

National Cancer
Centre Singapore

SingHealth

A regional centre of excellence, the National Cancer Centre Singapore (NCCS) is a one-stop centre offering a holistic range of clinical services to patients. Its inspirational concept of care is patient-focused, with multidisciplinary teams of professionals working together to improve the quality of life for patients and their families. NCCS and its nexus of hospitals treat about 69%* of cancer patients in the public sector. NCCS also conducts clinical and basic research, and develops public education programmes wholly directed at the prevention and treatment of cancer.

*MOH Annual Statistics Bulletin 2005

Message from the CEO



We have embraced changes over the past year to raise the standards of holistic care at NCCS.

Cancer management has taken on an exciting dimension with a suite of new treatment protocols, screening technologies and educational programmes to detect cancer earlier and improve patients' chances of treatment and cure. On the research front, we have advanced our understanding of battling cancer with innovations to better predict individual susceptibility to disease, more precisely diagnose cancer, and tailor-make treatment based on detailed molecular understanding.

In a gratifying affirmation of our expertise, one of our clinician scientists won the Merit Award at the meeting of the American Society of Clinical Oncology 2005. The centre's success is due in no small measure to the quality of our staff. Their dedication, drive and talent have helped lessen the burden of cancer patients.

We will continue to strengthen our clinical and research collaboration with regional cancer centres, build our research endowment and strengthen our professional audit to provide measurably better care to our patients.

A handwritten signature in black ink that reads "Soo Khee Chee". The signature is written in a cursive, flowing style.

Professor Soo Khee Chee
Director, NCCS

CLINICAL EXCELLENCE

Advanced Anti-Cancer Treatments

The Department of Medical Oncology continues to introduce new drugs to treat cancer. Drugs like Herceptin, which improves the chance of survival for many breast cancer patients, are being offered to eligible patients. Overseas patients with diseases that had no effective treatment in the past, such as Glivec-resistant gastrointestinal stromal tumour and renal cell carcinoma, now seek treatment here. The number of new patients has increased by 15-20% compared with that in the same period in 2004, consolidating NCCS' status as a regional clinical trial centre.

Tailored Comprehensive Screening Programmes

The Neoplasm Interception Programme (NIP) clinic opened this year to provide cancer screenings. NIP is a specialist clinic that nips cancer in the bud through cancer risk evaluation. The comprehensive screening programme is tailored to each individual's risk profile in the major cancers.

Expertise in Performing Complex Surgeries

The Department of Surgical Oncology is performing a higher number of complex procedures in various surgical sub-specialties, in particular head and neck, hepatobiliary, pancreas and thoracic surgeries. It is rapidly establishing itself as a regional referral unit for complex cancer surgery. New procedures introduced include peritonectomy and intra-peritoneal chemotherapy for the management of advanced intra-peritoneal disease, sentinel lymph node biopsy for breast cancer surgery, and neo-adjuvant chemotherapy and surgery for initially

inoperable metastatic colorectal cancer to the liver. In addition, the department continues to push the frontiers of surgery by offering palliative resections for better pain management.

Cutting-edge Technology

The Department of Oncologic Imaging's acquisition of 64-slice Multi-Detector Computed Tomography (MDCT) advances the early detection and treatment of cancer. The 64-slice MDCT allows for technically advanced applications in the screening for lung and colon cancers. These applications include CT colonography and low-dose CT for lung cancer screening. CT colonography is non-invasive and has been shown in studies to be as efficacious as conventional methods in detecting cancer.

Faster imaging opens doors to new applications like perfusion imaging and also supports clinical trials. In one example, the effect of anti-angiogenesis agents on tumour can be observed through dynamic contrast-enhanced CT studies. High-quality imaging allows doctors to make better therapeutic decisions for their patients, as well as supports cancer-screening initiatives for the above-average risk population in Singapore.

The Department of Radiation Oncology is the first in South-east Asia to acquire a computer radiography (CR) system. This compact online image review and management system provides patients with fast, cost-effective, and environmentally friendly film-less images.

