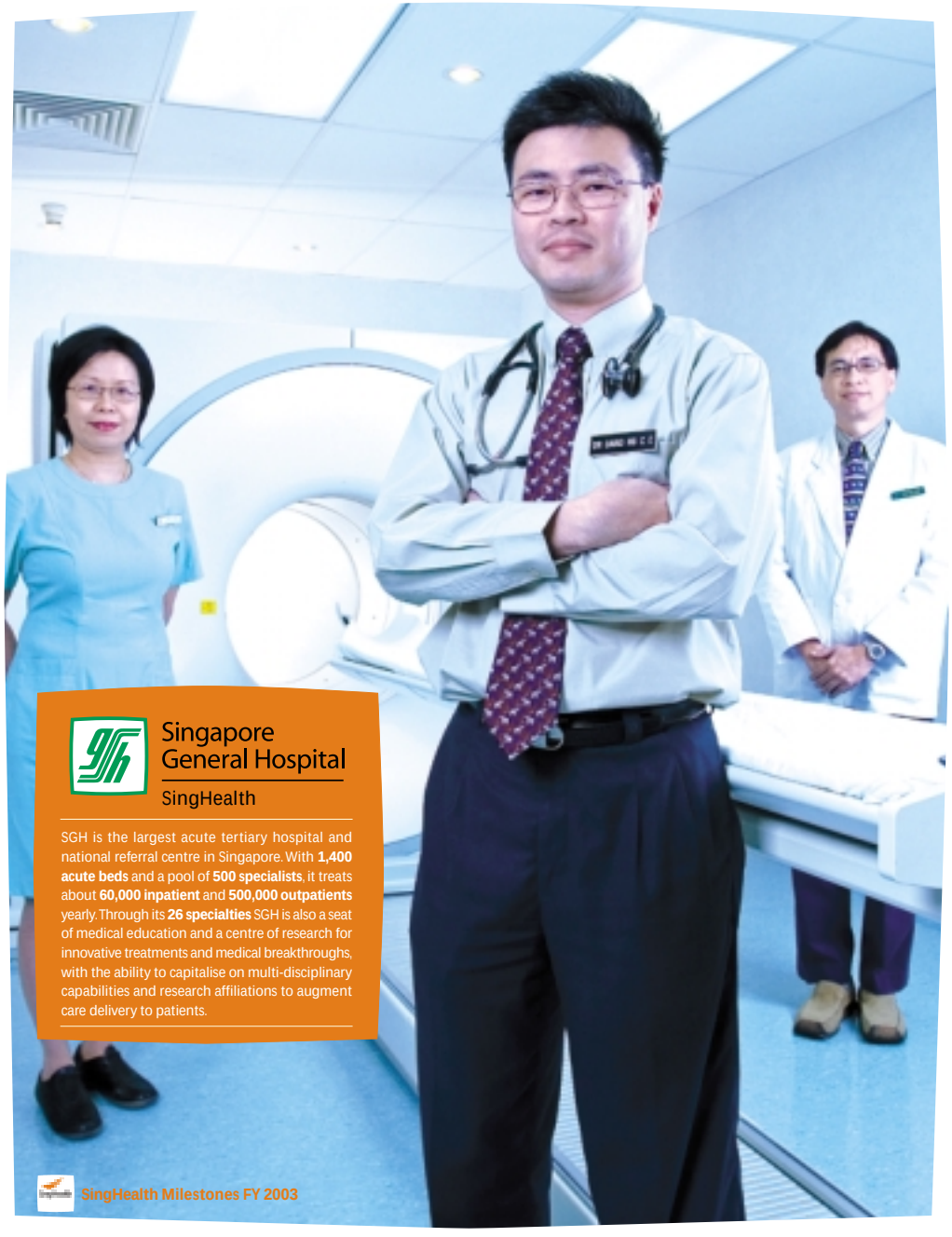


Singapore General Hospital
SingHealth

SGH is the largest acute tertiary hospital and national referral centre in Singapore. With **1,400 acute beds** and a pool of **500 specialists**, it treats about **60,000 inpatient** and **500,000 outpatients** yearly. Through its **26 specialties** SGH is also a seat of medical education and a centre of research for innovative treatments and medical breakthroughs, with the ability to capitalise on multi-disciplinary capabilities and research affiliations to augment care delivery to patients.

Prof Tan Ser Kiat
CEO, SGH

2003 has been a most trying and challenging year in the history of SGH. The painful events of the year brought the staff together to work cohesively as a team. Together, we weathered the storm and triumphed, emerging a much stronger team. Our staff has risen to the challenge well. The lessons learnt were translated into improvements in clinical services and professional developments.

