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## GETTING BACK UP

Understanding osteoporosis and spinal fractures

# A GUT FEELING

Get the inside scoop  
on colorectal cancer

## LESS PAIN, MORE GAIN

A new hip replacement  
approach by CGH



ISSUE 1 2024

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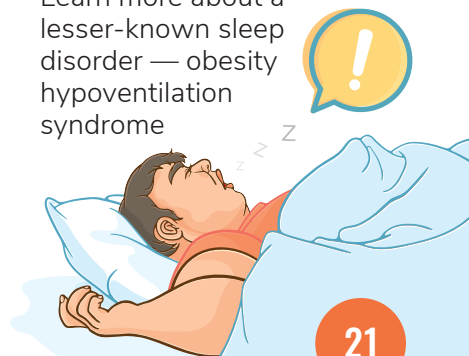
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# A GUT FEELING:

## The inside scoop on colorectal cancer

Unravel the twists and turns of colorectal health.

**D**id you know that the human colon, with its winding twists and turns, can span up to 150cm in length? The colon is part of the large intestine, together with the rectum and anus. As food reaches the end of its journey through the small intestine, it carries on to the colon, where water and some nutrients and electrolytes from partially-digested food are removed. The remaining material — solid waste also known as stools — moves through the colon, is stored in the rectum, and leaves the body through the anus.

## COLORECTAL CANCER

Colorectal cancer relates to the colon and rectum. It is the most commonly-diagnosed cancer in Singapore. **“Even so, it is one of the most preventable and treatable cancers with regular screening and early detection,”** says **Dr Wong Neng Wei, Associate Consultant, Department of Surgery, Changi General Hospital (CGH).**

Some factors that could increase the risk of colorectal cancer include:

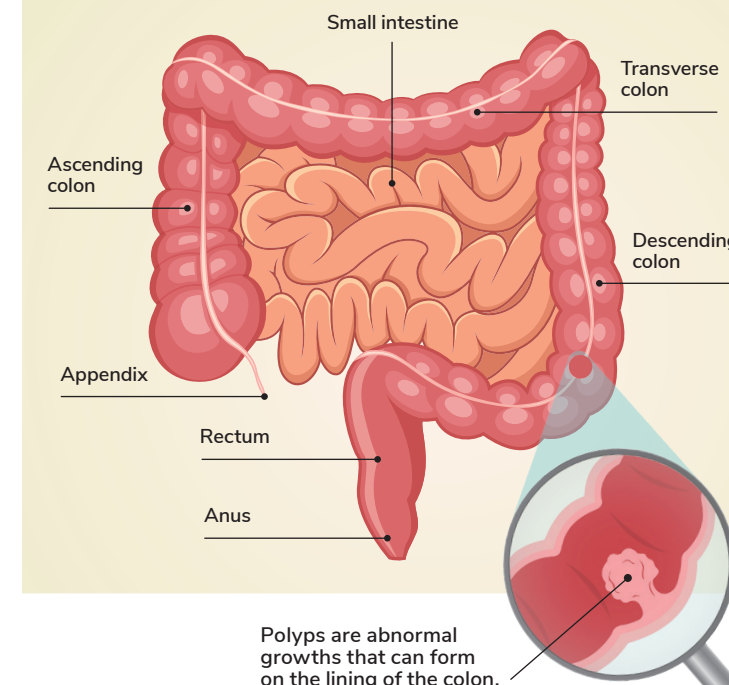
- ▶ Persons aged 50 years old and above
- ▶ Personal or family history of colorectal cancer
- ▶ Personal or family history of polyps (benign growth) in the colon
- ▶ Personal history of ulcerative colitis, which is an inflammatory disease that affects the large intestines, which in the long term may lead to cancerous changes

Additional risk factors that may contribute to increased risk of colorectal cancer include smoking, a sedentary lifestyle and dietary-related factors such as the excessive consumption of processed foods, red meat and alcohol.

Colorectal cancer screening is recommended for anyone with the above risk factors.



## THE HUMAN COLON



Polyps are abnormal growths that can form on the lining of the colon.

## POLYPS

Polyps in the large intestine are outgrowths from the inner lining of the colon and rectum. Most polyps are small and harmless. However, colorectal cancers can still originate from non-cancerous polyps. These are polyps with cell changes that are inclined to develop into cancer over time.

Anyone can develop polyps in the colon and rectum. The prevalence of colorectal polyps increases with age, with patients aged 50 years old and older at an increased risk. Other risk factors include smoking, being overweight, and a personal or family history of colorectal polyps or colorectal cancer.

Polyps usually do not manifest any symptoms. However, some patients with polyps that have turned cancerous may experience a change in their bowel habits, have blood in the stool, or experience pain or symptoms of anaemia (low haemoglobin).

A colonoscopy or computed tomography (CT) colonography is usually used to detect polyps in the body. **“As a leading centre for artificial intelligence research in Singapore,**



CGH was one of the first institutions to use computer-aided detection (CAdE) to assist in the detection of polyps, which has been demonstrated in studies to increase the polyp detection rate,” says Clinical Assistant Professor James Li, Consultant, Department of Gastroenterology and Hepatology, CGH. “Although most polyps detected during colonoscopy are small and can be removed at the first colonoscopy, larger polyps, or polyps with advanced histology (at higher risk of turning cancerous or are at an early stage of cancer), require more highly-specialised techniques for removal.”

CGH offers the full range of services for endoscopic resection of these large polyps with advanced histology. These techniques include endoscopic submucosal dissection and endoscopic mucosal resection, which are performed endoscopically and may minimise the need for surgery in patients with such polyps. Lifestyle modifications, such as quitting smoking, having a diet with plenty of vegetables and fruits, and maintaining a healthy body weight, can also help reduce the risk of colorectal polyps.

Spotting the silent signs

A large proportion of patients who are diagnosed with colorectal cancer are usually asymptomatic, especially for those diagnosed in the early stage. Colorectal cancer typically develops from a polyp (benign growth). The importance of screening is not only for early detection of the cancer but also for the removal of polyp(s) before it becomes cancerous.

Should colorectal cancer symptoms occur, they may include:

- ▶ Change in bowel habits (diarrhoea, constipation, change in size of stools or sensation of incomplete emptying)
- ▶ Blood in or mixed with stools
- ▶ Abdominal bloating, or abdominal discomfort or pain
- ▶ Abdominal mass or lump
- ▶ Unexplainable loss of weight

“A colonoscopy can help the doctor to investigate the causes of symptoms such as abdominal pain, changes in bowel habits and rectal bleeding. It is not only the most accurate method of detecting colorectal polyps, but also allows for the doctor performing the colonoscopy to remove the detected polyps to decrease the risk of colorectal cancer.”

Clinical Assistant Professor James Li, Consultant, Department of Gastroenterology and Hepatology, CGH

Determining the diagnosis

“One of the recommended tests that can help diagnose colorectal cancer is colonoscopy,” says Dr Li. Colonoscopy refers to the insertion of a long, flexible tube with a micro camera at the tip through the anus into the rectum, and then to the caecum (the start of the large intestine and where the opening of the appendix is located). Patients undergoing colonoscopy will require bowel preparation before the procedure to allow the doctor to inspect the entire colon and not miss abnormalities that may be hidden by faecal material.

“A colonoscopy can help the doctor to investigate the causes of symptoms such as abdominal pain, changes in bowel habits and rectal bleeding,” says Dr Li. “It is not

COLORECTAL CANCER SYMPTOMS

Change in bowel habits

Blood in or mixed with stools

Abdominal bloating, discomfort or pain

Abdominal mass or lump

Weight loss

Fatigue

# COLONOSCOPY

A flexible fibre-optic instrument is inserted through the anus to examine the colon.

Colon polyps can be detected and removed during colonoscopy procedures.

Colonoscopies can help to detect cancerous growths in the colon.

only the most accurate method of detecting colorectal polyps, but also allows for the doctor performing the colonoscopy to remove the detected polyps to decrease the risk of colorectal cancer.”

Dr Wong shares that CT colonography is an alternative to colonoscopy. “X-rays are used to detect the presence of growths in the large intestine during the CT colonography by gently pumping air into the intestine to

expand the colon while the patient lies on a CT machine for the scan, he says. “It is potentially less invasive than a colonoscopy, but is unable to detect growths that are smaller than 6mm in size. A colonoscopy will still be required in the event of an abnormal CT colonography finding for assessment and biopsy of the growth.”

