2020 will best be remembered as a momentous year, not just for SingHealth but for Singapore and the world. It is the year that Singaporeans stood together in solidarity in our fight against the COVID-19 pandemic. The battle was led by frontline staff across the nation, including our healthcare teams.

In the past months, our staff have been working tirelessly, putting in place strict protocols to identify, isolate and manage COVID-19 patients and responding swiftly to changing needs, which is no mean feat as it involves changes in processes, as well as making quick adjustments on the ground and working round the clock. From doctors, nurses and allied health professionals, to operations, administrative and ancillary staff providing critical support services, as well as staff volunteers - all hands were on deck to keep our patients and fellow Singaporeans safe. We also responded to the nation’s wider needs during this period, with Bright Vision Hospital (BVH), one of the three community hospitals managed by SingHealth Community Hospitals (SCH), designated as Singapore’s first hospital isolation facility for patients with the virus. To manage the clusters at foreign worker dormitories, SingHealth staff were also deployed to the dormitories to provide screening and tend to medical needs.

Through it all, our staff have shown the tenacity and resilience that we can withstand the most challenging of times together as one family. This is the SingHealth spirit that defines us and has brought us far as we commemorate our 20th anniversary this year. For the past two decades, we have shaped the healthcare landscape in Singapore, with innovative models of care to improve our patients’ lives. On the research and education front, we have gained inroads in establishing ourselves in partnership with Duke-NUS Medical School as a leading Academic Medical Centre (AMC). We will continue to enhance our existing infrastructure and expand the scope of our care services as we adapt to the evolving needs of our population in the next 20 years and beyond.

Transforming our Infrastructure
Since the launch of the Campus Masterplan, we have made marked progress in transforming our campus infrastructure. With the opening of Outram Community Hospital (OCH) in December 2019, patients have seamless access to multi-disciplinary care from OCH, Singapore General Hospital (SGH) and the SingHealth National Specialty Centres. Patient safety has always been our priority, and our newly upgraded SGH Burn Centre now boasts a modular design that allows part of the facility to be closed off during a mass burns incident to reduce the risk of cross-contamination.

Another significant development is the groundbreaking of the SGH Elective Care Centre and new National Dental Centre Singapore (NDCS) building, which features new facilities in elective surgical and dental care to meet growing healthcare needs. With our sights set on community care, Singapore National Eye Centre (SNEC) launched a new Myopia Centre in Bedok - Singapore’s first one-stop centre to provide early detection and treatment for myopia. The centre will also educate the public on preventive measures and advanced clinical research in this field.

Enabling More Diverse Care
We are well placed to take patient care further with our expansion of specialised areas of healthcare. The new SingHealth Duke-NUS Genomic Medicine Centre was launched in October 2019 to provide highly specialised genetics care and facilitate genomic research and education across all our institutions. This will advance the diagnosis and identification of genetic elements and risk factors, as well as tailoring treatment for genetic disorders.

Similarly, the Rare Disease Fund was launched with the support of the Ministry of Health (MOH) to provide long-term financial support for patients with rare diseases requiring high-cost treatments. Managed by the KH Health Fund as part of SingHealth Fund, it allows us to work with the community to support patients with rare diseases over their lifetimes.

The Changi Aviation Medicine Centre, a collaboration between Changi General Hospital (CGH) and the Civil Aviation Authority of Singapore, offers customised care to pilots, cabin crew and air traffic control staff. It is Singapore’s first aviation medicine centre to be established within a government restructured hospital, and provides customised medical examinations and treatments in the unique flying environment.

Strengthening our Academic Medicine Expertise
Our partnership with Duke-NUS Medical School has grown from strength to strength. Last year, researchers from the Singapore Eye Research Institute (SERI), SNEC and Duke-NUS received the President’s Science Award, the highest honour bestowed on exceptional research scientists and engineers. They were recognised for their pioneering work in the field of myopia research that has contributed to a decrease in the prevalence and severity of myopia in children. The SingHealth-Duke-NUS Translational Immunology Institute (TII) was designated as a worldwide Centre of Excellence for translational immunology studies. Our clinicians from the National Heart Centre Singapore (NHCS), SGH, Duke-NUS and NHKM also won the National Medical Excellence Awards for their outstanding contributions towards clinical care and mentorship.

In the fight against COVID-19, we have made significant contributions. These include a collaboration led by Duke-NUS Medical School, with SGH, National Centre for Infectious Diseases (NCID) and the Ministry of Health (MOH) which successfully cultured the SARS-CoV-2 virus to help in the diagnosis of COVID-19. To protect healthcare workers when they perform COVID-19 swab tests, SGH has developed two devices - SISAFE, a foldable swab screen system that halves testing time, and SISIELD, which blocks healthcare workers from droplet deposition. The Viral Research and Experimental Medicine Centre and CGH also lent their expertise with studies in areas ranging from immune system responses in COVID-19 patients to the efficacy of different types of protective masks for healthcare workers.

Looking To The Future
The next 20 years will bring even more opportunities as healthcare needs evolve and new innovations transform the way we deliver care. There will be challenges that test our strength, resilience and tenacity. I am confident that whatever comes our way, we will emerge stronger together. What will remain constant, as we draw from the strengths of each institution in the cluster, is our commitment to always put patients at the heart of all we do.
Achieving Greater Things Together

2019 spelt continued success for Duke-NUS Medical School (Duke-NUS), which charted significant milestones in education, research and innovation. Bolstered by its exceptional Academic Medicine partnership with SingHealth, we continued to break new ground at the forefront of medical science.

Our faculty, many of whom have been involved in research, education and patient care, continued with impressive publication numbers – well over 6,000 papers in peer-reviewed journals to date. Duke-NUS has been involved in more than 200 research collaborations with various institutions and organisations. These achievements are proof of the synergistic collaborations between Duke-NUS and our colleagues within the SingHealth Duke-NUS Academic Medical Centre (AMC).

We have experienced a watershed year in terms of education, welcoming our biggest cohort to date. The Class of 2023 comprised 81 dynamic students who hailed from a variety of professional backgrounds, from journalism to engineering and nursing. With their unique perspectives and experiences, they are well-poised to become outstanding clinicians, clinician scientists and Clinicians Plus – equipped to assume diverse leading roles related to healthcare and medical science.

In staying true to our mission to nurture mature graduates into multi-faceted clinicians, we introduced the Singapore National Centre for Infectious Diseases, Ministry of Health and Singapore Police Force to link three infection clusters in Singapore, thereby expediting infection containment efforts.

On top of showcasing our School’s cutting-edge research capabilities, the achievement bears testimony to the strength of our SingHealth Duke-NUS Academic Medicine partnership, which enables us to collaborate across disciplines to produce exceptional outcomes. This was also reflected in our researchers’ success in cultivating the novel coronavirus in our laboratory, together with our SingHealth partners. Duke-NUS’ scientists have also partnered with leading RNA (Ribonucleic Acid) medicines company Arcturus Therapeutics to develop a vaccine for COVID-19, amplifying our credibility as a world leader in impactful medical science.

Aside from harnessing cutting-edge medical research in light of a national healthcare emergency, scientists from our Signature Research Programmes have also addressed pressing chronic conditions affecting large populations, including diabetes and liver, cardiovascular and Alzheimer’s diseases. Their translational research accomplishments have earned them prestigious national and international accolades, including the Singapore Translational Research (StaR) Investigator Award and the Clinician Scientist Award at the 2019 National Medical Research Council (NMRC) awards, as well as the Young Investigator Award 2019, at the William Harvey Medal International Association of Inflammation Societies, the President’s Science and Technology Awards 2019, and the SingHealth Duke-NUS Research Achievement Awards 2019.

Reaffirming Duke-NUS’ commitment to bringing scientific discovery from bench to bedside, our commercialisation efforts broke new ground. In a billion-dollar landmark biotech deal that is the largest to date for a Singapore start-up, Enleofen Bio – co-founded by Professor Stuart Cook, Director of Duke-NUS’ Cardiovascular and Metabolic Disorders (CVMD) programme – inked a partnership with global pharmaceutical giant Boehringer Ingelheim to develop therapies to treat fibrotic diseases. The strategic partnership will not only leverage the breakthrough discovery in our laboratories but also the prolific collaboration by clinicians and clinician scientists from Duke-NUS’ CVMD programme with the National Heart Centre Singapore, SingHealth Duke-NUS AMC and Enleofen Bio.

Our research ecosystem has been further complemented by our eight medical research centres, which help solve healthcare challenges especially relevant to Singapore and the region, and also seek to further integrate research and learning. These help us to see the full picture of population health through disciplines such as quantitative research and protocol design. The year 2019 marked several milestones for two of our Centres – the Centre of Regulatory Excellence and the Lien Centre for Palliative Care, which commemorated their fifth and tenth anniversaries respectively.

Finally, our solid partnership with SingHealth continues to grow from strength to strength. In 2019, we expanded upon our SingHealth Duke-NUS Joint Institutes, with the opening of the National Dental Research Institute Singapore. This brought our total number of joint institutes to 14, as we grow the expertise and reach of our unique ecosystem to flourish as an unchallenged whole.

I thank Mr Kai Nargolwala, my predecessor as Chairman of the Duke-NUS Governing Board, for his stellar leadership of the School for the past seven years. I also thank members of the Governing Board, who have individually and collectively done much to guide the evolution of the School, and who, together with the deanship, management, faculty and staff, have enhanced our partnership with SingHealth and other key stakeholders, positioning Duke-NUS as a leading institution both in Singapore and internationally.

I look forward to the years to come, as we continue transforming medicine and improving lives.

Mr Goh Yew Lin
Chairman, Duke-NUS Medical School Governing Board
Forging Ahead as One

The SingHealth-Duke NUS Academic Medical Centre (AMC) has come a long way to where we are today - a strong partnership with momentous milestones achieved in clinical care, research and education. The impact of our combined strengths has been evident through the COVID-19 pandemic, where our clinicians and scientists spearheaded game-changing research, placing the AMC at the forefront of the battle against the virus. This strong partnership engenders external trust and support for our causes, inspiring donations that enable us to turn promising research into tomorrow’s cures. A generous $2 million gift, received in March from The Hour Glass to support research into COVID-19 cures, is a strong testament of this trust.

This year is especially meaningful as we celebrate SingHealth’s 20th anniversary and the 15th year of our AMC partnership. Over the years, the joint collaboration has borne many productive initiatives. Progress in Academic Medicine was enhanced through the establishment of our 15 Academic Clinical Programmes (ACPs) and 14 joint institutes, including the Academic Medicine Education Institute (AMEI) and Academic Medicine Research Institute (AMRI), facilitating the active development of educators and scientists within the AMC and bringing patient care to new frontiers as we transform for best outcomes and experiences for our patients.

The Academic Medicine partnership has enriched our research and education initiatives, with over 22,000 publications in international peer-reviewed journals and a diverse range of education programmes. In patient care, our 12 SingHealth-Duke NUS Disease Centres (SDDCs) spanning across different specialties and institutions underscore our shared commitment to provide person-centric care by streamlining the patient’s treatment journey and delivering consistent evidence-based care.

Looking back, we are heartened by what we have achieved journeying with our patients, staff and partners, and we are excited at what is to come in the years ahead. In this Annual Report, we feature the stories of Mr Jacky Goh, a patient who has received care in SingHealth institutions for the past 20 years; and our staff who have borne witness to the transformation journey of the AMC, including Mr Chong Pang Boon and Dr Damien Tan. Their stories reflect not only our dedication to the advancement of quality care, but also embody our common purpose of putting patients at the heart of all we do.

Our journey has been enriched by the tremendous support and dedication from our staff, who bring with them passion, deep expertise and compassion, our wide array of partners who share our vision, and our students and trainees, the future of healthcare. We are humbled and privileged to serve our patients who entrust their lives to us and we will continue to do our best to keep them at the heart of all we do.

The future holds limitless possibilities for the SingHealth-Duke NUS AMC family. Together, we will continue to make strides toward Defining Tomorrow’s Medicine.

Prof Thomas Coffman
Dean, Duke-NUS Medical School

Prof Ivy Ng
Group Chief Executive Officer, SingHealth

Mr Jacky Goh, a 21-year-old National Serviceman, was born premature with left vocal cord palsy. Treated at KK Women’s and Children’s Hospital (KKH) during his childhood years, he was transferred to Singapore General Hospital (SGH) at the age of 18 and has been under the care of the Ear, Nose & Throat (ENT) care team there since. Affectionately called the “KK boy” due to his frequent visits to KKH, he shares his journey with KKH and SGH and how the doctors, nurses and speech therapists have cared for and supported him from the day he was born.

Our journey has been enriched by the tremendous support and dedication from our staff, who bring with them passion, deep expertise and compassion, our wide array of partners who share our vision, and our students and trainees, the future of healthcare. We are humbled and privileged to serve our patients who entrust their lives to us and we will continue to do our best to keep them at the heart of all we do.

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Prof Ivy Ng
Group Chief Executive Officer, SingHealth
SingHealth is established and is presently Singapore’s largest healthcare group, with over 40 clinical specialties and a network of acute hospitals, national specialty centres, polyclinics and community hospitals.

The Singapore Sport & Exercise Medicine Centre @ Changi General Hospital (CGH), the largest multidisciplinary sports centre in Singapore, is established. Equipped with the latest technologies and a gym, the centre caters to recreational and competitive athletes from a wide range of sports.

Singapore Cord Blood Bank (SCBB) is established with a commitment to save lives through serving the needs of patients and the community with cord blood banking.

The SingHealth Duke-NUS Academic Medical Centre (AMC) is formed, harnessing the collective strengths of SingHealth’s clinical expertise and Duke-NUS’ medical education and research capabilities to drive the transformation of healthcare and provide affordable, accessible and quality care to patients.

National Cancer Centre Singapore (NCCS) signs a landmark agreement with eight Asian national cancer centres, the World Health Organisation (WHO) and International Agency for Research on Cancer (IARC) to embark on cancer prevention advocacy, cancer research, training and collaboration.

The KK Gynaecological Cancer Centre in KK Women’s and Children’s Hospital (KKH) is the sole collaborator from Asia in a vaccine trial for human papillomavirus (HPV), a sexually transmitted infection that causes cervical cancer. This trial would later result in the world’s first cervical cancer vaccine in 2006.

The old Kandang Kerbau Hospital, birthplace of over 1.2 million Singaporeans, is gazetted a historic site by the National Heritage Board in recognition of the hospital’s contribution to the provision of obstetrical and gynaecological care in Singapore since 1858.

Singapore National Eye Centre (SNEC) and National Dental Centre Singapore (NDCS) jointly perform the first Osteo-Odonto Keratoprosthesis (OOKP) “Tooth-in-Eye” surgery in Southeast Asia to restore sight.

SingHealth’s Delivering on Target (DOT) Programme, which right-sites patients with stable chronic conditions from specialist clinics to partner general practitioners (GPs), is extended as a national programme for patients of chronic diseases.

