

We.

This is a story about our partners and us. Our collaborative journey in research, medicine and clinical practice.

Forming a symbiotic entity to serve the community. As the healthcare landscape is rapidly evolving, with an ageing population and rising burden of chronic diseases, our close existence has never been more vital. Inside these pages, discover research highlights and grinds *we* face daily. Read on.

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Adding years of healthy life

We. A Story About Our Partners & Us.
NHG Biennial Research Report 2010-2011

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National Healthcare Group

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About Us

The National Healthcare Group (NHG) is a leader in public healthcare in Singapore, recognised at home and abroad for the quality of its medical expertise and facilities. Care is provided through an integrated network of nine primary healthcare polyclinics, acute care hospitals, national specialty centres, innovative virtual specialty centres and business divisions. Together, they bring a rich legacy of 340 years of medical expertise to our philosophy of patient-centric care.

By designing accessible and seamless healthcare services around patient needs, NHG ensures that patient care is fully coordinated within the cluster and is also extended to high-level collaborations with other healthcare providers at home and abroad.

NHG's vision of "Adding years of healthy life" is more than just about healing the sick. It encompasses the more difficult but infinitely more rewarding task of preventing illness and preserving health and quality of life. With some 10,000 staff, NHG aims to provide care that is patient-centric, accessible, seamless, comprehensive, appropriate and cost-effective.

Foreword

Research innovations have created paradigm shifts on how treatment and healthcare are being delivered to our patients every day, and inter-disciplinary collaboration is important in bringing about this change.

At NHG, we believe that this can be achieved through strategic partnerships and investments in research manpower to equip our clinician scientists and research professionals with the relevant skills and knowledge to face the challenges in research today.

FY2010 – 2011 had been significant for NHG in building our foundation for current and future research. I am happy to share that our researchers have successfully secured a total of \$6.0 million (FY2010) and \$4.84 million (FY2011) of research funding through external sources such as National Medical Research Council (NMRC), A*STAR, Ministry of Health (MOH) and National Kidney Foundation (NKF), as well as through internal funding sources – the Small Innovative Grant (SIG) and Clinician Leadership in Research (CLR) Programme. Our researchers received a total of 61 local and international awards and produced 587 publications over these 2 years; 45.2% increase in the number of awards received and 39.4% publications produced as compared to FY2008-2009.

As NHG continues to be a leader in Infectious Diseases and Neuroscience research through the Translational and Clinical Research (TCR) Programme led by Tan Tock Seng Hospital (TTSH) and the Institute of Mental Health (IMH) respectively, we are also dedicated to developing our other areas of strengths in order to advance healthcare through research – within and beyond our institutions, locally and internationally, intra- and inter-discipline.

NHG is privileged to be the primary clinical partner of Singapore's newest medical school, Lee Kong Chian School of Medicine (LKCMedicine) – a joint medical school by two world-class universities – Nanyang Technological University



A/Prof Lim Tock Han
DEPUTY GROUP CHIEF EXECUTIVE OFFICER
(EDUCATION & RESEARCH)
NATIONAL HEALTHCARE GROUP

(NTU) and Imperial College of London (ICL). This partnership has called for NHG to ramp up our research efforts to be in sync with our academic partner's research vision and foci and to develop our pool of clinician scientists so that they can complement NTU/LKCMedicine's expertise in catalysing their discoveries, development and implementation of innovative solutions to meet the pressing clinical needs of our patients. In order to foster greater collaborations with NTU, the NHG-NTU Innovation Seed Grant (ISG) was launched in August 2011. Designed to fund cross-disciplinary collaborative projects in medical innovation and improvement including diagnostics and therapeutics, 11 projects with a total value of \$500,000 were awarded.

In FY2010-2011, we had also committed a total of \$1.0 million to support the development of 14 clinician scientists through our SIG and CLR Programme. The programme was jointly launched with Khoo Teck Puat Hospital.

In order to contribute to the national target of 160 clinician scientists by 2015, NHG launched the Clinician Scientist Career Scheme (CSCS) which aims to provide a customised research career track for our clinicians. This scheme is a testimony of NHG's commitment to developing clinician scientists within the cluster to enable them to vie for larger external research grants, spearhead research in NHG, develop NHG's areas of strength as well as contribute to raising the standard of care and delivery through their research innovations. Through such scheme, we can also look forward to more collaboration with our valued partners, which include academic and research institutes, industry partners and government agencies.

Moving forward, we will continue to expand our research capability through building up our research manpower, research support network and infrastructure, foster greater collaborations and partnership and focus on developing our strengths, I am confident that with the strong management support for research within the cluster and NHG's unique culture of collaboration and teamwork, our clinician scientists will continue to propel forward to unravel complex research questions for the benefits of the patients we serve.

About the NHG Research Committee (RC)

The NHG Research Committee (RC) is the steering committee for research in NHG. The RC is chaired by Associate Professor Lim Tock Han, Deputy Group CEO (Education & Research), and comprises of members from NHG institutions.

The main functions of RC are to provide strategic research directions for NHG in line with the cluster and national research agendas, which includes collaboration with Nanyang Technological University / Lee Kong Chian School of Medicine. The RC reviews the recommendation for funding made by the SRC prior to approval by our NHG Senior Management (SMM).

A/Prof Lim Tock Han	Deputy Group CEO (Education & Research) <i>National Healthcare Group</i>
A/Prof Chong Siow Ann	Vice Chairman, Medical Board <i>Institute of Mental Health</i>
Dr Heng Bee Hoon	Director <i>Health Services & Outcomes Research National Healthcare Group</i>
Dr Mark Tang Boon Yang	Director of Research <i>National Skin Centre</i>
Dr Stephen Teoh	Head of Research <i>National Healthcare Group Eye Institute</i>
Dr Tang Wern Ee	Head, Clinical Research Unit <i>National Healthcare Group Polyclinics</i>
A/Prof Leo Yee Sin	Clinical Director <i>Communicable Disease Centre Tan Tock Seng Hospital</i>
Dr Leong Khai Pang	Assistant Chairman, Medical Board <i>Tan Tock Seng Hospital</i>
Dr Chan Kay Fei	Head of Department <i>Rehabilitation Medicine Tan Tock Seng Hospital</i>
A/Prof Ding Yew Yoong	Senior Consultant <i>Tan Tock Seng Hospital</i>

About the NHG Research Ethics Committee (REC)

The NHG Human Research Protection Program is under the oversight of the Research Ethics Committee (REC), which is appointed by the NHG Cluster Chief Executive Officer. The REC develops and implements policies and procedures related to human subjects protection, including both the Domain Specific Review Board (DSRB) and the Research Quality Assurance (RQA) program.

A/Prof Chin Jing Jih	Chairperson <i>Tan Tock Seng Hospital</i>
Dr Lee Soo Chin	Deputy Chairperson DSRB Domain B1 Chairperson <i>National University Health System</i>
A/Prof Sim Kang	DSRB Domain A Chairperson <i>Institute of Mental Health</i>
A/Prof Chng Wee Joo	DSRB Domain B2 Chairperson <i>National University Health System</i>
Dr Yong Wei Peng	DSRB Domain C Chairperson <i>National University Health System</i>
A/Prof Low Ying Peng	DSRB Domain D Chairperson <i>Tan Tock Seng Hospital</i>
Prof Nicholas Paton	DSRB Domain E Chairperson <i>National University Health System</i>
Dr Jason Yap	DSRB Domain F1 Chairperson <i>Agency for Integrated Care</i>
Prof Lee Wing On	DSRB Domain F2 Chairperson <i>National Institute of Education</i>
Ms Kuah Boon Theng	Legal Counsel <i>Legal Clinic LLC</i>
Mr Lek Siang Pheng	Legal Counsel <i>Rodyk & Davidson LLC</i>
Ms Cynthia Chan	Legal Counsel <i>Tan Tock Seng Hospital</i>
Dr Allan Harkness	Theologian <i>AGST Alliance</i>
Prof Alastair Campbell	Bioethics Advisor <i>Yong Loo Lin School of Medicine, National University of Singapore</i>

The Cast

We are 6 individuals from various NHG institutions starting the day with different tasks at hand. As different as our roles can be, we all serve one common purpose – to serve the community through research. And this would not be possible without our partners.



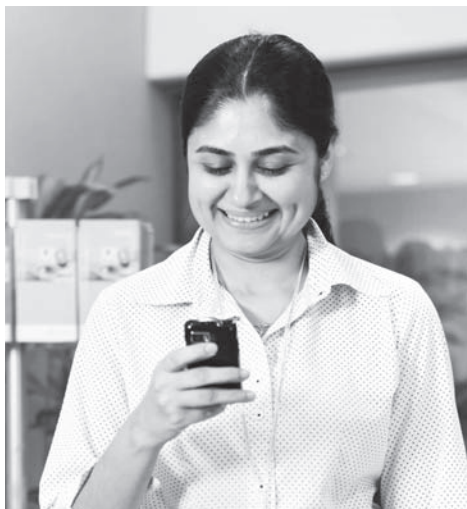
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Dr Nathan Goh

TAN TOCK SENG HOSPITAL
PRINCIPAL INVESTIGATOR
@thenateffect



08:59
TUESDAY AM

Institutional Support

A New Day

And we wonder as we begin this day, what will it bring – a day of anguish, restlessness and impossible pursuits? Or one that is filled with heartfelt memories, forging new friendships, aspiring new engagements, insightful collaborations and unbreakable bonds?

Every other day, we are posed with new challenges in our journey in research. Our healthcare and medical landscape is evolving rapidly. We need to keep abreast with current methodologies and research to meet with the growing needs and challenges. It has never been more crucial for us to work closely with our institutions with their specialised fields. Their relentless support and pursuit for perfection ensures quality performance on our side.

We know that when we call it a day, we can rest assured that as one we stand stronger and undeterred.

Our Institutions

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Tan Tock Seng Hospital (TTSH), established in 1844, is one of Singapore's largest multi-disciplinary hospitals with both the inpatient and outpatient services under one roof. The hospital has 36 clinical and allied health departments, 15 specialist centres and sees over 2000 patients at its specialist clinics and some 460 patients at its emergency department every day.

Its research strength lies in clinical research, which emphasises on the treatment and outcomes of patients in chronic diseases and infectious diseases.

It has always been TTSH's practice to determine the best ways of delivering care to the patient that is relevant, timely,

cost-effective and evidence-based. Many of the productive researchers in TTSH are busy clinicians, working on their own clinical research, pharmaceutical sponsored clinical trials and working with external collaborators. Research is very much encouraged and supported.

Clinical Research Unit (CRU)

In April 2011, the TTSH Clinical Research Unit (CRU) reorganised its structure to meet TTSH's research needs. From the historical administration, coordination and publication section, the CRU is organised into the following units:

- i. Biomedical Collaboration and Support Team;
- ii. Hospital Research Inventory Team;
- iii. Clinical Trials Support Team; and
- iv. Publications Support Team.

Between 2010 – 2011, the team successfully negotiated through 27 clinical trial agreements and budgets, 28 collaborative research agreements, 2 material transfer agreements, 19 confidentiality agreements and 1 service agreement.

For 2010/2011, the CRU processed more than 200 requests of feasibilities in clinical trials from pharmaceutical companies and clinical research organisations. Over the years, TTSH also saw an increase in the number of clinical trials initiated

by TTSH doctors. The CRU team had successfully assisted the investigators in 8 clinical trial certificate (CTC) applications and submission of progress reports for 12 ongoing projects, 2 CTC renewals and 2 Clinical Trial Test Materials (CTM) applications between 2010 and 2011.”

In terms of publications, 2011 was a harvest year for TTSH. A total of 281 publications were submitted in 2011 and 22 of these publications have an impact factor of >5, 92 with an impact factor of >2 and the rest with an impact factor of <2.

KEY RESEARCH PROGRAMME / FOCUS AREAS

Research Focus Areas	Key Principal Investigators
Anaesthesiology	Dr Nicholas Chua Dr Jonathan Tan Dr Mandy Lim
Breast Cancer	Dr Tan Ern Yu
Cardiology	Dr David Foo Dr Daniel Yeo Dr Paul Ong
Diagnostic Radiology	Dr Tan Cher Heng
Emergency Medicine	Dr Ooi Chee Kheong Dr Gregory Cham
Endocrinology	Dr Rinkoo Dalan Dr Melvin Leow
ENT	Dr Stephen Lo

Gastroenterology	Dr Charles Vu Dr Yang Wei Lyn
General Medicine	A/Prof Tay Jam Chin Dr Ashish Sule
Geriatric Medicine	Dr Chong Mei Sian Dr Laura Tay A/Prof Ding Yew Yoong
HIV-1 Research	Dr Ng Oon Tek Dr Mark Chen I-Cheng Dr Lin Li Dr Lawrence Lee Dr Arlene Chua A/Prof Lim Poh Lian Dr Ling Li Min Dr Lee Cheng Chuan Dr David Lye
Influenza	A/Prof Leo Yee Sin
Lab Medicine / Molecular	Dr Timothy Barkham
Other Infectious Disease	Dr David Lye Dr Angela Chow Dr Lim Poh Lian
Orthopaedic Surgery	Dr Ernest Kwek
Rehabilitation Medicine	Dr Karen Chua Dr Adela Tow Dr Kong Keng He
Respiratory & Critical Care Medicine	A/Prof Alan Ng

Respiratory pathogens	Dr Mark Chen I-Cheng A/Prof Leo Yee Sin
Rheumatology, Immunology and Allergy	Dr Leong Khai Pang Dr Howe Hwee Siew Dr Koh Ee Tzun
Trauma	Dr Chiu Ming Terk
Tuberculosis	Prof Wang Yee Tang Dr Cynthia Chee
STOP Dengue Translational Clinical Research	A/Prof Leo Yee Sin Dr David Lye
Urology	A/Prof Chia Sing Joo Dr Chong Kian Tai Dr Tan Yung Khan



Institute of Mental Health

The Institute of Mental Health (IMH) is a 2,000-bed acute tertiary psychiatric hospital situated on a 25-hectare campus at Buangkok Green Medical Park. Set amidst serene surroundings, IMH offers a comprehensive range of psychiatric, rehabilitative and counselling services for children, adolescents, adults, and the elderly.

IMH's tradition of care started in 1928. Over the years, IMH has gained a reputation for quality research. In 2008, the Ministry of Health, Singapore, entrusted IMH with a S\$25 million research grant to implement translational and clinical research into the causes of schizophrenia and related psychotic disorders.

Highlights

The vision of the IMH Research Division is to change the way we think about mental health and to change the ways we treat

INSTITUTE OF MENTAL HEALTH



Loving Hearts, Beautiful Minds

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those with mental illness. The key thrusts are in mental health policy research and translational and clinical research.

Translational and Clinical Research

These studies seek to generate scientifically relevant research that will contribute meaningfully to understanding behaviour and neurobiological processes. These processes inform the understanding of mental disorder, treatment response, and recovery. One of IMH's greatest assets is the large population of patients that it serves and its wide range of clinical expertise. This expertise encompasses the capability to do structured assessments of psychopathology in patients with different mental illnesses, and of different ethnic groups; as well as the cognitive assessments of these patients with a wide array of neuropsychological instruments.

Important components of this thrust are interventional studies that include clinical trials and other psychosocial and somatic treatments (both pharma and PI-initiated studies). With the establishment of IMH's Clinical Trial Unit (CTU), there is a wide variety of ongoing clinical trials. The CTU provides the clinical research infrastructure to support investigators in the design, conduct, and reporting of clinical trials. It also maintains quality controls (through monitoring and audit) and assists in the handling of the contractual and budgetary aspects of trials.