In another step forward, Intensity Modulated Radiation Therapy (IMRT) has been used to treat 112 nasopharyngeal cancer (NPC) patients. IMRT

improves the quality of life of patients by reducing the xerostomia (dryness of the mouth) rate. The use of this cutting-edge technology has also shown a local control and survival advantage.

Clinical Trials


The Clinical Trials Office of the Division of Clinical Trials & Epidemiological Sciences coordinated over 60 clinical trials in 2005. Many of the trials conducted were early-phase trials that gave NCCS the opportunity to use very new drugs. About half the number of trials was initiated by NCCS investigators or in collaboration with international trial groups.

Besides providing statistical and epidemiological support for investigators, the Biostatistics and Epidemiology group also initiated and carried out its own research projects. Among these were projects investigating:

- Bayesian statistical designs for clinical trials;
- dormancy of breast cancer after mastectomy;
- epidemiology of breast cancer in Singapore;
- oral squamous cell carcinoma;
- treatment of medulloblastoma in children.

Advances in Research

In FY2005, 97 of NCCS' publications were internationally ranked at Journal Impact Factor (JIF) greater than or equal to 2.0

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Breast Cancers

The Division of Medical Sciences offers a clinical research service to women at high risk of breast and/or ovarian cancers. This comprises genotyping, mutation and genomic rearrangement analysis of breast cancer genes (BRCA1 and BRCA2). In particular, genes on chromosome 11 are being analysed for the identification of possible cancer-related genes, which may be important in the diagnosis, prognosis and treatment of cancer.

Photodynamic Diagnosis and Treatment (PDT)

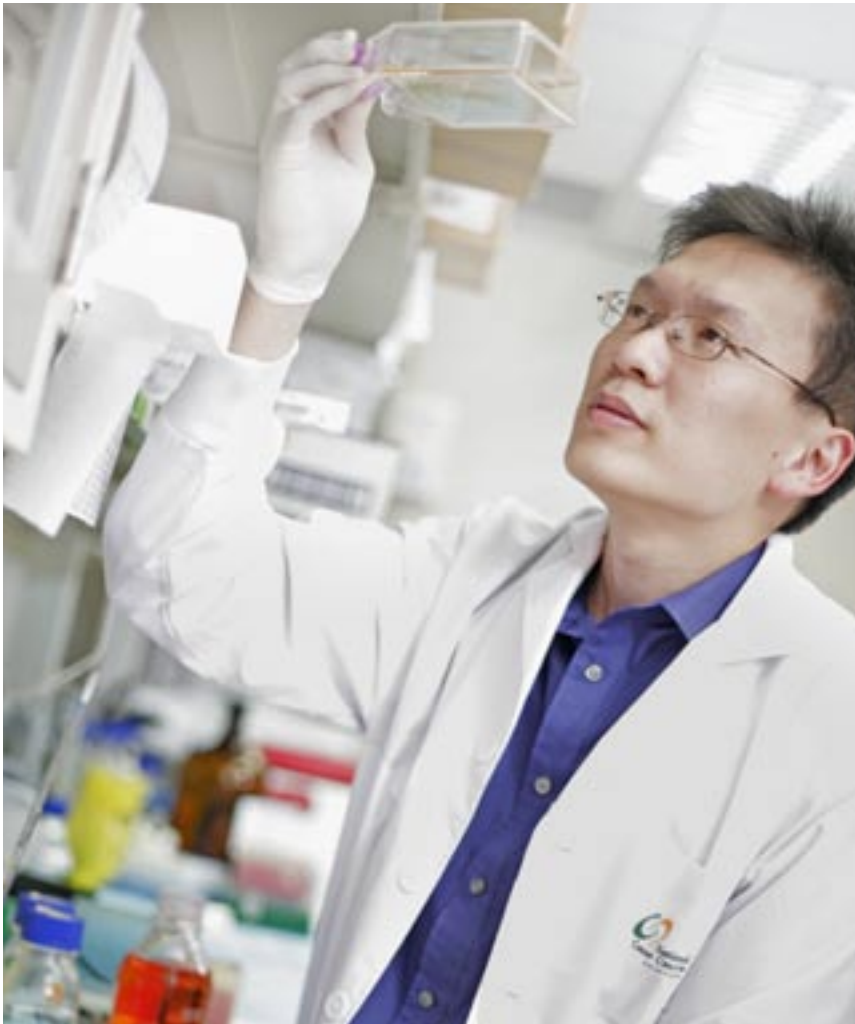
Pioneered by the Division of Medical Sciences at NCCS, this technique uses fluorescence diagnosis for auto-fluorescence early cancer detection and drug-induced light therapy to treat cancer. Findings have shown that these diagnostic methods using laser confocal fluorescence endomicroscopy has the potential to facilitate the early detection of head and neck and bladder cancers.