We will continue to build upon our reputation of clinical excellence. As the flagship medical institution, SGH will work continuously towards enhancing care through innovations while managing costs to ensure that our patients have the best care and outcomes. The Campus is a priceless repository of talent which will help us achieve our vision of a leading academic medical institution through research, collaboration and training an even better generation of healthcare professionals.

clinical excellence

Pain - the Fifth Vital Sign

During the year, SGH became the region's first hospital to include pain as a fifth vital sign, a move to keep pace with international medical standards and practices. Patients would now be assessed and monitored for pain in addition to other basic vital signs such as pulse, blood pressure, core temperature and respiration rate.

More Treatment Options for Patients

A range of new clinical capabilities and programmes was launched to meet patient needs and to improve service levels. For example, the introduction of endovascular stenting in 2003 provided a treatment option for arterial stenoses and aneurysms, and endovenous laser therapy for varicose veins. In addition, the new laparoscopic surgery – including laparoscopic hernia repair and laparoscopic cardiomyopathy for reflux disease and achalasia – offered a minimally invasive alternative to conventional surgery.

Another minimally invasive procedure was the new mammotome biopsy service, a vacuum-assisted percutaneous breast biopsy procedure using computer image-guidance to aid in removing multiple tissue samples. Patients undergoing breast biopsies would enjoy minimal pain and scarring and a faster recovery time. The new procedure could potentially remove all radiological evidence of a breast abnormality, providing a highly-accurate diagnosis without the need for open breast surgery. Other new diagnostic investigation procedures including MR Arthrography, CT Virtual Colonoscopy, Cardiac MRI and CT were made available to patients during the year.

Three New Units Opened at SGH

SGH continued to build on its organisational structure to provide more holistic care to patients during the year. The Department of Behavioural Medicine was established in April 2003 to provide a comprehensive integrated multi-disciplinary service to manage patients with psychological and psychiatric disorders. Its team of psychiatrists, psychologists and nurses would support other clinical departments by helping patients manage conditions including anxiety, depression, eating disorders, psychosis and organic brain disorders.

A Surgical Assessment Clinic was also launched during the year to provide pre-operation assessment of surgical patients and to prepare and educate them for surgery. The clinic would serve a total of six surgical departments namely Orthopaedic, Hand, Obstetrics & Gynaecology, Otolaryngology, Plastic and Dental Surgery.

In addition, the Geriatric Medicine Unit was established to provide holistic care for geriatric patients in the hospital. The unit introduced a co-management programme with the Orthopaedic Surgery and Urology departments, where doctors from the unit would provide clinical support in these wards. These efforts translated into encouraging results, with reduced length of stay as well as improvements in clinical outcomes for the patients.

Enhanced Imaging Capabilities

SGH implemented a filmless Image Management System across its wards and clinics during the year. The system would manage radiological images and scanned medical records, allowing

Patients undergoing breast biopsies enjoy minimal pain and scarring, and a faster recovery time with the new Mammotome Biopsy Service.

clinicians to access radiological images electronically throughout the hospital. It would enhance the care of patients requiring transfers between SGH and the national specialist centres on Outram Campus once the system was fully rolled out across the campus in 2004.

A new Cyclotron Centre was opened to manufacture radioactive tracers required in Positron Emission Tomography (PET) scanning at all PET Centres in Singapore. The availability of PET imaging within SGH would certainly enhance the advancements in Oncology, Neurology and Cardiology, in particular on cancer treatment and molecular imaging in Singapore as well as the region.

Cutting-Edge Research Investigations

Doctors from the Department of Obstetrics & Gynaecology undertook a research using subtractive hybridisation and real-time PCR to analyse gene expression profiles in endometriosis. The team filed a patent entitled 'Method and Probes for Diagnosing a Ggynaecological Condition' with the US Patent and Trademark Office in September 2003.

The Department further began a study on establishing and validating a pre-implantation genetic diagnosis programme in Singapore, which would be used to work up pre-implantation genetic diagnosis for alpha and beta thalassaemia in couples where both partners were carriers and desired a normal pregnancy.

The Department of Rheumatology and Immunology received a five-year BMRC grant to conduct a prospective study to develop HRQoL measures for clinical trials and cohort studies in Singapore.

The Department of General Surgery published 33 Medlined research papers in 2003, covering a range of both basic and clinical surgical sciences.