KEY RESEARCH PROGRAMME / FOCUS AREA	
Research Focus Areas	Key Principal Investigator(s) & Theme Lead(s)
Singapore Translational Clinical Research in Psychosis – This project examines the Vulnerability, Disease Progression, and Treatment in Schizophrenia and Related Psychoses	A/Prof Chong Siow Ann
Child Guidance – Child Related Conditions Such As Disruptive Behaviours and Autism	A/Prof Daniel Fung Dr Lim Choon Guan
Addiction Medicine Research – This includes studies on the Predictors of treatment outcome for pathological gamblers, Neuropsychological functioning among Addiction Patients and the first PI-initiated clinical drug trial that hopes to reduce the opiate withdrawal syndrome during inpatient detoxification	Dr Guo Song Dr Victoria Manning
Singapore Mental Health Study	A/Prof Chong Siow Ann

Well-being of the Singapore Elderly (WiSE)	A/Prof Chong Siow Ann A/Prof Mythily Subramaniam Dr Seng Kok Han
Health Services Research & Psychiatric Epidemiology	A/Prof Mythily Subramaniam
Neuroimaging, Genetic and Imaging-Genetic Paradigms to Elucidate Brain White Matter Disruptions Underlying Major Psychoses	A/Prof Sim Kang
Phenotyping and Interventive Research	Dr Jimmy Lee
Nursing Related Research Areas	Ms Poh Chee Lien



Ang Mo Kio Polyclinic



Clementi Polyclinic

NATIONAL HEALTHCARE GROUP POLYCLINICS



National Healthcare Group
POLYCLINICS

National Healthcare Group Polyclinics

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Clinical Research Unit

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National Healthcare Group Polyclinics is committed to our mission to be the leading health promoting institution that helps advance family medicine and transform primary healthcare in Singapore. Our research focus is in primary care research that improves the access, effectiveness and quality of primary healthcare services especially in the area of chronic care delivery. Significant progress has been made in research in National Healthcare Group Polyclinics over the past 2 years.

Our staff have been actively engaged in research projects in the areas of chronic disease management and care delivery in

the primary care setting. Two of our family physicians: Dr Lee Eng Sing and Dr Darren Seah successfully applied for the NHG-KTPH Clinician Leadership in Research Programme 2011. Another two National Healthcare Group Polyclinics physicians: Dr Zheng Mingli and Dr Predeebha Kannan were awarded the NHG HOMER 2011 grants for their proposals to conduct studies in interprofessional collaboration and education in primary care.

“National Healthcare Group Polyclinics aims to continue to build up its expertise in primary care research and its translation into quality patient care.”

In addition to conducting investigator-initiated studies, National Healthcare Group Polyclinics has collaborated with other healthcare institutions as well as tertiary institutions in a variety of research studies. National Healthcare Group Polyclinics has also conducted several pharma-sponsored vaccine clinical trials including pneumococcal and influenza vaccine trials over the past 2 years.

KEY RESEARCH PROGRAMME / FOCUS AREA

Research Focus Areas	Key Principal Investigator
Study of Attitudes of Polyclinic Doctors and Nurses Towards Interprofessional Collaboration	Dr Zheng Mingli

Use of Blended Inter-professional Learning In An Infection Control Workshop In Primary Care	Dr Predeebha Kannan
Health Literacy And The Primary Care Healthcare Professional	Dr Tang Wern Ee
A Physician Led Weight Loss Programme - Does It Work?	Dr Richard Lee
Colorectal Cancer Screening With FOBT: Does Physician Education And Recommendation (E&R) Result In Increased Uptake In NHG Polyclinics?	Dr Angelia Chua
The Impact of Interpersonal Continuity of Care on Patients with Type 2 Diabetes Mellitus: A Retrospective Cohort Study	Dr David Ng
Frozen Shoulder Treatments (FroST) Evaluation Study	Mr Kwok Boon Chong
Knowledge Of Osteoporosis And Calcium-Rich Foods And The Osteoporosis Health Belief Among Singapore Adults	Ms Wan Ling Chiang

A Pilot Study: Parental Attitudes and Perception Towards Childhood Immunizations in a Singapore Primary Health Care Setting

Ms Euan Lim
Poh Hia

NATIONAL SKIN CENTRE



NATIONAL
SKIN
CENTRE

National Skin Centre

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Clinical Trial / Database Unit

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Seated (from left): Dr Pan Jiun Yi, Dr Mark Tang,
Dr Goh Boon Kee

Standing (from left): Dr Dwi Pramono Sarengat, Ms Brenda Seah, Ms Veron Lu, Ms Joan Fung,
Ms Chin Mei Yee, Dr Mo Xuejun

As the national tertiary academic centre for dermatological diseases in Singapore, National Skin Centre (NSC) is committed to the pursuit of academic excellence in dermatology, with a focus on translational and clinical research, especially in Asian skin diseases. Research interest and activities continued to grow with a steady increase in the number of research projects initiated over the past 2 years.

We also continued to strengthen our existing collaborative ties with various research institutions both in Singapore and overseas.

Our research team welcomed 2 new members. Dr Dwi Pramono Sarengat, who has a PhD in Human Genetics from Kobe University, Japan, joined us as a Research Scientist and Dr Mo Xuejun joined us as a Postdoctoral Research Fellow, under the mentorship of Dr Pramono. Dr Mo holds a PhD in Chemistry from the National University of Singapore. They are actively involved in all of our key research areas such as molecular genetics, cutaneous oncology and pigmentary disorders.

KEY RESEARCH PROGRAMME / FOCUS AREA

Research Focus Areas	Key Principal Investigator
Atopic Dermatitis	Dr Mark Tang
Acne	Dr Mark Tang
Psoriasis	Dr Colin Theng

Cutaneous Lymphoma	A/Prof Tan Suat Hoon
Genetic Skin Diseases	Dr Dwi Pramono Sarengat
Sexually Transmitted Infections	Prof Roy Chan
Pigmentary Disorders	Dr Steven Thng
Hair Disorders	Dr Joyce Lee
Paediatric Dermatology	A/Prof Giam Yoke Chin
Immunodermatology	Dr Lim Yen Loo

NATIONAL HEALTHCARE GROUP EYE INSTITUTE



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The NHG Eye Institute (NHGEI) Research Unit aims to provide a well-

rounded environment conducive to clinicians and researchers in conducting education, clinical and laboratory research within a healthcare setting. We are committed to developing a local, regional and international centre of quality clinical research so as to achieve the NHG vision of “adding years to healthy life”, and to be a part of the Ministry of Health’s drive in biomedical translational research. We are always focused on the improvement in population health and the translation of medical and clinical knowledge to our patients through the pursuit of scientific and clinical research into all areas related to ocular pathology and vision. We also strive to improve the academic and clinical standing of all our clinical staff.

The NHGEI Research Unit comprises of the Clinical Department of Ophthalmology at Tan Tock Seng Hospital & continues to cultivate this research and facilitate research by our clinicians through:

- i. Annual Research Methodology Workshop;
- ii. Monthly Research Round;
- iii. Availability of Biostatistician for Researchers;
- iv. NHGEI Core Research Team support:
 - Grant writing/proposal advice;
 - Internal Biostatisticians and data support;
 - Literature search: Training & facilitation;
 - Research Co-ordination;
 - Administrative support: DSRB, Finance & IT; and
- v. Dedicated time for research.

The NHGEI Research Unit has thematic research focus groups directed at all areas of sub-specialties:

KEY RESEARCH PROGRAMME / FOCUS AREA	
Research Focus Areas	Key Principal Investigators(s)
Translational Bench-to-Bedside research (in collaboration with Singapore Eye Research Institute)	A/Prof Lim Tock Han Dr Wong Hong Tym
Extending Primary Eye Care into the Community & Beyond Projects like Tele-ophthalmology Project, Diabetic Retinopathy Screening and Hand-Held Ophthalmic Camera System	Dr Johnson Tan A/Prof Lim Tock Han Dr Rupesh Agrawal
Basic Science Research in Proteomic Analysis of Ocular Aqueous in Uveitic patients (in collaboration with Singapore Immunology Network)	Dr Stephen Teoh Dr Rupesh Agrawal
Glaucoma Research (in collaboration with Singapore Eye Research Institute)	Dr Wong Hon Tym

Ophthalmic Imaging Research (in collaboration with Singapore Eye Research Institute, Nanyang Technological University and Nanyang Polytechnic)	Dr Laude Augustinus Dr Colin Tan Dr Stephen Teoh
Optics and Visual Sciences (especially in cataract surgery and optics of intraocular lenses)	Dr Fam Han Bor
Clinical Trials in Age-related Macular Degeneration, Polypoidal Choroidal Vasculopathy and Diabetic Retinopathy	Dr Rajagopalan Rajesh Dr Nikolle Tan

HEALTH SERVICES & OUTCOMES RESEARCH



Health Services & Outcomes Research

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The Health Services & Outcomes Research (HSOR) department was set up in 2005 to improve the quality of healthcare in NHG by providing the best available evidence for decision-making and knowledge translation, building capacity and advancing knowledge in health services



research. The multi-disciplinary team of 20 specialists and researchers from diverse backgrounds work closely with clinical heads and managers on the ground in formulating the questions and translating the evidence into decisions and practice.

Using a range of techniques ranging from surveys, risk adjustment and predictive modeling, data-mining, cost-analysis, simulation and programming, the team supports stakeholders in answering questions on micro-level issues (*e.g. outcomes of a specific disease management programme*) to more system level issues (*e.g. continuity of care programmes in the community*). The department continues to publish in local and international peer-reviewed journals, and present in local and international scientific meetings and conferences. The awards and research grants attest to the strength that is only possible with collaborations with partners from various NHG departments and institutions and with agencies outside of NHG.

KEY RESEARCH PROGRAMME / FOCUS AREA

Research Focus Areas	Key Principal Investigator(s)
Clinical Decision Modelling	Dr Sun Yan Palvannan Kannapiran Li Rui Jie Dr Gary Ang Dr Nakul Saxena
Evaluation Research	Anusha Govinda Raj Dr Joseph Antonio Molina Pradeep Paul George Chong Wai Fung Tan Woan Shin Dr Sun Yan Charis Ng Wei Ling Kelvin Teo Wei Sheng Li Rui Jie Cheryl Anthony Lobo Dr Gary Ang Dr Nakul Saxena Dr Thet May Mee

Health Technology Assessment & Systematic Review	Dr Joseph Antonio Molina Pradeep Paul George Cheryl Anthony Lobo Tan Woan Shin Anusha Govinda Raj Charis Ng Wei Ling Chong Wai Fung Dr Sun Yan Kelvin Teo Wei Sheng Li Rui Jie Dr Gary Ang Dr Nakul Saxena Dr Thet May Mee
Operations Research	Teow Kiok Liang Palvannan Kannapiran Dr Zhu Zhe Cheng Dr Meng Fan Wen
Patient-Reported Outcomes & Survey Methods	Li Rui Jie Charis Ng Wei Ling

RESEARCH & DEVELOPMENT OFFICE

The NHG Research & Development Office (RDO) was established in 2004 to promote relevant research through better collaboration and harmonisation of research initiatives among NHG Institutions.

The key offices within RDO are the Office of Human Research Protection Program and the Office of Research Support. Working in synergy, these offices provide a comprehensive ethical framework and

administrative support services for NHG research community.

Office of Human Research Protection Program

Since its inception in 2004, the NHG Human Subjects Protection Program (HSPP) has matured and grown beyond its original scope of providing ethics review and oversight.

As such, the NHG Office of Human Research Protection Program (OHRPP) was formally established in July 2010. In tandem with NHG’s mission to improve health and reduce illness in an environment of continuous learning and relevant research, the OHRPP’s goals are to ensure the safety and well-being of human research participants, and to advocate their rights through:

- i. Efficient and high quality ethics review;
- ii. Education on human research protection;
- iii. Quality assurance and continuous improvement; and
- iv. Engagement of public and research partners.

Within the NHG OHRPP, the Domain Specific Review Board (DSRB) provides ethics oversight and ethics review services for clinical research projects conducted in NHG institutions and external partnering institutions. In FY2010 and FY2011, Jurong Health Services (JHS), Dover Park

Hospice (DPH) and Ang Mo Kio – Thye Hua Kwan Hospital (AMK-THKH) signed Memorandums of Understanding (MOUs) with NHG to appoint the NHG DSRB as their research ethics oversight committee.

Such partnerships allow a common platform to provide quality ethics review and establish common guidelines for research conducted across different institutions. Apart from the above-mentioned institutions, our partner institutions also include the Agency for Integrated Care (AIC), Khoo Teck Puat Hospital (KTPH), Lilly-NUS Centre for Clinical Pharmacology Pte Ltd (Lilly-NUS), National University Hospital (NUH) and National University of Singapore (NUS). In FY2010 and FY2011, NHG DSRB reviewed a total of 663 and 657 research applications respectively, received from NHG institutions and its partner institutions.

Office of Research Support

The Office of Research Support (ORS) plays a vital role in supporting research activities in the NHG cluster and in facilitating collaborations between our institutions and partners.

“ORS is instrumental in facilitating and enabling research in the cluster that has impact on patients’ care and delivery.”

In keeping up with the changing healthcare and research landscape, especially in light of the development of the Lee Kong Chian School of Medicine (LKCMedicine), we are even more committed to constantly improve and enhance our suite of research support services to our institutions.

These services comprise of:

- i. Research Training & Development;
- ii. Grant Administration & Management;
- iii. Research Informatics;
- iv. Industry Liaison & Partnership;
- v. Legal Review & Support;
- vi. Project Management; and
- vii. Provision of Research Support Personnel including Account Manager, Biostatistician, Research Coordinator.



Research Achievements

Rewarding Collaborations

I can still vividly recall my kampong days in Pulau Ubin where everyone knows everybody. We would play marbles, hopscotch, hide-and-seek and police and thieves. There were days when it would be blazing hot and days when it would be pouring endlessly. Regardless, we would still be playing outdoors.

Until one day one of our playmates, Jon, who has always been the life of the party, did not turn up like he had promised. We eventually found out from his parents that he was down with dengue haemorrhagic fever. As kids, we never really thought much of it until we saw him for ourselves. Jon who has always been a vivacious kid laid there still and solemn.

Memory of Jon laying helplessly in the hospital remains indelibly etched in my mind to this day. That was my very first encounter with dengue and it almost claimed the life of my very good friend.

Dengue encompasses a wide spectrum of disease, from benign febrile illness to the more severe forms of haemorrhagic fever and shock syndrome.

At Tan Tock Seng Hospital (TTSH), we are dedicated to fighting dengue. We have been analysing data and taking care of dengue patients for years. TTSH has established a network of collaborators with experience and expertise in areas such as innovative drug discoveries, research on biomarkers and disease mechanisms in our efforts to fight dengue.

These efforts were recognised by the National Medical Research Council (NMRC) when 3 of my colleagues were awarded the Clinician Investigator Salary Support Programme (CISSP) in 2010.

I am very fortunate to be part of this collaborative effort. I believe that through these engagements, locally and internationally, we would one day find more effective treatments and improved care for dengue patients like Jon.

Dr Nathan Goh
TAN TOCK SENG HOSPITAL
PRINCIPAL INVESTIGATOR

Extramural Awards and Grants

NATIONAL HEALTHCARE GROUP MOST SIGNIFICANT RESEARCH FROM FY2010 – 2011

Tan Tock Seng Hospital

GERIATRIC MEDICINE

1. It was reported that a certain pattern of gene expression in white blood cells found in the peripheral blood predicted the rate of deterioration of dementia patients. This is a novel finding and can conceivably be used in the routine clinical evaluation of patients in the near future.
2. The psychometric properties of the Zarit Burden Interview were examined and showed that there are four factors: demands of care and social impact, control over the situation, psychological impact, and worry about caregiving performance. This helps doctors understand the psychological burdens of caregivers of people with cognitive impairment.
3. The mortality of elderly patients admitted for pneumonia in acute geriatric units and in usual medical wards was compared. It was found out that there was no benefit in survival except in the very old patients (beyond 80 years) who have pre-morbid ambulation impairment.
4. A study involving 1607 elderly patients from three hospitals demonstrated that recent hospitalisation, pre-morbid

ambulation impairment, and absence of cough and purulent sputum were associated with higher 30-day mortality.

5. A study in the emergency department showed that geriatric assessment and intervention delivered there significantly reduced re-attendance and hospitalisation rates.