The Group Procurement Office (GPO) is set up to centrally purchase drugs, supplies, equipment and IT services for SingHealth institutions. ALPS would later be launched in 2018, bringing together healthcare supply chain professionals from all three public healthcare clusters to meet the procurement and supply chain needs of Singapore’s healthcare system.

A team from Singapore General Hospital (SGH) and National Dental Centre Singapore (NDCS) performs the world’s first modified jaw advancement technique for Obstructive Sleep Apnoea in Asians.

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Milestones depicting SingHealth’s development as a leader over the years.

Innovative initiatives in SingHealth that have significant impact on patient care, research and education.

**2009**

- Professors Donald Tan, Roger Beuerman and Aung Tin from SNEC and the Singapore Eye Research Institute (SERI) are the pioneer recipients of the inaugural President’s Science Award for their innovative breakthroughs in ‘bench-to-bedside’ medical research in blinding corneal diseases and glaucoma, leading to major advancements in scientific knowledge and the treatment of these diseases.

**2011**

- The SingHealth Residency Programme is established with the aim of nurturing the future generation of medical professionals, equipping them with the necessary skills and a strong sense of ethics and compassion.

- SingHealth Academy is launched with a commitment to high quality clinical training and education to nurture a multidisciplinary team of healthcare professionals and leaders.

- Duke-NUS Medical School is officially opened after its first student intake in 2007, offering medical training programmes for post-graduates in Singapore.

**2012**

- The SingHealth Duke-NUS Academic Clinical Programmes (ACP) are formed. The ACP framework harnesses the expertise of each discipline across SingHealth and Duke-NUS for greater synergy in clinical care, education and research. By 2020, 15 ACPs have been formed.

- National Heart Centre Singapore’s (NHCS) new building at 5 Hospital Drive is officially opened with increased capacity and dedicated facilities to allow for training of healthcare professionals and research on cardiac care.

**2013**

- The SingHealth Duke-NUS Disease Centres (SDDCs) are formed. These are strategic models of care which enables teams from different disciplines and institutions to work closely to provide care for patients with specific conditions. With SDDCs, the patient’s journey is streamlined, cutting down the number of visits and saving time and money. By 2020, 12 SDDCs have been formed.

- The National Heart Research Institute Singapore (NHRI) is established by NHCS and the Duke-NUS Cardiovascular and Metabolic Disorders Signature Research Programme, with the aim of transforming cardiovascular outcomes through patient-centred research.

- The SingHealth Office of Regional Health (SORH) is set up to enable our population to keep well, get well and age well in their communities and homes. To achieve this, the Office works closely with community partners to identify population health needs, promote behavioural changes and develop sustainable programmes to improve quality of life. It also leverages health services research to understand healthcare utilisation patterns and facilitate appropriate interventions across the care continuum.

**2014**

- KKH and Temasek Foundation partner to pilot the Kids in Tough Situations (KITS) programme to provide community-based therapy to children experiencing trauma-related emotional and psychological difficulties. Other Temasek Foundation partnerships include the ‘Stay Prepared – Trauma Network for Children’ in 2016 and the pilot launch of Singapore’s first Donor Human Milk Bank programme in 2017.

- The National Neuroscience Research Institute Singapore (NNRIS) is established to synergise expertise from NNI and Duke-NUS Medical School to develop research programmes and integrate resources and new research facilities.

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- National Heart Centre Singapore’s (NHCS) new building at 5 Hospital Drive is officially opened with increased capacity and dedicated facilities to allow for training of healthcare professionals and research on cardiac care.

- The Integrated Building (IB), jointly run by CGH and St. Andrew’s Community Hospital (SACH) is opened, providing a new model of care to optimise rehabilitation for patients.

- NHCS jointly launches the world’s first global diabetes registry with the American College of Cardiology to generate data and identify treatment gaps to result in better care and outcomes for patients. This significant collaboration aims to help manage the prevalence of diabetes in Singapore, which is higher than the world’s average.
Prime Minister Lee Hsien Loong unveils a Masterplan to re-develop the SGH Campus over the next 20 years to boost capacity and accessibility to meet the healthcare needs of Singapore.

SingHealth Fund, a company limited by guarantee, is established. Initially set up as SingHealth Foundation in 2002, the Fund brings all SingHealth institutions’ health funds under one umbrella for enhanced governance and greater transparency.

Community Nursing Posts in the south-eastern and eastern regions of Singapore, led by nurses from SGH and CGH, are set up to anchor population health and facilitate the shift of care from hospitals to the community. This new model enables the elderly with multiple chronic diseases to receive care closer to their homes.

A groundbreaking ceremony is held for the new NCICS Building and comprehensive proton therapy centre, named the Goh Chong Liang Proton Therapy Centre. NCICS received a $50 million donation from the Goh Foundation to establish this centre, which will provide a new form of radiation therapy that targets cancer cells precisely and minimises damage to healthy tissues.

A Masterplan to re-develop the SGH Community Hospital (OCH), allowing for the cross sharing of best practices and strengthening of collaborations.

To boost training of healthcare professionals, five colleges and a medical simulation institute under SingHealth Academy are launched.

Researchers from NHCS, Duke-NUS Medical School and other international research teams make a breakthrough discovery of interleukin 11 (IL11), a critical protein that causes fibrotic diseases and organ damage. This discovery has allowed the team to explore the development of a therapeutic target and potentially offer hope to patients with end-stage heart and kidney failure.

MILESTONES

2017

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2018

CGH joins the SingHealth Duke-NUS AMC family as part of the nation’s reorganisation of the public healthcare system into three integrated clusters, to better meet Singaporeans’ future healthcare needs.

CGH’s new Medical Centre is opened, enhancing specialist care by providing care to patients with complex medical conditions in a more integrated way.

2019

The integrated hospital campus housing Singapore General Hospital (SGH) and SKCH is opened to serve the population in the north-east region of Singapore.

The National Dental Research Institute Singapore (NDRIS) is established to develop novel effective therapies for common chronic diseases, leverage technology to increase efficiency and introduce new care models to improve community health.

SGH is ranked the third best hospital in the world by Newsweek magazine for its clinical research and outstanding nursing care.

CGH sets up the Chang Aviation Medicine Centre (CAMC), Singapore’s first within a government restructured hospital, offering customised care for pilots, cabin crew and air traffic control staff.

The National Rehabilitation Institute Singapore (NRI) is opened to serve the population in the north-east region of Singapore.

2020

The groundbreaking ceremony for the Elective Care Centre (ECC) and NDICS Building is held. The new building will feature new facilities in elective surgical and dental care to meet growing healthcare needs.

The SingHealth Duke-NUS Global Health Institute (SDGHI) is launched to address current and emerging health challenges across ASEAN member states and in other Asian countries. Today, SDGHI works closely with faculty from across all ACPs on various programmes and collaborations.

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Minister for Health Gan Kim Yong announces the new Eastern General and Community Hospitals which will come under the management of SingHealth. It will be Singapore’s 12th public general hospital and is expected to be ready by 2030.

KKH, SHP and Temasek Foundation launch Singapore’s first Integrated Maternal and Child Wellness Hub to support the health and well-being of mothers and young children in the community.

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A 20 YEAR JOURNEY WITH SINGHEALTH

Mr Jacky Goh
Patient under the care of SingHealth institutions for 20 years

Mr Chong Pang Boon
Chief Operating Officer (Security), SingHealth
Chief Operating Officer, National Heart Centre Singapore and National Dental Centre Singapore

KEEPING HIS EAR CLOSE TO THE GROUND

Mr Chong Pang Boon
Chief Operating Officer (Security), SingHealth
Chief Operating Officer, National Heart Centre Singapore and National Dental Centre Singapore

STORIES

OUR STAFF, OUR STRENGTH

Dr Damien Tan
Senior Consultant, Department of Gastroenterology and Hepatology, Director, Endoscopy Centre, Singapore General Hospital (SGH)

Ms Jane Tan
Senior Medical Laboratory Scientist, Pathology - Histology/Cytology, Sengkang General Hospital (SKH)

Ms Ang Bee Leng
Nurse Clinician, Bukit Merah Polyclinic, SingHealth Polyclinics (SHP)

Ms Lakshi Renuka Segaran
Senior Executive, Business Office, KK Women's and Children's Hospital (KKH)

Dr Koh Lip Hoe
Chief and Senior Consultant, Department of Geriatric Medicine, Changi General Hospital (CGH)

Ms Suzleyn Jelina
Senior Staff Nurse (Community Nursing), Singapore General Hospital (SGH)
A 20-YEAR JOURNEY WITH SINGHEALTH

Born 24 weeks premature and weighing a mere 777 grams, it was a touch-and-go situation for Mr Jacky Goh in 1998 at KK Women’s and Children’s Hospital (KKH).

Young Jacky suffered respiratory distress syndrome and needed to have a breathing tube inserted. Doctors also diagnosed him with a myriad of diseases, like chronic lung disease, prolonged jaundice, an enlarged liver and gastroesophageal reflux disease, amongst others.

“My Mum told me that only she and my Dad could hold me in those early days. When other people tried to hold me, I would turn blue immediately. It was quite alarming and there did not seem to be a scientific explanation to this,” said Jacky, who is now 21 and currently serving his National Service as an intelligence vocationalist.

The family was well-supported by the doctors and nurses during Jacky’s stay in hospital, the first years of his life. Dr Khoo was part of the team that looked after Jacky when he was admitted to the Neonatal Intensive Care Unit after birth. Jacky started consulting Dr Khoo twice a year from the age of two years old due to his Very Low Birth Weight (VLBW) and other medical issues. Initial concerns included mild motor delay, but with early intervention, Dr Khoo was relieved that Jacky showed great improvement with no residual motor issues.

However, Jacky had to work hard at the speech and articulation difficulties he experienced as a result of left vocal cord palsy through his childhood and into his teenage years. This condition affected his ability to speak. Accompanied by his mother, Jacky had speech therapy sessions every six to seven months until he turned 18.

During each 45-minute speech therapy session, Jacky focused mainly on smooth speech techniques, where he was trained to link words and pause appropriately when speaking, as well as to pronounce the ‘s’ sound.

“The speech therapists were very patient with me, even more so than my teachers,” recalled Jacky with a chuckle. “I always looked forward to these sessions as they were very effective and I would always learn something new that could help me improve in my day-to-day communication.”

Gradually, his friends were better able to understand when he spoke, and with stronger oral presentation skills, class presentations became less daunting. “I began to speak with more confidence and it really made a difference to my self-esteem,” he commented.

Dr Khoo, who witnessed his progress, also witnessed the self-esteem and joy in Jacky’s life. “I feel that my opinions and experiences are valued,” said Jacky. “I discuss issues that I may have and they ask my input on how we can resolve them. I feel that my opinions and experiences are valued.”

Seamless Transition of Care to SGH

Jacky went for his last speech therapy and follow-up session at KKH when he turned 18. As KKH cares for women and children, he was transferred to Singapore General Hospital (SGH) to continue his care journey as an adult.

“It felt like nothing had changed even though I had to go to a different hospital. The transition was so seamless,” he commented.

At SGH, he no longer has speech therapy sessions, but undergoes throat examinations annually with the Ear, Nose & Throat (ENT) Department’s care team. During these sessions, the care team also checks if he has any issues with eating or swallowing.

“My long-term treatment at SGH was seamless,” he said.

Keeping in Touch

Although Jacky now receives care at SGH, the family continues to maintain close ties with KKH.

“Every now and then, Jacky and his family attend the World Prematurity Day events that we organise annually,” shared Dr Khoo. “Jacky has also sent me emails over the years to update me on how he and his mother are faring, which I always look forward to.”

Dr Khoo’s close relationship with the family is evident when she offered the family help and support when Jacky’s father passed on suddenly and Mdm Susy needed some supporting letters for her application for citizenship.

Mdm Susy sees it as her duty to continue to volunteer at charity events organised by KKH, especially at the behest of her late husband, who saw it as a way to show their continued gratitude to the hospital. Mother and son also continue to visit the doctors and nurses who treated Jacky during special occasions such as Lunar New Year and Deepavali.

Describing the close ties the family shares with KKH, Jacky said, “I do not think I would be around if not for the doctors and nurses who took care of me along the way. I like to see them as my extended family, very much a part of our lives and would like to keep it this way!”
S
cending close to 30 years of his
career in public service, it is little
wonder that Mr Chong Pang
Boon sees his multiple roles as Chief
Operating Officer (COO) within the
SingHealth cluster as a calling.

His first job was in the Singapore Police
Force, which was followed by a two-
year stint at the Singapore General
Hospital (SGH) and subsequently at the
Land Transport Authority (LTA),
where he spent 10 years and thought
would be his last career stop before
retirement.

So what has brought Mr Chong back
to the healthcare family?

It was a phone call from Mr Tan Jock Thian,
then COO, KK Women’s and Children’s
Hospital (KKH) and concurrently
Group COO of SingHealth, who
approached him to take up the
position as KKH’s Director of Patient
Support Services and Ambulatory
Services in 2010. “I was initially a little
hesitant due to my limited working
experience in healthcare. However,
Mr Tan assured me that I can make a
difference in healthcare given my
past working experience in different
public agencies. I think it was my
inclination to respond to a calling that
eventually tipped the balance and
hence I accepted the offer,” recalled
Mr Chong.

Fast forward 10 years to today, where
Mr Chong is now the COO of Security,
SingHealth – a role he fell into by
virtue of his time with the police
force - as well as COO of the National
Heart Centre Singapore (NHCS) and
National Dental Centre Singapore
(NDCS). Juggling these roles often
sees Mr Chong shuttling between
different departments on SGH Campus
in a single day, easily clocking more
than 10,000 steps in the process.
He works closely with his different
teams to ensure that the operations
in the two national specialty centres
are running smoothly, and that the
cluster’s security measures are
comprehensive, allowing the teams to
promptly respond to any issues.

Enhancing Everyday Operations
at SingHealth

When asked about the link between
Operations and how it benefits
patient care, Mr Chong shared that it
is about taking care of patients’ needs
at every step of their journey.

“A patient’s journey with us doesn’t
start at the consultation room.
It starts from a call through our call
centres or making an appointment
online, through transport via
ambulances and shuttle buses to our
institutions or as they are dropped off
at our driveways, walk through our
corridors, use our escalators, lifts and
so on,” said Mr Chong. “All these touch
points are managed by the Operations
department. We strive to make our
facilities and patient services well-run
and easily accessible, and these touch
points all play a part in ensuring a
seamless patient journey before they
even see the doctor.”

Responding to the New and
Unexpected

While these core operations are
central to Mr Chong’s work, a large
part of it is also about expecting the
unexpected and constantly innovating
beyond tried and tested strategies.

In his capacity as COO (Security) of
SingHealth, Mr Chong oversees the
security personnel and operations
for all SingHealth institutions.
When construction for Outram
Community Hospital (OCH) was
completed in November 2019, it featured
a technologically-enabled Command
Centre, which allows a well-trained
team to remotely monitor and
respond to emergencies or incidents
anywhere on SGH Campus at all times,
enhancing overall organisational
capabilities, improving manpower
efficiency and coordination.