Accolades for SGH

SGH bagged three awards at the 'Asian Hospital Management Awards 2003' in the Human Resource Development, Quality Medical Care and Customer Service categories respectively. The hospital also became the first restructured hospital to receive accreditation from the Singapore Workforce Development Agency as an 'Approved Assessment Centre' under the National Skills Recognition Scheme.

The Department of Pathology scored the rare distinction of being the largest and most comprehensive complex of laboratories in Singapore to receive accreditation by the College of American Pathologists. In another achievement, the Dietetics and Nutrition Services Department became the first in-house kitchen in a hospital to achieve the Hazard Analysis Critical Control Point certification in September 2003.

In recognition of the commendable workplace health promotion programmes in the hospital, SGH received the Singapore H.E.A.L.T.H Award (Silver), and the SHARE Gold Award for supporting the Community Chest SHARE programme.

QC Team PETS from Ward 76 clinched the NOVA award in 2003 with its winning project on 'Improvement in the current method of elevating patient's leg while sitting out of bed'.

The awards and accolades won by SGH staff are a testament of their commitment to excellence.

Outstanding Individual Performance

A/Prof Ho Lai Yun (Department of Neonatal & Developmental Medicine) received the Outstanding Paediatrician for Asia Award presented by the Association of Paediatric Societies in Southeast Asia Region.

Dr Ling Ai Ee (Department of Pathology) received the Excellence Award at the 6th Asia Pacific Congress of Medical Virology for her outstanding contributions to medical virology.

Dr Goh Yau Hong (Department of Otolaryngology) received the Enterprising Agency Award at the Enterprising Challenge Award for his research on developing a disposable diagnostic card to detect early-stage nasopharyngeal cancer.

Dr Gan Yu Unn and Dr Tay Kiang Hiong (Department of Diagnostic Radiology) received the Young Radiologist Award and the Best Paper Award respectively at the 12th Annual Scientific Meeting of the Singapore Radiological Society.

Dr Beh Siu Joo (Department of Diagnostic Radiology) received the Best Paper Award under the Ambulatory Category at the International Conference on Evidence-based Medicine incorporating the 10th Annual SGH-Stanford University Hospital Joint Update 2003.

Ms Lou Huei-Xin and Ms Andrea Kwa (Pharmacy Department) received second prizes in the Oral Presentation and Poster presentation respectively at the Pharmacy Congress. Ms Lou was also the winner of the Best Paper award at the Society of Transplantation Singapore Meeting.

Ms Koh Lai Heng (Department of Pathology) was conferred the President's Social Service Award for Individuals for her long-term commitment to volunteering.

Mdm Pek Lye Peng (Ward 52A) won the Singapore Labour Foundation Educational Tours Award for Model Workers, in recognition of her outstanding work performance, exemplary work conduct and good work attitude.

collaboration

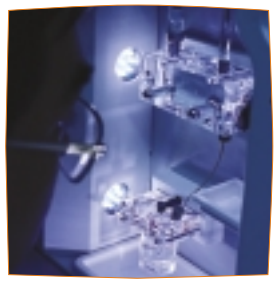
International Research Collaborations

Assoc Prof Xiao Zhi Cheng (Department of Clinical Research) led a 24-member international research team to discover an interaction between F3/contactin and Notch1 on the surface of cells found in the central nervous system. The breakthrough, which was published in CELL, provided invaluable insights into the regeneration or repair of the myelin sheath.

In another international project, the Department of Gastroenterology started a research initiative involving Hong Kong, China, United Kingdom, Germany and Malaysia. The team would study the use of MARS for critically ill patients with treatment of viral liver disease.

Innovative Liver Cancer Treatments

PSiOncology Pte Ltd, a joint venture between SGH and the UK-based biotechnology company pSiMedica, worked on developing innovative localised treatments, using nano-structured porous silicon, for cancers of the liver and other abdominal organs in patients with late stage, inoperable disease. The efficacy of its lead product, 32-P-Biosilicon™, was recently demonstrated in pre-clinical brachytherapy trials using animal models bearing human tumours. In its next phase, the collaboration would be conducting clinical trials on patients with inoperable liver cancer to assess the safety of the product and to monitor the efficacy of the implantable radioactive device.



The discovery of an interaction between F3/contactin and Notch1 on the surface of cells found in the central nervous system - a breakthrough which provided invaluable insights into the regeneration or repair of the myelin sheath.

Local Research Collaborations

The Department of Endocrinology collaborated with the Dermatology Unit to investigate the prevalence of chronic urticaria and other cutaneous manifestation of Graves' Disease. The aim was to identify patients with Graves' Disease who were at risk of cutaneous manifestation by detecting a special group of antibodies directed against the receptors on mast cells.