INFECTIOUS DISEASES

1. The STOP Dengue programme has fully characterised a human dengue serotype 1 monoclonal antibody with therapeutic effects *in vivo*. Environmental Health Institute (EHI) has demonstrated the usefulness of saliva IgA as a non-invasive diagnostic tool for dengue. Additionally, EHI has identified saliva IgA ACA-ELISA testing as a sensitive tool for detecting secondary infection. This has valuable application in hyperendemic areas such as Singapore. The programme has successfully established a mouse model of severe dengue based on a non-mouse adapted dengue serotype 2 strain in AG129 mice, which exhibits fulminant dengue-associated vascular leakage. Tan Tock Seng Hospital saw a 33% decrease in dengue inpatients after the introduction of evidence-based dengue admission criteria. These criteria triaged patients with more severe signs and symptoms, reducing unnecessary hospitalisations and subsequent cost savings to patients without any adverse consequences to patient outcome. STOP dengue has recruited close to 4000 subjects from primary and tertiary care centres with well-characterised clinical samples from dengue confirmed and acute febrile patients, yielding a highly valuable platform for diagnostic and prognostic test development and validation.
2. Completion of the seroepidemiology of pandemic H1N1 study. The project involved cohorts recruited from various institutions (NUS, TTSH, the Singapore Armed Forces and Nursing Homes) with a combined total of close to 3,200 subjects. The analysis had shown positive outcome and had published several papers both as lead author as well as key collaborators in high impact factor infectious disease journals. The outcomes were also presented at both local and international conferences.
3. The Communicable Diseases Centre (CDC) heads a multi-centre collaboration involving several local restructured hospitals to document the molecular epidemiology of HIV-1 in Singapore. This multi-centred study has helped in the identification of a novel recombinant strain, CRF51_01B, which was generated in Singapore as a result of recombination of the two existing strains, CRF01_AE and subtype B. CDC also established the in-house viral resistance HIV-1 genotyping; research done on in house viral load assay (completed 2008-2009) by CDC has enabled us to have a cheaper in-house assay for

our patients. Since April 2010, this in-house viral load assay has been made available as a lab service (IDRL) for patients, proving CDC's translational (diagnostic) research capability.

NURSING

1. A very exciting development is the initiative taken by the nursing profession to embrace research. A Knowledge, Attitude and Practice survey of 244 nurses was conducted and this study showed that they appreciated the importance of oral care of ICU patients, but they have not been trained to provide this.
2. Another project showed that nurses were not uniformly knowledgeable about the safe use of nasogastric tubes. This led to the development of a set of guidelines now used in the hospital.
3. The Palliative Performance Scale is known to predict patients' prognosis but it is not very useful when the score is in the mid-range. The predictive power of the instrument was increased by a group of nursing professionals in TTSH by showing that the magnitude of change of the score was a very sensitive tool.
4. The qualitative literature concerning the experiences of newly qualified nurses was reviewed. This understanding may help the hospital make the transition from training to practice easier for TTSH staff.

Institute of Mental Health

1. The flagship Translational Clinical Research (TCR) Programme in Psychosis has published to date a total of 36 scientific papers with numerous presentations at local and international conferences, on the outcomes and contributed to growing knowledge in the field of Schizophrenia and related psychoses. One patent is in the process of being filed and a copyright is being applied for another invention. The successful completion of our large single-site clinical trial on neuro-cognition which was part of the TCR in Psychosis has created a platform for investigational medicine which incorporates animal models and proof of concept in man – and this has already attracted the attention and interest from a number of pharmaceutical companies, with another trial underway.
2. The Singapore Mental Health Study is a landmark study and the first comprehensive and in-depth examination of the mental health status of the resident population. The study has provided valuable information to help policy makers and service providers in their planning, with locally relevant data. An extension of this study is the present Well-being of the Singapore Elderly (WiSE) which will be conducted from October 2012 for a period of 12 months. The issues related to an ageing population, costs of medical treatment and determination

of caregivers stress and burden will guide policy and development of relevant services as we face the challenge of our aging population.

3. The Child and Adolescents Psychiatry Research Unit is conducting pioneering research in Brain Computer Interface and a patent was successfully filed for Brainpal™ with IMH, A*Star, NUS as joint inventors. Based on earlier promising findings, the latest project will examine the underlying mechanism for behavioural and attention improvement amongst children with Attention-Deficit-Hyperactivity-Disorder (ADHD) after undergoing an electroencephalogram (EEG)-based BCI treatment. This is at an exciting stage of development to explore alternative treatment modalities in the ADHD population.

National Skin Centre

1. Elucidation of the molecular genetics of atopic dermatitis (AD). It was found that AD patients with FLG mutations had a significantly higher risk of recurrent skin infections.
2. A pilot study on teledermatology in patients from the Institute of Mental Health showed that teledermatology was equally safe and effective in providing dermatological care, compared to on-site physical consultation, with the added advantages of less manpower, resources and time consumed.

National Healthcare Group Eye Institute

1. Cytomegalovirus retinitis (CMVR) is the most common ocular infection affecting AIDS patients and is an important cause of blindness amongst these patients. With increased accessibility to Highly Active Antiretroviral Therapy (HAART), there are increasing public programs worldwide for early HIV detection and treatment to prevent AIDS. However, similar screening programs for CMVR are uncommon. As such, the vast majority of patients requiring regular CMVR screening will simply not receive it as specialist care is both limited and inaccessible.

In Singapore, we have adopted the use of Telemedicine in the form of composite montage images derived from 9-field digital fundus photography (DFP) for CMVR screening. We found 100% sensitivity and 99.9% specificity with this technique with a high level of agreement with indirect fundus ophthalmoscopy, the gold standard for diagnosis of retinal pathologies.

2. A study was conducted to determine the safety of substituting the first day postoperative review after routine cataract surgery (phacoemulsification) with a telephone survey. This is the first study which utilises a standardised questionnaire as a form

of postoperative review in an Asian population. It was found out that a nurse-administered telephone survey seemed to be a safe and effective alternative to first day postoperative review after routine phacoemulsification. The survey also enabled the detection of serious postoperative complications. The first day postoperative hospital visit may be safely substituted in a selected patient population with greater patient convenience achieved and liberation of clinic resources.

3. A study conducted by the Department of Ophthalmology showed that the instillation of antibiotic into the eye during cataract surgery, as currently practiced in TTSH, reduced the incidence of postoperative infection six-fold, from 0.064% to 0.01%.
4. The quality of life of patients with uveitis was studied using the Visual

Functioning Questionnaire, showing that it was worse in patients than in controls. This introduced another dimension that doctors can measure as they treat patients with uveitis.

Health Services & Outcomes Research

1. A decision analysis to support universal screening for Methicillin-resistant Staphylococcus Aureus (MRSA) colonisation in a large acute hospital in Singapore. By constructing a decision model in collaboration with stakeholders, we informed the decision to start universal screening for MRSA colonisation before admission. This was a rigorous basis for making a decision that had clinical, economic and operational impact and promises better patient health outcome through reduced infections.

EXTRAMURAL AWARDS

National Medical Research Council Research Training Fellowship/Scientist Award

The NMRC Research Training Fellowship is awarded to outstanding and talented clinicians, health science professionals and biostatisticians for overseas research training or to pursue a graduate degree in research in local institutions.

FY2010

Awardee	Institution	Area of Research/Project
Dr Tan Yung Khan	TTSH	Novel Use Of Paramagnetic Iron-Oxide Nanoparticles To Improve The Efficiency And Effectiveness Of Endoscopic Stone Fragment Retrieval

National Medical Research Council Research Training Fellowship/Scientist Award *(continued from previous page)*

FY2011

Awardee	Institution	Area of Research/Project
Ms Goh Tze Jui	IMH	Cognitive-Behavioral Therapy For Children With Autism Spectrum Disorders: Incorporating The Internet To Increase Motivation
Mr Lam Zhang Yang, Max	IMH	Elucidating The Genetic Architecture Of Neuropsychological Performance
Awardee	Institution	Area of Research/Project
Dr Ng Oon Tek	TTSH	The Clinical Implications Of Subtype AE Compared To Subtype B HIV-1 Infections
Dr Rupesh Agrawal	TTSH (NHGEI)	Developing A Molecular-Targeted Fluorescent Probe As The Basis For A Human Retinal Leukogram To Image The Progression Of Intraocular Inflammation And Diabetic Retinopathy

National Medical Research Council Clinician Investigator Salary Support Programme (CISSP)

NMRC has introduced a pilot programme to support more clinicians to participate in clinical research by providing funding for clinicians' research time. Three of our clinicians were recipients of this award.

FY2010

Awardee	Institution	Area of Research/Project
A/Prof Swapna Verma	IMH	Supported For The Involvement In The Singapore Translational And Clinical Research In Neuroscience Flagship Programme
Dr Lee Chee Keong, Jimmy	IMH	Supported For The Involvement In The Singapore Translational And Clinical Research In Neuroscience Flagship Programme
A/Prof Leo Yee Sin Dr David Lye Dr Kurukularatne Changa	TTSH	Infectious Diseases / STOP Dengue

Ministry of Health - Healthcare Research Scholarship

FY2010

Awardee	Institution	Area of Research/Project
Dr Tan Pei Lin, Lynnette	TTSH	Psychological Medicine

FY2011

Awardee	Institution	Area of Research/Project
Dr Tay Bee Gek, Laura	TTSH	Genetic Medicine

Other Extramural Awards

2010 AWARDS

Event Title	Award Title	Area of Research/Project	Awardee	Institution
5th Singapore Public Health & Occupational Medicine Conference (PHOM) and 4th Asian Regional Health Technology Assessment Conference	Best Oral Presentation	Genetic Syndrome And Depression Among Respondents With Diabetes Melitus In The Lower Income Group And It's Implications On Diabetes	Ms Wong Lai Yin	HSOR
4th International Conference on Schizophrenia 2010	Poster Presentation (3rd Prize)	Combining Cognitive And Social Skills Training In An Early Psychosis Peer Support Group	Ms Ling, Joycelyn Jenda	IMH
DSS Annual Scientific Meeting 2010	Best Paper Award	Patient's Perception Of Sexual Health Services In Singapore	Dr Ong Chun Wei, Gavin	NSC

Other Extramural Awards *(continued from previous page)*

2010 AWARDS

Event Title	Award Title	Area of Research/ Project	Awardee	Institution
Dermatology Update 2010	Best Original Studies Award	Characteristics Of Contact Allergy In Spa Workers And Masseuses	Dr Pan Jiun Yit	NSC
	Best Case Report and Case Series Award	Chronic Actinic Dermatitis In Asian Skin: A Clinicopathological And Photobiological Study Of Singaporean Patients	Dr Tan Wei Min	NSC
Singapore Society of Nephrology's Annual Scientific Conference 2010	Best Oral Presentation	Determining Patient Factors Influencing The Switch From Conservative To Dialysis Therapy	Dr Leo Cheang Han, Christopher	TTSH
Japanese Society of Gastroenterology 2010	Japanese Society of Gastroenterology Research Fellowship	3 Month Research Program At The University Of Kobe School Of Medicine, Japan	Dr Tsao Kin Kwok, Stephen	TTSH
American Urological Association Annual Meeting 2010	First Prize, Best video	Anatomic Retroapical Technique Of Synchronous (<i>Posterior And Anterior</i>) Urethral Transection: Novel Approach For Ameliorating Apical Margin Positivity During Robotic Radical Prostatectomy	Dr Tan Yau Min, Gerald	TTSH
Residents Research day at NUH	2nd Best free paper	Clinicopathologic And Radiologic Correlation Of Orbital Tumors – Ten Year Study.	Dr Rupesh Agrawal	TTSH (NHGEI)

Other Extramural Awards *(continued from previous page)*

2010 AWARDS

Event Title	Award Title	Area of Research/ Project	Awardee	Institution
American Academy of Ophthalmology Meeting 2010	Best of Show Poster, American Academy of Ophthalmology Meeting	A Nationwide Survey Of Ophthalmology Residents' Interest In Pediatric Ophthalmology & Strabismus As A Career	Dr Foo Fong Yee	TTSH (NHGEI)
European Vision Research community	'Pick of the Year' for 5 best publications for the year 2010	Ophthalmology Research	Dr Augustinus Laude	TTSH (NHGEI)

2011 AWARDS

Event Title	Award Title	Area of Research/Project	Awardee	Institution
45th Annual Singapore Malaysia Congress of Medicine 2011	Best Oral Presentation – Merit	Progression From Newly Diagnosed Impaired Fasting Glucose To Type 2 Diabetes Melitus In Singapore	Dr Ang Yee, Gary	HSOR
3rd Asian Cognitive Behavior Therapy (CBT) Conference 2011 – Seoul, Korea	Best Poster Award	Culturally-Appropriate Anxiety Assessment: Preliminary Validation Of The Asian Children's Anxiety Scale In A Community Sample	Asst/Prof Sung Cohan, Sharon	IMH
45th Singapore-Malaysian Congress of Medicine 2011	Galloway Memorial Lecture and gold medal by the Council of the Academy of Medicine of Singapore 2011	What Ails The Populace: The Singapore Mental Health Study	A/Prof Chong Siow Ann	IMH

Other Extramural Awards *(continued from previous page)*

2011 AWARDS

Event Title	Award Title	Area of Research/Project	Awardee	Institution
24th Annual Meeting of the Dermatological Society of Singapore 2011	Best Paper Presentation	Is Propionibacterium Acnes Associated With Hair Casts And Alopecia?	Dr Wang Cho Ee, Etienne	NSC
2nd Singapore International Neurocognitive Symposium 2011	Best Platform Presentation	HIV Associated Neurocognitive Disorder - Novel Data From The Communicable Disease Centre, Singapore	Dr Chan Lai Gwen	TTSH
The International Conference on Rehabilitation Robotics (ICORR) 2011	Best Paper	Advanced Brain Computer Interface (BCI) Technology For Wrist And Hand Rehabilitation After Stroke	Dr Chua Sui Geok, Karen	TTSH
Lancet Oncology and the Asian Oncology Summit 2011	The Lancet Oncology Editor's Poster Choice Award	Nab-Paclitaxel In The Treatment Of Advanced Pancreatic Cancer Refractory To Gemcitabine — Final Results Of A Phase 2 Trial. Cost-Effectiveness Of Epidermal Growth-Factor Receptor Mutation Testing And First- Line Treatment With Gefitinib For Advanced Non-Small-Cell Lung Cancer	Dr Gilberto Lopes	TTSH
Society of Transplantation Singapore Annual Scientific Meeting 2011	Best Oral Presentation	Evaluating The Clinical Utility Of Therapeutic Drug Monitoring Of Mycophenolic Acid In Kidney Transplant Patients	Dr Goh Su Mein	TTSH

Other Extramural Awards *(continued from previous page)*

2011 AWARDS

Event Title	Award Title	Area of Research/Project	Awardee	Institution
18th Conference on Retroviruses and Opportunistic Infections (CROI) 2011	Young Investigator Award	Increased Rates Of CD4+ T-Cell Decline And Faster Time To Antiretroviral Therapy Initiation In HIV-1 Subtype CRF01_AE Infected Seroconverters In Singapore	Dr Ng Oon Tek	TTSH
International Academy for Advances in Ophthalmology 2011	Gold Medal Recipient at EyeAdvance 2012	Ophthalmology	Dr Fam Han Bor	TTSH (NHGEI)

National Medical Research Council – New Investigator Grant (NIG)

NMRC NIG is a grant catered for new clinical investigators and a step for new investigators to getting a first independent national level grant.

FY2010

Awardee	Institution	Area of Research/Project
Dr Tan Yung Khan	TTSH	Novel Use Of Paramagnetic Iron-Oxide Nanoparticles To Improve The Efficiency And Effectiveness Of Endoscopic Stone Fragment Retrieval

FY2011

Awardee	Institution	Area of Research/Project
Dr Lim Choon Guan	IMH	Functional Magnetic Resonance Imaging Investigation Of The Effects Of Brain-Computer Interfaced Based Training On Selective Attention And Response Inhibition In Children With Attention Deficit Hyperactivity Disorder (ADHD)

National Medical Research Council – New Investigator Grant (NIG)

(continued from previous page)

FY2011

Awardee	Institution	Area of Research/Project
Dr Chia Li-Ann, Faith	TTSH	The Immunomodulatory Role Of Sphingosine Kinase In T Cell/Neutrophil Interactions
Dr Teoh Charn Beng, Stephen	TTSH (NHGEI)	CMV Retinitis Intravitreal Ganciclovir Singapore Study

National Medical Research Council – Individual Research Grant (IRG)

Individual Research Grants (IRG) are provided to individual researchers to enable them to carry out medical research on a specifically defined topic within a limited time period (*3 years*) in local public institutions. The focus of the research should be translational and clinical in nature.

