Maryland and the Alberta University respectively. It was found that the actual amount of active ingredients in most tested products vary from their label claims, ranging from 0% - 115% in the US and 41% - 108% in Canada.

### Recommendation by international researchers

Claims can easily be made without proper validation through clinical studies.

This is why many researchers have recommended that "Prior to obtaining any supplement containing chondroitin sulfate or glucosamine, the consumer should become informed about the manufacturer and the product."

The American Arthritis Foundation advised that "When a supplement has been studied with good results, find out which brand was used in the study, and buy that."

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