The Command Centre was put to
good use just a month later when
a destination-based road network
was implemented on SGH Campus in
late December 2019, which saw the
roads split into three separate, non-
connecting routes. Mr Chong and his
security team monitored the road
conditions closely over two weeks
through the extensive security camera
coverage from the Command Centre.
They identified traffic pressure points
and addressed them, ensuring a
smooth transition for motorists and
pedestrians. “Improvements to the
road network are just as important
as enhancements to our facilities and
services in serving our stakeholders’
welfare”, said Mr Chong.

Very soon after the road network
change was implemented, the world
was hit with the COVID-19 pandemic.
Mr Chong and his teams sprang
into action, referring to plans and
protocols that were drawn up for
past epidemics. From setting up
the infrastructure for temperature
screening of visitors and patients,
to reaching out to patients with up-
to-date information about the virus
situation and the new hospital and
visitation policies, Mr Chong and his
teams were like a well-oiled machine,
ready to meet these challenges head-
on.

When the Ministry of Health
raised the risk assessment of the
Disease Outbreak Response System
Condition (DORSCON) to orange, the
teams worked over night to set up
temperature screening stations
at all of SingHealth’s 11 institutions
and recruited staff volunteers
from different departments across
SingHealth to man the stations.

“In Operations, nothing is the job of
a single individual. We always work
in teams, often across functions,
departments or even institutions.”

“Operations is highly situational and
diverse. You are always prepared for
something that may happen even
though details may be lacking at
times,” said Mr Chong.

Looking to the Future

So what does the next decade hold for
SingHealth?

“We are always planning for the future
and I believe SingHealth will continue
to play a key role in the healthcare
scene in Singapore,” said Mr Chong.

“Administrators have an equally
important role to play, just like our
fellow healthcare colleagues, and
we have to rise to the occasion and
partner with clinicians in an inter-
dependent ecosystem to ensure that
patients receive the best care and
treatment possible.”

He added, “I owe it to many of
my colleagues who have worked
alongside me and I think it’s safe
to say that this will be my final career
destination!”

Mr Chong’s appointment as COO
(Security), SingHealth’s part of SingHealth’s Operations Support Services
involves working with all SingHealth institutions. His COO appointment
means a particular service area that spans across the cluster.
OUR STAFF, OUR STRENGTH

As SingHealth celebrates its 20th anniversary this year, hear from some of our staff who have journeyed with us for the past two decades, as we stand united with a SingHealth spirit of compassion, adaptability and tenacity!

Dr Damien Tan, Senior Consultant, Department of Gastroenterology and Hepatology, and Director, Endoscopy Centre, Singapore General Hospital (SGH)

Joined Changi General Hospital (CGH) in May 1999

Research and innovation are what makes a difference to patients. I can do a biopsy, or put in a stent, but research helps patients survive beyond that threshold.

After my specialist training in advanced endoscopy and pancreatology, I was awarded the SingHealth Duke-NUS Medicine Academic Clinical Programme (MED ACP) Nurturing Clinician Scientist Award, which led to further training in research. I was subsequently awarded the National Medical Research Council (NMRC) Transition Award and obtained a scholarship for my Masters in Clinical Investigation at the National University of Singapore (NUS).

Apart from my research background, I am also interested in the development of medical devices. I attended a three-month local course with the Singapore Stanford Biodesign (SSB) Programme in 2017. Modelled after the Biodesign Programme at Stanford University, the SSB programme trains and nurtures the next generation of medical technology innovators. From the course, I learnt how to design new medical devices and also foster a research culture in the Department of Gastroenterology and Hepatology.

Assoc Prof Chow Wan Cheng, then Academic Chairman of the MED ACP, saw my interest in design and invited me to kick-start a culture of innovation in the ACP. As a result, I was appointed the Director of Medical Devices and Apps last year and I set out to guide young doctors undertaking MedTech research. I linked them up with senior doctors in our department who have developed successful medical devices to provide counsel on their projects. I look forward to seeing these collaborations bearing fruit in the years ahead.

Ms Ang Bee Leng, Nurse Clinician, Bukit Merah Polyclinic, SingHealth Polyclinics (SHP)

Joined SHP in 2000

Being at the frontline of the SARS outbreak in 2003 was my first glimpse at how important it is to have support from colleagues. One of the biggest challenges at the time was the lack of information at the onset of SARS. When health and travel declaration forms were subsequently introduced, some patients or visitors became agitated when we asked questions to find out more.

It was the camaraderie and mutual support amongst colleagues that carried us through that time, and I never felt that I was alone. This rings true once again during the current COVID-19 pandemic, where support from each other and the public motivates us in our fight against the virus.

Over the years, I have also learnt the value of teamwork, having served on various committees such as the SingHealth Nurses’ Day committee in 2019. This role required working closely with representatives from different SingHealth institutions and vendors to plan and execute the festivities. I was heartened to see my fellow nurses enjoying themselves and feeling appreciated for the work we do.

In spite of our varying backgrounds, specialties and roles, working as a team towards a common goal is something I find fulfilling. I thrive on working alongside my colleagues to provide our patients with the best care possible.
Ms Lakshi Renuka Segaran, Senior Executive, Business Office, KK Women’s and Children’s Hospital (KKH)

Joined KKH in May 2000

Patients at KKH who do not have identification documents, or newborn babies who have not obtained birth certificates would be registered at the admissions counter with a temporary number. Their records will then be merged with their ID number the next time they come to the hospital.

However, nine years ago, the computer system at the time was not able to accommodate this and other scenarios.

A Patient Merger Process Improvement Project (PIP) was set up to address this issue. I worked with the Information Systems Department to merge all records under a single patient. Together with my supervisor, we went through all possible patient merger scenarios and conducted user interface testing of all the scenarios over the next few months.

The new system was implemented in January 2011 after nine months and even won the Gold award in the Singapore Productivity Association’s National Innovation and Quality Circles (IQC) Assessment that year. Being part of the PIP was my proudest moment in KKH and I am honoured to have had the opportunity to lend my expertise in a project that benefits our patients.

Ms Suzleyn Jelina Binti Abd Wahab, Senior Staff Nurse (Community Nursing), Singapore General Hospital (SGH)

Joined SGH in January 2000

What strikes me most in my 20 years in SingHealth is the transformation of the nursing profession, especially in terms of training opportunities and the evolving healthcare landscape. Take my own experience for example — after graduation, I trained for a specialised area by completing an Advanced Diploma in Neuroscience. Over the years, I have worked in different areas, from the General Ward, Intermediate Care Area to Neuroscience Intensive Care Unit, lending richness to my nursing experience.

I am currently in Community Nursing — a new frontier aligned with the nation’s strategic shift from the hospital to the community. As a Community Nurse, my role is to ensure that patients transit safely and smoothly as they are discharged from the hospital back to their home. We conduct home visits to check on patients’ recovery and how they are coping. Sometimes, patients may not know where to turn to for help for their other needs and we work closely with community partners to care for them holistically.

In my role, I see aspects of my patients’ lives which I would never have been able to experience as a ward nurse, such as elderly patients living in sub-optimal conditions. It is an eye opener and made me realise that every patient is a unique individual shaped by their life experiences and their recovery is dependent on many factors such as the availability of social support, home environment and access to services.

Being a community nurse has helped me see a different side to nursing. It adds fuel to my passion and reaffirms my choice to be a nurse as I can now be with my patients every step of their recovery journey. I hope to be the force of change, working alongside my patients to enable them to lead a healthy, thriving life in the community.

Dr Koh Lip Hoe, Chief and Senior Consultant, Department of Geriatric Medicine, Changi General Hospital (CGH)

Joined CGH in 2000

Camaraderie with colleagues has been a key source of motivation for me for the past 20 years. Many milestones would not have been reached without this critical success factor. When the Palliative Care Service was first established in 2012, there was some apprehension as to whether the service could be sustained by the small team of just two nurses and two doctors. Having recently completed my training in Palliative Medicine then, I had to grapple with the clinical load and administrative work of the new service. It was our collective grit and strong team spirit, anchored on the strength of the multidisciplinary team, which saw the service grow to what it is today, providing a wide array of services and integrated frameworks to meet the end-of-life care needs of our patients.

In 2015, our palliative nurses and inpatient operations team organised a wedding solemnisation ceremony in the hospital for the daughter of a patient who had advanced cancer, as she was too sick to leave the hospital. The nurses helped to apply make-up on the patient and decorated the discharge lounge where the solemnisation took place. The patient was visibly elated to witness the ceremony and we were moved to be part of the special moment. We were gratified to have done this for the patient as she passed away a few days after.

To me, patient care means improving the quality of life for patients and their families, focusing on the patient as an individual. Much like the patient who was able to witness her daughter’s wedding solemnisation, I would like for all my patients to experience the same compassion and committed care.
Since the first COVID-19 patient in Singapore was diagnosed, SingHealth institutions have been fighting the battle on many fronts. Across our institutions, we swiftly put in place strict infection control measures, visitor restriction and screening policies to ensure the safety of staff, patients and caregivers. We remained steadfast in our call of duty – helping with the day-to-day management, active surveillance and outreach in the community, providing support to the wider national needs while continuing to care for our patients. On the research and innovation fronts, we continue to push boundaries, leaning on our collective strengths to find new ways to cope with the challenge.

These efforts are underpinned by the solidarity of our staff, who displayed indomitable strength from the beginning. Their contribution is unparalleled and we will arm them with the resilience to walk the journey together.
Commitment to our patients is our foremost priority. Initiatives like free medication delivery were introduced to reduce the amount of time that patients spend in hospital, curbing the incidences of transmission.

Pilots for video and telephone consultations have been rolled out in institutions such as National Heart Centre Singapore (NHCS), KK Women’s and Children’s Hospital (KKH), Singapore General Hospital (SGH) and Singapore National Eye Centre (SNEC), and will subsequently be introduced in other SingHealth institutions.

At SGH, purpose-built containers, each containing a negative-pressure room with ensuite toilet and shower facilities, are deployed to segregate patients deemed to be at risk of having COVID-19 or other infectious diseases. This new ward is sheltered and cordoned off with fencing to prevent unauthorised entry and will complement existing isolation facilities in the event that additional capacity is required.

Technology is also used to make it easier for patients to receive their COVID-19 screening results. Patients who have been screened for the virus can view their test results on the SingHealth Health Buddy app, Healthhub app or Healthhub website using their Singpass login. Those whose results are positive will be informed by the clinical teams.

To support the Ministry of Health’s COVID-19 surveillance efforts, a team of doctors and nurses from SGH, Changi General Hospital (CGH), Sengkang General Hospital (SKH) and SingHealth Polyclinics (SHP) trained 110 staff from 22 nursing homes on how to administer nasopharyngeal swabs and assisted our nursing home colleagues with swabbing 2,230 staff and 831 residents.

At SGH, purpose-built containers are deployed to complement existing isolation facilities.

A momentous research achievement in the early fight against COVID-19 was a collaboration led by Duke-NUS Medical School, with SGH, National Centre for Infectious Diseases (NCID) and the Ministry of Health (MOH), which successfully cultured the SARS-CoV-2 virus to help in the diagnosis of COVID-19. Duke-NUS also collaborated with Arcturus Therapeutics, a San Diego-based leading mRNA medical company, to develop a COVID-19 vaccine for Singapore.

The institution has also developed a SARS-CoV-2 serology test called cPass, which can rapidly detect neutralising antibodies without the need for a containment facility or live biological materials. The test, co-developed by leading global biotechnology company GenScript and A*STAR, has been made available to Singapore hospitals for testing potential vaccines, the presence of herd immunity and for contact tracing applications. Researchers at the Viral Research and Experimental Medicine Centre (ViREMICS), a unit of the SingHealth Duke-NUS Academic Medical Centre, found that some patients with COVID-19 may have an over-active immune response that can cause inflammation and respiratory distress. This finding could pave the way for research into drugs to prevent harmful immune responses that may worsen the disease.

To protect healthcare workers when they perform COVID-19 swab tests, SGH developed two devices - the SG SAFE, a foldable swab screen system that halves the testing time for the COVID-19 virus, and SG SHIELD, which blocks healthcare workers from droplet deposition.

Inspired by SG SAFE, the Departments of Diagnostic Radiology and Anaesthesiology at SGH developed SG SAFER, a mobile X-ray unit that can be deployed off-site. The booth isolates the patient from the radiographer and equipment, reducing exposure risk to both parties, and the X-ray can be performed by just one trained radiographer instead of the usual two.

Residents at the CCF at Singapore Expo are kept engaged and informed of new announcements through Doctor Covid, a chatbot co-developed by SingHealth and A*STAR, hosted on the Telegram app. Future enhancements will allow residents to self-report data on their risk factors and mental well-being into the Doctor Covid app, allowing for timely, targeted intervention when required.

To mitigate the public’s concern of touching common surfaces during the pandemic, an automated escalator handrail cleaning device was installed at KK+ and is on trial for a month to assess its effectiveness.

Remote-controlled TEMI robots are being used at Sengkang Community Hospital (SKCH) and the CCF at Singapore Expo to further reduce the risk of staff exposure as they care for COVID-19 patients during their stay. Through virtual face-to-face consultations on the robot’s screen, it minimises staff exposure to the virus without compromising on interaction with the patients.

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Supporting our staff

As our staff work hard to stem the virus, the SingHealth Staff Care Centre (S2C2) offers a network of support with peer support and counselling helplines and dedicated resources to take care of our staff’s emotional health. The “Resilience in Crisis Fund” was set up to recognise the tireless efforts of our frontliners and staff who have gone beyond their call of duty to lend a helping hand. Together with the support and donation from the Board of Directors, senior leadership and partners, more than $1 million has been raised for the Fund, which aims to boost the well-being and resilience of our healthcare workers battling at the front lines of health emergencies, like the current COVID-19 pandemic.
OUR STAFF AT THE FRONTLINE

Our staff have been our towers of strength since the start of the pandemic. Read their stories as they share their accounts in the battle against the invisible enemy in their fields of work.

Ms Koh Sim Moy, Senior Patient Experience Manager, Office of Patient Experience, Singapore General Hospital (SGH)

“Have you been in touch with any of your family members?”

As a Senior Patient Experience Manager (SPEM) at SGH, I try to provide COVID-19 patients with emotional support during this challenging period as they could not have face-to-face contact with their loved ones.

On one occasion, I spoke to a COVID-19 patient and asked him about his condition. He was puzzled as he assumed that I would know. Explaining that I was not allowed to access his medical records due to the Personal Data Protection Act (PDPA), I assured him that he was in good hands and he was much comforted. It gave me much joy that our short conversation had much joy that our short conversation had.

I was not sure whether I would be safe when I joined the team at the isolation ward where suspect cases of COVID-19 patients are being cared for. However, my worries eased when I saw how colleagues from the Infectious Diseases Department and my seniors took care of us.