Liver Cancers

Dr Caroline Lee's work with the hepatitis B virus (HBV) X protein has provided evidence that HBV-dependent hepatocellular carcinoma (HCC) may be caused by an impaired cellular DNA repair mechanism disrupted by the X protein. Her laboratory has also identified a dysfunctional gene in HCC patients which causes chromosomal instability.

Brain Tumours

Brain tumour research at the Division of Medical Sciences has identified a novel mechanism of Temozolomide (TMZ) glioma cell genotoxicity. TMZ is a crucial chemotherapeutic agent in treating patients with brain tumours. NCCS is focused on overcoming chemotherapy resistance in glioma tumour cells, so that patients can live longer. The lab has produced findings on how glioma cells can undergo massive tumour necrosis by the addition of celecoxib to enhance radio sensitivity of glioma cells.



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COLLABORATION

Local Partnerships

Working with Community Agencies

The Department of Medical Oncology worked closely with community agencies such as the Singapore Cancer Society to provide seamless care to patients and raise public awareness of cancer detection and treatment.

Establishment of Cancer Databases

The Department of Surgical Oncology worked with the Singapore Cancer Syndicate and other public institutions to establish a comprehensive national database on hepatocellular carcinoma. It also helped build a gastric and lung cancer database.

Academic Partnerships

The Department of Oncologic Imaging collaborated with local universities in various fields.

- Automated tumour volume measurements: software was developed with unique image processing algorithms to provide objective and reproducible measurements of tumour volume for the assessment of response to treatment.
- Prostate spectroscopy: NCCS is one of the few centres in Asia-Pacific (the others in Japan, China and Australia) that offers prostate spectroscopy to detect prostate cancer with higher precision.

► The Division of Cellular and Molecular Research's wide-ranging research interests include basic mechanistic studies in molecular biology, biochemistry, genetics, cell biology and immunology.

- Angiogenesis imaging: Angiogenesis can be mathematically modelled by studying the kinetics of gadolinium as it passes through tumour. This form of imaging detects the start of cancer by detecting the formation of blood vessels of early tumours.

International Partnerships

Partnerships in Medical Oncology

The Department of Medical Oncology collaborated with Indonesian oncologists through the Homepedin organisation. Joint research projects were set up with the Van Andel Research Institute in Michigan, US.

Cellular and Molecular Research

The Division of Cellular and Molecular Research's wide-ranging research interests include basic mechanistic studies in molecular biology, biochemistry, genetics, cell biology and immunology. The following international collaborations were undertaken:

- Dr Paula Lam collaborated with University of Zurich, Switzerland, in the characterisation of pYEBac102 recombinants.
- Prof Malcolm Paterson worked with King Faisal Specialist Hospital & Research Centre in Riyadh, Saudi Arabia, on "Initiation of strand incision at a G:T mismatch in model DNA by human cells". NCCS also worked with its Saudi counterpart on triggering the calcium transient by non-ionising (far UV) radiation. In addition, collaborations extended to University of Alberta Edmonton, Canada, and the Oregon Health & Science University in Portland, US. Research collaboration with the University of Edinburgh, UK, was in the field of radiobiological accuracy and uncertainty.
- Dr Hung The Huynh worked with McGill University, Canada, on chemotherapy prevention and the use of anti-estrogen treatments of breast cancer. His liver cancer research focused on the use of SarCNU in the treatment of hepatocellular carcinoma.
- Dr Patrick Tan teamed up with both the University of Hong Kong and the University of Florida, US, to study the genomics of demethylation in cancer.
- Dr Kanaga Sabapathy embarked on studies related to p53/p73 with the University of Milan, Italy. He also collaborated with the National Helania

Research Foundation in Athens, Greece, to study the role of c-Jun/JNK. This key protein regulates cell death and survival and is highly active in cancers, strokes and Alzheimer's disease.