Another screening option is the Faecal Immunochemical Test (FIT), a simple and convenient test that detects the presence of small amounts of blood in faeces, that can be performed in the comfort of your own home. If abnormal results are detected, appropriate medical follow-up can be carried out.

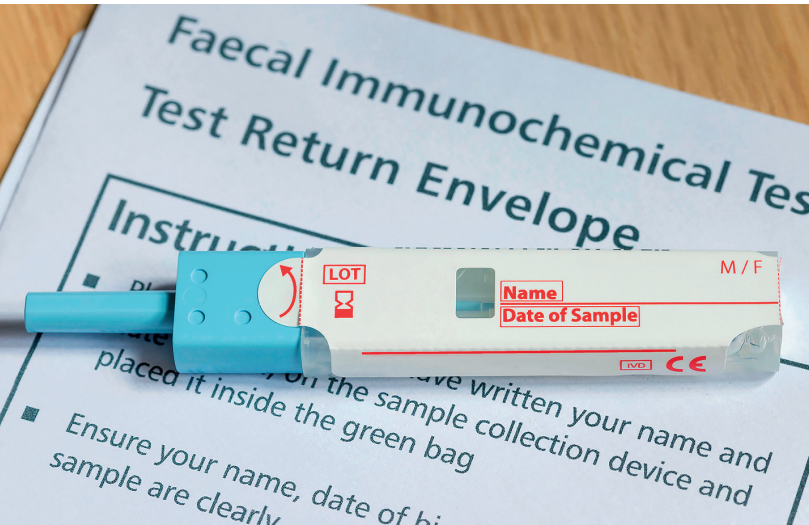
Reduce the risk of colorectal cancer

Leading a healthy lifestyle is important in lowering the risk of developing colorectal cancer.

- ▶ Avoid smoking and consuming excessive alcohol.
- ▶ Eat more dietary fibre and reduce your intake of processed and red meat.
- ▶ Maintain an active lifestyle with regular exercises and keep a healthy weight.

Regular screening is also important for polyp detection and removal before they have the chance to become cancerous.

Below: The Faecal Immunochemical Test (FIT) can be performed in the comfort of your own home to detect the presence of small amounts of blood in faeces.





Above: Ms Belinda Tay believes that staying positive has helped her on her recovery journey.

Staying strong and positive

“I have always had constipation since I was young. I would see the doctor and would be prescribed medication. Nothing serious was ever noted,” shares Ms Belinda Tay, 70. “One day, I realised that there was blood in my stool. My friends said that it might be piles or haemorrhoids, so I went to see a GP and was referred to CGH.”

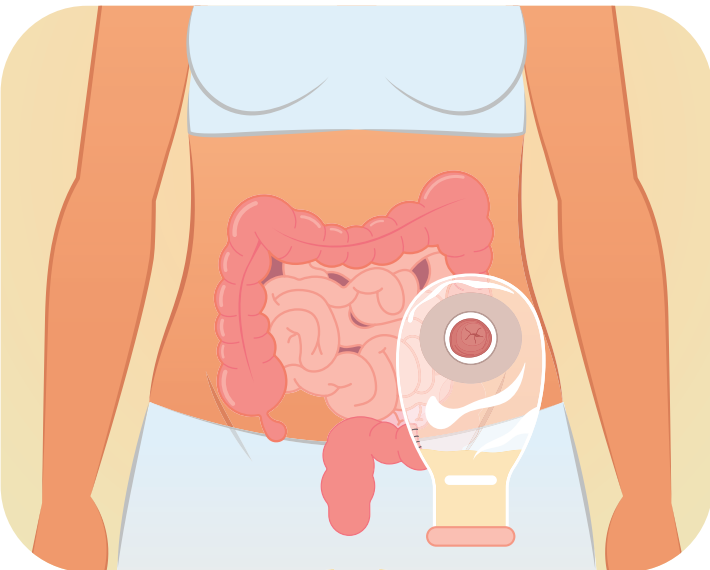
At CGH, tests revealed that she had stage 3B colorectal cancer. Ms Tay proceeded with the surgery, which went smoothly. “The doctors and nurses at CGH took very good care of me. Ms Madalinah Tan, CGH Assistant Nurse Clinician, and Ms Josephine Ong, CGH Senior Staff Nurse, looked after my health and well-being from the very beginning, enabling me to have a successful surgery and recovery. I recovered well and fast and was quickly able to walk by myself to the toilet with little assistance,” says Ms Tay. “The CGH doctor also checked on me every morning until I was discharged.”

“My advice to those facing cancer is to stay strong and positive as it plays an instrumental part in your recovery. The healthcare team will do their part and be there for you every step of the way,” says Ms Tay, who continues to go for regular follow-ups at CGH to check for any relapse.

Managing colorectal cancer at CGH

At CGH, colorectal cancer management is a multi-disciplinary effort to provide comprehensive care for patients. CGH colorectal surgeons work with fellow surgeons, medical oncologists, radiation oncologists, gastroenterologists, nurses and allied health professionals to provide holistic care. “The treatment strategies depend on the stage of the cancer and how extensive it is — for example, whether it involves other organs like the liver or lungs,” explains Dr Wong. For very early tumours or cancerous polyps, endoscopic therapy in the form of removal via colonoscopy is an option that can be provided by gastroenterologists or colorectal surgeons.

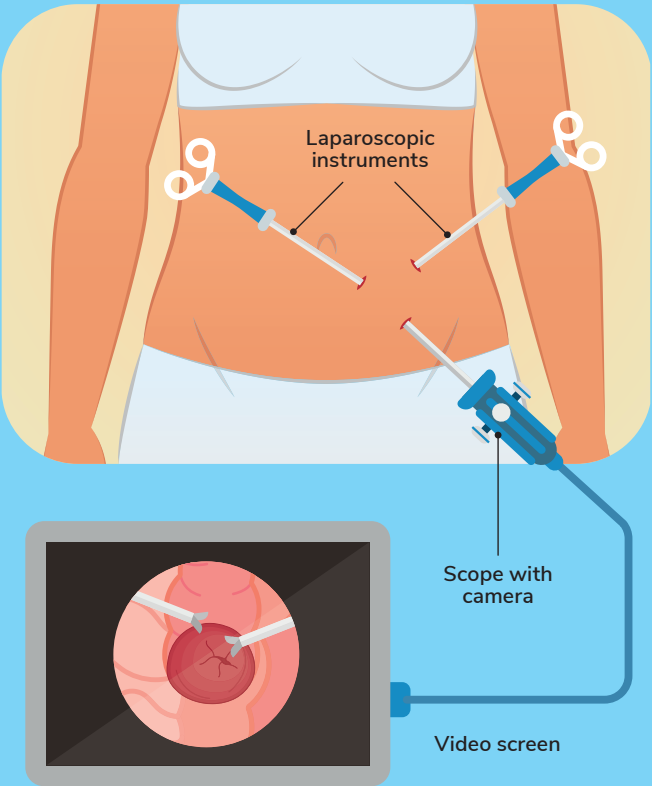
For most stages of colorectal cancer, surgery remains the most common form of treatment. It entails removal of the part of the intestine containing the cancer with its surrounding lymph nodes. After removal of the affected portion of intestine, the two ends of colon are typically reconnected to restore continuity of the gut. However, there may be situations where a stoma may be created from one or both ends of the intestines, where an opening is created in the abdominal wall to allow the discharge of faeces into a colostomy bag. This may be temporary or permanent.



Above: A stoma may be created from one or both ends of the intestines, where an opening is created in the abdominal wall to allow the discharge of waste into a colostomy bag.

LAPAROSCOPY

Minimally-invasive surgeries have helped to improve patients’ recovery times and reduce post-operative pain.



At CGH, the majority of colorectal cancer surgeries are performed with minimally-invasive techniques (keyhole surgery) either via laparoscopy (using instruments to perform surgery, via smaller incisions, with the aid of a micro camera inserted through the abdominal wall) or with robotic assistance. These have shown to improve patients’ recovery time and causes less post-operative pain.

In certain circumstances, chemotherapy and/or radiotherapy may be required for the patient before surgery or after surgery. Advanced colorectal cancer treatment now also includes targeted therapy and immunotherapy, which targets specific genes or enhances the body’s immune system to fight cancer. Robotic surgery is an extension of laparoscopic (keyhole) surgery and is a developing field, with many new surgical systems being developed worldwide. The multi-disciplinary team at CGH will discuss the optimal treatment plan with patients to best suit their needs.