The Department of Urology designed and developed a robotic prostate biopsy device, in collaboration with the National Cancer Centre and Nanyang Technological University. The device would be undergoing clinical trial to assess its accuracy and reproducibility in biopsy needle delivery to a pre-determined intra-prostatic area.

The Speech Therapy department participated in a multi-centre, longitudinal study in the management of clefts and secondary palate.

Clinical Trials

The Department of Experimental Surgery implemented 35 research projects, with six contracted and collaborative projects in pre-clinical trial evaluation of drugs and devices conducted with the local and overseas industry. The Associate for Accreditation and Assessment of Animal Care conducted a preliminary evaluation of the department's programmes and facilities during the year, as part of the department's plan to achieve international standards and accreditation.

In addition, the Department of Gastroenterology was involved in various clinical trials on treatment-resistant chronic hepatitis B, using various new nucleoside analogues.

Advanced Training for Healthcare Professionals

The Postgraduate Allied Health Institute was set up in July 2003, offering 350 training places in 50 professional development courses and clinical attachment programmes. These courses provided a formalised framework in the development of advanced professional skills and competencies for allied health staff.

Despite disruptions caused by the SARS outbreak, the Postgraduate Medical Institute conducted six Continuing Medical Education programmes for more than 500 general practitioners during the year. It also collaborated with the Singapore Medical Association to hold seven CME series seminars on medical ethics and health law.

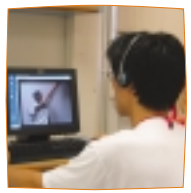
Knowledge Sharing with Overseas Students

By offering various scholarships, the Postgraduate Medical Institute attracted 43 foreign doctors from 14 countries to undertake postgraduate training. The Associate Dean's Office also accepted 45 overseas elective students for attachment at SGH during the year.

The Institute of Advanced Nursing also had an active year, collaborating with the Ministry of Foreign Affairs to conduct the Nursing Management course for participants from 14 countries. The Learning Centre organised hospital management training and study visit programmes for more than 110 healthcare professionals from China, Thailand and Australia.

Public Education for the Community

In an ongoing public health education programme, doctors, nurses and allied health professionals from SGH gave about 80 talks at public forums or health fairs organised by the hospital or in collaboration with community organisations.



The introduction of the E-physiotherapy service enables patients to undergo rehabilitation from the comfort of their own home, while the Surgical Assessment Clinic provides pre-operation assessment which prepares and educates patients for their surgery.

Support for Singapore's Healthcare Aspirations

As the largest player in the public healthcare sector, SGH set the example by introducing corresponding initiatives to respond to the Ministry of Health's eight healthcare priorities unveiled by Acting Minister for Health, Mr Khaw Boon Wan in August 2003 (see chart below).

commitment

New Programmes to Boost Patient Care

The year saw the introduction of a Renal Health Management Programme to streamline and coordinate the care of patients with chronic kidney disease or chronic renal failure. The programme allowed for continued care between the primary healthcare team at the polyclinics and the hospital-based nephrological service at SGH.

SGH also introduced Speech Therapy and Occupational Therapy for children with Autism Spectrum Disorder while they waited their turn to enrol in the STEP programme at Margaret Drive Special School. The speech therapy would provide early intervention, helping these children develop their communicative ability during their two-year wait for admission to the school.

Physiotherapy by Internet

E-physiotherapy was a new service introduced for the benefit and convenience of patients who were unable to travel to the hospital for treatment due to physical limitations or lack of time. It allowed for physiotherapy sessions to be conducted over the internet while patients underwent rehabilitation at home. The new service provided continuing care for patients recovering from stroke, traumatic head injuries, Parkinson's Disease and other neurological conditions. It was an especially viable service option during the SARS outbreak, during which patients stayed away from hospitals.

Active Case - Coordinating Roles for Nurses

The nurse case-coordinator assumed a more active role in discharge planning and health education under a new Ward-Based Case Management System. He or she would focus solely on supervising patient care, paving the way for establishing a stronger rapport between the nursing staff and the patients and

Ministry of Health Priorities	SGH Initiatives
• Build a healthy population	• Healthy Lifestyle programme
• Manage diseases	• Disease Management Programmes, SGH Homecare services
• Exploit information technology	• SMS reminders, e-prescriptions, e-Menu, e-physiotherapy
• Manage healthcare inflation	• Savings through GPO, "Cut Waste" theme
• Ensure healthcare financing through 3 Ms	• Cost-effective pricing strategies
• Exploit economic value as regional hub	• Hospital management consultancy, regional business development tie-ups
• Counter disease outbreak	• Epidemiological & Surveillance unit
• Safeguard medical standards	• Evaluate over-servicing (drugs/investigations) and prolonged stay

The Inpatient Pulmonary Rehabilitation Programme helps patients with chronic lung problems to achieve and maintain maximum level of independence.

their relatives. Just one nurse case-coordinator would now be able to provide relatives with advice on the patient's condition and assistance in discharge planning and placement in step-down facilities.