- Dr Ganesan Gopalan worked with the University of California in Irvine, US, on the generation of Aurora-A knockout mice. Aurora-A is an oncogene that is over-expressed in cancer patients. Studies hope to explore whether mice without this gene do well.
- Prof Soo Khee Chee and Dr Olivo Malini partnered Munich scientists to study biophotonics instrumentation in cancer diagnosis.

Clinical Trial Collaborations

Projects from the Division of Clinical Trials and Epidemiological Science over the past year include:

- The development of software for the computation of sample sizes in early-phase clinical trials, in collaboration with the United Kingdom Children's Cancer Study Group and University of Sheffield, UK.
- A study on "Efficacy, disease progression and mammographic density" as a follow-up to the Singapore Breast Screening Project in collaboration with the National University of Singapore, Wolfson Institute of Preventive Medicine, UK, and the UK Medical Research Council.

- Research into oral lichen planus and oral squamous cell carcinoma, in collaboration with National Dental Centre, Singapore, University of Leicester, UK, and University of Georgia US.
- Investigation of oncologic treatment of medulloblastoma in children, in collaboration with University of Leicester, UK.

COMMITMENT

Patient Support Programmes

CanSurVive 2005

The Cancer Education and Information Service department and Patient Education department held the first outward-bound programme for cancer survivors in Singapore to commemorate World Cancer Survivors' Day on June 5, 2005. CanSurVive was a one-day programme for survivors aged 15 to 55 years old. This experiential programme aimed to restore confidence and hope in survivors through the completion of challenging obstacles. After the games, the 70 participants including patients, their families and caregivers continued to work with social workers and counsellors to make the most of their new life after cancer.

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Enreach in Mandarin

Enreach, a critically-acclaimed residential outreach programme, was held for the first time in Mandarin to meet the needs of Mandarin-speaking patients. The session empowered and bonded patients and their families by providing opportunities for sharing, discussion and learning. The programme was jointly organised by the Singapore Cancer Society.

Breast Cancer Awareness Month

NCCS hosted the National Breast Cancer Awareness Month in October 2005. Dr Ho Gay Hui spearheaded the effort. Among the public outreach activities were "pink silhouette" walks, public forums, car rallies as well as treasure hunts and art exhibitions by cancer survivors. Also taking part were member organisations including The Cancer Institute, Breast Cancer Foundation and the Singapore Cancer Society.

Lung Cancer Awareness Month

Dr Koong Heng Nung chaired the planning committee for the Lung Cancer Awareness Month in November 2005. The committee, which included members from the Singapore Cancer Society and Health Promotion Board, chose the theme "Women and Smoking" for that year's campaign. A series of articles on the dangers of smoking among women and of second-hand smoking was published in local newspapers. New advances in the treatment of lung cancer were also highlighted.

Public Education Programmes

Through various school and community outreach programmes, the Cancer Education and Information Service department conducted and organised cancer talks that were attended by more than 23,400 people. The Cancer Helpline also received more than 6,000 callers.

Sharing Expertise

The Department of Psychosocial Oncology contributed to the professional growth in the field by offering attachments to social work students from Shanghai, under the University of Hong Kong Social Work (Graduate) Placement Programme. The department also hosted undergraduates from the National University of Singapore and Monash University, as

well as social workers and counsellors from various hospices.

NCCS hosts the secretariat of the Asia-Pacific Hospice Palliative Care Network (APHN), which expanded in 2005 from 133 to 137 member organisations, and from 691 to 727 individual members. In 2005, NCCS consultants made 10 trips to support the development of palliative care by conducting training of member organisations in various countries.