The senior consultants would check in daily and ensure that we followed proper steps when donning the full Personal Protective Equipment (PPE). After managing the first few cases, we thought the worst was over until we found out that a COVID-19 patient was a local transmission case without known travel or contact history.

It then dawned upon me why the seniors are so cautious. I had initially thought they were over-reacting but in light of the confirmed COVID-19 patient whom we thought was low-risk, we finally understood. That gave me the reassurance that we are working in a safe and well-protected environment.

Ms Catherine Poye, Senior Nurse Educator, Nurses Development Unit, KK Women’s and Children’s Hospital (KKKH)

“During COVID-19, I was re-deployed to the Delivery Suite, where I had previously worked for 10 years. I helped to assess whether patients had to be isolated for COVID-19 or other infectious diseases. As husbands were then not allowed in the isolation rooms unless their wives were in active labour, we allayed their anxieties by providing regular updates.

I subsequently served as the nursing lead for a phlebotomy team deployed to a dormitory to help with serology tests. I vividly remember a migrant worker fainting from the fear of blood during the procedure. On our next attempt, we used numbing spray on his arm whilst I held his hands and made small talk. It went smoothly and he was all smiles when he left the station.

I hope to show my appreciation to the migrant workers for their contributions by making sure that they are safe before they go back to work.

Dr Sashikumar Ganapathy, Deputy Head of Department and Consultant, Department of Emergency Medicine, KK Women’s and Children’s Hospital (KKKH)

As Deputy Head of the Emergency Medicine Department at KKKh, I spearheaded the implementation of multiple changes to infrastructure, equipping and manpower, to meet the needs of the hospital’s Children’s Emergency (CE) in response to the rapidly evolving COVID-19 situation.

While the situation was especially dynamic in the initial stages, one key motivation kept me on course – ensuring that care at CE continues with minimal disruption.

I changed the staff roster by switching from a conventional shift system to one based on modular teams, to reduce the risk of cross-infection and allow care to continue uninterrupted.

As President of Club Rainbow (Singapore), my team and I sourced for sponsors to provide meals and support families during this period. As a doctor, my foremost priority is to help patients. As a fellow human being, I do what I can to help those whose lives have been affected by the pandemic.

Dr Catherine Chan, Consultant, Post-Acute & Continuing Care, Bright Vision Hospital (BVH)

When we knew that BVH would be converted to care for clinically stable and recovering COVID-19 patients, we sprang into action.

Various teams in the hospital had to coordinate both internally and externally as we transferred more than 100 existing patients to neighbouring community hospitals and nursing homes. We also conducted training sessions to equip staff with knowledge and skills to care for COVID-19 patients while ensuring that stringent safety protocols and precautionary measures were in place to minimise the risk of transmission.

To prepare myself for working in the frontline with my team, I had my hair cut short for a more practical and infection-control safe hairstyle. All the efforts are worth it and I am proud to be in BVH, supporting the nation’s combat against COVID-19!

Ms Yip Shu Min, Senior Nurse Manager, Sengkang Community Hospital (SKCH)

“I manage the wards for COVID-19 patients in SKCH. Besides being involved in the opening of wards for these patients, I oversaw the training for our nurses to ensure that they are familiar with infection control measures and also mentally prepared to care for COVID-19 patients.

In our team is an unusual ‘member’ called TEMI! A video-oriented, personal AI assistant robot – my teammates have even affectionately nicknamed it “Te-Min” after me.

I use TEMI often to interact with patients and see them through its screen. This reduces physical contact and transmission risks yet allows me to check on our patients without losing the personal touch. We also tap on TEMI to lead patients in exercise sessions. Our patients have even fun and enjoy keeping active when doing the workouts alongside TEMI!
When the situation at the dormitories became known, I volunteered to be deployed at the S11 dormitory where I helped at the registration, triage, consultation and pharmacy areas. I also assisted doctors in minor procedures, such as performing swabs for COVID-19, wound dressing, rescue therapy and arranging admission for patients.

I found myself playing the role of counselor too. The migrant workers face mental stress as they are unable to go out and miss their family. They are also worried when they hear of fellow workers who are tested positive. I tried to address their concerns and allay their anxieties. It is not always easy to do so as I am in full PPE all the time and the heat could be suffocating. But I know I will appreciate a listening ear if I am in their shoes. I am grateful for their contributions to Singapore and I want to show my gratitude.

Although we bore the battle scars of SARS, one is never totally prepared for such a situation, especially when it is constantly evolving. The evening that I got the call about our first positive patient, my mind was focused on the safety of the junior doctors and the nurses who were attending to the patient. Despite the uncertainties of dealing with an unknown virus, the junior doctors were very professional. They kept themselves busy and rallied to provide emotional support for one another. I couldn’t be more proud of the way they rose to the occasion and displayed grit and determination like seasoned healthcare practitioners!

One particular challenge we faced is that the emergence of COVID-19 coincided with the regular flu season, thus causing a spike in the number of tests that we needed to conduct each day.

Unfazed, we solicited help from various departments and this is where the “we are in this together” spirit struck me. Support came pouring from departments like Supply Chain Management and Biomedical Engineering, who prioritised the ordering of reagents, consumables, and equipment, and the Clinical Trials & Research Unit who provided additional manpower and extra equipment. Buoyed by the camaraderie, we were able to accomplish all the required testing.

It also helped that there were colleagues who had been through SARS and H1N1, who used their experience to help navigate the obstinacies we faced in the laboratory. Their presence gave us the assurance that we will overcome this together and emerge better prepared for future challenges.

Mr Tengku Hilmi Bin Tengku Abdul Kadir, Porter, Team Leader, Sengkang General Hospital (SKH)

When I was informed that the patient I had assisted in transferring to the isolation ward was diagnosed with COVID-19, I was neither worried nor scared. I was mentally prepared and calm as I have been trained to handle patients with infectious diseases such as Ebola and tuberculosis. Besides, I knew I was protected as I had donned the PPE when managing these cases.

After the patient was discharged and I accompanied him to the taxi stand, I was relieved that he had recovered and could return to his normal life. Nobody likes being sick and that is why we are here to help. I felt encouraged and honoured that I am part of the patient’s recovery journey.

Mr Andres Lim, Pharmacist, Sengkang General Hospital (SKH)

People often think of a pharmacist as one who packs and dispenses medications. In reality, we work behind the scenes ensuring medication safety for our patients. My responsibilities in the COVID-19 wards include providing drug information, verifying medications, performing interventions for drug-related issues, medication reconciliation and counselling for patients.

I still remember the first time I conducted an inhaler counselling session for a patient in the isolation ward awaiting discharge. What stood out for me was how my colleagues went out of their way to look out for one another. Knowing that it is my first time, a healthcare assistant helped me to don my face shield and tighten the knot when my PPE gown came loose before entering the patient’s room. Teamwork is important and I believe we can do so much more together than doing it alone.

Ms Tan Lay Kian, Senior Staff Nurse, SingHealth Polyclinics (SHP)

Clinical Associate Prof Raghuram Jagadesan, Senior Consultant, Respiratory & Critical Care Medicine, Changi General Hospital (CGH)

I had seen the toll that SARS exacted on healthcare personnel in Singapore in 2003. There was a foreboding sense of déjà vu when we first heard of the situation in Wuhan, bringing memories of the fear and uncertainty many in the medical fraternity felt back then.

Although we bore the battle scars from SARS, one is never totally prepared for such a situation, especially when it is constantly evolving. The evening that I got the call about our first positive patient, my mind was focused on the safety of the junior doctors and the nurses who were attending to the patient.

Despite the uncertainties of dealing with an unknown virus, the junior doctors were very professional. They kept themselves busy and rallied to provide emotional support for one another. I couldn’t be more proud of the way they rose to the occasion and displayed grit and determination like seasoned healthcare practitioners!

One particular challenge we faced is that the emergence of COVID-19 coincided with the regular flu season, thus causing a spike in the number of tests that we needed to conduct each day.

Unfazed, we solicited help from various departments and this is where the “we are in this together” spirit struck me. Support came pouring from departments like Supply Chain Management and Biomedical Engineering, who prioritised the ordering of reagents, consumables, and equipment, and the Clinical Trials & Research Unit who provided additional manpower and extra equipment. Buoyed by the camaraderie, we were able to accomplish all the required testing.

It also helped that there were colleagues who had been through SARS and H1N1, who used their experience to help navigate the obstinacies we faced in the laboratory. Their presence gave us the assurance that we will overcome this together and emerge better prepared for future challenges.

Dr Jiang Boran, Senior Medical Laboratory Scientist, Changi General Hospital (CGH)
HIGHLIGHTS

ENHANCING CARE
KEEPING OUR PATIENTS
AND HEALTHCARE WORKERS SAFE

EDUCATION
RESEARCH
GIVING
ENHANCING CARE

PATIENTS. AT THE HEART OF ALL WE DO.° We are committed to providing quality care to our patients with concerted efforts to improve patient experience and care accessibility.

Care in the community

Myopia care in the community

A new centre in Bedok North is bringing comprehensive myopia care closer to the community. An initiative by Singapore National Eye Centre (SNEC), optometrists at the centre take the lead in assessing patients with myopia instead of relying on specialists. This allows the centre to see a larger number of patients. SNEC is also collaborating with Singapore Polytechnic to provide students with clinical attachments and internships at the centre.

Collaborating with GPs for non-emergency medical conditions

Changi General Hospital (CGH) launched a refreshed GPFirst public education campaign to encourage residents to visit General Practitioners (GPs) for non-emergency medical conditions. Since its launch in 2014, there has been a 10.5 percent reduction in non-emergency self-referrals at CGH’s Accident and Emergency Department. In addition to a dedicated Facebook page, CGH is collaborating with Gametize Pte Ltd to introduce a gaming application, “GPFirst Challenge”, to educate the public in an engaging way.

Scheme to help prevent dementia

The Temasek Foundation-National Neuroscience Institute (NNI) Memory Rehabilitation programme (SMART) has been extended to the community after its pilot was found to improve patients’ memory and ability to perform daily activities. The programme aims to prevent or delay the onset of dementia in stroke patients through cognitive and physical exercises. NNI has also developed a six-month training programme for primary care practitioners to help detect and treat dementia. Temasek Foundation has committed $1.21 million to support the programme for three years from 2017.

Customised care for aviation professionals

The Changi Aviation Medicine Centre at CGH has been set up to offer specialised care for pilots, cabin crew and air traffic control staff. A collaboration between CGH and the Civil Aviation Authority of Singapore, it is the first aviation medicine centre within a government restructured hospital and will offer medical examinations customised for the industry, as well as programmes for sleep disorder and fatigue management.

Upgraded SGH Burn Centre to offer better care

The upgraded SGH Burn Centre features a modular design that allows part of the facility to be closed off during a mass burn incident to reduce risk of cross-contamination. It also has two operating theatres with custom climate control systems to create low-humidity and warm temperature environments, preventing bacteria growth and lowering patients’ risk of hypothermia due to extensive skin destruction or loss. The Centre’s 10 high-dependency and isolation rooms can be converted into intensive care units to maximise care delivery, depending on patients’ needs.

Centre for non-emergency surgery to be ready by 2026

Patients can expect a shorter wait for non-emergency surgery when the new SGH Elective Care Centre (ECC) and National Dental Centre Singapore (NDCS) building is completed. The new building will feature new facilities in elective surgical and dental care to meet growing healthcare needs.

Outram Community Hospital opens to meet changing healthcare needs

Outram Community Hospital (OCH), Singapore’s ninth community hospital, provides step-down care to cater to the higher proportion of elderly in the community. Its facilities resemble a public estate, with multiple terrains like stairs, rocky paths and simulated pedestrian crossings, to allow for patients to adapt before they return home. Its close proximity to SGH also enables care teams to develop end-to-end care plans with ease.
New services

New app more than just a call button

Patients in some of SGH’s wards now have access to MyCare, an app that allows viewing of care schedules, meals, medications, tests and medical information. The app also includes interactive features such as a messaging service between patients and nurses, and requests for snacks, toileting assistance or other housekeeping services. This programme is being piloted at SGH with the use of wireless wearable biosensors that allow automatic and continuous monitoring of patients’ vital signs. Both programmes will be progressively rolled out in SGH, CGH, KK Women’s and Children’s Hospital (KKH) and National Heart Centre Singapore (NHCS) by 2021.

Easier access to health education materials

Patients can now scan a QR code on posters in the waiting areas of SingHealth Polyclinics (SHP) to access health education materials, instead of referring to leaflets. The move is projected to save costs on the production of health education materials.

New surgery for severe ankle arthritis

A new type of ankle surgery, which results in better joint motion for patients with severe ankle arthritis, is now available at Sengkang General Hospital (SKH). Patients who undergo this surgery are expected to be able to resume normal activities six to eight weeks after. With the new procedure, patients have a lower risk of post-surgical complications.

Launch of digital MCs at all SingHealth institutions

Patients visiting SingHealth institutions will now receive an SMS containing a link to their digital medical certificates (MCs). Paper MCs are only available upon request if patients do not own mobile phones.

Prevention and empowerment

Exercise guidelines for pregnant women launched

Led by KKH and in partnership with SHP and industry partners, the first guidelines on physical activity and exercise for pregnant women have been launched in a bid to curb the high rate of gestational diabetes in Singapore. Pregnant women tend to be less active and thus are more likely to gain weight. This can lead to an increased risk of adverse consequences for both mother and child, such as stillbirth, congenital malformations or the development of diabetes later in life.

Hub offers services for new mums and infants

In a collaboration between KKH, SHP and Temasek Foundation, mothers and infants can now benefit from a programme that provides enhanced health screening, services and care. Available at Punggol Polyclinic, the programme aims to enable early detection of developmental delays in infants by extending existing services offered by polyclinics, such as growth monitoring.

Helping patients with rare diseases cope with medical expenses

Launched by the Ministry of Health (MOH) and SingHealth Fund, the Rare Disease Fund (RDF) supports medications for rare conditions in the hope that effective treatments can be made more accessible, thereby increasing patients’ life expectancy and improving their quality of life. At its launch, the RDF stood at $70 million with the Government matching community donations by three to one. In addition, the Government is funding all operational expenses of managing the fund to ensure that donations received are used solely to support this group of patients.
Since its launch in 2017, the SingHealth Duke-NUS Institute for Patient Safety & Quality (IPSQ) aims to build a Safety Culture at SingHealth by focusing on eliminating preventable harm and improving patient outcomes with the following key measures:

1. Cultivating a strong patient safety culture across SingHealth
2. Adopting an integrated approach in patient safety and quality management
3. Providing strategic leadership across multiple platforms and domains in this area
4. Encouraging interdisciplinary collaboration and coordination among stakeholders and partners

Academic Medicine – Enhancing Performance, Improving Care (AM-EPIC) Framework

The AM-EPIC Framework encompasses six competency domains, namely Patient Safety & Quality, Risk Management, Innovation, Staff Resilience, Patient Centeredness and Advocacy, and Clinical Governance. In 2019, IPSQ trained a total of 1,893 participants across SingHealth, where participants learn about the quality improvement model and basic QI tools.