Confidence from the care team

Mr Wong, 64, first felt that something was amiss when passing motion. His stomach was bloated, and he had no appetite. He eventually decided to have a colonoscopy at CGH, where he was subsequently diagnosed with colorectal cancer.

Dr James Ngu, Senior Consultant, Department of Surgery, CGH, explained the necessary surgery to Mr Wong. “I was quite worried at first but Dr Ngu was very detailed in explaining the procedure, giving me the confidence to go through with the operation,” says Mr Wong. “Ms Josephine Ong, Senior Staff Nurse, was also very detailed in explaining how to care for my wounds, which gave me more confidence to do so myself.”

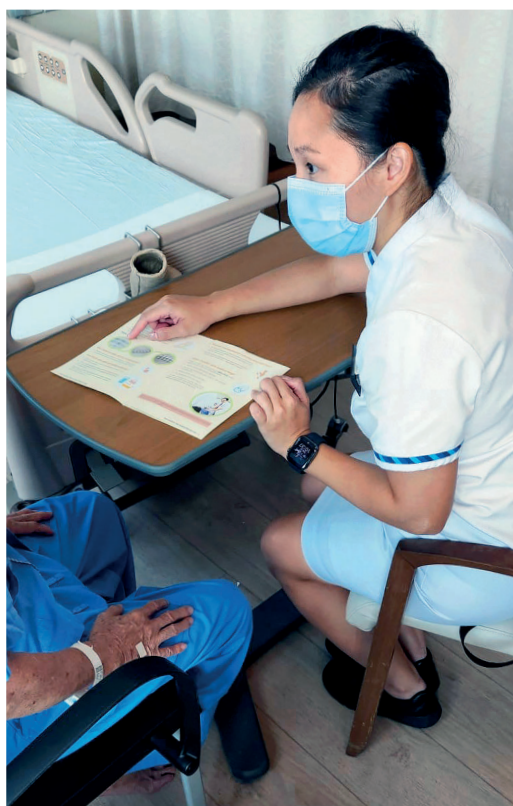
After the successful procedure, Mr Wong recovered in a few days and was able to carry on with his life with only minor adjustments. “I used to have to lift heavy items in my work. Now, I delegate the heavy lifting to other staff, or get assistance to do so.” He also regained his appetite and now has a more positive outlook on life. “Based on my experience, I encourage people who have had symptoms like mine to go for a screening. I thought that I was very healthy and did not realise that there was something wrong with my body. That was my one regret — it would have been much better if I had detected the colorectal cancer earlier,” shares Mr Wong.

## NURSING CARE FOR COLORECTAL PATIENTS

CGH colorectal nurses support patients and their families in the wards or in the specialist outpatient clinics once their symptoms are indicative of colorectal cancer. **“We aim to provide evidence-based care, support and advice for patients through information and education prior to their admission,”** says **Ms Josephine Ong, Senior Staff Nurse, CGH.** “We share on the treatment plans to alleviate patients’ fears and anxieties, and reduce the psychological impact.”

During the counselling sessions, CGH colorectal nurses conduct a series of assessments to holistically evaluate the patients’ health status so that the patients are aware of their condition and care plan. This

Below: CGH colorectal nurses advise and educate patients on pain management and wound care management after their surgery.



empowers patients to take charge of their own health through the setting of realistic goals and expectations to facilitate and enhance their post-surgery recovery, as well as formulating their early discharge plan.

### Inpatient care

CGH colorectal nurses and surgeons go on ward rounds to conduct initial assessments. Empowered to manage patient care, the colorectal nurses advise and educate patients on pain management after their surgery and wound care management, as well as provide dietary advice and a discharge care plan.

One of the key components recommended for patients after their surgery is to regain mobility as soon as possible. As such, referrals to physiotherapists are made for their rehabilitation. Patients who require step-down care and continuity of care may be recommended to a community hospital. “This seamless coordination is a key component of our work, so as to ensure that there is no lapse in care or communication between the ward nurses, physiotherapists and step-down care at the community hospitals,” says Ms Ong.

### Continued care in the community

To ensure the continuity of care for patients from hospital to home, CGH colorectal nurses conduct nursing assessments in a structured manner with discharged



Above: CGH colorectal nurses and physiotherapists help post-operative colorectal cancer patients with stoma management at hydrotherapy sessions.

patients through a phone consultation, to follow up with them on their recovery progress.

This targeted practice is used to empower patients and their families with the relevant knowledge so that they can cope better in the community, and helps to prevent readmission to the hospital. In partnership with patients and their families, the colorectal nurses also further develop a care plan that will enable them to pick up early signs of complications that may arise and require immediate medical treatment.

### CGH support group for patients

For many patients, going through the cancer journey is difficult and can cause frustration, anger and helplessness. Recognising that there are many cancer survivors with similar

experiences, a CGH support group enables patients to not go through this alone. The support group consists of a team of doctors, nurses, colorectal cancer patients and survivors, as well as caregivers. Volunteers aid the nurse-led support group every week, providing emotional and psychological assistance to newly-diagnosed colorectal cancer patients and their caregivers to help them overcome the challenges and adjust to changes in their lifestyles. The support has also expanded to additional platforms such as a mobile chat group and an online support hub for patients.



Scan the QR code to join the CGH Colorectal Support Group.

## RECOVERING WITH PHYSIOTHERAPY

CGH physiotherapists attend to colorectal cancer patients immediately after their surgeries to prevent respiratory complications and help them regain functional mobility. “Both of these are crucial in the prevention of post-operative complications and in reducing the length of stay in the hospital, says **Ms Wong Fu Foong, Senior Physiotherapist, CGH.** **“The immediacy of care also allows us to attend to patients’ rehabilitative needs and begin discussions on care plans with patients and their loved ones.”**

After patients are discharged from CGH back to home, physiotherapists continue to care for them at CGH’s specialist outpatient clinic, to ensure a smooth recuperation journey towards optimised function and quality of life. “A cancer diagnosis can be daunting, and their hospital stay and surgery may leave patients wary of what activities they can safely return to,” adds Ms Wong. “Physiotherapists help them to return to function, exercise and participation in activities of interest with confidence and assurance.”

In recent times, some CGH patients expressed interest in resuming water-based activities with a stoma. This led to the CGH care team starting hydrotherapy sessions catering specially to colorectal cancer patients with a stoma. Conducted by physiotherapists and colorectal nurses, the hydrotherapy sessions focus on techniques to help patients manage their stomas in water and engage in water-based activities. They also help develop patients’ cardiovascular strength, core strength and general strength. This service, which is unique to CGH, aims to not only strengthen patients physically through water-based exercises, but also addresses their fears of water activities with a stoma bag and concerns about their body image.



Above: CGH Senior Physiotherapist Wong Fu Foong (left) helps to strengthen patients physically through water-based exercises and minimise their fear of the stoma bag getting contaminated.

# HIP HIP HOORAY!

**H**ip replacement surgery is a common procedure in Singapore, with around 1,900 patients undergoing it each year due to conditions such as hip fractures or from hip degeneration. As Singapore moves towards a 'super-aged society' — with one in five individuals aged 65 and above by 2026 — the demand for hip replacement surgeries is expected to rise.

Recognising the need for an approach to hip replacement surgery that prioritises patient comfort and enhances recovery, CGH introduced the Anterior-Based Muscle Sparing (ABMS) surgical technique in July 2023. Performed for the first time in a public hospital in Singapore, the new approach has demonstrated positive outcomes in the hip replacement surgeries conducted to date.

**"The ABMS technique, which is new to Singapore, enables the CGH care team to enhance the patient experience as we continually innovate healthcare for better outcomes in Singapore and around the world,"** says **Adj Assoc Prof Andy Yeo Kuei Siong**, Chief and Senior Consultant, Department of Orthopaedic Surgery, CGH. "This patient-centric approach focuses on minimal invasiveness, patient safety and versatility, with less post-surgical complications and reduced recovery times."

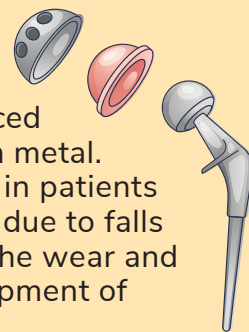
**Changi General Hospital (CGH) introduces the new Anterior-Based Muscle Sparing approach for hip replacement surgery for enhanced patient recovery.**



## HIP REPLACEMENT, EXPLAINED

Hip replacement is a surgical procedure in which the hip's ball-and-socket joint is replaced by prosthetic implants commonly made from metal.