FY2010

Awardee	Institution	Area of Research/Project
Dr Sung Min	IMH	A Striatal Synaptic Dysfunction Hypothesis For Repetitive Behaviors In Autism Evaluated By Re-Sequencing Of Candidate Genes

FY2011

Awardee	Institution	Area of Research/Project
Dr Howe Hwee Siew	TTSH	The Role Of IL-33 And ST2 In The Pathogenesis Of Seronegative Spondyloarthritis

National Medical Research Council – Exploratory Development Grant

FY2011

Awardee	Institution	Area of Research/Project
Dr Zacharias Aloysius Dwi Pramono	NSC	Elucidation Of The Role Of MicroRNA In The Pathogenesis Of Atopic Dermatitis
Dr Ng Oon Tek	TTSH	Molecular Epidemiology of HIV-1 In Singapore And Characterisation Of Unique Novel Recombinant Forms

National Medical Research Council – Programme Project Grant (PPG)

FY2011

Awardee	Institution	Area of Research/Project
Dr Chen I-Cheng, Mark	TTSH	Influenza And Other Respiratory Pathogens In Singapore - Investigating The Effect Of Host And Virus Interactions On Disease Transmission And Disease Severity

National Medical Research Council – Reinvestment Fund

FY2011

Awardee	Institution	Area of Research/Project
Dr Ng Oon Tek	TTSH	Reinvestment Fund FY2011-2014 For HIV Molecular Epidemiology Programme At CDC

Other NMRC Grants

FY2010

Awardee	Institution	Area of Research/Project
Dr Chen I-Cheng, Mark	TTSH	Optimising Local Management of Global Pandemics – A Modelling Approach
Dr Yong Quek Wei	TTSH	Biomarkers And Management Of Cardiovascular Diseases - Singapore HF Outcomes And Phenotypes (<i>SHOP Study</i>)

FY2011

Awardee	Institution	Area of Research/Project
A/Prof Leo Yee Sin	TTSH	STOP Dengue 1st Scientific Advisory Board (SAB) Meeting 2011 (<i>Additional Budget</i>)
Dr Ng Oon Tek	TTSH	The Clinical Implications Of Subtype AE Compared To Subtype B HIV-1 Infections

National Research Foundation – Proof of Concept

FY2011

Awardee	Institution	Area of Research/Project
A/ Prof Fung Shuen Sheng, Daniel	IMH	An Interactive Web-Based Game For Helping Angry Children And Youth

A*STAR Biomedical Research Council Translational Clinical Research Partnership Grant Call 2010

FY2011

Awardee	Institution	Area of Research/Project
Dr Wong Hon Tym	TTSH (NHGEI)	Angle Closure Glaucoma: Novel Methods For Imaging, Risk Assessment And Screening

OTHER EXTRAMURAL GRANTS

FY2010

Recipient	Institution	Area of Research/Project	Sponsor
Dr Chia Li-Ann, Faith	TTSH	Assessment Of Renal Disease Activity And Response In Lupus Nephritis - Comparison Of Agreement In Rating By Rheumatologists And Renal Physicians	National Kidney Foundation
Dr Chong Yew Lam	TTSH	Risk Factors For Failed Ureteroscopy And The Role Of Alpha-Adrenergic Antagonists	National Kidney Foundation
Dr Chua Sui Geok, Karen	TTSH	Arts-Bci: Advanced Brain Computer Interface (BCI) Technology For Wrist And Hand Rehabilitation After Stroke	A*STAR – Science and Engineering Research Council
Dr Howe Hwee Siew	TTSH	Mycobacterium Tuberculosis Infection In Sle Patients	Singapore Anti-Tuberculosis Association
Dr Ong Kheng Yeow, Adrian	TTSH	Longitudinal Analysis Of The Humoral Immune Response Of Dengue Patients From The Acute Phase Up To One Year After Infection	A*STAR – Singapore Immunology Network

OTHER EXTRAMURAL GRANTS *(continued from previous page)*

FY2011

Recipient	Institution	Area of Research/Project	Sponsor
Dr Andrea Loraine Glenn	IMH	Role Of Brain Structure And Its Function In Juvenile Delinquency And Risk-Taking Behaviours	AXA
Ms Chan Ee Yuee	TTSH	Pain Experience And Patient Self-Management After Discharge From Total Knee Anthroplasty	Ministry of Health – Nursing Research Committee
Dr Chan Kay Fei	TTSH	Study On The Cost-Benefits Of A Case Manager Based System For Rehabilitation Of Injured Workers.	Ministry of Manpower
Dr Chee Bin Eng, Cynthia	TTSH	Biomarkers In Tuberculosis: Lipid-Specific Immune Response	A*STAR SIGN
Dr Chong Kian Tai Prof Liu Quan	TTSH NTU	Preclinical Investigation Of Gold Nanoparticles For Plasmonic Photothermal Therapy Of Renal Cell Carcinoma	A*STAR – Science and Engineering Research Council
Dr Howe Hwee Siew	TTSH	ISN/RPS Classification Of Lupus Nephritis-Clinical And Outcome Correlations In A Singapore Cohort	National Kidney Foundation
Dr Kong Keng He	TTSH	Efficacy Of Computer Gaming In Facilitating Upper Limb Recovery In Stroke Rehabilitation: A Pilot Randomized Controlled Trial	Ministry of Health
A/Prof Leow Khee Shing, Melvin	TTSH	Exploring The Role Of Epigenetic Mechanisms In The Temporal Regulation Of TSH Gene Expression In Thyrotoxicosis And Hypothyroidism	Endocrine & Metabolic Society of Singapore
Mr Teow Kiok Liang	HSOR	Integrated Hospital Simulation Model	Ministry of Health
Dr Foo Tun Lin	TTSH	Biomechanical Analysis Of Proximal Interphalangeal Joint Fracture Dislocations	AOTrauma Asia-Pacific



An Unbreakable Bond

Every year, awards and grants are given to scientists, researchers and medical professionals for their breakthrough discoveries and their exceptional contributions to the community.

Some of such awards and grants are given out during the Singapore Health and Biomedical Congress (SHBC). This is the largest healthcare scientific meeting in Singapore, attracting many local and international healthcare professionals from Singapore and the world.

I am very happy to be here today to catch up with my friends from other institutions that I have worked and collaborated with before. One of them is my very good friend, Veron Chan.

She is here to support her Associate Professor Said Noor Hanif from National Skin Centre who is receiving the Best Poster Award in Clinical Research for his project on ‘UVA-1 Phototherapy Versus Betamethasone Valerate 0.1% Cream for Chronic Vesicular Eczema’.

Speaking of awards, I am here to support my fellow colleague Dr Lee Chee Keong who will be receiving the Singapore Clinician-Investigator Award. I had the privilege of working with him for this paper, ‘Erythrocytes: A Valid Source of Lipid-Based Biomarker of Schizophrenia’.

I sensed a strong bond of connectedness when the individuals/teams went on stage to receive their awards accompanied by the rousing applause from the audience.

It did not matter whether they come from Institute of Mental Health, National Healthcare Group Eye Institute, National Healthcare Group HQ, National Healthcare Group Polyclinics, National Skin Center or Tan Tock Seng Hospital, we all felt very happy for one another.

I believe the passion we have with our work and drive to seek breakthrough discoveries are the key elements that have brought us together. I hope this bond remains unbreakable for us to continue our relentless contribution to the community.

Gwen Lim
INSTITUTE OF MENTAL HEALTH
CLINICAL RESEARCH NURSE

Intramural Awards and Grants

Singapore Health and Biomedical Congress 2010

Award Title	Paper	Awardee	Institution
Singapore Young Investigator Award (Quality, Health Services Research) - Silver Medal	Predicting Hospital Admissions At Emergency Department's Triage Using Routine Administrative Data	Dr Sun Yan	HSOR
Best Poster Award (Basic Science Research/ Translational Research) – Gold Medal	Disruptions Of Subcortical-Cortical Structure Connectivities In Schizophrenia: Evidence From Analyses Of Hippocampal Shape, Cortical Thickness, And Integrity Of White Matter Bundles	A/Prof Sim Kang	IMH
Singapore Clinician-Investigator Award – Bronze Medal	Velo-Cardio-Facial Syndrome Related Gene Influences Neurocognitive And Neuroanatomical Intermediate Phenotypes In Chinese Patients With Schizophrenia	A/Prof Sim Kang	IMH

Singapore Health and Biomedical Congress 2010

(continued from previous page)

Award Title	Paper	Awardee	Institution
Best Poster Award (Allied Health) – Silver Medal	Pharmacist-Conducted Medication Reconciliation At Ward Admission: Evaluating Discrepancies	Mr Li Kaihui, Benny	IMH
Singapore Allied Health Award – Bronze Medal	Pharmacist-Run Medication Management Clinic In Community Wellness Centre – A One-Year Review	Mr Li Kaihui, Benny	IMH
Singapore Nursing Award – Gold Medal	A Prospective Controlled Study To Examine The Effects Of Aromatherapy In Improving Sleep Quality For Patients With Schizophrenia In Long Term Care Settings	Mr Zhuo Zhenyu	IMH
Best Poster Award (Quality, Health Services Research) – Bronze Medal	Perception And Receptiveness Of Primary Healthcare Personnel To Seasonal Influenza Vaccine	Dr Predeebha Kannan	NHGP



Gwen Lim

51m

@gwenny

Woohoo! So proud of you guys! Our stars of the event – congrats Benny, Sim Kang and Zhen Yu!



Dr Ghayathri

25m

@ghayavision

Congrats to your colleagues, Gwen! A friend of mine, Dr Rupesh has received an award for his research. So happy for him.

Singapore Health and Biomedical Congress 2010

(continued from previous page)

Award Title	Paper	Awardee	Institution
Best Poster Award (Nursing) – Gold Medal	Diabetic Patients' Perception Of Insulin Initiation	Ms Chan Mei Fong, Carolyn	NHGP
Singapore Clinician – Investigator Award – Silver Medal	The Cost Effectiveness Of Epidermal Growth Factor Mutation Testing And First Line Treatment With Gefitinib For Advanced Non-Small Cell Lung Cancer	Dr Gilberto de Lima Lopes	TTSH
Singapore Young Investigator Award – Gold Medal	Cost-Benefit Analysis Of A 21-Gene Recurrence Score For Early Stage Breast Cancer In Singapore	Dr Gilberto de Lima Lopes	TTSH

National Healthcare Group Eye Institute 3rd International Ophthalmology Congress 2010

Award Title	Paper	Awardee	Institution
NHG Eye Institute – Allergan Research Prize	Cytomegalovirus Retinitis (CMVR) With And Without Extra-Ocular CMV Infection – A Comparison Of Patient Groups In Singapore	Dr Gan Yi'an, Nicola	TTSH (NHGEI)
NHG Eye Institute – Bausch + Lomb Research Prize	Outcome Of Severely Traumatized Eyes With No Light Perception At A Tertiary Referral Eye Care Centre In Singapore	Dr Rupesh Agrawal	TTSH (NHGEI)
NHG Eye Institute – Bausch + Lomb Merit Prize	Ahmed Tube Implantation In Refractory Glaucoma: A Comparison Of Outcomes With And Without The Use Of Adjuvant MMC Application	Dr Tien Chih-Hui, Melissa	TTSH (NHGEI)
NHG Eye Institute – Alcon Research Prize	A Novel Classification Of The Vascular Patterns Of Polypoidal Choroidal Vasculopathy And Its Relation To Clinical Outcomes – A 5-Year Study	Dr Tan Siang Hui, Colin	TTSH (NHGEI)

Singapore Health and Biomedical Congress 2011

Award Title	Paper	Awardee	Institution
Young Investigator Award (<i>Quality & Health Services Research</i>) – Gold Medal	Real-Time Prediction Of Waiting Time In Emergency Department Using Quantile Regression	Dr Sun Yan	HSOR
Best Poster Award (<i>Quality & Health Services Research</i>) – Gold Medal	Direct Medical Cost Of Chronic Obstructive Pulmonary Disease In Singapore	Mr Teo Wee Sheng, Kelvin	HSOR
Singapore Clinician-Investigator Award – Gold Medal	Aberrant Cerebral Fronto-Temporal Connectivity And Characterization Of A Neural Mechanism For Psychotic Symptoms In Schizophrenia	A/Prof Sim Kang	IMH
Singapore Clinician-Investigator Award – Bronze Medal	Erythrocytes: A Valid Source Of Lipid-Based Biomarker Of Schizophrenia	Dr Lee Chee Keong, Jimmy	IMH
Singapore Young Investigator Award (<i>Quality & Health Services Research</i>) – Silver Medal	Prevalence Of Smoking And Nicotine Dependence In Singapore	Ms Louisa Picco	IMH
Singapore Nursing Award – Gold Medal	A Randomised Controlled Study Examining The Impact Of A Staffing Model And Nursing Care Delivery System On Patient, Nurse And Organisational Outcomes	Ms Rajni Parasuram	IMH
Best Poster (<i>Nursing</i>) – Gold Medal	Effectiveness Of Peer-Led Self-Management Programmes For Adults With Schizophrenia And Other Psychotic Disorders: A Systematic Review	Ms Li Ziqiang	IMH

Research Achievements

Award Title	Paper	Awardee	Institution
Best Poster (<i>Allied Health</i>) – Bronze Medal	Computer-Assisted CBT For Selective Mutism: Preliminary Results From A Randomized Controlled Trial In Singapore	Asst/Prof Sung Cohan, Sharon	IMH
Best Poster Award (<i>Nursing</i>) – Silver Medal	The Impact Of Advanced Practice Nurse In The Management Of Patients With Hypertension And Dyslipidaemia In Primary Care	Ms Carolyn Chan Mei Fong	NHGP
Best Poster Award (<i>Clinical Research</i>) – Bronze Medal	A Comparative Study Of UVA-1 Phototherapy Versus Betamethasone Valerate 0.1% Cream For Chronic Vesicular Hand Eczema	Dr Noor Hanif Bin Said	NSC
Singapore Clinician Scientist Award 2011 – Silver Medal	A Novel Angiographic And Anatomic Classification Of Polypoidal Choroidal Vasculopathy Predicts Its 5-Year Clinical Outcomes	Dr Tan Siang Hui, Colin	TTSH (NHGEI)
Singapore Young Investigator Award (<i>Quality and Health Services Research</i>) – Bronze Medal	A Qualitative Assessment Of Myopia In Students - The Impact Of Modified Ophthalmic Quality-Of-Life Assessments	Dr Chew Cher Yong, Milton	TTSH (NHGEI)

From left: Louisa Picco, Rajni Parasuram,
Dr Jimmy Lee, Dr Chua Hong
Choon (CEO), Dr Sim Kang,
Li Ziqiang, Asst/Prof Sharon Sung
(SHBC 2011 Awardees) from IMH



INTRAMURAL GRANTS

Nanyang Technological University – National Healthcare Group (NTU-NHG) Innovation Seed Grant

In August 2011, NHG through the Research & Development Office (RDO) and NTU through the College of Engineering launched the NTU-NHG Innovation Seed Grant 2011 to co-fund research projects.

FY2011

Recipient	Institution	Area of Research/Project
A/Prof Fung Shuen Sheng, Daniel	IMH	The Use Of Interactive Virtual Reality Exposure In The Treatment Of Selective Mutism
Dr Sung Min	IMH	Robot Assisted Social Skills Therapy In Autism Spectrum Disorders
Dr Gilberto de Lima Lopes	JHS-IMC	Evaluating The Growth Inhibition Effect Of A New Anticancer Agent In Animal With Xenografted Tumor Derived From Breast Cancer Patients
Dr Tang Boon Yang, Mark	NSC	A Feasibility Study Of Keratin As A Tissue Regeneration Template For Chronic Wounds
Dr Cheng Shin Chuen	TTSH	Mechanistic And Pathological Study Of The Genesis, Growth, And Rupture Of Abdominal Aortic Aneurysms
Dr Chew Yoon Chong, Winston	TTSH	Development Of A Novel Tissue Engineering Approach For Microsurgical Flap Coverage
Dr Tan Cher Heng	TTSH	Development Of Targeted Ultra-Sensitive Contrast Agent For Hepatocellular Carcinoma Detection And Treatment
Dr Ng Kin-Wah, James	TTSH	Development Of An OCT-Based Screening Tool For Identifying Narrow Iridocorneal Angles In The Anterior Segment Of The Eye
Dr Tow Peh-Er, Adela	TTSH	User Feedback Controlled Power Assisted Leg With Balance Stabilisers For Enabling Walking Tasks
Dr Vu Kien Fong, Charles	TTSH	Precise Visualization Of Fine Needle Aspiration Under Ultrasound Guidance Using Mems Technique
Dr Rupesh Agrawal	TTSH NHGEI	Development Of Sustained Release Ganciclovir Implant For Treatment Of CMV Retinitis In HIV-AIDS Patients

National Healthcare Group – Khoo Teck Puat Hospital (NHG-KTPH) Small Innovative Grant (SIG)

The Small Innovative Grant I (SIG I) grant call opened for application in November 2010.