International collaborations

IPSQ has formed an extensive collaborative network with international partners. IPSQ collaborates with partners, co-hosting events such as Global Patient Safety Assessment Tool and Medication Safety Tool Field Testing with the World Health Organisation (WHO) in Singapore in August 2019. IPSQ is also a member of the Global Patient Safety Network (GPSN) and participated in WHO Consultative Meetings to discuss the celebration of the inaugural World Patient Safety Day in September 2019.
EDUCATION

Education is one of the key pillars in building a vibrant and thriving Academic Medical Centre. Through the five strategic thrusts in the Joint Education Masterplan, we seek to develop healthcare professionals to deliver seamless and integrated care for our patients.

Developing collaborative practice-ready professionals through Interprofessional Education (IPE)

Collaborating for holistic care of diabetes patients

In 2019, the SingHealth Academy College of Allied Health (CAH) and Clinical Nursing (CCN) jointly organised its second series of IPE workshops on diabetes management. Over 150 allied health professionals as well as medical, pharmacy and nursing students strengthened their understanding on the role that each healthcare professional plays in managing diabetes patients with complex chronic conditions and how collaborative teamwork is important to deliver integrated and patient-centred care.

Facilitating interprofessional education and practice

Since 2017, the SingHealth Academy College of Clinical Medicine (CCM) has placed stronger emphasis on the facilitation of IPE for healthcare professionals to provide collaborative patient care. To date, at least nine IPE teaching sessions have been conducted where more than 230 healthcare professionals and 100 students in different healthcare professions gathered to conceptualise integrated care plans for the management of chronic diseases such as paediatric asthma and Down’s Syndrome.

In FY2019, a series of nine IPE workshops were implemented for healthcare educators across SingHealth institutions to equip them with the skills to effectively integrate IPE into their teaching practice. An IPE Register e-platform was also created to encourage healthcare educators to register their IPE activities and share ideas on the planning and delivery of these activities.

Strengthening nurses’ knowledge in pain management

More than 300 SingHealth nurses attended the inaugural pain management seminar in October 2019 to hone their skills and knowledge in acute and chronic pain management. Organised by the SingHealth Academy College of Clinical Nursing (CCN), the seminar gathered expertise from multiple healthcare professions, such as doctors, physiotherapists, nurses, psychologists and Traditional Chinese Medicine physicians, to provide holistic insights on the different types of pain management across various clinical settings.

Developing healthcare educators

The biennial SingHealth Duke-NUS Education Conference was held on 27 and 28 September 2019 with the theme, “Building Resilience and Well-being in Healthcare Education through Interprofessional Collaborations”. Organised by AMEI and SingHealth Academy, the conference emphasised the importance of education in helping healthcare professionals develop mindfulness and resilience, and ensure collaborative and sustainable healthcare in the long run. Close to 900 interprofessional healthcare educators and participants from the region shared insights on developing effective educational programmes for integrated care.

Transforming healthcare simulation

Held from 22 to 25 October 2019, the S3 Conference 2019 had its highest turnout to date of more than 500 local and international delegates. With the theme, “Beyond the Now: Transforming Healthcare Simulation”, healthcare simulation specialists, educators and industry partners explored the use of emerging simulation technologies to transform learning.

Highlights of the conference included the inaugural SIMS Games Challenge, where five teams were paired with industry developers to create prototypes of games to enhance healthcare learning. The top three winning games were listed on the AppFORO Marketplace, an international platform that hosts serious games.

Harnessing advances in technology

In December 2019, SingHealth successfully obtained the InnoLearnt 2020 (4iLEARN 2020) grant from SkillsFuture Singapore, which offers healthcare educators opportunities to develop game-based training and assessment programmes with simulated scenarios to improve learning outcomes. Working closely with local industry experts, SingHealth aims to roll out a series of 10 game-based programmes. Plans are also underway to build a multi-purpose simulation training space in Academia with a variety of virtual, augmented and mixed reality technological equipment, which will offer more realistic and interactive learning experiences for healthcare professionals.

Simulating surgical treatment outcomes for cleft lip and palate patients

The Cleft Orthognathic Symposium & Workshop in 2019 was attended by 40 multidisciplinary oral health practitioners. Since its inception in 2016, the symposium has strengthened the expertise of over 140 multidisciplinary oral health professionals in the field of cleft orthognathic management. With the use of image processing software with 3D visualisation, surgeons are better equipped to plan critical decisions during cleft lip and palate surgeries.

Establishing a regional platform for serious games

SingHealth Duke-NUS Institute of Medical Simulation (SIMS) was awarded a $178,000 grant by the Singapore Tourism Board to organise three runs of the Games for Research Innovation & Commercialisation in Healthcare Asia (Games RIC Asia) Conference, in partnership with the Serious Games Association Singapore. The biennial conference will be a platform for healthcare professionals, educators and industry partners to explore the use of serious games in healthcare education.

SimHealth Institute is also working closely with local industry partners to develop serious games that focus on serious subjects like pain management and complex chronic conditions.

Enhancing education platforms through innovation and technology

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SimHealth Institute is also working closely with local industry partners to develop serious games that focus on serious subjects like pain management and complex chronic conditions.
Deepening specialised knowledge in ophthalmic medical technology

In September 2019, Singapore National Eye Centre (SNEC) launched the Specialist Diploma in Ophthalmic Medical Technology, which was co-developed with SingHealth Academy College of Allied Health (CAH). The programme aims to broaden the capabilities of Ophthalmic Medical Technologists (OMTs) to independently perform ophthalmic imaging, grading and investigation tests to cope with the rising demand for holistic eye care in an ageing population. The first of its kind in the region, the one-year programme is based on a modular structure which allows OMTs to advance learning at their own pace and ultimately attain the Specialist Diploma.

New SMU-Duke-NUS Medicine Pathway

Duke-NUS introduced the SMU-Duke-NUS Medicine Pathway, which allows selected Singapore Management University (SMU) graduates from Law, Business or Computing to pursue medical studies at Duke-NUS Medical School. This, together with four other admission pathways, will provide the medical community in Singapore the benefit of clinicians with different perspectives and experiences.

Grooming exemplary Clinician Scientist Residents

In 2019, the National Outstanding Clinician Scientist Resident Awards were awarded to two SingHealth Clinician Scientist (CS) Residents for their exemplary contributions in clinical research. This is the third consecutive year that SingHealth CS Residents have clinched the national award. To date, SingHealth has trained more than half of the CS Residents nationally.

Building healthcare capacities and capabilities

Nurturing a pipeline of healthcare administrators

In May 2019, SingHealth welcomed its first cohort of SMU Healthcare Economics and Management students to its inaugural 10-week internship programme. Organised by the SingHealth Academy College of Healthcare Administration and Leadership (CHeAL), the internship places students in various departments across SingHealth’s hospitals and institutions, equipping them with the relevant knowledge and skills to spearhead effective administration and management within the healthcare system.

Strengthening global collaborations in nursing

To build and strengthen global partnerships in healthcare, the SingHealth Academy College of Clinical Nursing (CCN) organised six workshops for nursing professionals in Sri Lanka, Myanmar, China and Nepal in 2019. These workshops equipped more than 800 foreign nurses with knowledge and skills across a wide range of topics, such as basic ICU nursing care, advanced nursing care and orthopaedic nursing.

From October 2019 to January 2020, CCN also conducted three post-training evaluation audits under the JinJingJi project for hospitals in Tianjin, Beijing and Hebei. The College established 25 Standard Operating Procedures and implemented 246 projects to improve patient safety. One such project was the enhancement of infection control measures, which included the installation of hand-washing facilities at every department in the hospital and the creation of a hand hygiene compliance system. This resulted in a significant increase in hand hygiene compliance rate to 92.15%.

Biggest Doctor of Medicine (MD) cohort admitted to Duke-NUS

Duke-NUS Medical School admitted its biggest cohort yet in the class of 2023 with 81 students. The class comprises students from a wide variety of academic backgrounds, including undergraduate degrees in over 10 different majors from the arts and sciences, from 28 different universities, with 16 holding Master’s Degrees and two holding PhD degrees.
**Integrating training and development structures and support services**

**Ensuring quality training for healthcare professionals**

Last year, SingHealth successfully became a Singapore Workforce Skills Qualification (WSQ) Approved Training Organisation (ATO) accredited by SkillsFuture Singapore, which allows the cluster to offer healthcare professionals in Singapore a suite of certified training courses aligned to the WSQ national credential system. Supported by the SingHealth Academy College of Healthcare Administration and Leadership (CheAL), the first course, “WSQ-Demonstrate the Service Vision (Level 1 Service Leadership)”, was launched in 2019. The course equipped patient service and care support associates with foundational skills and knowledge to ease into their roles in healthcare.

**Update to Duke-NUS’ PhD programmes**

The Duke-NUS Medical School’s PhD programmes have grown from strength to strength since its inception. The first batch of graduates from the PhD Programme in Integrated Biology and Medicine (IBM) received their joint degree in previous years. This year, the Duke-NUS Medical School’s PhD Programme in Quantitative Bioinformatics was renamed the PhD Programme in Quantitative Bioinformatics (QBM). The PhD Programme in Clinical Sciences (CS) enrolled its second cohort.

**Achieving international recognition in healthcare simulation**

In 2019, the SingHealth Duke-NUS Institute of Medical Simulation (SIMS) became the first and largest healthcare simulation institute in Singapore and Southeast Asia to achieve full accreditation across the four SingHealth campuses by the Society for Simulation in Healthcare (SSH) - the leading healthcare simulation accreditation body in the world. The sites that have successfully achieved accreditation include SIMS at Academia, KK Women’s and Children’s Hospital (KKH), Sengkang General Hospital (SKH) and Changi General Hospital (CGH). The achievement formally recognises the SingHealth Duke-NUS Academic Medical Centre (AMC)’s excellence in healthcare simulation in accordance with international industry standards in the areas of Assessment, Research, Teaching/Education and Systems Integration.

**Ensuring assessment of Residency programmes**

In 2019, SingHealth implemented the Clinical Learning Environment Review (CLER) to enhance assessment and provide feedback to the SingHealth Duke-NUS Academic Clinical Programmes (ACPs) on the development of Residents in the areas of patient safety, care transition, supervision, healthcare quality, professionalism and wellness. The SingHealth-CLER aims to harness strengths and opportunities in clinical learning environments to enhance medical training for Residents. The pilot run of SingHealth-CLER was rolled out in the Obstetrics and Gynaecology ACP, with plans to roll out to the other 14 ACPs progressively.

**Fostering wellness and resilience**

**Project DOVE commemorates 10 years of community outreach**

Since 2010, the student-led Project DOVE (Duke-NUS Overseas Volunteering Expedition) has been providing sustainable medical care and health education to underserved communities in Southeast Asia. To commemorate its 10th anniversary in 2019, the team went to Quang Tri, Vietnam to provide medical care and health education and were also able to fulfil a need for the community - build toilets for one of the preschools. In total, they cared for a record 1,010 patients from 20 different villages, more than twice the number of patients they treated in previous years.

**Mentoring the next generation of SingHealth nurses**

In 2019, the SingHealth Nursing Student Mentoring And Retention (SMART) programme was started to provide a positive and nurturing environment for sponsored nursing students. Over 41 weeks, nursing students were mentored by experienced nurse mentors, where they gained insights about themselves as well as knowledge on work processes, organisational culture and career progression. This programme has garnered positive responses from the respective tertiary education institutions and has paired more than 120 students with nurse mentors to date.

**Fostering wellness and resilience in junior doctors**

To foster resilience among medical Residents and those in their Postgraduate Year 1 (PGY1), SingHealth Residency rolled out a number of key initiatives to strengthen their mental wellness and personal well-being. These included online wellness modules with practical tips to help junior doctors ease into their workplace. Residents also led peer support initiatives, such as ‘Casa’ (meaning ‘home’ in Latin), which is supported by a pool of mentors who identify and reach out to Residents in early stages of distress and burnout. To date, more than 160 SingHealth Residents have benefited from the ‘Casa’ initiative. The Residents’ Committee also organised wellness initiatives and events such as the Residency Year End Party and Christmas carolling.
Indonesia is designated by the World Health Organisation as a ‘high burden country’ for tuberculosis (TB), with an estimated 842,000 new cases in 2017. The prevalence of diabetes mellitus (DM) in Indonesians aged over 15 years old has also been increasing from 6.9% in 2013 to 8.5% in 2018. The estimated prevalence of DM among TB patients was 10% in 2012. The current increase in the prevalence of Type 2-DM suggests a potentially alarming rise in the number of patients with both conditions who will bear the associated health and economic burdens in the future. A research team comprising members from SDGHI, University of Indonesia and Duke Kunshan University is exploring a new model of integrated care for the co-management of TB and DM within the primary healthcare setting in Jakarta and identifying evidence-based interventions for effective co-management.

The SingHealth Duke-NUS Global Health Institute (SDGHI) is a joint institute of SingHealth and Duke-NUS Medical School, which aims to address current and emerging health challenges across ASEAN member states and other Asian countries. Working in collaboration with regional partners, the Institute seeks to tackle prevalent health challenges and strengthen health systems to enhance capabilities to manage pandemics and disease outbreak. As part of efforts to build global health research capacities of the faculty, SDGHI launched two bi-annual grant schemes. The first round of grants is underway, with more details on the progress of two of the inaugural projects below.

Study on integrated primary care for co-management of tuberculosis and diabetes mellitus in Indonesia

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Epidemiology of critical respiratory diseases in ex-premature infants in Vietnam

In low- and middle-income countries, improvement in the survival of premature infants comes with an associated increase in short- and long-term morbidities. Ex-premature infants often have to be readmitted to hospital for respiratory conditions during the first few years of their lives. Little is known about long-term health outcomes of these infants and the impact on paediatric critical care services in these countries. To address this gap, an SDGHI project team is studying the prevalence, disease trajectory and outcomes of ex-premature infants with respiratory illnesses who are admitted to the Paediatric Intensive Care Unit (PICU) at Hanoi’s Vietnam National Children’s Hospital.
At the SingHealth Duke-NUS Academic Medical Centre, our commitment to quality medical care drives the clinical and translational research we do. Every breakthrough seeks to contribute to better patient outcomes.

Innovations and new treatments

Easier delivery of drugs to the brain

Duke-NUS has developed a technology called TRANSPORT, which uses a cell surface protein called MFSD2a, for the targeted delivery of therapeutics and nutritional agents to the brain. TRANSPORT was licensed to Vanteres Pte Ltd and Travecta Therapeutics to apply the technology in the fields of nutrition and drug delivery respectively.

Detecting curable aldosteronism with non-invasive testing

11C-metomidate PET/CT imaging is a non-invasive test that integrates structural and functional information to identify unilateral adrenal disease, replacing the invasive procedure called adrenal vein sampling. The new procedure identifies small growths in a patient’s glands and reveals if they are producing too much of the hormone aldosterone, which results in excess salt in the body, causing hypertension. The new test can be done in less than an hour without the need for hospitalisation and patients are currently being recruited at Changi General Hospital (CGH).