The Department of Surgical Oncology also hosted several overseas fellows keen to learn complex surgical oncology procedures.

Volunteerism

Dr Cynthia Goh and Dr Grace Pang went to Vietnam's National Cancer Institute in Hanoi to train medical personnel on palliative care. Dr Yong Wei Sean performed surgeries in tsunami-hit Aceh.



Awards

Service Excellence

Dr Koo Wen Hsin & Dr Tay Miah Hiang were 2005 winners of the Healthcare Humanity Awards presented by National Healthcare Group. The awards recognise inspirational role models who exemplify the values of courage, extraordinary dedication, selflessness, steadfastness in ethics, compassion and humanity.

Four NCCS staff received the Excellence Service Award from SPRING Singapore for their outstanding service – Dr Koong Heng Nung, Senior Consultant, Department of Surgical Oncology; Senior Staff Nurse Audrey Quek Ai Huah; Senior Staff Nurse Tan Cheng Khim; and Enrolled Nurse Sorada Srisatit.

Dr Ho Gay Hui, Consultant, Department of Surgical Oncology, won the Service Quality Partners Award presented by Singapore General Hospital in 2005.

Senior Nurse Manager Flora Yong & Senior Staff Nurse Alice Chua Foong Sin received the SingHealth-Lee Foundation Nursing Excellence Award, the cluster's highest honour for outstanding nurses.

Senior Staff Nurse Alice Chua Foong Sin also won the Ministry Of Health Nurses Merit Award, which recognises nurses' professional development as well as outstanding dedication and commitment to nursing.

Senior Staff Nurse Maitri Lau Choon Kuan and Senior Nurse Lee Kim Hua clinched the NCC Care Excellence Award for their excellent customer service. The latter was also awarded the Singapore General Hospital prize for Outstanding Performance in the Advanced Diploma in Oncology Nursing.

Research and Clinical Excellence

Dr Tan Min-Han received the prestigious Merit Award by the American Society of Clinical Oncology (ASCO) in Florida, US, in May 2005. The award recognises his research on the genetic determinants of survival in kidney cancer.

A/Prof Malini Olivo received the SingHealth Foundation Investigator Excellence Award 2005 for her outstanding contribution to advancing knowledge in the field of bio-photonics imaging for the early detection of cancer in Singapore.

Ms Constance Saw was conferred the Best Oral Presentation for her work on "novel 3-D confocal microscopy and real time uptake of hyperin visualized in human bladder carcinoma" during the 2nd Asian Association Schools of Pharmacy in Bangkok, Thailand.

Mr Ren Jianwei won the 1st Prize for Best Basic Scientific Poster in the 2005 Combined Scientific Meeting. Mr Ren's research, which focused on FAT10, a protein over-expressed in numerous human cancers, has shown that the FAT10 interferes with the mitotic checkpoint, resulting in increased chromosomal instability.

The NMRC- Hong Leong Foundation Medical Research Scientist award was presented to Dr Paula Lam for her work on "Engineering a replication competent HSV-1 amplicon viral vector". Her work revolves around refining the viral vectors to improve the efficacy of delivering therapeutic genes into site of disease.

During the Graduate seminar 2005 organised by Department of Pharmacy, NUS, Mr William Chin was awarded the Best Oral Presentation for his work on the "Therapeutic efficacy of Chorlin e6 conjugated with PVP as a novel sensitizer for phototherapy".

Dr Yong Wei Sean was awarded the Sir James Fraser Travelling Fellowship 2005 by the Royal College of Surgeons Edinburgh to enhance insights on the treatment of breast cancer.

Dr Ivy Ho was presented with a fellowship to the EMBO Workshop Third IRCC International Cancer Conference in Torino, Italy.

	FY 05	FY 04
Workload per annum		
Day Surgeries	9,549	9,215
Specialist Outpatient Clinic Attendances	117,696	114,021
Staffing (as at end March)		
Total	420	389
Doctors	85	71
Nurses	68	64
Health Sciences Professionals	95	87
Others	173	168