FY2011

Recipient	Institution	Area of Research/Project
Ms Tan Woan Shin	HSOR	An Evaluation Of Medisave Liberalisation For Diabetic Patients In The National Healthcare Group
A/Prof Sim Kang	IMH	Progressive Brain Abnormalities And Their Relationship To Outcome In Schizophrenia: Longitudinal Structural Magnetic Resonance And Diffusion Tensor Imaging Study
A/Prof Swapna Verma	IMH	The Frequency Of Anti-NMDA Receptor And Anti-VGKC Encephalitides In Patients Presenting With Acute Psychosis
Dr Chong Mei Sian	TTSH	Quality Of Life And Resource Utilisation In Mild-Moderate Dementia Patients - An Asian Perspective
Dr Tan Ern Yu	TTSH	Optimising Hormonal Therapy In Hormone Responsive Breast Cancer
Dr Pek Chern Kuok, Don	TTSH (NHGEI)	Pilot Study Of Comparative Analysis Of The Tear Protein Profile In Pseudomonas Aeruginosa Keratitis Patients
Dr Teoh Charn Beng, Stephen	TTSH (NHGEI)	Prospective Evaluation Of Retinal Vascular Parametric Changes In Patients With HIV
Dr Teoh Charn Beng, Stephen	TTSH (NHGEI)	A Pilot Randomised Control Study To Assess The Efficacy And Safety Of Oral Valganciclovir As An Adjunctive Versus Steroids Monotherapy For CMV-Associated Immune Recovery Uveitis In Immunocompromised Patients



Gwen Lim

@gwenny

26m

So happy for Chern Kuok for winning the SIG award. He really deserves it. He worked so hard and thorough on it.

National Healthcare Group – Clinician Leadership in Research (CLR) Programme

First launched in 2007, the Clinician Leadership in Research (CLR) Programme is a 2-year programme that consists of 3 components: Mentorship, Training and Assessment. Successful applicants explore collaborative opportunities with their nominated mentors and receive a seed funding and academic allowances to support these research projects.

In November 2010, the FY11 CLR grant call was jointly launched as part of a collaborative effort between the National Healthcare Group Research & Development Office (NHG RDO) and Khoo Teck Puat Hospital (KTPH).

FY2011

Recipient	Institution	Area of Research/Project
Dr Lee Eng Sing	NHGP	The Prevalence Of Microalbuminuria And Macroalbuminuria In Type 2 Diabetic Patients In The Primary Care Setting Of A Public Institution In Singapore
Dr Seah Ee-Jin, Darren	NHGP	A Study Of The Impact Of Photograph-Assisted Dietary Review Amongst Type 2 Diabetics In A Primary Care Setting
Dr Chan Lai Gwen	TTSH	A Pilot Study Of The Long Term Psychiatric, Neurobehavioral And Psychosocial Outcomes After Traumatic Brain Injury
Dr Saclolo Rafael Pulido	TTSH	Comparison Of Arterial & Venous Blood Gas Values In Patients With Respiratory And Metabolic Emergencies
Dr See Keng Kew, Terence	TTSH	Refinement Of A Triage Electrocardiogram Protocol At The Emergency Department
Dr Teo Ying Xin	TTSH	Accuracy of emergency physician-performed Ultrasonography in detecting Deep Vein Thrombosis



Dr Nathan Goh 2m
 @thenateffect
 Meeting Jon for dinner. It's been a long time. So much to catch up on. Gonna share with him about the CLR programme.

TTSH Pitch-For-Fund Program

In 2011, the TTSH inaugural Pitch-For-Fund Program was launched. The aim of the program is to enable TTSH staff to quickly obtain some monies for a small research project so that they can present their preliminary data when they apply for a grant at the national level. There were 26 applications reviewed by members of the Clinical Research Committee. Shortlisted applicants are required to entice a panel of judges through the presentation of their research proposals. The 5 awardees were granted \$10,000 each for a period of one year.

FY2011

Recipient	Institution	Area of Research/Project
Dr Chan Yung-Wei, Stephen	TTSH	Efficacy Of A Brain Computer Interface (BCI) Neurofeedback (NF) Training Module For Pain Management - A Validation And Pilot Study
Dr Pek Chong Han, Don	TTSH	An Evaluation Of Triamcinolone Acetonide And Fibrin Glue In The Prevention Of Seroma Formation After Axillary Dissection: A Randomized Trial
Dr Tan Ern Yu	TTSH	Defining The Factors Behind Treatment Failure In Breast Cancer
Dr Rupesh Agrawal	TTSH (NHGEI)	Biological Markers And Cytokine Profiling In Retinal Vasculitis
Dr Tien Chih Hui, Melissa	TTSH (NHGEI)	Use Of MP1 Microperimeter In The Prognostication Of Visual Function Post Macular Hole Surgery



Eileen Ng 29m
 @wonderleen
 Hey Gwen! Don't forget our appointment later. There's so much I wanna share with you about TTSH's Pitch-For-Fund Program. See ya!

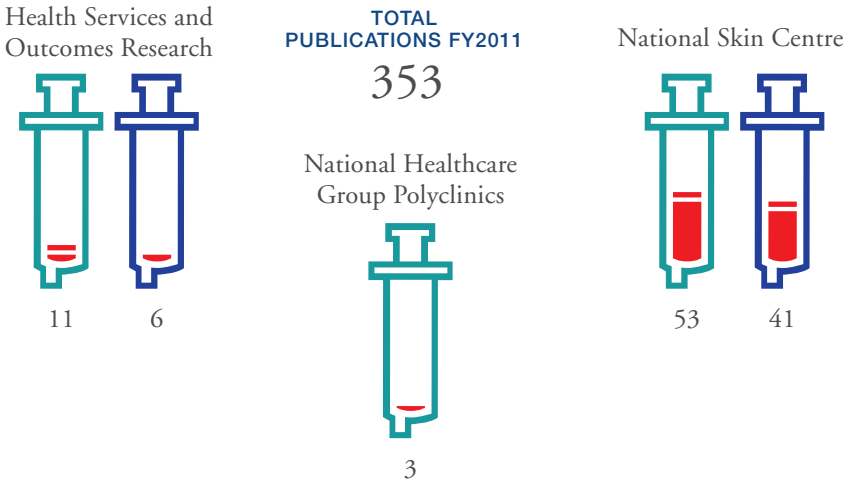
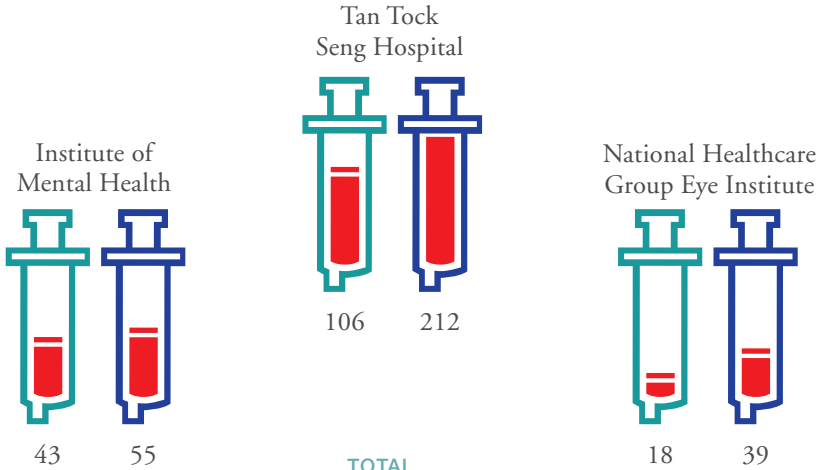


Gwen Lim 12m
 @gwenny
 Veron sharing with me regarding TTSH's Pitch-For-Fund Program.



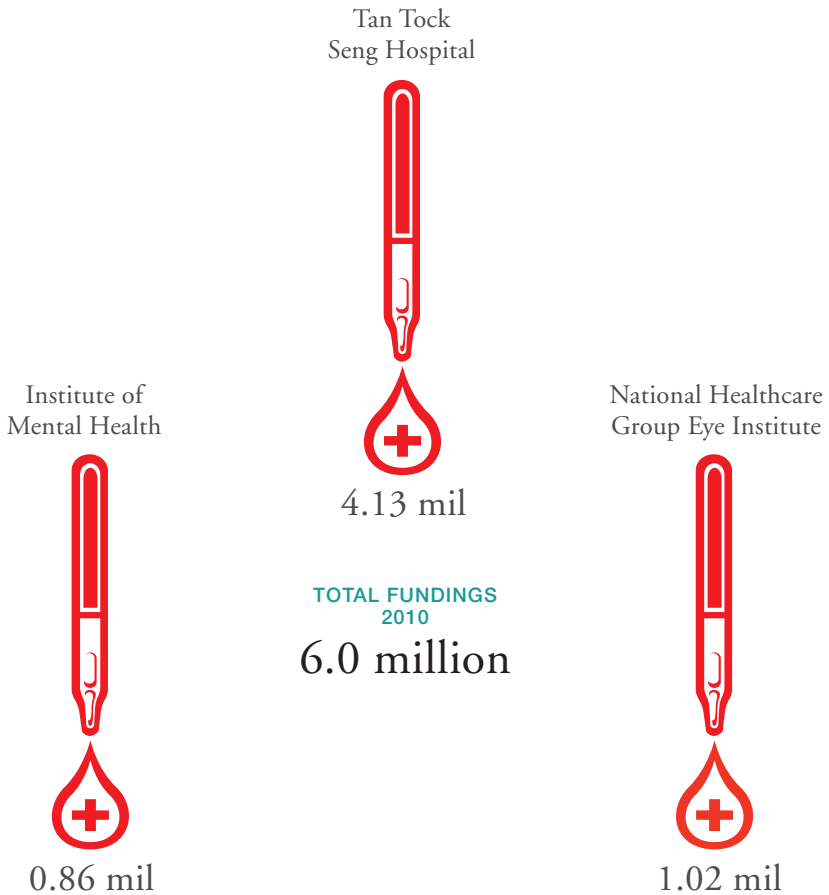
Overview *of* Publications *and* Grants

NHG Publications in FY2010 & FY2011



● FY2010 ● FY2011

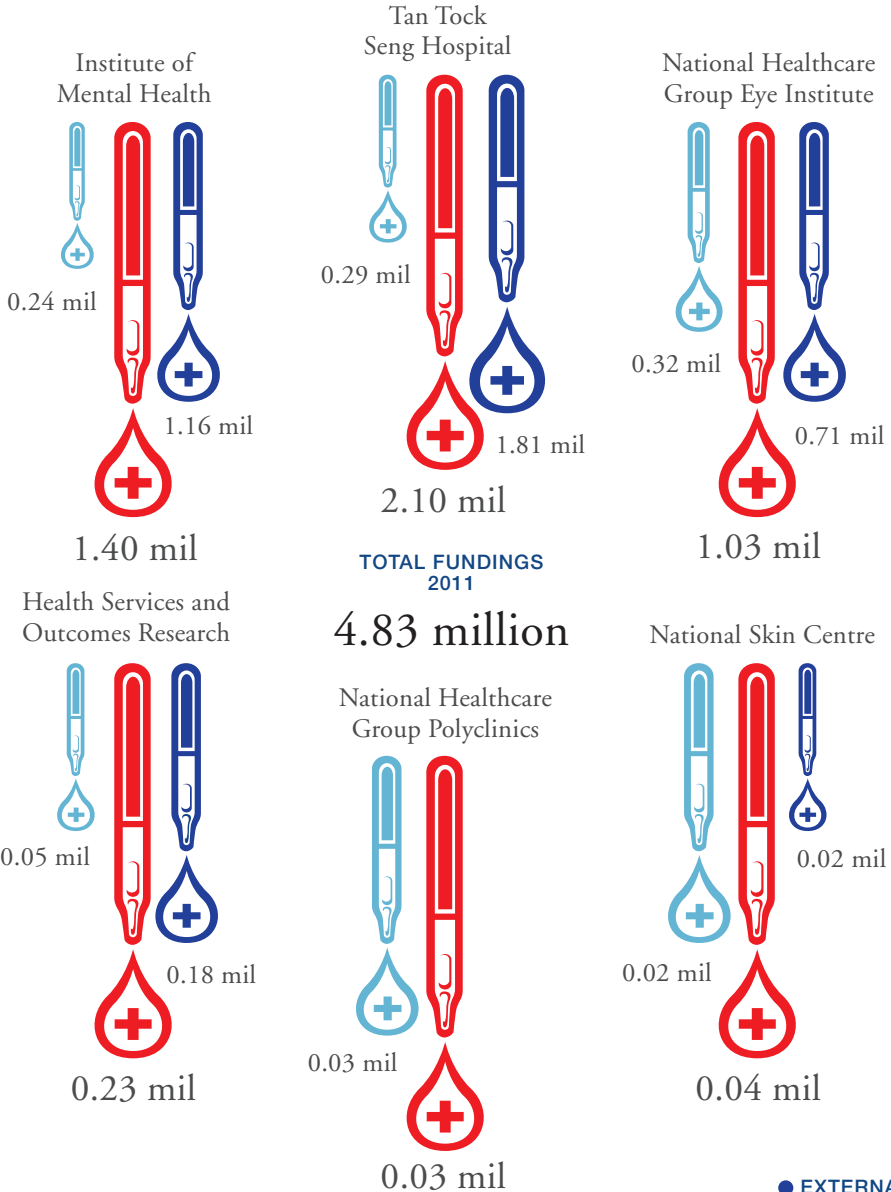
Research Fundings Received in FY2010



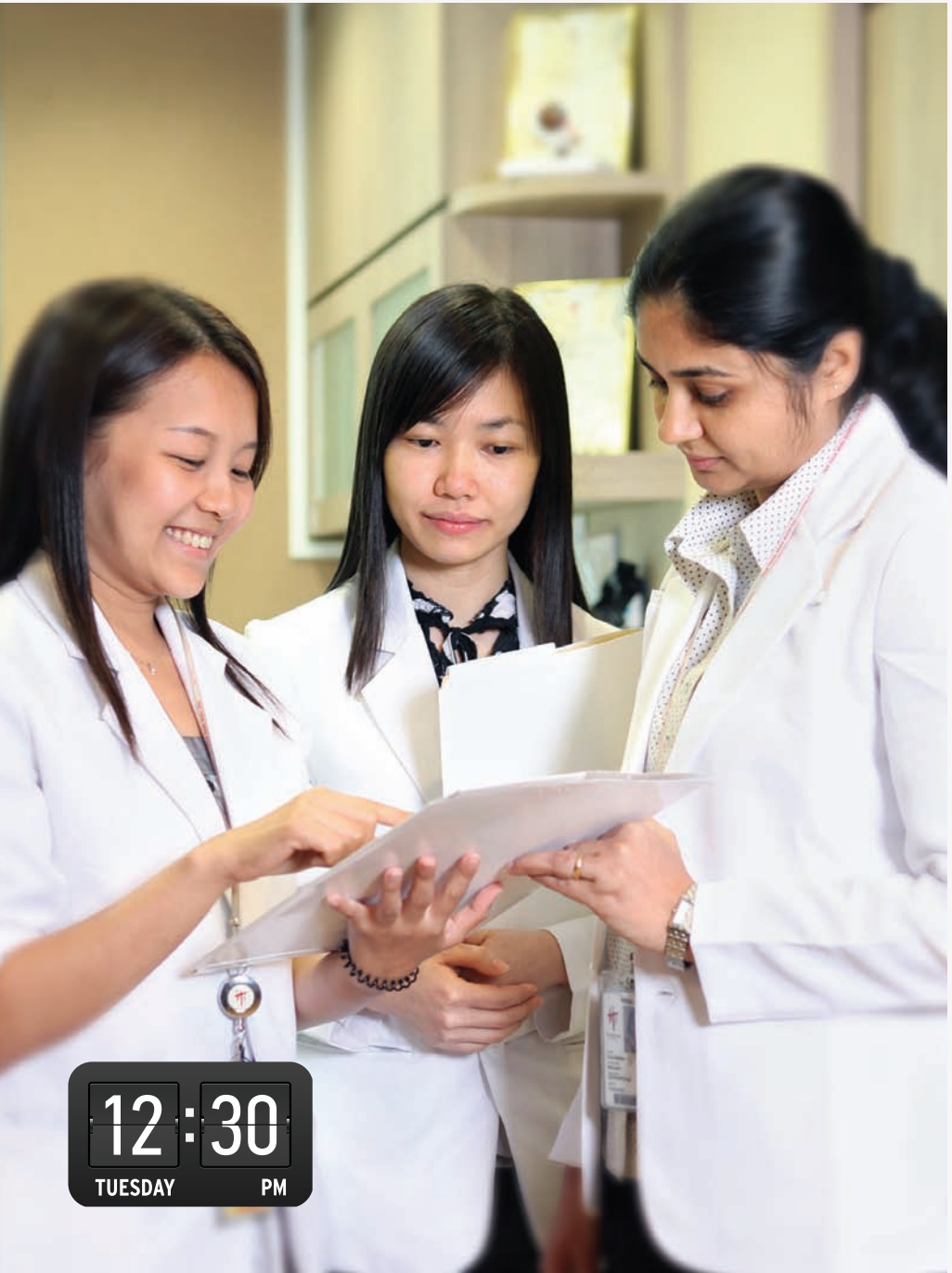
All external funding were received from sources, including, but not limited to, National Medical Research Council (NMRC), Biomedical Research Council (BMRC), National Kidney Foundation and Singapore Heart Foundation.