Smaller needles for painless dental visits

National Dental Centre Singapore (NDCS), in partnership with Nanyang Technological University, has developed a microneedle patch for administering anaesthesia during dental procedures. Compared to the long needles that are typically used, the patch appears far less daunting and is able to deliver anaesthetic in a painless manner, thereby improving clinical efficiency.

New approach in dengue vaccine development and treatment

A team of Duke-NUS researchers devised a new approach in vaccine development and treatment strategies to effectively target dengue infection across disease stages. The discovery of how the dengue virus changes shape to evade vaccines and therapies is instrumental to understanding the way it adapts to the host’s immunological defences.
Neuroscience

The Brain Bank Singapore

The Brain Bank Singapore (BBS) is believed to be the first of its kind in Southeast Asia. With significant differences between Caucasian and Asian brains that may affect treatment outcomes, it is important to understand the unique characteristics of Asian neurodevelopmental conditions.

Improving survival of out-of-hospital cardiac arrest

Led by Duke-NUS, the Pan-Asian Resuscitation Outcomes Study (PAROS) clinical research network is an international collaborative group that conducts research on pre-hospital emergency care. The network’s main focus area is Out-of-Hospital Cardiac Arrest (OHCA) which is associated with low survival rates. In Singapore, the survival rate for OHCA has improved significantly over the years due to extensive research on PEC interventions launched on a national level, such as telephone cardiopulmonary resuscitation (t-CPR), community CPR training and First Responder Apps. In 2019, in collaboration with the Singapore Civil Defence Force, high performance CPR and manual defibrillation by paramedics were implemented. High Performance CPR is a “chooreographed” CPR event and aims to deliver high quality CPR, with minimal breaks in chest compressions, full chest recoil, adequate compression depth and compression rate. Using manual defibrillation, paramedics can shorten pauses in chest compressions during resuscitation.

Health services research

Differences in biological clock mechanisms uncovered

A new study led by Duke-NUS and the University of California, Santa Cruz explains how mutations in certain proteins can shorten our biological clock timing, making some people extreme “morning larks” because their internal clocks operate on a 20-hour cycle instead of being synchronised with the 24-hour cycle of day and night. Learning about the biological clock mechanisms of individual patients could help clinicians tailor sleep disorder therapies.

Genes in development of diabetic kidney disease identified

Duke-NUS researchers from the Diabetes Study in Nephropathy and Other Microvascular Complications (DYNAMO) group, as well as their international counterparts, have identified genes that could be involved in the development of diabetic kidney disease, suggesting potential targets for treating the condition. They compared the genetic data of 76 Finnish sibling pairs, where both siblings had Type 1 diabetes for more than 15 years but only one had developed diabetic kidney disease, and found differences between the siblings at different genetic levels that could explain the occurrence of the disease.

Local study on migraines

A study led by Duke-NUS found that migraine plays a substantial economic burden on Singapore, costing the city state SGD$1.04 billion in 2018. The study revealed that 80 per cent of the total estimated cost was attributed to healthcare expenses. Knowing the estimated total costs of migraine, in terms of monetary value and productivity levels, will drive research in a health issue that has a significant impact on our society.

Cancer

Personalising lung cancer treatment for Asians

Scientists from the GIS and National Cancer Centre Singapore (NCCS) found that cancer stem cells, which are responsible for tumour growth and repair, are dependent on an amino acid called methionine as fuel. Targeting the nutrient dependency of cancer stem cells by starving them of methionine can offer another way of treating lung cancer and other solid tumours. This discovery gives critical new insights as drug resistance can be a problem in cancer treatment.

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Chronic diseases

Early identification of patients with high risk of incident Chronic Kidney Disease

Using data of more than five million individuals from 34 multi-national groups, a team from Duke-NUS developed and validated equations for the five-year risk of incident Chronic Kidney Disease (CKD), defined as reduced estimated glomerular filtration rate to less than 60 ml/min/1.73m2. The equation uses factors such as age, sex, race/ethnicity, history of cardiovascular disease and body mass index to estimate the five-year risk of incident CKD. The information plays an important role in providing early interventions to prevent the development of CKD.

New nerve cell to treat chronic epilepsy

A team from Duke-NUS has developed a new nerve cell from human stem cells. After the cells were transplanted into epileptic mice, they rebalanced the mice’s brain circuits, resulting in less severe episodes of recurrent seizures. This development holds promise for new avenues in the treatment of chronic epilepsy.

Technology

Technology

Study on use of app for HPBM

A pilot study by SingHealth Polyclinics (SHP), Duke-NUS and the Ministry of Health Holdings launched to determine the accuracy of smartphone app-assisted home blood pressure monitoring as compared to conventional handwritten logbooks. No statistically significant difference in accuracy was found, but the results indicated that adults with hypertension are able to utilise newer digital sphygmomanometers to monitor their blood pressure. Further measures are needed to sustain this self-management behaviour.

AI to provide more accurate spinal anaesthesia

uSINE™ is an ultrasound-guided, automated spinal landmark identification system powered by artificial intelligence. Developed by KK Women’s and Children’s Hospital (KKH), together with the National University of Singapore (NUS) Faculty of Engineering, the novel system enhances patient care by improving the accuracy and success rate of first-attempt needle insertion during spinal anaesthesia. In a study of 100 patients who required spinal anaesthesia for surgical procedures, all ultrasound imaging scans with automated spinal landmark identification were successful and the first-attempt success rate for spinal puncture was 92 per cent.

A new study led by Duke-NUS and the University of California, Santa Cruz explains how mutations in certain proteins can shorten our biological clock timing, making some people extreme “morning larks” because their internal clocks operate on a 20-hour cycle instead of being synchronised with the 24-hour cycle of day and night. Learning about the biological clock mechanisms of individual patients could help clinicians tailor sleep disorder therapies.

Genes in development of diabetic kidney disease identified

Duke-NUS researchers from the Diabetes Study in Nephropathy and Other Microvascular Complications (DYNAMO) group, as well as their international counterparts, have identified genes that could be involved in the development of diabetic kidney disease, suggesting potential targets for treating the condition. They compared the genetic data of 76 Finnish sibling pairs, where both siblings had Type 1 diabetes for more than 15 years but only one had developed diabetic kidney disease, and found differences between the siblings at different genetic levels that could explain the occurrence of the disease.

Local study on migraines

A study led by Duke-NUS found that migraine plays a substantial economic burden on Singapore, costing the city state SGD$1.04 billion in 2018. The study revealed that 80 per cent of the total estimated cost was attributed to healthcare expenses. Knowing the estimated total costs of migraine, in terms of monetary value and productivity levels, will drive research in a health issue that has a significant impact on our society.

A NEW STUDY LEAD BY DUKE-NUS AND THE UNIVERSITY OF CALIFORNIA, SANTA CRUZ EXPLAINS HOW MUTATIONS IN CERTAIN PROTEINS CAN SHORTEN OUR BIOLOGICAL CLOCK TIMING, MAKING SOME PEOPLE EXTREME “MORNING LARKS” BECAUSE THEIR INTERNAL CLOCKS OPERATE ON A 20-HOUR CYCLE INSTEAD OF BEING SYNCHRONISED WITH THE 24-HOUR CYCLE OF DAY AND NIGHT. LEARNING ABOUT THE BIOLOGICAL CLOCK MECHANISMS OF INDIVIDUAL PATIENTS COULD HELP CLINICIANS TAILOR SLEEP DISORDER THERAPIES.

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Transplant

Preserving corneal lenticules for future transplants

Clinicians from Singapore Eye Research Institute (SERI) came up with OptiQ, a new tissue banking facility that preserves extracted corneal lenticules from patients diagnosed with presbyopia (long-sightedness) and hyperopia (far-sightedness) for future use as implants. The use of biological lenticules instead of synthetic options as an implant is safer and carries a lower risk of rejection. Patients also avoid the risk of corneal inflammation, scarring and haze due to superior biocompatibility and any rejection or adverse effects can be easily reversed.

Awards

Developing new treatments for Parkinson’s Disease

A $25 million grant from the National Medical Research Council (NMRC) under the Open Fund-Large Collaborative Grant (OF-LCG) programme was awarded to the Singapore Parkinson’s Disease Translational Clinical Programme (SPARK, Phase II). Led by the National Neuroscience Institute (NNI), National University of Singapore, GIS and Duke-NUS, the programme aims to identify risk factors, develop new drugs and use stem cell transplants to treat Parkinson’s Disease. With three in 1,000 persons in Singapore aged 50 and above suffering from the disease, the project will give patients better quality of life and provide relief to their caregivers.

Exploring efficient and effective cancer treatments

A consortium led by the National Cancer Centre Singapore (NCCS) was awarded $10 million by the NMRC under the OF-LCG programme for research on lymphoma. The grant will be used to explore the different approaches to use the immune system to overcome lymphoma cancer cells and develop new tests to predict which patients would most likely benefit from immunotherapy. Such a test, likely to cost less than $1,000, will be able to determine whether a patient suffering from a particular subtype of lymphoma will respond to immunotherapy treatment, avoiding unnecessary costs and loss of time.

President’s Science and Technology Award

Over three decades, Prof Audrey Chia and the SERI team have made significant breakthroughs in reducing myopia, a condition which affects 80% of children by the time they are 18 years old. The research team was the first to identify low-dose atropine eye drops as a safe and effective treatment option for long-term use in children. For their outstanding contributions, the team received the President’s Science Award (Team).

Milestones

The Centre of Regulatory Excellence (CoRE) turns five

The Centre of Regulatory Excellence (CoRE) celebrated five years of capacity building and promotion of regulatory excellence for health products and systems with a graduation ceremony for the inaugural cohort of its Graduate Certificate Programme in Pharmaceutical Regulation in October 2019. CoRE continues to work with APEC, ASEAN and the World Health Organisation (WHO) to advance regulatory capability, scientific excellence and health in Singapore and the Asia Pacific.

The Lien Centre for Palliative Care (LCPC) celebrates 10th anniversary

The Lien Centre for Palliative Care (LCPC) marked a decade of improving the end-of-life experience for patients with an anniversary magazine and a one-day conference featuring research highlights over the past 10 years. Titled “Delivering Value at End-of-Life”, centre faculty and international speakers shared their expertise with an audience of over 200 stakeholders, partners, collaborators and practitioners. LCPC is now a globally recognised centre of palliative care research and education and some of its accomplishments include over SGD$5 million in research grants and the training of thousands of healthcare professionals.

Award recipient to embark on study programme

Dr Hamid Rahmatullah Bin Abd Razak, Associate Consultant from the Department of Orthopaedic Surgery at Sengkang General Hospital (SKH) is embarking on the MD (Res) programme at the Imperial College London under the auspices of the NMRC Research Training Fellowship 2019 and the Lee Kuan Yew Scholarship Award. He intends to study the effects of an anti-inflammatory agent on early primary osteoarthritis in a bid to break the inflammatory cycle of osteoarthritis. Dr Hamid was one of the recipients of the prestigious Lee Kuan Yew Scholarship Award in 2019.
GIVING

Philanthropic gifts go a long way in supporting the three key pillars of research, education and improvements in clinical care as we pursue Academic Medicine. With generous support from like-minded partners who believe in our vision to define tomorrow’s medicine and our passion to do the best we can for our patients, their gifts enable us to:

**Facilities, Professorships and Named Funds**

In FY 2019, two new facilities and 11 new named funds, including four Professorships, were established:

- **Facilities**
  - The Ngee Ann Kongsi Discovery Tower
  - The Ngee Ann Kongsi Auditorium

- **Professorships**
  - Foo Keong Tatt Professorship in Urology
  - Goh Hak Su Professorship in Colorectal Surgery
  - Professorship in Geriatric Oncology
  - Robert Loh Faculty Professorship in Ophthalmology

- **Named Funds**
  - Edward Jacob Pathology Academic Fund
  - Gilbert Chiang Shih Chuin Bursary
  - Lim Suh Fen Cardiovascular Research & Education Fund
  - Medical Oncology Programme Fund
  - Tan Chiew Lian Palliative Care Research & Education Fund
  - Teo Sok Yong and Goh Cheng Liang Childhood Cancer Programme
  - The Hour Glass Virology Research Fund

Funds received in FY2019

$78.84m + $89.03m + $45.16m = $213.03m

Academic Medicine (Research & Medical Education) Patients in need Areas of greatest need Total funds received

**EVERY DOLLAR COUNTS!**

From glitzy gala dinners to staff bazaars, every fundraising event makes a difference. The generous support of individuals and organisations who are passionate about improving healthcare and supporting patients will go a long way in advancing medicine through research, education and clinical care.

**Gala dinners**

Almost 800 guests turned up in support of medical research and education at the SingHealth Duke-NUS Gala Dinner 2019. Themed ‘Odyssey of Stars’, the biennial event, which took place on 14 September 2019 at the Ritz-Carlton, Millenia Singapore, was an opportunity to thank donors and partners for their generous support and celebrate healthcare advances. The evening of fine dining, networking and entertainment included a silent auction.

**National Neuroscience Institute (NNI) celebrated its 20th anniversary in 2019, with a Gala Dinner and an exclusive ‘One Heart One Mind’ recipe book, raising $168,500 for the NNI Health Research Endowment Fund.**

**Guests gave generously at Singapore National Eye Centre’s (SNEC) The Golden Eye Ball 2019, raising $1,466,000 for VisionSave, to support research in eye diseases and help patients in financial need.**
Inaugural Staff Giving Day
National Dental Centre Singapore (NDCS) held its inaugural Giving Day on 7 November 2019, where over 80 staff gathered for a kampong-themed event and made donations towards the NDCS Tooth Fairy Fund.

Staff initiatives to build a culture of giving

A Night to Remember
Championing the importance of humanities in medicine, Residents from the SingHealth Duke-NUS Medicine Academic Clinical Programme (MED ACP) organised their first fundraising concert on 13 December 2019 called “A Night to Remember”. The event also featured displays of art pieces that echoed their daily reflections and encounters at work. The net proceeds from the events went towards the SGH Needy Patients Fund.

Running for a hearty cause
10 National Heart Centre Singapore (NHCS) staff members competed in the 10km race at the Standard Chartered Marathon 2019 on 1 December 2019, raising close to $10,000 for the NHCS Heart To Heart Fund.

Inaugural Staff Giving Day
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Festive staff fundraising
A Chinese New Year celebration for SingHealth Polyclinics (SHP) staff turned into a spontaneous fundraising event when an impromptu auction for decorative DIY ornaments was held and over $500 in proceeds went towards the SHP Gift of Family Fund.

Partnering others to help our patients

Charity golf for rare diseases
In conjunction with their 50th Anniversary, the Singapore Glass Association organised a Charity Golf Tournament and raised $100,000 for the Rare Disease Fund (RDF), which supports patients requiring medications for rare conditions. The RDF is managed by the KKH Health Fund (part of SingHealth Fund).