In most cases, hip replacement is needed in patients who suffer from hip fractures, which can be due to falls or from degeneration, which can be due to the wear and tear of the hip joint, loss of cartilage, development of bone spurs or age.



## Less pain, more gain

Patients who underwent ABMS hip replacement surgery at CGH reported significantly less pain and faster recovery, with most of them up and walking within 24 hours post-surgery.

They spent an average of one to two days in the hospital, without facing

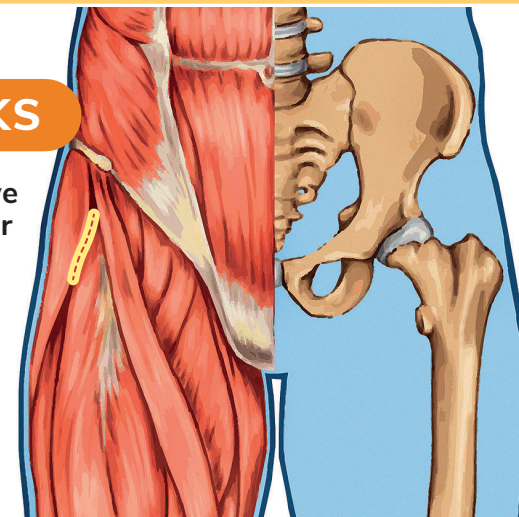
**"This patient-centric approach focuses on minimal invasiveness, patient safety, and versatility, with less post-surgical complications and reduced recovery times."**

**Adj Assoc Prof Andy Yeo Kuei Siong**, Chief and Senior Consultant, Department of Orthopaedic Surgery, CGH

By Ms Tanya Pillay, CGH

## HOW THE ABMS TECHNIQUE WORKS

- Practised widely across the world, this minimally-invasive approach accesses the hip joint by using the intermuscular interval — between the tensor fascia latae and gluteus medius muscles — without cutting or splitting a single muscle nor potentially touching nerves. This results in less blood loss and less pain for patients.
- By working through this interval between the muscles, retractors are placed around the hip joint to expose the hip socket and the thigh bone. Surgical tools are then inserted to shape and prepare the bone to accept the prosthetic hip implants.
- The metallic shell of the prosthetic implant is inserted into the hip socket, and the femoral head is replaced with an artificial ball on a stem that goes down into the hollow of the thigh bone. The ball and socket are then placed together to complete the procedure.

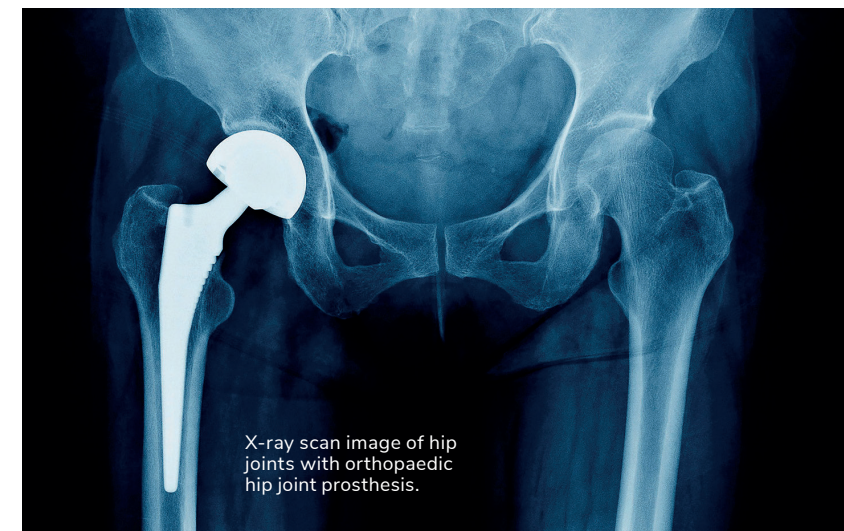


surgical complications. The minimally-invasive nature of the procedure — with a smaller incision made further from the groin area — contributed to faster wound-healing and reduced chances of complications and infections.

**"Our surgeons and care team in the operating theatres have undergone specialised training to perform this complex and high-skilled surgery,"** says **Dr Moo Ing How**, Consultant, Department of Orthopaedic Surgery, CGH, who performed the first ABMS approach in a hip replacement surgery at CGH.

## Recovering in double-quick time

The enhanced patient journey from surgery to post-recovery has transformed the lives of patients such as 75-year-old Tang Yau Chng, who was one of the first patients at CGH to undergo a hip replacement



X-ray scan image of hip joints with orthopaedic hip joint prosthesis.

surgery using the ABMS approach. With osteoarthritis in his right hip, Mr Tang opted for an ABMS hip replacement surgery in November 2023. Just three hours post-surgery, Mr Tang was able to stand on his own and do simple leg-and-hip exercises such as marching on the spot!

**"Before consulting with Dr Moo and the dedicated CGH care team, I could still carry out my usual routine — my part-time work, driving, and even playing golf — but I had to do everything in pain,"** Mr Tang shares. **"Now, at just one-and-a-half months after surgery, I am almost fully recovered. I can walk up to 5,000 steps every day**

**and I'm looking forward to playing golf very soon!"**

Dr Moo adds that the ABMS approach is more versatile and suitable for patients of all body sizes and ages, especially senior patients with chronic conditions and comorbidities, to achieve faster recovery and an enhanced quality of life post-surgery.

With the introduction of the new ABMS approach to hip replacement surgery, CGH exemplifies a commitment to medical excellence to achieve well-rounded patient care, promoting a swifter and more comfortable recovery for those in need.

# DELIVERING AWARD-WINNING QUALITY CARE

Hear from three superstars of the Changi General Hospital (CGH) care team, who received the top Superstar Award for Exemplar Professional.

Over 600 staff and service partners from CGH were celebrated at the Singapore Health Quality Service Awards (SHQSA) 2024 for their dedication and outstanding contributions to healthcare, as well as their delivery of quality care to our patients and the community from hospital to home.

## A warm touch



If there is one thing **Ms Joyce Tan, Senior Patient Service Associate (PSA), CGH**, ensures she has an ample supply of, it would be beverages. “A warm drink never fails to calm our patients down. It’s almost like magic,” Ms Tan says half in jest.

Behind her friendly and approachable demeanour, Ms Tan is all serious when it comes to ensuring the comfort of patients at CGH. “Some patients may feel cold because they are unwell. I will keep a lookout for how I can help, such as by offering a blanket and a warm drink to those who need it,” Ms Tan shares.

“This is more than a job. It is about the patients I get to help, and the things I learn. These add to the sense of fulfilment I derive from my job.”

**Ms Joyce Tan**, Senior Patient Service Associate, CGH

Providing the human touch comes naturally to Ms Tan, who made a mid-career switch from the hotel industry to the healthcare sector in 2006 when she was 46. The transition from looking after hotel guests to looking after patients and their families when they arrive at the hospital and in the Specialist Outpatient Clinics proved to be life-changing for her, and she has not looked back since.

Eighteen years on, the now 64-year-old is the oldest member in the team. Affectionately known as ‘Mummy Joyce’ among the PSAs, she readily avails herself to guide and mentor younger team members as they learn the ropes of the job.

Technology played a part in streamlining her work as she now spends more time interacting and helping patients at the hospital’s self-registration kiosks, and guiding them on navigating the Health Buddy mobile application, instead of manually keying in details.

Ms Tan also supports the clinical team closely, taking patients’ vitals such as their blood pressure, height, weight and blood glucose levels. A fluent Mandarin speaker, she assists doctors in translating medical information for patients in the consultation rooms when

there is a language barrier. To do so, she took the time to learn the medical terms of the disciplines she serves — Orthopaedic Surgery, Anaesthesia Pain, Neurology and Neurosurgery. “It helps that I like to learn new things,” she shares.

“This is more than a job. It is about the patients I get to help, and the things I learn. These add to the sense of fulfilment I derive from my job,” says Ms Tan.

## A face of calm amid emergencies

When emotions run high at the CGH Emergency Department (ED) because of the nature of cases, patients or their next-of-kin may display aggressive behaviour. On such occasions, **Ms Nennie Fadillah Hasnawi, Patient Service Associate (PSA) Executive, CGH**, manages the situations in a firm but positive manner. In addition, Ms Nennie also mentors and coaches her team members on the handling of such scenarios, providing guidance and support to them.

“When patients come to the ED, they are often lost

“My work at the CGH ED is important in providing patients with some comfort and clarity in what may be a time of anxiety and confusion for them. Doing my best to address their questions and concerns helps them receive medical care with a peace of mind.”