● TOTAL

Research Fundings Received in FY2011



Internal Funding Source is NHG Endowment Fund



12:30
TUESDAY PM

Partnerships and Collaborations

Hand in Hand

There has been an increasing emphasis on research especially in collaborative research both internally and externally. I am fortunate that I have been given the opportunity to be involved in one such research. I am assisting Dr Wong Hon Tym in the noble methods of imaging, risk assessment and screening as part of his research on Angle Closure Glaucoma.

There are two main types of glaucoma – open-angle glaucoma and closed-angle glaucoma. Angle closure glaucoma is characterised by sudden ocular pain, seeing halos around lights, red eye, very high intraocular pressure, nausea and vomiting, sudden decreased vision, and a fixed, mid-dilated pupil.

Although we are still new to the scene of collaborative research, we managed to set up an infrastructure that encourages and supports collaboration amongst various local institutions including Singapore Eye Research

Institute (SERI), Nanyang Technological University (NTU), Centre for Disease Control and Prevention (CDC), Agency for Science, Technology and Research (A*STAR) and various pharmaceutical companies.

This research that I am assisting Dr Wong on received the A*STAR Biomedical Research Council (BMRC) Translational Clinical Research Partnership (TCRP) Grant.

When I was studying in NTU, I was involved in a collaborative research with one of NHG's institutions. My course mate and I had the opportunity to assist our Professor Liu Quan with Dr Chong Kian Tai from Tan Tock Seng Hospital.

It was an eye-opening experience for me and that was when I learned the value of collaborative research. Our challenge was to build on our existing momentum and to explore new initiatives in collaborative research and to further establish a core faculty of dedicated clinician-scientists and basic research scientists who can bridge the links from 'bench to bedside'.

Winning the grant from A*STAR acknowledges the value of Dr Wong's research. However, what I find most fulfilling is the collaborative nature of the research amongst various institutions together.

Dr Ghayathri
NATIONAL HEALTHCARE GROUP
EYE INSTITUTE
RESEARCH MANAGER

External Research Collaborators

TRANSLATIONAL RESEARCH

Atopic Dermatitis

*National Skin Centre (NSC) in collaboration with A*STAR⁷⁶*

Atopic dermatitis (AD) is a high burden, chronic relapsing inflammatory skin condition that has a very high prevalence in Singapore, making it a top priority research focus for us. Together with Prof Birgit Lane's Epithelial Biology Laboratory, Institute of Molecular Biology⁸⁰, A*STAR, we have embarked on several ongoing studies to elucidate the molecular genetics of this important skin disease. Filaggrin (FLG) mutations have been found to be the strongest genetic risk factor for AD and we found that up to 20% of Chinese AD patients locally carried one or more FLG null mutations. Our group also found several novel population-specific filaggrin mutations within our

cohort, confirming that Asian populations have a wider genetic landscape of FLG mutations compared to Europeans. A subsequent study found that AD patients with FLG mutations had more severe, early onset disease, and more significantly, had a much higher risk of recurrent bacterial infections and disease flares.

We were successful in securing a National Medical Research Council (NMRC)⁸³ Exploratory Developmental Grant for a pilot study to elucidate the role of microRNA in AD. This ongoing pilot study aims to identify microRNAs and their target molecules involved in the pathogenesis and progression of AD. This work is being carried out by Dr Dwi Pramono Sarengat and Dr Mo XueJun, in collaboration with Dr Prabha Sampath and Prof Birgit Lane's team from A*STAR.

It is hoped that these new insights may provide the basis for future development of new therapeutic options for AD.

We also completed a retrospective study on the efficacy and side effects of azathioprine and cyclosporine treatment in AD patients. It was found that both therapies were effective and generally safe as steroid-sparing agents in patients with severe AD. The majority of patients improved within one month of treatment initiation with an overall incidence around 10-15% of major side effects in both groups.

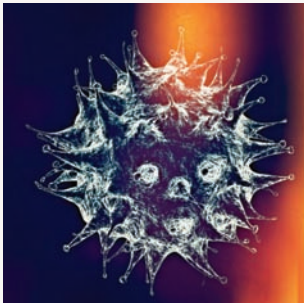


Dr Nathan Goh

12m

@thenateffect

Managed to take a snapshot of this microscopic view of a virus strain.



Dengue

Tan Tock Seng Hospital (TTSH) in collaboration with multiple local and international collaborators

STOP Dengue Translational and Clinical Research (TCR) funded by NMRC in December 2008 has been set up to serve

as the focal point for dengue research collaboration in Singapore, intending to integrate established groups from Department of Infectious Diseases, TTSH; National University of Singapore (NUS)⁶⁶ and Duke-NUS Graduate Medical School⁶⁰, to form internationally competitive programs. This multi-disciplinary 5-year programme seeks and integrates knowledge gathered on developing optimal dengue management strategies, understanding of disease pathogenesis, discovery of prognostic makers, prevention of the spread of dengue and effective targeted therapy.

The entire STOP Dengue programme is a collaborative effort of expertise from various fields and institutions which aims to make Singapore the preferred location for innovative drug studies, research on biomarkers, and disease mechanisms for Dengue. The first three years of STOP Dengue's collaborative research have led to some key outcomes. The team of basic science and clinician researchers has published 58 peer-reviewed journal papers, contributed to 12 book chapters, had 11 oral presentations and 42 poster presentations. In addition, it had trained 12 PhD and 5 Masters students and won additional competitive research grant funding.

STOP Dengue TCR's promising programs will benefit from the synergies obtained by such collaborations and intends to be the vehicle that will integrate the establishment with upcoming programs in Singapore to improve collaborations

between scientists and clinicians with the aim of translating discoveries in the laboratory into interventions that can improve dengue care.

*For list of collaborators, please refer to Annex on page 54. Local collaborators: 43, 47, 50, 51, 55, 59, 60, 65, 67, 69, 70, 71, 73, 78, 79. International collaborators: 3, 4, 5, 7, 8, 9, 12, 13, 15, 16, 17, 18, 20, 21, 22, 23, 24, 25, 26, 27, 31, 32, 35, 36.

Human Immunodeficiency Virus (HIV)

Tan Tock Seng Hospital (TTSH) in collaboration with multiple local and international collaborators

The Communicable Disease Centre (CDC), Tan Tock Seng Hospital is the national reference centre for HIV clinical care in Singapore. As the largest HIV treatment centre caring for 2,500 patients (*70% of national patients*), the CDC HIV treatment program has been at the forefront of research, collaborating extensively locally, regionally and internationally to bring PROGRESS to HIV patient care, PUBLISH results to contribute generalisable knowledge and PATENT ideas to commercialise benefits.

Extensive collaboration has been a main contributor to the progress in HIV research in the CDC. Locally, CDC investigators are heading a multi-centred collaboration involving National University Hospital (NUH)⁴³, Singapore General Hospital (SGH)⁴⁶ and Changi General Hospital (CGH)⁴⁰ documenting the molecular epidemiology of HIV-1 in Singapore. Additionally, a NMRC-funded collaboration with A*STAR⁷⁵ institutes



Dr Nathan Goh

23m

@thenateffect

Bumped into one of the 5 trainees Masters students from the STOP Dengue programme.

resulted in a locally-developed HIV-1 quantitation assay which has been successfully patented. Regionally, the CDC is the Singapore representative on the sole pan-Asian HIV database, the Treat Asia HIV Observational Database (TAHOD). The associated Treat Asia Quality Assurance Scheme (TAQAS) has facilitated quality control for a locally developed genotypic resistance test at the CDC.

Current international collaborators include the Johns Hopkins Medical Institution with projects examining molecular epidemiology, and the University of Texas³⁸ examining inter-subtype differences in bystander T-cell apoptosis.

The results of research have helped to improve HIV patient care. The locally developed viral load and genotypic resistance test has facilitated access to these tests for our patients. The patenting of the viral load kit helps to ensure continued access for our patients. Research into the molecular epidemiology of HIV-1 in Singapore has helped the identification of a novel recombinant strain, CRF51_01B, which was generated in Singapore as a result of recombination of the two existing strains, CRF01_AE and subtype B. These findings have been published.

Genetic Skin Diseases and Genetics Research

*National Skin Centre (NSC) in collaboration with A*STAR⁷⁷*

The NSC Molecular Diagnostic Laboratory continued to play a key role in genetic research work, mainly for the diagnosis of genodermatoses and rare skin diseases, such as epidermolysis bullosa, ectodermal dysplasia, incontinentia pigmenti and various forms of unusual pigment disorders.

We also have several ongoing collaborative studies with A*STAR focused on identifying the genetic basis for vitiligo and acne, both very common and clinically relevant conditions.

Psychosis

Institute of Mental Health (IMH) in collaboration with multiple local and international collaborators

THE SINGAPORE TRANSLATIONAL AND CLINICAL RESEARCH IN PSYCHOSIS (STCRP): VULNERABILITY, DISEASE PROGRESSION, AND TREATMENT IN SCHIZOPHRENIA AND RELATED PSYCHOSES

This is a 5-year, 25-million-dollar project which is funded by the National Research Foundation⁸³ which sets out to identify the biomarkers for schizophrenia and related psychoses.

This project is ongoing and to date, The Neuroscience TCR team has published to date a total of 36 scientific papers with numerous presentations at local and

international conferences..One patent is being in the process of being filed and a copyright is being applied for another invention.

Through the Neuroscience TCR programme, IMH has now created an internationally competitive biomedical research infrastructure in schizophrenia, with high quality phenotyping of the Asian populations in terms of clinical and neurocognitive assessments. This will enable IMH to participate or collaborate effectively with other sites in the international academic and pharma-based studies of schizophrenia. It can also position itself to play a leading role in forming a Chinese schizophrenia GWAS consortium and be a potential key player in international schizophrenia GWAS consortia.

The IMH team has also established an ethical, high-quality, efficient, and cost-effective system in engaging, recruiting and retaining a large population of patients within the Institute for clinical trials. This has been clearly demonstrated by the successful completion of the single site Randomised Controlled Trial which is part of this project. And we have also established the infrastructure for investigational medicine and clinical trials incorporating both animal models and proof of concept studies in man. This platform has attracted the attention and interest of the pharma industry and currently, there is already a neurocognitive trial with a pharma and a couple are in discussion.

In terms of social impact, the extensive network built with community mental health partners for LYRIKS (*Longitudinal Youth-At-Risk Study*) has equipped primary health care workers with the relevant knowledge to identify young people at risk of mental disorders, raised the visibility of mental health and a change in public mindset towards mental illnesses. This has and will result in early detection and better access to mental health care and reduction in direct and indirect costs in mental care e.g. lesser need for prolonged and frequent hospitalizations, reduced complications with the law and judicial system, reduced likelihood of school dropouts among youth and work disability.

COLLABORATION WITHIN THE FLAGSHIP PROGRAMME IN TRANSLATIONAL CLINICAL RESEARCH IN PSYCHOSIS

IMH is leading a consortium for this programme and our partners comprise research institutes and academic medical centers within Singapore (*Genome Institute of Singapore, Singapore Clinical Research Institute*⁴⁵, *Duke-NUS Graduate Medical School*⁶⁰) as well as outside Singapore (*Hadassah-Hebrew University Medical Center*¹, *National Institute of Mental Health (NIMH)*³⁰, *University of Hong Kong*¹¹ and *University of Melbourne*¹⁴)

*For list of collaborators, please refer to Annex on page 54. Local collaborators: 41, 45, 49, 57, 58, 60, 61, 68, 72, 74, 75, 77. International collaborators: 1, 2, 6, 10, 11, 14, 30, 33.

CLINICAL RESEARCH

Addictions

Institute of Mental Health (IMH) national collaborations

The National Addictions Management Service (NAMS) was incorporated in August 2008. Gambling is an exceptionally popular pastime in Singapore. However, for around 3% of the population, it can become problematic, or can lead to a pathological gambling disorder. The study “Predictors of treatment outcome for pathological gamblers” examines whether the baseline demographic and clinical characteristics of new pathological gambling cases can predict treatment outcomes over the course of one-year.

“Other addiction research areas look to examine the cognitive profile of Singaporean addiction patients, specifically in the areas of non-verbal learning and memory, planning and organisation ability, impulsivity and decision-making and mental flexibility. There is also a clinical trial which examines the efficacy and safety of medication for opiates addiction.”

Child and Adolescence Research

Institute of Mental Health (IMH) in collaborations with Child Guidance Clinic (CGC) & other local and international collaborators

The Research Unit in Child Guidance Clinic (CGC) was first initiated in 2008 through the award of the National Medical Research Council (NMRC)⁸³ Clinician-Scientists Individual Research Grant (CS-IRG) to A/Prof Daniel Fung Shuen Sheng. Today, the unit consists of a multidisciplinary team of child psychiatrists, allied health specialists and research staff providing expert knowledge and support to numerous research studies within the department of child and adolescent psychiatry.

To date, the research unit in CGC have also established working relationships with various renowned local and international institutions, including Nanyang Technological University⁶², A*STAR⁷⁵, DUKE-NUS Graduate Medical School⁶⁰, the National Institutes of Health (USA)²⁹, the University of Pennsylvania (USA)³⁷ and McGill University (Canada)³⁶.

This culminated to the publication and presentation of our findings in different academic platforms such as journals and conferences both locally and worldwide.

In the previous year, research findings were represented in eight conferences. Concurrently, we have approximately 10 manuscripts published in different journals (*including peer reviewed*

journals) as well as another 10 in preparation for submission.

Clinical research in CGC has always been guided by exploring approaches that might have the most impact on clinical practice. The research unit has secured many grants and awards totalling to nearly S\$3.5million since its inception to conduct clinical trials and research studies across various populations. The scientist-practitioner model has also brought about new perspectives in clinical work within the department, and led to a study assessing whether a nutritional approach (*fish oil supplementation*) coupled with social skills training might be effective in reducing aggression amongst children with disruptive behaviour disorder.

Dementia Study

SINGAPORE MENTAL HEALTH STUDY ON THE ELDERLY / WELL-BEING OF THE SINGAPORE ELDERLY (WISE)

Institute of Mental Health (IMH) national collaborations

Dementia is a growing public health issue in the Asia-Pacific region. In Singapore, with the rate of population ageing at 3% per year, 2 to 3 times higher than that of other developed countries, the number of people with dementia will more than double from 22,000 in 2005 to 52,600 by 2020 leading to social and economic burden. To provide robust evidence of the burden of dementia and depression among elderly in Singapore and to bridge the knowledge gap, the IMH Research Division has embarked on a three year nationwide epidemiological survey – Well-Being of the Singapore Elderly (WISE).

In the first year of the study, focus group discussions with family caregivers of people with dementia were conducted. The purpose of these discussions is to understand the needs of caregivers, identify the challenges they face and explore ways or services by which these challenges could be reduced. Preliminary discussions have yielded rich culture- and ethnicity-specific information on challenges and needs of caregivers. Information collected from these close and personal discussions with caregivers have been compiled into a short technical report for the Ministry of Health to assist in timely dissemination of information that can lead to informed and appropriate planning of services in future.