The nurse case-coordinator would also be making on-line referrals to the community hospitals and nursing homes under a new Discharge Planning Programme. This programme incorporated two new IT systems – the Community Healthcare Management System and the Integrated Care Internet Services – in the wards to provide prompt information transfer between the hospital and the step-down facilities, resulting in a smoother transition for patients and their caregivers.

Foot Screening of Diabetic Patients

Patients at the Diabetes Centre, who were referred by polyclinics, would now receive a more appropriate level of care with the introduction of protocol-led pathways. These pathways included routine foot screening and patient education by the podiatrist during the patient's first visit to the centre to allow for the detection of early foot problems.

Support for Burn Patients

A Burns Support Group was formed to provide pyschological and social support to burns survivors. The group would comprise burns survivors and hospital staff mainly from the departments of Plastic Surgery, SGH Burns Centre, Medical Social Services and the Rehabilitation Centre. A dedicated Medical Social Worker would also operate an electronic information hot-line dedicated to meeting the needs of survivors and their family members.

New Cord Blood Bank Under Planning

Plans to set up the Singapore Cord Blood Bank gained momentum during the year driven by SGH's Department of Haematology. This first public cord blood bank in Singapore would be launched in 2004 under the collaborative efforts of SingHealth, National Healthcare Group and other partners.

Action against SARS

SGH played a key role in the fight against the SARS virus when the outbreak affected Singapore in March 2003. A SARS Taskforce was established immediately to direct hospital-wide efforts to contain the infection adopting the 'protect, detect and isolate' strategy.

Through internal and public communication channels within the hospital, SGH stressed the importance of personal hygiene, safety and precautionary measures in the fight against the deadly virus. Staff were issued with personal protective equipment, and mandatory temperature taking became a part of the daily routine.

SGH became the region's first hospital to include pain as a fifth vital sign.

The hospital also implemented stringent infection control measures. All ICU units in the hospital were renovated with negative-pressure isolation rooms and high-efficient particulate filters, while isolation wards were created to admit patients suspected of the infection. While visitors were screened, the two-visitors per patient policy was strictly enforced and contact tracing performed when necessary. Departments such as the Medical Social Services and Behavioural Medicine were also active in providing support in the form of counselling and debriefing for staff during the height of the crisis.

The Department of Internal Medicine played an instrumental role during the outbreak when it admitted the first laboratory-associated case of SARS. The early recognition and isolation of the patient within an hour of his arrival in the ward helped in preventing a recurring outbreak in Singapore. The Pathology Department was also active in diagnosing the SARS virus during the crisis as the department's Virology section was appointed a World Health Organisation Collaborating Laboratory for the diagnosis of the SARS virus. The newly built Biosafety Level 3 laboratory, equipped with the latest diagnostic technology for the safe diagnosis and typing of dangerous microorganisms, was fully utilised and contributed significantly to the diagnostic efforts during the crisis.

Sadly, the hospital lost two staff members in the fight against SARS. Dr Alexandre Chao from the Department of General Surgery and Mdm Kiew Miyaw Tan from the Urology Centre succumbed to the disease on 22 April and 25 April respectively.

SGH		
Size	**FY 2003**	**FY 2002**
Bed Complement (as at end Mar)	1,545	1,501
Beds in Service	1,407	1,386
Workload		
Bed Occupancy Rate	70.7%	79.7%
Inpatient Admissions	56,529	68,126
Inpatient Discharges	57,027	68,224
Total Patient Days	364,388	403,261
Average Length of Stay (days)	6.4	5.9
Total Surgical Operations	59,418	71,604
Day Surgeries	32,472	37,100
Inpatient Surgeries	26,946	34,504
SOC Attendances	479,855	567,986
A&E Attendances	105,459	116,918
Staffing (Average Monthly)		
Total	5,053	4,953
Doctors	503	469
Nurses	1,948	1,905
Allied Healthcare Professionals	827	802
Others	1,776	1,776