**Ms Nennie Fadillah Hasnawi**, Patient Service Associate, CGH

and anxious. I find fulfilment in being able to answer their questions, address their concerns, and set their minds at ease,” she shares. “I enjoy my work because I get to meet and help people from all walks of life.”

Ms Nennie was one of the first PSAs deployed to the Transit Place, a new CGH initiative where PSAs could support and care for patients awaiting admission in a designated space within the ED.



During the pilot run, Ms Nennie observed that there were areas where PSAs could support care delivery by relieving the nurses of non-clinical tasks, like delivering meals and helping patients call their families.

This would enable the nurses to focus more on providing care to the patients. Ms Nennie also suggested having more PSAs in the area so that they could proactively explain the steps in the administrative process and alleviate patients’ anxiety.

Ms Nennie joined CGH as a screening officer during the Severe Acute Respiratory Syndrome (SARS) outbreak some 20 years ago, and with the experience gained over the years, she now leads a team of 15 PSAs. “Coming to work feels like spending the day with my friends. We are working but we are happy and motivated to collectively give our patients warm and excellent service. I think that is really important to keep us going in the ED,” says Ms Nennie.

Ms Nennie is also a recipient of the CGH Service Angels Celebration 2022 STAR award — merit award, and the Singapore Health Quality Service Award 2023 — STAR award.

"I believe my work at the CGH ED is important in providing patients with some comfort and clarity in what may be a time of anxiety and confusion for them. Doing my best to address their questions and concerns helps them receive medical care with a peace of mind."

## A champion of safety

A firm advocate of preventing falls in patients, **Ms Zhang Qingqing, Senior Staff Nurse, CGH**, fosters a culture of vigilance and awareness in her ward, empowering patients with the knowledge



and resources to reduce the risk of falls. Her efforts saw staff, patients and their families affectionately crowning her "The Fall Prevention Champion", and earned her ward the achievement of zero falls over the past two years.

Besides fall prevention, Ms Zhang also promotes good hygiene practices for the safety and well-being of patients and the care team.

Inspired to become a nurse in her teens after her maternal grandparents were diagnosed with cancer, Ms Zhang aspires to be a compassionate nurse and groom the next generation of nurses.

"To be a good nurse, you have to ensure that you are skilful, responsible towards your patients and always empathetic."

Ms Zhang recounts her experience in caring for a senior patient who was discharged after his treatment for a diabetic foot ulcer. His wife, who was his only family member, was not well enough to fetch him from the hospital, so Ms Zhang accompanied the patient, who was in a wheelchair, to the taxi stand and ensured

**"To be a good nurse, you have to ensure that you are skilful, responsible towards your patients and always empathetic."**

**Ms Zhang Qingqing,**  
Senior Staff Nurse, CGH

that he was able to board a taxi, before calling his wife to update her on the patient's status. "I wanted to make sure he arrived home safely, so I called to check on them and was relieved that he was okay," she adds.

Dedicated to education and professional development among the nurses, Ms Zhang actively shares her knowledge and conducts trainings for both new and existing members of the nursing team. She also regularly identifies opportunities to enhance work processes and improve patient experiences.

While she was working in a high dependency ward, Ms Zhang observed that essential supplies for an emergency blood transfusion could be gathered beforehand to save the care team time when the need arises. She created a one-stop grab box that contains 11 essential supplies such as syringes, a flushing bag, saline, alcohol swabs and a blood transfusion set — items needed to help patients during emergencies such as uncontrollable haemorrhaging. For such events, doctors use these equipment to conduct a Massive Transfusion Protocol to manually deliver blood to patients.

"In a high dependency setting, emergencies happen often and suddenly. We make every effort by constantly looking into ways to streamline our work and save precious minutes that can make a real difference when saving lives," Ms Zhang says.

# EMPOWERED TO LIVE TO THE FULLEST

**Changi General Hospital's (CGH) HomeCare Assist (HCA) ensures that needy patients with chronic conditions can continue to receive care in their own homes or after they are discharged from the hospital. A beneficiary shares how the HCA has supported her in overcoming a sleep disorder.**

**F**or years, Mdm Siti Zuraidah's nights were anything but peaceful. Every night, she would wake up multiple times, choking and gasping for air. "It felt like I was being suffocated," she recounts.

Mdm Siti initially attributed her breathing difficulties to poor ventilation. It was not until she was told that she was having unusual breathing patterns and loud snores that she decided to seek help. In 2017, Mdm Siti was diagnosed with obstructive sleep apnoea (OSA) at CGH's Department of Sleep Medicine, Surgery and Science. OSA is a severe sleep disorder that causes a person's breathing to be disrupted and oxygen levels to plummet during sleep. To help restore her regular breathing, the CGH care team prescribed continuous positive airway pressure (CPAP) therapy, which helps to keep patients' airways continuously open, allowing them to breathe easily during sleep.

## More than just a good night's rest

Since then, the CPAP therapy has not only helped Mdm Siti regain restorative sleep but also combat daytime sleepiness, irritability and poor concentration — effects of OSA.

Mdm Siti has been looking forward to regaining her health and a new life after her release from prison. However, financial concerns weighed heavily on her. Like most OSA patients, Mdm Siti, who is in her 40s, will likely have to rely on CPAP therapy for life.



"I did not have the means to afford a CPAP machine," explains Mdm Siti, who currently lives in a 2-bedroom rental flat with her daughter, son-in-law and two grandchildren.

The CGH HCA aided Mdm Siti with the provision of a CPAP machine. Supported by the CGH Health Fund, the HCA brings relief to needy patients with chronic conditions, like Mdm Siti, to receive timely medical assistance and treatment for recovery. **"I feel very honoured, and appreciate all the kindness that the donors have shown to me and my family,"** she says. Receiving this assistance has also gifted her a new sense of purpose, allowing her to focus on her recovery and restore her relationships with her loved ones. "I just want to get back on my feet and carry out my responsibilities as a mother, daughter and sister well," she shares.



**Scan the QR code to find out more about the HCA and learn how you can support our beneficiaries.**

# A PASSION FOR RESEARCH PAYS OFF

By Ms Belinda Wan, CGH

Below: Not a one-woman show: Geraldine credits her team members with their diverse strengths and experience for her win.

## Changi General Hospital (CGH) Manager Geraldine Lim clinches top honour at awards for Clinical Research Coordinators.

**C**linical Trials and Research Unit (CTRU) Manager Geraldine Lim flew the research flag high for CGH, winning the Distinguished Contributor Award for Clinical Research Coordinators (CRC) 2023. The sole recipient of the pinnacle Distinction award, Ms Lim was one of nine CRCs recognised for their commitment and significant contributions to Singapore's clinical research ecosystem at the awards organised by the Singapore Clinical Research Institute (SCRI).