Diabetes

REDUCING THE INCIDENCE OF SEVERE HYPOGLYCAEMIA REQUIRING OUTPATIENT OR HOSPITAL CARE FOR DIABETIC PATIENTS SEEN IN THE NATIONAL HEALTHCARE GROUP POLYCLINICS

National Healthcare Group Polyclinics in collaboration with Tan Tock Seng Hospital (TTSH), National University Hospital (NUH)⁴³, Alexandra Hospital (AH)³⁹ and Khoo Teck Phuat Hospital (KTPH)⁴¹

This was a 2-phase study spearheaded by the National Healthcare Group Polyclinics. In the first phase of the study, National Healthcare Group Polyclinics conducted a cross-sectional retrospective study amongst polyclinic patients with diabetes mellitus to determine the incidence of severe hypoglycaemic episodes and the factors which predispose a diabetic patient to hypoglycaemia requiring hospital admission.

The second phase of the study was an interventional study aimed at reducing the incidence of hypoglycaemia in polyclinic patients with diabetes. The interventions were

- i. Minimising the use of long acting sulphonylureas amongst polyclinic patients who were at high risk of developing hypoglycemia: patients aged 65 and above and patients with renal impairment; and
- ii. Establishing a care path for polyclinic patients admitted to NUH, TTSH and KTPH for hypoglycemia to be closely monitored and followed up at the polyclinics after hospital discharge. This care path ensured that these patients received health education for sick day management by National Healthcare Group Polyclinics Care Managers and were followed up by physicians at the polyclinics who would individualise the patients' care plans to reduce the risk of further episodes of hypoglycaemia.

“The outcomes of this collaboration were the identification of risk factors for hypoglycemia and implementation of effective interventions to reduce the incidence of hypoglycemia amongst polyclinic patients.”

THE PREVALENCE OF MICROALBUMINURIA AND MACROALBUMINURIA IN TYPE 2 DIABETIC PATIENTS IN THE PRIMARY CARE SETTING OF A PUBLIC INSTITUTION IN SINGAPORE.

National Healthcare Group Polyclinics in collaboration with Khoo Teck Phuat Hospital (KTPH)⁴¹

Microalbuminuria is an early sign of kidney damage and an independent risk factor for cardiovascular disease in patients with diabetes. The prevalence of microalbuminuria in Singapore has been reported to be 36% to 48.5% using a qualitative urine test for one urine sample.

“The aim of this study was to determine the prevalence of microalbuminuria using a more stringent criterion of two positive quantitative urine albumin creatinine ratio (ACR) tests.”

The findings of this study were that when the more stringent criteria was used, the prevalence of microalbuminuria was lower than previously reported. The usage of Angiotensin Converting Enzyme Inhibitor (ACEI) or Angiotensin Receptor Blocker (ARB) in this population may be a contributory factor.

Presence of hypertension, poor diabetic control and suboptimal blood pressure control were identified as possible risk

factors for albuminuria in patients with Type 2 Diabetes Mellitus.

Mental Health Research

COLLABORATIONS FOR THE SINGAPORE MENTAL HEALTH STUDY (SMHS)

Institute of Mental Health (IMH) in collaboration with 5 centres including Ministry of Health (MOH)⁵¹, RAND Health³⁴ and Nanyang Technological University (NTU)⁶³

The first National Mental Health Blueprint (NMHBP) launched by MOH in year 2007 indicated major enhancements to mental health policies and services in Singapore. It was important to obtain reliable and comprehensive baseline information on the state of mental health in the population and build capacity for further research and evaluation. The Research Division of the Institute of Mental Health led this collaborative effort between five centres that included the MOH, RAND Health, a research division within the RAND Corporation, USA and NTU.

SINGAPORE MENTAL HEALTH STUDY

Institute of Mental Health (IMH) with multiple international and local collaborators

The immense impact mental disorders have on individuals and their families pose a growing challenge to the healthcare systems throughout the world. The ageing population and the trend of social changes (such as increasing divorce rates, changing family structures, and economic pressures)

pose great challenges to the mental well-being of Singapore. IMH has embarked on a nationwide program: The Singapore Mental Health Study (SMHS).

“The SMHS brought together international and local expertise for an extensive and comprehensive assessment of the nation’s mental health. The survey was concluded in December 2010 while the analysis and studies are still ongoing. As part of the study, the positive mental health instrument was developed and validated to help Singaporeans assess their mental well-being.”

Several scientific papers have been published from the study findings. The results have also been presented to the scientific community at local and international conferences. The dissemination of the key survey findings through extensive media coverage; as well as the development of the positive mental health instrument have successfully resulted in raising awareness on mental health issues among the general public and policy.

MENTAL HEALTH POLICY RESEARCH

These studies seek to reduce the burden of mental illness and to address the real-world questions faced by persons living with mental illness, their families, care providers, payers and policymakers in selecting, delivering, and financing optimal care. The strategic initiatives include the following:

- i. Population-based Psychiatric Epidemiology;
- ii. Mental Health Literacy and Health Seeking Behaviour;
- iii. Quality Assessment and Quality Improvement; and
- iv. Ethics of Psychiatric Treatment and Research

Included are commissioned studies from various agencies and organisations like the Singapore Armed Forces (SAF)⁵⁷, Singapore Prison Service (SPS)⁵⁸, Ministry of Health (MOH)³⁴, Ministry of Community Development, Youth and Sports (MCYS)⁴⁹ and the Agency for Integrated Care (AIC)⁵³.

Cutaneous Oncology

National Skin Centre (NSC) in collaboration with Nanyang Technological University (NTU)⁶²

Skin cancer remained an important focus for laboratory based research in NSC. We continued to expand our molecular database of Asian cases of basal cell carcinoma with an ongoing study looking at molecular expression profiling in various subgroups of basal cell carcinoma of varying aggressiveness.

A study on the expression of N-Wiskott Aldrich Syndrome Protein in squamous cell carcinoma was also commenced in collaboration with School of Biological Sciences⁶³, NTU. A retrospective review of melanoma cases seen in NSC was done which identified important clinical differences between Asian and Caucasians.

We also maintained a large database of cutaneous lymphoma patients from which we continue to generate various research projects, including one that found a higher than previously reported association with a second malignancy in local patients with lymphomatoid papulosis. It is hoped that these studies will identify unique epidemiological, clinical and biomarkers unique to Asian skin cancers that may help prognosticate and guide the treatment of these skin cancers.

Psychosis

*Imaging the Brain in Psychosis
Institute of Mental Health (IMH) in
collaboration with multiple local and
international institutions*

Within this network employing structural magnetic resonance imaging (MRI) and diffusion tensor imaging (DTI), we seek to understand the macroscopic and microstructural brain grey and white matter anomalies found in schizophrenia (SZ) and bipolar disorder (BD) with the aim of identifying potential markers of illness, possible mechanisms of pathophysiology and plausible targets for intervention in the future.

“This has been performed so far at several levels including that of focal brain changes, interconnected brain nodes, white matter tractography as well as comparison across diagnoses.”

Overall, the series of projects within this component has generated much scientific collaborations and forged stronger camaraderie between IMH and our partners including National Neuroscience Institute⁴², A*STAR⁷⁵, National University of Singapore (NUS)⁶⁶, Nanyang Technological University (NTU)⁶² as well as several overseas centres.

“SCHIZOPHRENIA” BIOMARKERS IN PSYCHOSIS

*Institute of Mental Health (IMH) in
collaboration with National University of
Singapore (NUS)⁶⁶*

The practice of psychiatry is dependent on observations and obtained accounts to make diagnoses and monitor effects of treatment. This programme utilises available technological advancements to identify biomarkers of clinical utility.

Blood presented an easily accessible tissue on which we based our first studies. We adopted an “Omics” approach to elucidate a blood-based molecular signature, and to examine the relationship

with clinical symptomatology and responses. Blood transcriptomes and lipidomes were profiled using microarray and mass spectrometry, respectively, to identify an expression signature unique to patients with schizophrenia.

Clinicians from the IMH and scientists from NUS involved in this collaborative study. This study is funded by grants from National Medical Research Council (NMRC)⁸³, Singapore, and the NHG. To date, we have had 2 publications, made 3 conference presentations and won 2 research awards. The group has also made 2 invention disclosures and filed for a provisional patent. The group is expanding on their study to profile other molecular biomarkers, and make clinically relevant correlations.

HEALTH SERVICES RESEARCH

Clinical and Epidemiological Research

National Skin Centre (NSC) in collaboration with University of Lubeck¹⁹, Singapore General Hospital (SGH)⁴⁶ and Nanyang Technological University (NTU)⁶²

Clinical and epidemiological studies in highly prevalent, high morbidity skin diseases remain an important area of research, given the diverse and large patient population seen at NSC. We conducted several studies in various conditions such as acne,

psoriasis, immunobullous diseases, cutaneous infections and sexually transmitted diseases.

Several noteworthy studies include a project on the key clinical and histological features of a newly described vasculitic condition known as lymphocytic thrombophilic arteritis, the prevalence and etiology of chronic ulcers in rheumatological patients, the use of a PCR kit for the rapid diagnosis dermatophytes nail infections and a study on the prevalence of different human papilloma viruses genotypes causing genital warts locally. We also completed a study on treatment outcomes in patients with newly diagnosed bullous pemphigoid which found that mucosal involvement and the need to proceed to second line therapy were associated with prolonged duration of disease activity beyond 6 months.

We are also involved in a collaborative study with the Department of Dermatology, University of Lubeck, Germany, using diagnostic immunoblot analysis to further characterise patients with various undifferentiated immunobullous diseases. Other ongoing collaborative studies include a study with the Department of Radiology, SGH, on the use of a non-invasive elastography scan to detect methotrexate-induced liver fibrosis and other exploratory study with School of Chemical and Biomedical Engineering⁶⁴, NTU on developing a novel Raman probe for determining the depth of pigmentation in various skin diseases.

Elderly Research

MARINE PARADE ELDERLY NEEDS SURVEY – UNDERSTANDING THE HEALTH, SOCIAL AND LIVEABILITY ISSUES OF SENIORS

Health Services & Outcomes Research (HSOR) with local partners

In Singapore, persons over 65 years old consumed close to 20% of public sector primary care and hospital services. The healthcare utilisation by this group of seniors is estimated to have a four-fold increase by 2030. To effectively deliver good-quality health and social care, service providers need to accurately identify the multiple needs of the elderly and the existing gaps in health and social services in the community.

An Elderly Needs Survey was developed to comprehensively review the health, social, financial and environmental aspects of elderly residents in Marine Parade. Marine Parade was chosen as the site for the survey as approximately 20% of the total resident population in the estate were aged 66 and above, and this was comparable to the projection of 18.7% for Singapore in 2030.

The survey aimed to derive data regarding residents' physical health, mental health, wellbeing, social function, needs for various services, liveability, financial status, receptivity towards new interventions, and socio-demographic profile.”

This study was done in collaboration with Ministry of Health (MOH)⁵¹, Agency for Integrated Care (AIC)⁵³, Ministry of

Community Development, Youth and Sports (MCYS)⁴⁹, Ministry of National Development (MND)⁵², Health Promotion Board (HPB)⁸¹ and the Centre for Enabled Living (CEL)⁵⁴.

Integrated Care Management Research

PROFILING DISCHARGE NEEDS USING CLUSTERING AND DECISION TREE

Health Services & Outcomes Research (HSOR) with Home Nursing Foundation (HNF)⁵⁶ and Tan Tock Seng Hospital (TTSH)

HNF, together with TTSH, implemented an Integrated Home Care Programme to manage patients within TTSH's catchment. Initiated in 2010, this collaborative study between HNF, TTSH and HSOR aimed to identify clusters of patients according to their post-discharge needs to assist service planning.

Case managers and care-coordinators in TTSH identified and assessed patients likely to require home care after their discharge. A survey was then conducted to collect data on patients' demographics, social support, socio-economic status, cognition, mood and behaviour, functional status, continence, disease diagnosis, and medication.

A total of 488 patients were interviewed. The top five needs identified were education about their disease, management of their chronic diseases, monitoring of symptoms, monitoring for adherence to medication, and physiotherapy. Patients

were then grouped into three clusters according to their needs. Cluster 1 (35% of patients) had about 6 needs on average. Patients in Cluster 2 (23% of patients) had the least number of needs, typically not more than 3, and were mostly wound care, management of chronic disease, or pain management.

On the other hand, Cluster 3 (42% of patients) had the most number of needs, with an average of 7 out of 15.

The findings of this study provided a compact stratification of needs of the population of interest. This insight could guide decision makers in policy making and services and resource planning.

Operations Research

APPLICATION OF DISCRETE EVENT SIMULATION ON WESTERN REGION ACUTE INPATIENT FLOW ANALYSIS

Health Services & Outcomes Research (HSOR) with local partners

Due to the growing ageing population, National University Hospital (NUH)⁴³ is facing more pressure in coping with the increased acute inpatient demand with their current bed capacity.

A collaborative study between NUH and HSOR was started in 2011 to use the Discrete Event Simulation (DES) model to identify system constraints and key resources required to meet the anticipated growth of acute inpatient load within the western region, consisting of NUH, Ng Teng Fong General Hospital (NTFGH)⁴⁴ and step-down care facilities in the region.

Presently, the inpatient flow of Singapore's western region is as follows: patients are admitted to either NUH or NTFGH. After a few days' stay, most are discharged home. Some patients are discharged to step down care facilities such as community hospitals and nursing homes. There are also transfers between NUH and NTFGH.

“ A discrete event simulation (DES) model was constructed to quantify the relationships among different departments within an institution, and among different institutions. Using this model, we were also able to model a detailed patient flow across departments such as the emergency department, inpatient wards, operating theatres and outpatient clinics within an institution. The DES model is a highly useful tool to perform various what-if analyses for future capacity planning.”

OTHERS

New medical innovations are set to come from collaborations between National Healthcare Group (NHG) and Nanyang Technological University. NTU build strong collaborations to alleviate and develop the biomedical landscape in Singapore. NTU scientists have been working with Clinicians from NHG to tackle clinical concerns through research and development with engineering and technology as well as diagnostics developments through numerous individual projects and joint workshops. NTU scientists from multidisciplinary are working with Clinicians from across institutions of the NHG on development of translatable bedside solutions in cancer detection and treatment, robotic assisted surgeries as well as tissue regeneration for skin and wounds.

“The numerous forms of joint collaborations developed this year mark a milestone for NTU and NHG in helping to shape and build the biomedical research landscape in Singapore. The scale and complexity of research today challenges clinicians, scientists and engineers to search beyond

the confines of their own individual disciplines to seek multidisciplinary and inter-disciplinary models with the aim of finding the best solutions to solve biomedical mysteries and challenges. This may systemically result in the invention of new medical devices, clinical practices and streamlining of processes.”

Invention of presently unavailable medical devices is made reality through a Memorandum of Understanding for the NTU-NHG Innovation Seed Grant which was signed in August 2011 – with a total of \$500,000 to be invested by NTU and NHG over two years to support medical research projects that serves a platform that contributes to the building of capability. The agreement was signed in Tan Tock Seng Hospital by NTU’s Professor Janie Fouke, Dean of the College of Engineering, and NHG Group CEO Professor Chee Yam Cheng. Professor Stephen Smith, NTU’s Vice President for Research and former dean of LKCMedicine, and Professor Philip Choo, Deputy Group CEO (Care Integration & Population Health) and CEO of Tan Tock Seng Hospital, witnessed the signing.

The partnership will bring together experts from different fields to focus on finding solutions to healthcare problems. This creates an environment where engineers who can design the smartest devices, doctors who possess a deep understanding of a particular disease, and business thinkers with ideas on how to optimise healthcare processes can talk with each other and come up with ways to deliver the excellent medical care that people deserve.

“A total of 11 projects were awarded under the NTU-NHG Innovation Seed Grant, to foster collaborations and delivering clinical outcome, each project is led by a Clinical Principal Investigator from NHG Institutions, namely Tan Tock Seng Hospital, Institute of Mental Health, NHG Polyclinics, and National Skin Centre, and a Co-Investigator to be led by a Professor from one of the six schools within NTU’s College of Engineering.”



Dr Nathan Goh 41m
@thenateffect
Great shot taken by one of my team members during our lab session at TTSH



This push to facilitate multi-disciplinary research between NHG’s Clinicians and NTU’s Scientists and Engineers is aligned with the LKCMedicine’s plans for its medical students and researchers to improve patient care, delivery and outcomes.