Giving back through ceramic art
Over 30 beautifully handcrafted ceramic pieces were sold at Changi General Hospital’s (CGH) annual ceramic exhibition, with 30% of the sale proceeds donated to HomeCare Assist, which supports patients in need so that they can continue on their recovery journey after being discharged.

Using art to thank donors
Students from Methodist Girls’ School created festive art pieces in appreciation to donors who gave to the Sengkang General Hospital (SKH) Better Health Fund during SKH’s year-end appeal.

Pink Carpet Party
President Halimah Yacob joined prestigious guests and patients at the National Cancer Centre Singapore’s (NCCS) Pink Carpet Party, which raised about $650,000 for the Women vs Cancer Campaign in support of cutting edge breast cancer research.

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Transformational gifts

$40m boost to research and education

Ng Ann Development (NAD), a subsidiary of The Ng Ann Kong’s, made a transformational gift of $40 million to SingHealth Fund, which will greatly boost medical research and education efforts to advance patient care. The generous gift was made in commemoration of NAD’s 50th anniversary in 2019 and reflected its strong commitment to partner clinicians, researchers and educators in SingHealth to make an impactful and lasting difference to the health of Singaporeans. It will enable SingHealth to conduct further research into strategic areas such as ageing, population health and artificial intelligence for healthcare and address challenges that affect local and Asian populations. It will also support the continuation of education programmes to build a strong pipeline of competent healthcare professionals to meet current and future needs.

$12m gift to fight childhood cancers

Annually, about 150 to 200 new cases of childhood cancers are detected in children younger than 15 years old in Singapore. While survival rates for the most common cancers among paediatric patients seen at KKHH are above 50%, more can be done to improve their survival and quality of life. In support of this battle against childhood cancers, the Goh Foundation has made a gift of $12 million to the SingHealth Duke-NUS Paediatrics Academic Clinical Programme (PAEDS ACP) to establish the Teo Sok Yong and Goh Cheng Liang Childhood Cancer Programme. This programme will enhance cancer diagnosis and treatment, perform cutting-edge research and provide advanced medical training and education to healthcare workers to better serve cancer patients and their families.

New faculty professorship to support excellence in eye care

Dr Robert Loh was a leading eye surgeon at Singapore General Hospital (SGH) in the 1950s and 1960s who pioneered ophthalmic care and research. He established the first Eye Bank, the introduction of micro and laser surgery, laser implants, retinal detachment surgery, corneal grafting and other innovative procedures that are standard treatments today. Dr Loh also set up the Singapore Society of Ophthalmology in the early 1960s, which later became the College of Ophthalmologists of the Academy of Medicine, Singapore. The Robert Loh Faculty Professorship in Ophthalmology has been established to enable eye specialists to build on his legacy and drive further advances in clinical care.

Holistic support for cancer survivors

Cancer survivors often face a myriad of physical, emotional and psychological issues that impact their lives long after their cancer has gone. To address the current gap in holistic post-treatment care, Temasek Foundation has given $2.1 million to establish the Temasek Foundation ACCESS (Accessible Cancer Care to Enable Support for Survivors) programme. A partnership with NCSS, this pilot programme will benefit 4,000 breast cancer patients through screening to assess patient’s emotional state, building a community network of medical support services for patients’ post-treatment recovery, developing a training programme to enable community partners to provide quality care for cancer survivors. The pilot programme will run for two years and may be extended to all NCSS patients in future.

Continuing the legacy of the “Founding Father of Colorectal Surgery”

Prof Goh Hak Su is known as the “Founding Father of Colorectal Surgery" and is highly regarded as a leading colorectal surgeon in Singapore. In 1989, Prof Goh established the Department of Colorectal Surgery in SGH, the first of its kind in the region. Today, the Department remains a premier colorectal centre with an international reputation in clinical work, teaching and research.

Honouring the pioneering work of the Father of Urology

Professor Foo Keong Tatt is often regarded as the “Father of Urology” and is widely recognised for his pioneering work and leadership in the field of urology in Singapore and the region. Prof Foo was the founding President of the Singapore Urological Association in 1966, where his visionary leadership as the Secretary General of the Urological Association of Asia and as the Honorary Executive Director of the Association helped bring Singapore to the international urology scene. Through the years, Prof Foo has received numerous awards and mentored generations of urologists in Singapore and Asia. As an active clinician and researcher, Prof Foo has published more than 100 papers in renowned journals. Prof Foo launched his latest book titled “The Grading and Staging of Clinical Benign Prostate Hyperplasia (BPH) for Optimal Care” this year to share his passion about treating the right patient at the right time with optimal care. The Foo Keong Tatt Professorship in Urology will recruit, retain and recognise the finest researchers and teachers to spearhead cutting-edge research, offer new dimensions of learning to our clinicians and encourage novel research ideas to improve patient outcomes.
ABOUT US

The SingHealth Duke-NUS Academic Medical Centre draws on the collective strengths of SingHealth and Duke-NUS Medical School to drive the transformation of healthcare and provide affordable, accessible, quality healthcare. With over 40 clinical specialties, a network of acute hospitals, national specialty centres, polyclinics and community hospitals, it delivers comprehensive, multi-disciplinary and integrated care. Beyond hospital walls, SingHealth works closely with community care providers to ensure patients remain well-supported after their discharge and to empower the population to stay healthy and age in place.

For more information, please visit: www.singhealth.com.sg

Our Vision
Defining Tomorrow’s Medicine

Our Mission
Care to Heal. Educate to Empower. Innovate to Advance.

Our Common Purpose
PATIENTS. AT THE HEART OF ALL WE DO.*

Our Core Values
Compassion. Integrity. Collaboration.

Members of the SingHealth group

Hospitals:
Singapore General Hospital, Changi General Hospital, Sengkang General Hospital and KK Women’s and Children’s Hospital

National Specialty Centres:
National Cancer Centre Singapore, National Dental Centre Singapore, National Heart Centre Singapore, National Neuroscience Institute and Singapore National Eye Centre

Community Hospitals:
Bright Vision Hospital, Sengkang Community Hospital and Outram Community Hospital

Polyclinics:
Bedok, Bukit Merah, Marine Parade, Outram, Pasir Ris, Punggol, Sengkang, Tampines, Eunos (expected completion: 2020) and Tampines North (expected completion: 2022)

Our Partner in Academic Medicine

Duke-NUS is a partnership between Duke University School of Medicine and the National University of Singapore (NUS).

In 2005, with support from the Singapore government, NUS and Duke University, two academic institutions with strong track records in research and education, committed to combine the unique medical education curriculum at Duke University School of Medicine with the academic rigour and rich resources offered by NUS and to offer students an enriching and innovative medical educational experience.

Duke-NUS is located on the main campus of the largest healthcare group in the country, Singapore Health Services (SingHealth). This group collectively delivers multidisciplinary care among more than 40 clinical specialties across a large network of hospitals, national specialty centres and polyclinics. Together, Duke-NUS and SingHealth constitute a leading, world class Academic Medical Centre embodying the goal of delivering the highest levels of patient care, education and research.
SingHealth Duke-NUS Senior Management

SingHealth

Prof Ivy Ng
Group Chief Executive Officer

Prof Feng Kok Yong
Deputy Group Chief Executive Officer (Medical & Clinical Services)

Prof Kenneth Kwek
Deputy Group Chief Executive Officer (Organisational Transformation & Informatics)

Prof Lee Chien Earn
Deputy Group Chief Executive Officer (Research & Education)

Prof Terrance Chua
Group Chairman, Medical Board

Assoc Prof Peter Lim Ai Chi
Group Chief Financial Officer

Mr Sia Kheng Hong
Group Chief Medical Informatics Officer

Ms Esther Tan
Group Chief Human Resource Officer

Assoc Prof Tan Say Beng
Group Chief Research Officer

Duke-NUS

Prof Chan Choon Meng
Group Chief Education Officer

Assoc Prof Chwe Wan Cheng
Group Director, Academic Medicine

Adjunct Assoc Prof Tracy Carol Ayre
Group Chief Nurse

Prof Celia Tan
(13 July 2020 - 31 July 2020)
Group Director, Allied Health

Assoc Prof Lita Chew
(1 August 2020 -)
Group Director, Allied Health

Ms Audrey Lau
Group Chief Communications Officer

Mr Benedict Tan
Group Chief Digital Strategy Officer

Dr Goh Min Liang
Group Chief Medical Informatics Officer

Assoc Prof Chua Yew Leong
Group Director, International Collaboration & Development

Dr Michael Wong
Group Director, Regional Health System

Ms Lee Chan Ee
Group Director, Organisational Transformation

Leadership

Chairman
Mr Tiong Beng Lee
Chairman, DBS Group Holdings Ltd and DBS Bank Ltd

Senior Deputy President and Provost, National University of Singapore
Dr Goh Min
Immediate Past President, NUS Pequot and and former Nominated Member of Parliament.

Members
Mr Puloy Lim
Managing Director, Cathay Pacific Holdings Ltd

Mr Lee Kim Shin
Managing Partner, Allen & Overy LLP

Ms Patricia Koh
Managing Director, Allen & Gledhill LLP

Mr Mok Wei Leng
Managing Director, Baker Tilly & Co

Mr Low Kow Choon
Managing Director, Grant Thornton Singapore

Ms Patricia Koh
Managing Director, Grant Thornton

Dr Goh Min
Immediate Past President, NUS Pequot and and former Nominated Member of Parliament.

Survey Members
Assoc Prof Benjamin Ong
Senior Vice President, Singapore General Hospital

Assoc Prof Tan See Beng
Chief Executive Officer, Singapore General Hospital

Assoc Prof Lita Chew
Group Director, Allied Health Services

Mr Goh Min Liong
Group Chief Medical Informatics Officer

Ms Audrey Lau
Group Chief Communications Officer

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Group Chief Digital Strategy Officer

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Group Chief Medical Informatics Officer

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Group Director, International Collaboration & Development

Dr Michael Wong
Group Director, Regional Health System

Ms Lee Chan Ee
Group Director, Organisational Transformation

Leadership

Chairman
Dr Adrian Ee
Chief Executive Officer

Prof Patrick J Casey
Senior Vice Dean, Office of Research

Ms Karen Chang
Senior Vice Dean & Group Director, Office of Corporate Services

Prof Ian Curran
Vice Dean, Office of Education

Prof Wong Tien Yin
Vice Dean, Office of Academic & Clinical Development

Dr Christopher J Laing
Senior Associate Dean and Head of Office, Innovation & Entrepreneurship

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Group Chief Executive Officer

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Deputy Group Chief Executive Officer (Medical & Clinical Services)

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Group Director, Regional Health System

Ms Lee Chan Ee
Group Director, Organisational Transformation
## SINGHEALTH GROUP

### OVERALL KEY FIGURES AND STATISTICS

#### MANPOWER

<table>
<thead>
<tr>
<th></th>
<th>Year ended 31 Mar</th>
<th>2020</th>
<th>2019</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medical</td>
<td></td>
<td>3,778</td>
<td>3,683</td>
<td>0.6%</td>
</tr>
<tr>
<td>Dental</td>
<td></td>
<td>165</td>
<td>173</td>
<td>5.2%</td>
</tr>
<tr>
<td>Nursing</td>
<td></td>
<td>10,832</td>
<td>10,515</td>
<td>3.0%</td>
</tr>
<tr>
<td>AHPs</td>
<td></td>
<td>5,826</td>
<td>5,627</td>
<td>3.5%</td>
</tr>
<tr>
<td>Others</td>
<td></td>
<td>9,293</td>
<td>8,957</td>
<td>3.5%</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td></td>
<td>29,894</td>
<td>28,935</td>
<td></td>
</tr>
</tbody>
</table>

#### KEY FIGURES

<table>
<thead>
<tr>
<th>ACUTE CARE AND POLYCLINICS</th>
<th>Year ended 31 Mar</th>
<th>2020</th>
<th>2019</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size</td>
<td>Beds (As at end Mar)</td>
<td>4,699</td>
<td>4,345</td>
<td>8.1%</td>
</tr>
<tr>
<td>Workload per annum</td>
<td></td>
<td>255,348</td>
<td>236,442</td>
<td>8.0%</td>
</tr>
<tr>
<td>Bed Occupancy Rate</td>
<td></td>
<td>81.9%</td>
<td>82.5%</td>
<td>-0.6% pt</td>
</tr>
<tr>
<td>Inpatients</td>
<td></td>
<td>258,942</td>
<td>247,928</td>
<td>4.8%</td>
</tr>
<tr>
<td>Total Patient Days</td>
<td></td>
<td>1,217,413</td>
<td>1,155,880</td>
<td>5.3%</td>
</tr>
<tr>
<td>Average Length of Stay (days)</td>
<td></td>
<td>4.8</td>
<td>4.9</td>
<td>-0.1 day</td>
</tr>
<tr>
<td>Day Surgeries</td>
<td></td>
<td>182,612</td>
<td>171,716</td>
<td>6.3%</td>
</tr>
<tr>
<td>Inpatient Surgeries</td>
<td></td>
<td>105,533</td>
<td>105,857</td>
<td>-0.3%</td>
</tr>
<tr>
<td>Specialist Outpatient Clinic Attendances</td>
<td></td>
<td>2,527,835</td>
<td>2,520,227</td>
<td>0.3%</td>
</tr>
<tr>
<td>Accident &amp; Emergency Attendances</td>
<td></td>
<td>522,910</td>
<td>473,068</td>
<td>10.5%</td>
</tr>
<tr>
<td>Dental Attendances</td>
<td></td>
<td>244,396</td>
<td>264,322</td>
<td>-7.5%</td>
</tr>
<tr>
<td>Dental Procedures</td>
<td></td>
<td>325,005</td>
<td>348,897</td>
<td>-7.0%</td>
</tr>
<tr>
<td>Polyclinic Attendances</td>
<td></td>
<td>1,837,506</td>
<td>1,807,359</td>
<td>1.7%</td>
</tr>
</tbody>
</table>

#### COMMUNITY HOSPITALS

| Size                        | Beds (As at end March) | 608 | 442 | 37.6% |
| Workload per annum          |                   | 144,860| 105,317| 37.5% |

### FINANCIAL INFORMATION

<table>
<thead>
<tr>
<th>Year ended 31 Mar</th>
<th>2020 ($ million)</th>
<th>2019 ($ million)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ASSETS BY MAJOR CATEGORIES</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Plant and Equipment</td>
<td>1,191</td>
<td>945</td>
</tr>
<tr>
<td>Trade and Other Receivables</td>
<td>1,709</td>
<td>1,391</td>
</tr>
<tr>
<td>Other Assets</td>
<td>1,687</td>
<td>1,428</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>4,587</td>
<td>3,764</td>
</tr>
<tr>
<td><strong>LIABILITIES BY MAJOR CATEGORIES</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trade and Other Payables</td>
<td>2,408</td>
<td>1,867</td>
</tr>
<tr>
<td>Other Current Liabilities</td>
<td>318</td>
<td>173</td>
</tr>
<tr>
<td>Non Current Liabilities</td>
<td>612</td>
<td>597</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>3,338</td>
<td>2,637</td>
</tr>
<tr>
<td><strong>TOTAL EQUITY</strong></td>
<td>1,249</td>
<td>1,127</td>
</tr>
</tbody>
</table>

| **REVENUE BREAKDOWN BY MAJOR CATEGORIES** |                   |                  |
| Clinical Revenue | 2,112             | 2,014            |
| Subvention       | 2,708             | 2,440            |
| Other Revenue*   | 953               | 818              |
| **Total**        | 5,773             | 5,272            |

| **EXPENDITURE BY MAJOR CATEGORIES** |                   |                  |
| Manpower         | 3,161             | 2,933            |
| Supplies and Consumables | 865             | 749              |
| Other Operating Expenses | 1,238          | 1,314            |
| Depreciation and Amortisation | 380            | 233              |
| **Total**        | 5,644             | 5,229            |

*Note: Key figures for Community Hospitals include SKCH and OCH data since start of operations (Aug 2018 and Nov 2019 respectively).