### The merits of meticulous multi-tasking

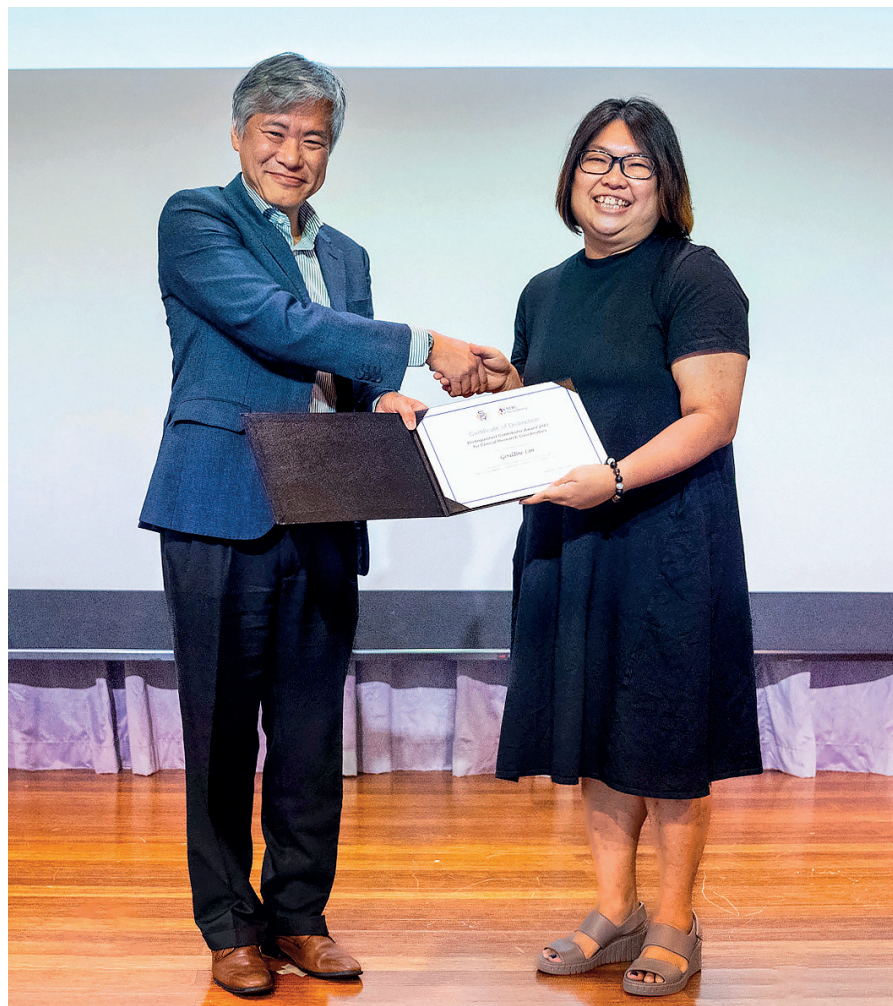
A former intensive care nurse and transplant coordinator, Ms Lim carved a career in clinical research over the years with patience and fortitude. Joining the CTRU team, which is part of the CGH Research Office, in 2012, she now oversees a team of 25 CRCs. Together, they support CGH clinicians in over 100 research projects behind the scenes, from drawing up study frameworks and research protocols, analysing challenges and collecting data to preparing for grants, taking charge of patient recruitment and training.

Ms Lim and her team work closely with several Principal Investigators, consultants, professors and patients, tracking multiple trials and ensuring timelines are adhered to. Beyond helping

investigators identify each study's potential challenges, she leverages her extensive knowledge and experience to offer suggestions that help smoothen the way forward. "Geraldine has guided many research assistants and CTRU staff to deliver successful projects," says Dr Barbara Helen Rosario, Principal Investigator and Senior Consultant, Department of Geriatric Medicine, CGH. "She is an inspiring individual who answers even the most minor questions with a smile."

### Breaking new ground

In pursuing her passion, Ms Lim has a front-row seat to witnessing the evolution of clinical research and technology. A project she found particularly memorable was the study led by Clinical Assistant Professor Troy Puar, Senior Consultant, Department of Endocrinology, CGH, and his team, that sought to enhance outcomes for patients with primary aldosteronism — a lesser-known, but curable form of hypertension. The project explored new blood



Above: CGH CTRU Manager Geraldine Lim receives the award from Adj Assoc Prof Danny Soon, Chief Executive Officer, Consortium for Clinical Research and Innovation, Singapore (CRIS) and Executive Director, Singapore Clinical Research Institute (SCRI).

Photo: Consortium for Clinical Research and Innovation, Singapore (CRIS)



Above: The SC<sup>3</sup> diagnoses hypertension through a combination of liquid chromatography and mass spectrometry technology.

tests to accurately measure for the hormones aldosterone and renin, to better identify and diagnose patients with primary aldosteronism.

In February 2023, the clinical tests for aldosterone and renin were successfully launched by CGH at the Shimadzu-SCG Clinomics Centre (SC<sup>3</sup>). To date, over 1,000 tests have been conducted locally on patients with hypertension. The project showcases the successful translation of research findings from bench to bedside, as CGH advances medical research to enhance patient outcomes. "Geraldine and her team members have been an enormous help in coordinating and supporting my research studies on primary aldosteronism to bring about better health for Singaporeans," adds Clin Asst Prof Puar.



Scan the QR code to find out more about the SC<sup>3</sup>.



### Teamwork makes the dream work

Ms Lim also mentors her team members, developing their potential to drive research and innovation through training. She credits the award to her team, whose strengths complement each other, and who are always willing to take on new challenges, and stand by one another.

### Doing right by patients

Patient participation is fundamental in clinical trials, and crucial to this is gaining the patients' trust. CRCs are empowered today to interact with patients directly.

By building good rapport with patients, Ms Lim and her team have been adept at recruitment for successful study outcomes. "Before we recruit patients, it is important that we listen and address any of their queries," she shares. "We explain any

"The passion I have in advocating for patients and seeing them get better with the trials keeps me and my team going as we innovate healthcare for tomorrow."

**Ms Geraldine Lim,**  
Manager, Clinical Trials and Research Unit (CTRU), CGH

risk to them in a transparent manner before they join any trial so that we build trust and connection."

This approach has paid off — some patients have participated in trials for years, joining one study after another. "The passion I have in advocating for patients and seeing them get better with the trials keeps me and my team going as we innovate healthcare for tomorrow," adds Ms Lim.

Interested in participating in clinical trials? Email [ctrucgh.com.sg](mailto:ctrucgh.com.sg) to enquire about studies and eligibility checks.

# UNCOVERING SKELETONS: OSTEOPOROSIS

NORMAL BONE

OSTEOPOROSIS

Imagine your bones as the pillars of a building, providing support and strength. If these pillars start losing their density and become sponges that are full of holes, it is akin to getting osteoporosis, a skeletal disease in which bone density and quality are reduced. **"Osteoporosis, which literally means 'bones with holes', is a chronic condition where bone density and quality are reduced,"** explains Dr Terry Teo, Consultant, Department of Orthopaedic Surgery, Changi General Hospital (CGH). "It is often called the 'silent disease' as unrecognized or untreated osteoporosis increases the risk of spine or hip fractures."

However, osteoporosis is preventable and treatable. The key is to build a strong skeleton when you are young, which will help to decrease the rate of bone loss as you age.



## Identifying the risk

Certain factors increase the risk of osteoporosis. It is advisable for men aged 65 and above, post-menopausal women, and women with early menopause to go for screenings for osteoporosis. During menopause, oestrogen levels drop quickly, which can lead to reduced bone density. Persons with a family history of osteoporosis and fragility fractures, as well as those who experience a height loss of over 2cm within three years, also face an elevated risk of osteoporosis.

## HOW DOES OSTEOPOROSIS OCCUR?

In adulthood, our body naturally removes old, damaged bone and replaces it with new bone every 7 to 10 years. This is known as **bone remodelling**.

### Before 30 years old

Our bone removal rate is **less than or equal to** the replacement rate.

### After 30 years old

Our bone removal rate is **higher than** the replacement rate.

**We look at this condition — that affects 59% of adults aged over 60 in Singapore — which makes bones more fragile and prone to breakage.**

Other factors that can also lead to lower bone density and the resulting osteoporosis are diabetes, inflammatory joint disease, thyroid conditions, liver diseases, renal diseases and medications such as long-term steroids.

Modifiable lifestyle factors such as inactivity, poor nutrition, low vitamin D, low calcium intake, smoking and excessive alcohol intake can also contribute to osteoporosis.

## Detecting the density

Early identification of patients at risk is key. A common method to diagnose osteoporosis is through bone mineral density (BMD) testing, which uses special X-rays to determine bone density. If there are other suspected causes, blood tests may be conducted, while X-rays may be used to detect fractures.

## Bridging the gaps

Healthy lifestyle choices can help reduce the risk of osteoporosis. These include weight-bearing, muscle-strengthening, and balance exercises such as walking, elastic band exercises and Tai Chi. Besides smoking cessation and appropriate alcohol intake, an appropriate calcium intake of 1,000 mg/day for healthy adults 51 years and older, and 800 mg/day for adults 19 to 50 years old can also reduce the risk of osteoporosis.

In addition, vitamin D helps the body absorb and use calcium, which strengthens the bones. Vitamin D can be found in eggs, cow or fish liver and oily fish. Other sources include fortified food products such as milk, soya milk, yoghurt, orange juice, breakfast cereals and margarine.

The daily recommended dietary allowance of vitamin D for those aged 18 and above is 2.5 micrograms (mcg) per day. One large egg yolk contains 1.02 mcg of vitamin D, and one 250 ml cup of fortified milk contains 2.9 to 3.1 mcg. Sun exposure of five to 30 minutes twice a week also helps with vitamin D intake.

## What to avoid:

- Smoking
- Excessive intake of alcohol
- Very high-fibre diets
- High sodium intake
- High caffeine intake

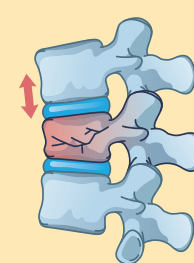
## Osteoporotic spinal fractures

Fractures caused by osteoporosis most often occur in the spine. Known as osteoporotic spinal fractures, these occur when the bones of the spine crack or break. This in turn leads to not only severe back pain that makes it difficult to stand walk, sit, or lift objects, but also a resulting humpback.

When one turns or changes positions, the pain might worsen, and in severe cases, it may result in nerve compression. When a nerve is pinched due to excessive pressure, it can cause pain, numbness or tingling in the area supplied by the nerve and may even radiate down the back of the legs. Physical examinations, magnetic resonance imaging (MRI) and X-rays are used to detect these spinal fractures.

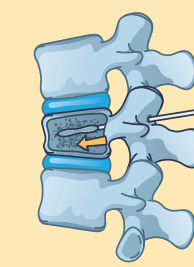
Most osteoporotic spinal fractures can be treated without surgery. With rest, pain relief medication and wearing a brace to reduce motion in the fractures, many patients are able to recover. On the occasions when the condition does not improve, surgery might be required. The surgery serves to reduce pain, resolve the nerve compression and prevent deformities. Two common procedures are surgical fixation — which uses implants to hold the spine in

Fractured vertebrae

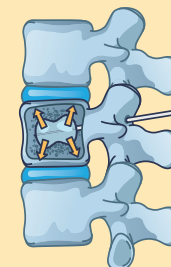


## SURGICAL RESTORATION

Surgical options like kyphoplasty can help patients with osteoporotic spinal fractures. It is a minimally-invasive procedure used to treat vertebral compression fractures by inflating a balloon to restore bone height then injecting bone cement into the vertebral body.



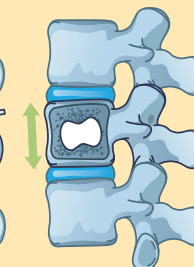
Balloon catheter inserted into affected vertebrae



Balloon inflated to create a cavity restoring collapse



Balloon removed and cavity filled with bone cement



Bone cement hardens, restoring vertebral height

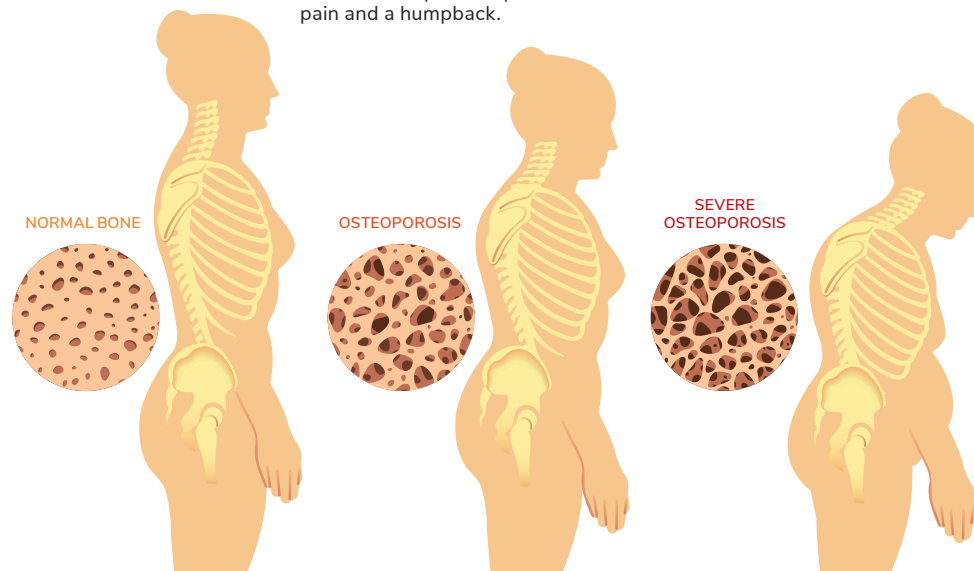
position for the fracture to heal, and cement augmentation — where bone cement is injected into the fracture to reduce the compression.

"Preventing the onset of osteoporosis is the best approach," says Dr Teo. "While there are ways to treat the condition, there are changes we can make in our lifestyle to reduce the risk of having osteoporosis, removing a major cause of disability among seniors."



Scan the QR code to read more about osteoporosis.

Below: Osteoporotic spinal fractures can cause pain and a humpback.



As part of CGH's ongoing efforts to care for patients with diseases and disorders of the spine, spinal cord and nerves, the one-stop multi-disciplinary **CGH-NNI Integrated Spine Centre** was launched to provide comprehensive and focused care for patients.

Find out more about the Centre here.





# HELPING PATIENTS BREATHE FREELY AND SLEEP WELL

**Changi General Hospital (CGH) helps patients with obesity hypoventilation syndrome (OHS) and advanced chronic obstructive pulmonary disease (COPD) get back on their feet with a new home-based ventilation pilot programme.**

By Ms Tanya Pillay, CGH

**M**et Mr Abu Baker Bin Mohamed Tahir, a 63-year-old who has been living with OHS since 2018. For years, he did not undergo treatment and continued to grapple with shortness of breath, disrupted sleep, heavy snoring and constant daytime sleepiness.

In June 2023, Mr Abu Baker's sleep and respiratory condition took a severe turn when he fell ill with an Influenza A viral infection while overseas. His breathing deteriorated, leading to a nine-day admission at CGH for

respiratory failure, including time in a high dependency ward for acute non-invasive ventilatory support.

It was during this challenging period that Mr Abu Baker was introduced to an innovative home-based model of care for chronic Non-Invasive Ventilation (NIV) to better address breathing difficulties and challenges faced by patients living with OHS and advanced COPD.

**The pilot Changi Home NIV Programme — the first-of-its-kind in Singapore's public hospitals — enables**

**these patients with complex medical needs to sleep and breathe better at night, and take steps towards regaining mobility and independence.**

With the use of advanced ventilator technology, remote monitoring and teleconsultation, the new model of care driven by a multi-disciplinary care team at CGH aims to transform patients' treatment experience from hospital to home, increase patient care access to NIV treatment and enhance patients' quality of life.

With the Changi Home NIV Programme, patients living with OHS and advanced COPD now have better access to CGH's home-based chronic NIV treatment.

"Over the years, we have become increasingly aware of the various challenges faced by OHS and COPD patients and their caregivers during treatment," says

**Clinical Assistant Professor Wong Hang Siang, Chief and Senior Consultant, Department of Sleep Medicine, Surgery & Science, CGH.**

"If left untreated, OHS and COPD patients may face a downward spiral as their breathing difficulties and sleep disorders start to impact their lives even when awake. For instance, they may feel sleepy or drowsy all the time, breathless, moody, and are not able to lie down comfortably." Dr Wong adds that some patients may also suffer from increased mental distress, as they are not able to work and carry out activities of daily living.

In the following weeks and months after enrolling in the programme, Mr Abu Baker, who works long hours in customer service at an MRT Passenger Service Centre, experienced a significant improvement in his condition.

**"The home-based ventilation treatment has greatly improved my life — both for sleep and during the day. My sleeping and breathing habits have improved, and I no longer feel breathless,"** he shares. **"I am also able to walk further distances both at work and for leisure, which I was never able to before."**

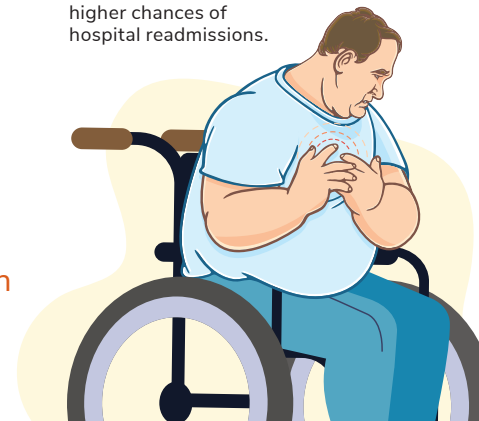


## An innovative model of care for patients

For individuals like Mr Abu Baker who battle OHS and advanced COPD, the NIV treatment is usually complex, and patients have to get accustomed to wearing the NIV mask during their sleep or treatment.

Traditionally, patients commencing NIV treatment often have to make frequent hospital visits for clinical reviews during the acclimatisation process, which includes regular adjustments on their fixed-pressure ventilator device so that they can benefit optimally from it. This poses a challenge to those with mobility issues as special transport arrangements have to be made, often by their caregivers, causing disruptions to their daily routines and work.