*Include donations to Charity Funds
**OVERALL STATISTICS**

**282** Doctor of Medicine (MD) Students
- Including 20 PhD students and 3 PhD graduates

**67** Integrated Biology and Medicine (IBM) PhD students
- Including 20 MD Students

**10** Quantitative Biology and Medicine (QBM) PhD students

**13** Clinical Sciences (CS) PhD students

**1,879** Faculty
- Including faculty in Research, Education and the Office of Academic and Clinical Development

**TOTAL 906** (2019) **855**

<table>
<thead>
<tr>
<th>Medical</th>
<th>Dental</th>
<th>Nursing</th>
<th>AHPs</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>11</td>
<td>98</td>
<td>797</td>
</tr>
</tbody>
</table>

**Year ended 31 March** 2020

<table>
<thead>
<tr>
<th>Medical</th>
<th>Dental</th>
<th>Nursing</th>
<th>AHPs</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>9</td>
<td>117</td>
<td>729</td>
</tr>
</tbody>
</table>

**TOTAL 8,993** (2019) **9,065**

<table>
<thead>
<tr>
<th>Medical</th>
<th>Dental</th>
<th>Nursing</th>
<th>AHPs</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,161</td>
<td>0</td>
<td>3,682</td>
<td>1,755</td>
<td>2,395</td>
</tr>
</tbody>
</table>

**Year ended 31 March** 2020

<table>
<thead>
<tr>
<th>Medical</th>
<th>Dental</th>
<th>Nursing</th>
<th>AHPs</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,147</td>
<td>0</td>
<td>3,708</td>
<td>1,789</td>
<td>2,421</td>
</tr>
</tbody>
</table>

**Size**
- Beds (As at end March): 1,796, 1,723

**Workload per annum**
- Bed Occupancy Rate: 82.7%, 84.4%
- Inpatients: 79,553, 80,423
- Total Patient Days: 480,971, 486,015
- Average Length of Stay (Days): 6.0, 6.0
- Day Surgeries: 58,170, 51,928
- Inpatient Surgeries: 45,147, 47,784
- Specialist Outpatient Clinic Attendances: 720,520, 749,507
- Accident & Emergency Attendances: 122,744, 124,691

Staffing figures refer to filled posts, in terms of full-time equivalent, and may not add up to total due to rounding. Figures include MOHH-hired doctors.
### Changi General Hospital

**Year ended 31 March 2020**

<table>
<thead>
<tr>
<th>Staff Category</th>
<th>707</th>
<th>6</th>
<th>2,256</th>
<th>1,005</th>
<th>1,609</th>
<th><strong>TOTAL 5,583</strong></th>
</tr>
</thead>
</table>

**Year ended 31 March 2019**

| Staff Category | 724    | 1     | 2,332  | 935    | 1,596  | **TOTAL 5,588** |

Staffing figures refer to filled posts, in terms of full-time equivalent, and may not add up to total due to rounding. Figures include MOHH-hired doctors.

### Sengkang General Hospital

**Year ended 31 March 2020**

| Staff Category | 425    | 2     | 1,425  | 572    | 982    | **TOTAL 3,406** |

**Year ended 31 March 2019**

| Staff Category | 374    | 2     | 1,102  | 502    | 828    | **TOTAL 2,808** |

Staffing figures refer to filled posts, in terms of full-time equivalent, and may not add up to total due to rounding. Figures include MOHH-hired doctors.

### Overall Statistics

#### Size
- **Beds (As at end March)**: 2020 = 1,071, 2019 = 1,066

#### Workload per annum

<table>
<thead>
<tr>
<th>Category</th>
<th>2020</th>
<th>2019</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bed Occupancy Rate</td>
<td>85.3%</td>
<td>84.6%</td>
</tr>
<tr>
<td>Inpatients</td>
<td>51,205</td>
<td>50,507</td>
</tr>
<tr>
<td>Total Patient Days</td>
<td>316,128</td>
<td>316,012</td>
</tr>
<tr>
<td>Average Length of Stay (days)</td>
<td>6.2</td>
<td>6.3</td>
</tr>
<tr>
<td>Day Surgeries</td>
<td>32,922</td>
<td>33,951</td>
</tr>
<tr>
<td>Inpatient Surgeries</td>
<td>22,426</td>
<td>24,581</td>
</tr>
<tr>
<td>Specialist Outpatient Clinic Attendances</td>
<td>440,322</td>
<td>447,829</td>
</tr>
<tr>
<td>Accident &amp; Emergency Attendances</td>
<td>137,747</td>
<td>139,006</td>
</tr>
<tr>
<td>Dental Attendances</td>
<td>3,597</td>
<td>3,945</td>
</tr>
<tr>
<td>Dental Procedures</td>
<td>3,526</td>
<td>4,347</td>
</tr>
</tbody>
</table>

Staffing figures refer to filled posts, in terms of full-time equivalent, and may not add up to total due to rounding. Figures include MOHH-hired doctors.
<table>
<thead>
<tr>
<th></th>
<th>2020</th>
<th>2019</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total</strong></td>
<td>4,775</td>
<td>4,801</td>
</tr>
<tr>
<td><strong>Medical</strong></td>
<td>712</td>
<td>722</td>
</tr>
<tr>
<td><strong>Dental</strong></td>
<td>10</td>
<td>13</td>
</tr>
<tr>
<td><strong>Nursing</strong></td>
<td>1,888</td>
<td>1,909</td>
</tr>
<tr>
<td><strong>AHPs</strong></td>
<td>911</td>
<td>896</td>
</tr>
<tr>
<td><strong>Others</strong></td>
<td>1,254</td>
<td>1,261</td>
</tr>
<tr>
<td><strong>Year ended 31 Mar</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>2020</th>
<th>2019</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total</strong></td>
<td>1,184</td>
<td>1,130</td>
</tr>
<tr>
<td><strong>Medical</strong></td>
<td>187</td>
<td>185</td>
</tr>
<tr>
<td><strong>Dental</strong></td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Nursing</strong></td>
<td>174</td>
<td>160</td>
</tr>
<tr>
<td><strong>AHPs</strong></td>
<td>453</td>
<td>427</td>
</tr>
<tr>
<td><strong>Others</strong></td>
<td>370</td>
<td>358</td>
</tr>
<tr>
<td><strong>Year ended 31 Mar</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Workload per annum**

<table>
<thead>
<tr>
<th></th>
<th>2020</th>
<th>2019</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Day Surgeries</strong></td>
<td>8,640</td>
<td>8,980</td>
</tr>
<tr>
<td><strong>Specialist Outpatient Clinic Attendances</strong></td>
<td>188,544</td>
<td>205,885</td>
</tr>
<tr>
<td><strong>Dental Attendances</strong></td>
<td>190,053</td>
<td>210,445</td>
</tr>
</tbody>
</table>
### National Heart Centre Singapore

<table>
<thead>
<tr>
<th></th>
<th>Medical</th>
<th>Dental</th>
<th>Nursing</th>
<th>AHPs</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>2020</td>
<td>113</td>
<td>0</td>
<td>479</td>
<td>311</td>
<td>359</td>
</tr>
<tr>
<td>2019</td>
<td>117</td>
<td>0</td>
<td>491</td>
<td>312</td>
<td>350</td>
</tr>
</tbody>
</table>

Staffing figures refer to filled posts, in terms of full-time equivalent, and may not add up to total due to rounding. Figures include MOHH-hired doctors.

### National Eye Centre

<table>
<thead>
<tr>
<th></th>
<th>Medical</th>
<th>Dental</th>
<th>Nursing</th>
<th>AHPs</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>2020</td>
<td>113</td>
<td>0</td>
<td>291</td>
<td>161</td>
<td>337</td>
</tr>
<tr>
<td>2019</td>
<td>115</td>
<td>0</td>
<td>305</td>
<td>160</td>
<td>340</td>
</tr>
</tbody>
</table>

Staffing figures refer to filled posts, in terms of full-time equivalent, and may not add up to total due to rounding. Figures include MOHH-hired doctors.

### National Neuroscience Institute

<table>
<thead>
<tr>
<th></th>
<th>Medical</th>
<th>Dental</th>
<th>Nursing</th>
<th>AHPs</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>2020</td>
<td>125</td>
<td>0</td>
<td>42</td>
<td>158</td>
<td>136</td>
</tr>
<tr>
<td>2019</td>
<td>101</td>
<td>0</td>
<td>41</td>
<td>151</td>
<td>132</td>
</tr>
</tbody>
</table>

Staffing figures refer to filled posts, in terms of full-time equivalent, and may not add up to total due to rounding. Figures include MOHH-hired doctors.

### Singapore National Eye Centre

<table>
<thead>
<tr>
<th></th>
<th>Medical</th>
<th>Dental</th>
<th>Nursing</th>
<th>AHPs</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>2020</td>
<td>113</td>
<td>0</td>
<td>291</td>
<td>161</td>
<td>337</td>
</tr>
<tr>
<td>2019</td>
<td>115</td>
<td>0</td>
<td>305</td>
<td>160</td>
<td>340</td>
</tr>
</tbody>
</table>

Staffing figures refer to filled posts, in terms of full-time equivalent, and may not add up to total due to rounding. Figures include MOHH-hired doctors.

### Polyclinics

<table>
<thead>
<tr>
<th></th>
<th>Medical</th>
<th>Dental</th>
<th>Nursing</th>
<th>AHPs</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>2020</td>
<td>198</td>
<td>22</td>
<td>277</td>
<td>206</td>
<td>498</td>
</tr>
<tr>
<td>2019</td>
<td>180</td>
<td>20</td>
<td>274</td>
<td>189</td>
<td>490</td>
</tr>
</tbody>
</table>

Staffing figures refer to filled posts, in terms of full-time equivalent, and may not add up to total due to rounding. Figures include MOHH-hired doctors.
### OVERALL STATISTICS

#### SingHealth Community Hospitals HQ

<table>
<thead>
<tr>
<th>Year ended 31 March</th>
<th>Medical</th>
<th>Dental</th>
<th>Nursing</th>
<th>AHPs</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>2019</td>
<td>1</td>
<td>0</td>
<td>4</td>
<td>1</td>
<td>100</td>
</tr>
<tr>
<td>2020</td>
<td>1</td>
<td>0</td>
<td>2</td>
<td>1</td>
<td>74</td>
</tr>
</tbody>
</table>

**TOTAL** (2019) 78

#### Bright Vision Hospital

<table>
<thead>
<tr>
<th>Year ended 31 March</th>
<th>Medical</th>
<th>Dental</th>
<th>Nursing</th>
<th>AHPs</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>2019</td>
<td>15</td>
<td>0</td>
<td>199</td>
<td>95</td>
<td>161</td>
</tr>
<tr>
<td>2020</td>
<td>23</td>
<td>0</td>
<td>194</td>
<td>101</td>
<td>158</td>
</tr>
</tbody>
</table>

**TOTAL** (2019) 470

#### Outram Community Hospital

<table>
<thead>
<tr>
<th>Year ended 31 March</th>
<th>Medical</th>
<th>Dental</th>
<th>Nursing</th>
<th>AHPs</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>2019</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>2020</td>
<td>17</td>
<td>0</td>
<td>105</td>
<td>50</td>
<td>53</td>
</tr>
</tbody>
</table>

**TOTAL** (2019) 225

#### Sengkang Community Hospital

<table>
<thead>
<tr>
<th>Year ended 31 March</th>
<th>Medical</th>
<th>Dental</th>
<th>Nursing</th>
<th>AHPs</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>2019</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>2020</td>
<td>17</td>
<td>0</td>
<td>178</td>
<td>77</td>
<td>104</td>
</tr>
</tbody>
</table>

**TOTAL** (2019) 380

**Note:** Key figures for Sengkang Community Hospital and Outram Community Hospital include data from start of operations (Aug 2018 and Nov 2019 respectively).

---

**Staffing figures refer to filled posts, in terms of full-time equivalent, and may not add up to total due to rounding. Figures include MOHH-hired doctors.**
### RESEARCH STATISTICS

#### STAFFING

- **98** Clinician-scientists (CSs) in SingHealth & Duke-NUS
  - **67** National
  - **31** Cluster & Faculty

- **228** Clinician-investigators

- **608** Principal investigators leading ongoing research

#### ALLIED HEALTH PROFESSIONALS

- **>200** Allied Health Professionals involved in research
- **166** papers published

### ACHIEVEMENTS

#### SINGHEALTH & DUKE-NUS

- **15,192** (SingHealth) | **7,160** (Duke-NUS)

- **S$1.91B** in Competitive Funding for SingHealth & Duke-NUS

- **18** new dentistry Residents joined SingHealth in AY19

- **347** medical students
- **433** nursing students
- **124** allied health students
- **8** dentistry students in FY19

### UNDERGRADUATE EDUCATION

- **$424,117** in quantum of grants awarded
- **201** presentations
- **54** research projects with nurses as principal investigators
- **47** publications
- **12** grants

### POSTGRADUATE & CONTINUING EDUCATION

- **5,272** healthcare professionals trained in 166 Allied Health Continuing Professional education training programmes
- **321** clinician attended a series of clinician development programmes to prepare them for multi-faceted roles in healthcare

### GRADUATE EDUCATION

- **1,704** healthcare professionals and administrators were trained in over 78 programme sessions to equip them with the right competencies to support care delivery
- **1,963** educators were equipped through 58 AMEI Education Grand Rounds and Faculty Development workshops
- **S$75,957** of AMEI Education Grants awarded to support the development of 11 educational projects and scholarly efforts to evaluate and improve educational outcomes

### RECOGNISING EDUCATIONAL EXCELLENCE

- **43** outstanding educators conferred the AMEI Golden Apple Awards 2019.
- **290** outstanding Residency faculty and top-performing Residents received the Residency in SingHealth Excellence (RSE) Awards 2019.
- **11** outstanding House Officers received the SingHealth Best Junior Doctors Awards 2019.
- **7** top-performing graduating Duke-NUS students accorded the SingHealth Awards 2019.