Due to its challenges and complexities, patients who are unable to comply with NIV treatment face higher chances of hospital readmissions.



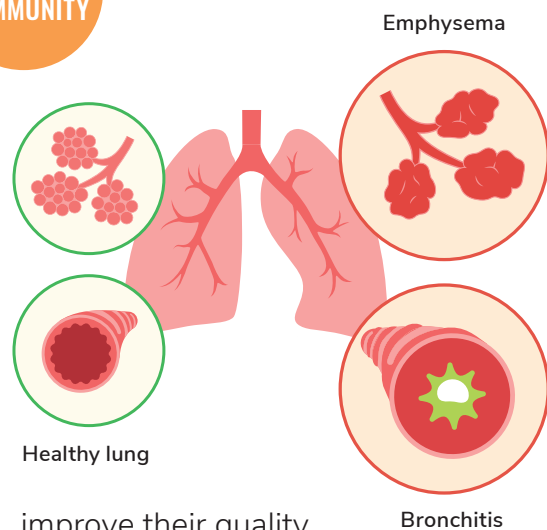
**"If left untreated, OHS and COPD patients may face a downward spiral as their breathing difficulties and sleep disorders start to impact their lives even when awake. For instance, they may feel sleepy or drowsy all the time, breathless, moody, and are not able to lie down comfortably."**

**Clinical Assistant Professor Wong Hang Siang, Chief and Senior Consultant, Department of Sleep Medicine, Surgery & Science, CGH**

For those who are unable to do so, the acclimatisation process becomes less than optimal, often leading to poor treatment tolerance — such as not being able to tolerate wearing the ventilator mask or the air pressure levels — and non-compliance to treatment. Consequently, these patients are at high risk of acute respiratory failure events such as severe breathlessness. These in turn often result in hospital readmissions, which may require treatment at high dependency wards or the intensive care unit.

"As the smart and caring general hospital, CGH introduced the pilot home-based NIV treatment programme to address prevailing challenges faced by OHS and advanced COPD patients, and enhance health outcomes and patient safety," says **Clinical Assistant Professor Mok Yingjuan, Senior Consultant, CGH Department of Sleep Medicine, Surgery & Science,** and the lead of the pilot programme. "Patients can receive high-quality care and support in the comfort and convenience of their homes,



**WHAT IS COPD?**

Chronic obstructive pulmonary disease (COPD) refers to a group of diseases that cause airflow blockage and breathing-related problems, such as emphysema and chronic bronchitis. Like OHS, COPD makes breathing difficult for patients, and is a condition associated with high rates of hospital readmission.

**WHAT IS OHS?**

Obesity hypoventilation syndrome (OHS) is a life-threatening sleep-breathing disorder characterised by respiratory failure, and is associated with significant morbidity and mortality, recurrent hospitalisations and a poor quality of life. Patients with OHS experience severe breathing difficulties both during sleep and while awake in the daytime.

*Read more about OHS on page 21.*

improve their quality of life, reduce the need for frequent hospital visits, and lower their risk of hospital readmissions.”

Complementing the home-based model of care, the programme makes use of advanced ventilator technology and remote monitoring, transmitting patient treatment data such as daily usage and air pressure requirements directly to the clinical team. Sleep specialists are able to adjust a patient's NIV device remotely, eliminating the need for patients to make frequent hospital visits for this purpose.

The CGH multi-disciplinary team, comprising respiratory sleep physicians, sleep technologists and community nurses, supports the patients on the home-based treatment.

“We leverage the use of technology for remote monitoring, and conduct nursing assessments and health coaching for patients to ensure that they are on track with their treatment plans,” says **Ms Tan Poh Choo, Assistant Director of Community Nursing, CGH.**

In the ongoing pilot, the CGH team of sleep specialists has seen promising early results in the patients enrolled in the programme so far. Some patients reported being able to walk further distances and have thus regained independence. They are able to sleep without feeling breathless and experience increased energy levels upon waking up. Some



patients have also been gradually weaned off oxygen support. The pilot programme was introduced by the Changi Sleep and Assisted Ventilation Centre at CGH. **The Changi Sleep and Assisted Ventilation Centre is one of the largest sleep centres in Singapore dedicated to the management of sleep disorders, promotion of sleep health and research.** The Centre is run by the CGH Department of Sleep Medicine, Surgery & Science, which is recognised as a top specialty globally by *Newsweek* for its clinical work and research health.

“Patients can receive high-quality care and support in the comfort and convenience of their homes, improve their quality of life, reduce the need for frequent hospital visits, and lower their risk of hospital readmissions.”

**Clinical Assistant Professor Mok Yingjuan**, Senior Consultant, Department of Sleep Medicine, Surgery & Science, CGH



Scan the QR code to find out more about the Changi Sleep and Assisted Ventilation Centre.

# NO WEIGH TO LIVE

**In conjunction with World Sleep Day on 15 March this year, learn more about a lesser-known but life-threatening sleep disorder — obesity hypoventilation syndrome (OHS).**

By Clinical Assistant Professor Mok Yingjuan, Senior Consultant, Department of Sleep Medicine, Surgery & Science, CGH



**OHS** is a complex sleep disorder that affects individuals with severe obesity. Characterised by shallow breathing or pauses in breathing during sleep, OHS can have serious implications for both physical and mental health.

**Understanding and treating OHS**

Obese individuals with a body mass index (BMI) of 30 and above are at risk of developing OHS. The excess weight puts pressure on the chest and abdomen, making it difficult for respiratory muscles to function properly during sleep. This leads to insufficient oxygen and abnormally high levels of carbon dioxide in the blood.

Common symptoms of OHS include daytime sleepiness, fatigue, morning headaches, difficulty concentrating and shortness of breath. Left untreated, OHS can increase the risk of serious health complications such as heart disease, stroke and diabetes. OHS patients are also at high risk of recurrent hospitalisations for acute episodes of respiratory failure, which may require ventilatory support in the high dependency or intensive care unit. Consequently, many OHS patients experience difficulties with activities of daily living which further impairs their quality of life.

At the Changi Sleep and Assisted Ventilation Centre, a multi-disciplinary team of respiratory sleep physicians, sleep technologists, respiratory therapists, chest physiotherapists and nurses, provide holistic treatment and management of OHS.

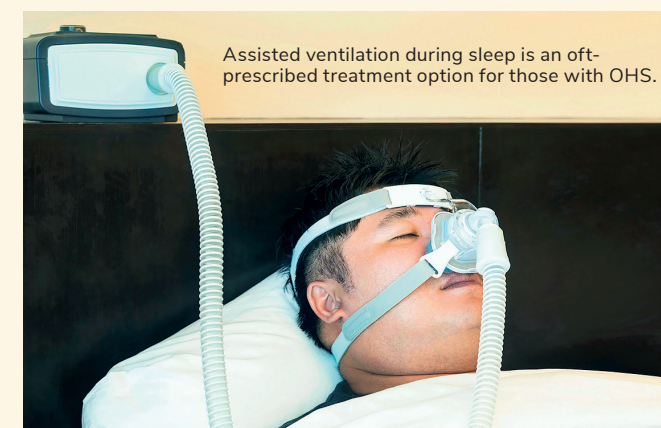
Positive airway pressure (PAP) therapy and weight loss are the mainstay of treatment for OHS. PAP therapy involves the patient wearing a mask connected to a ventilatory device that delivers pressurised air to the airway during sleep. This helps to prevent airway collapse and improves ventilation and oxygen levels during sleep, thus reducing the risk of respiratory complications. Weight loss can be achieved through lifestyle modifications such as diet and exercise. Medications and surgery for weight loss may also be recommended for some patients.

**The impact on sleep and mental health**

OHS not only affects sleep and breathing but can also have a significant impact on mental health and well-being. Poor sleep quality due to OHS can lead to irritability, mood swings and cognitive impairment, while the chronic stress of living with a sleep disorder can affect daily functioning and quality of life. Studies have shown that up to 50% of individuals with OHS experience symptoms of depression, anxiety or other mood disorders.

By managing OHS with appropriate treatment strategies, individuals can experience improvements in sleep quality, daytime symptoms and overall well-being. Regular follow-up appointments are essential for monitoring treatment effectiveness, adjusting ventilator therapy settings as needed and providing ongoing support.

With advancements in PAP device technologies and weight-loss strategies, individuals living with OHS can take control of their health, improve their sleep, and enhance their overall quality of life and mental well-being.



Assisted ventilation during sleep is an oft-prescribed treatment option for those with OHS.



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