**Details of these 11 projects can be found on page 48.*

ANNEX

International Collaborators

A. ASIA PACIFIC

1. Hadassah-Hebrew University Medical Center, Israel
2. Nagoya University Graduate School of Medicine, Japan
3. National Hospital for Tropical Diseases (NHTD), Ho Chi Minh City, Vietnam
4. Oxford University Clinical Research Unit, Vietnam
5. Pasteur Institute of Cambodia, Cambodia
6. Shanghai Jiao Tong University, China
7. Standard Diagnostics Inc, Korea
8. Universitas Andalas, Faculty of Medicine, Department of Microbiology, Padang, Sumatra, Indonesia
9. University Malaya Medical Centre, Kuala Lumpur, Malaysia
10. University of Delhi, India
11. University of Hong Kong, Hong Kong
12. University of Kelaniya, Sri Lanka
13. University of Peradeniya, Sri Lanka
14. University of Melbourne

B. EUROPE

15. Cambridge Institute for Medical Research, UK
16. Institut Mérieux, France
17. Pasteur Institute of Lille, France
18. University of Cambridge School of Clinical Medicine, Department of Medicine, UK
19. University of Lübeck, Department of Dermatology, Germany
20. Vela Diagnostics, Germany
21. Wellcome Trust, UK
22. World Health Organisation (WHO), Special Programme for Research & Training in Tropical Diseases (TDR)



- ASIA PACIFIC
- EUROPE
- NORTH AMERICA

C. NORTH AMERICA

23. Bio-Rad Laboratories, Inc.
24. Brandeis University, Waltham, Massachusetts
25. Colorado State University, USA
26. Duke University, Durham, USA
27. Massachusetts Institute of Technology (MIT), Department of Chemical Engineering, USA
28. McGill University, Canada
29. National Institutes of Health (NIH), USA
30. National Institute of Mental Health (NIMH), USA



31. Novartis Institute for Tropical Diseases, USA
32. Pennsylvania State University, USA
33. Psychiatric GWAS Consortium, International Schizophrenia Consortium, Molecular Genetics of Schizophrenia
34. RAND Health, RAND Corporation
35. University of California, Los Angeles (UCLA), USA
36. University of Miami, USA
37. University of Pennsylvania, USA
38. University of Texas, USA

Local Collaborators

HOSPITALS AND MEDICAL INSTITUTES

39. Alexandra Hospital (AH)
40. Changi General Hospital (CGH)
41. Khoo Teck Puat Hospital (KTPH)
42. National Neuroscience Institute (NNI)
43. National University Hospital (NUH)
44. Ng Teng Fong General Hospital (NTFGH)
45. Singapore Clinical Research Institute (SCRI)
46. Singapore General Hospital (SGH)
47. Singapore General Hospital (SGH), Department of Family Medicine and Continuing Care
48. Singapore General Hospital (SGH), Department of Radiology

MINISTRIES

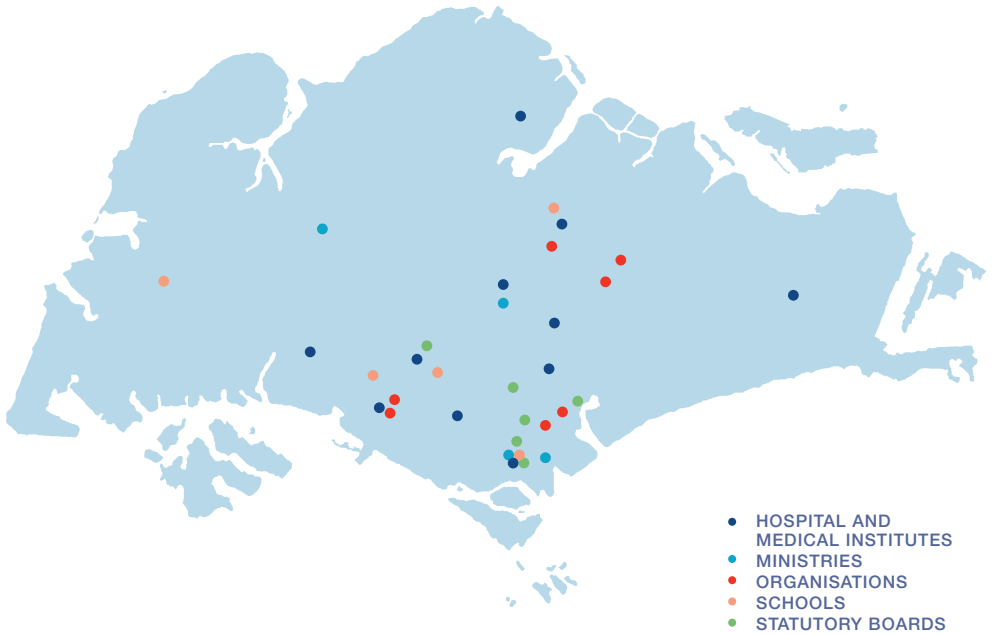
49. Ministry of Community Development, Youth & Sports (MCYS)
50. Ministry of Defence (MINDEF), Singapore Biodefence Center
51. Ministry of Health (MOH)
52. Ministry of National Development (MND)

ORGANIZATIONS

53. Agency for Integrated Care (AIC)
54. Center for Enabled Living (CEL)
55. DSO National Laboratories, Defense Medical and Environmental Research Institute
56. Home Nursing Foundation (HNF)
57. Singapore Armed Forces (SAF)
58. Singapore Prison Service (SPS)
59. Singapore-MIT Alliance for Research and Technology (SMART)

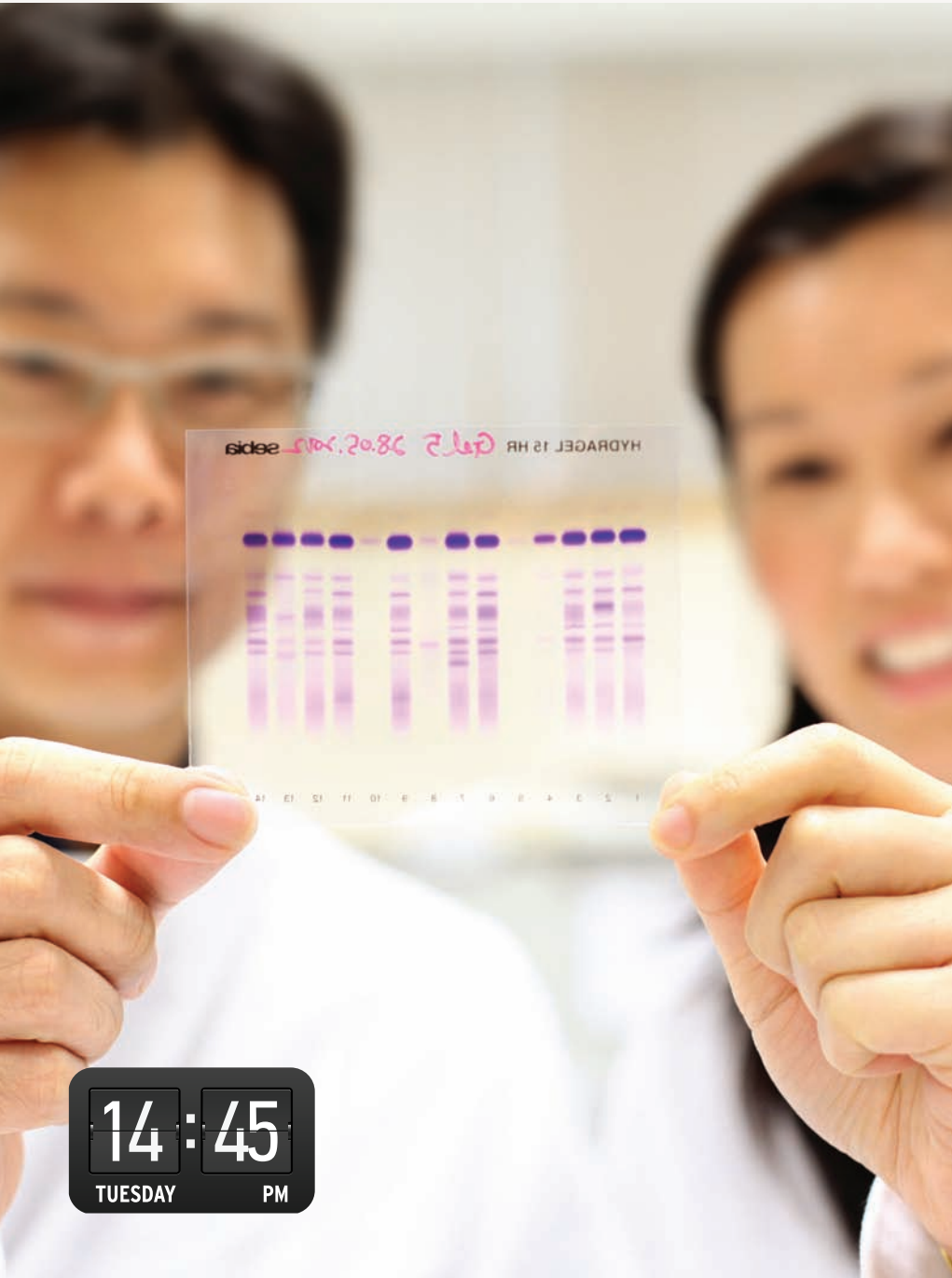
SCHOOLS

60. Duke-NUS Graduate Medical School
61. Duke-NUS Graduate Medical Cognitive Neuroscience Laboratory School
62. Nanyang Technological University (NTU)
63. Nanyang Technological University (NTU), School of Biological Sciences
64. Nanyang Technological University (NTU), School of Chemical and Biomedical Engineering
65. Nanyang Technological University (NTU), School of Physical and Mathematical Sciences, Division of Chemistry and Biological Chemistry
66. National University of Singapore (NUS)
67. National University of Singapore, Center for Bioimaging Sciences
68. National University of Singapore, Department of Biochemistry, Centre of Life Sciences
69. National University of Singapore, Department of Chemistry
70. National University of Singapore, Department of Epidemiology and Public Health
71. National University of Singapore, Department of Microbiology
72. National University of Singapore, Department of Psychology
73. National University of Singapore, Singapore Center for Health Services Research
74. National University of Singapore, Yong Loo Lin School of Medicine, Centre for Bioethics
75. National University of Singapore, Yong Loo Lin School of Medicine, Department of Community, Occupational & Family Medicine



STATUTORY BOARDS

76. Agency for Science Technology and Research (A*STAR)
77. A*STAR, Genome Institute of Singapore (GIS)
78. A*STAR, Institute of Bioengineering and Nanotechnology
79. A*STAR, Institute of Microelectronics
80. A*STAR, Institute of Molecular Biology (IMB)
81. Health Promotion Board (HPB)
82. National Environment Agency, Environment Health Institute
83. National Medical Research Council (NMRC)
84. National Research Foundation (NRF)



Between Us

Diabetes is a chronic disease and it stays with patients for life. It is the seventh most common cause of death in Singapore. Having a family history of diabetes drives me to be involved in the research process by providing clinical information of my patients with the team from Health Services and Outcomes Research (HSOR).

Just like my father, most of my patients are suffering from type 2 diabetes. Today, I'm meeting Dr Angela Yeo whom I've been working closely with for the past few months. She is going to share with me a study on the effectiveness of the Empowerment Self-Management Initiative (ESI) Programme.

The structured approach of this programme which is based on disease education and insulin administration

is aimed at changing patients' behavior by increasing their self-efficacy and knowledge, thus leading to better glycaemic control and health outcomes.

According to Dr Angela, findings have shown that the ESI programme was comparable to the current routine care and it highlighted the need to improve these measure especially for patients with long-standing diabetes.

The information which Dr Angela has shared, provided a good insight into the effectiveness of this programme. This certainly helps me to better understand my patients' behaviour and how I can better educate and motivate them in their self-care capabilities.

There needs to be hopeful therapies for people with diabetes to look forward to. I believe that this can be achieved through newer discoveries in pharmaceuticals agents, treatment delivery alternatives, self transplantation and medical advancements.

I'm glad to be able to work closely with Dr Angela. I hope to be able to learn other forms of research outcomes in the field of diabetes so that one day diabetes will not be a chronic disease that pose a heavy burden on one's life.

Dr Alan Tan
NATIONAL HEALTHCARE GROUP
POLYCLINICS
FAMILY PHYSICIAN

Internal Research Collaborations

CLINICAL RESEARCH

Dermatology Research

National Skin Centre (NSC), Tan Tock Seng Hospital (TTSH) and Institute of Mental Health (IMH)

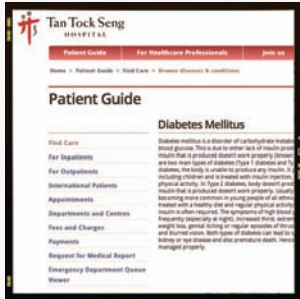
It was an exciting and successful period for clinical trials in NSC. We continued to attract pharmaceutical drug trials for various skin diseases. A phase IV trial on the efficacy and safety of a novel cream in the treatment of melasma and solar lentigines, common pigmentary disorders in Asians, was conducted. Another clinical trial investigated the effectiveness of a topical vitamin D cream for the treatment of chronic psoriasis, while another studied the efficacy of a biologic treatment in psoriasis. A phase IV comparative study of 2 topical acne treatments was also completed. We are involved in an ongoing

global, multi-center, phase III, randomized, double-blind, placebo-controlled trial on the efficacy, safety and tolerability of a novel oral drug in the treatment of moderate to severe psoriasis.

Other investigator-initiated clinical studies included the use of photodynamic therapy to treat truncal acne and recalcitrant warts and an exploratory study using simplified cellular grafting in the treatment of chronic recalcitrant ulcers. A pilot study on teledermatology in patients from IMH was completed which showed that teledermatology was equally safe and effective in providing dermatological care, compared to on-site physical consultation, with the added advantages of less manpower, resources and time consumed.



Dr Alan Tan 50m
 @thefamilyman
 Gonna forward some info,
 from TTSH's website for one
 of my patients.



Diabetes Research

A STUDY OF THE IMPACT OF PHOTOGRAPH-ASSISTED DIETARY REVIEW AMONGST TYPE 2 DIABETICS IN A PRIMARY CARE SETTING

National Healthcare Group Polyclinics & Tan Tock Seng Hospital (TTSH)

The study of the impact of photograph-assisted dietary review amongst Type 2 Diabetics is a clinical trial designed to determine whether a novel intervention: use of self-obtained dietary intake photographs during dietitian consultation improves dietary intervention measures and metabolic outcomes in patients with type 2 diabetes mellitus.

“The multidisciplinary study team comprises of physicians from NHGP, an endocrinologist from TTSH, dietitian and nurses.”

HEALTH SERVICES RESEARCH

Cardiology

AN EVALUATION OF THE CONTROL OF CORONARY RISK FACTOR INITIATIVE (LIVE) PROGRAMME

Health Services & Outcomes Research (HSOR) & NHG Disease Management

Integrated, team-based multi-dimensional packages of complementary interventions are among the key elements of successful disease management programmes. The objective was to evaluate the effectiveness of the LIVE programme in controlling Low Density Lipoprotein (LDL) and blood pressure (BP) levels, reducing risk of re-infarctions, and facilitating referral of patients with stable coronary artery disease to primary care.

Interventions were delivered by a team of physicians, case managers and other health care professionals. Case managers conducted patient education and were empowered to carry out titration of lipid-lowering medications. The evaluation utilised a cohort design comparing outcomes between patients enrolled in the programme and those who were not enrolled.

While results did not show an effect on the risk of re-infarction, the programme's favourable effects on LDL and BP suggested the potential usefulness of an evidence-based, multi-modal, multi-disciplinary disease management strategy on short to intermediate-term outcomes.

Diabetes

EVALUATION OF THE EMPOWERMENT SELF-MANAGEMENT INITIATIVE (ESI) PROGRAMME FOR PATIENTS WITH TYPE 2 DIABETES ON INSULIN

Health Services & Outcomes Research (HSOR) & National Healthcare Group Polyclinics

Diabetes Mellitus is the 7th most common cause of death in Singapore. Improved blood glucose control is associated with reduction in the risk of developing microvascular and macrovascular complications and may improve the quality of life. National Healthcare Group Polyclinics rolled out the Empowerment Self-Management Initiative (ESI) Programme to encourage the uptake of a care manager-led self-monitoring of blood glucose (SMBG) programme in patients who were prescribed insulin therapy. The programme undertook a structured approach towards disease education and insulin administration. The overall objective was to change patients' behaviour by increasing their self-efficacy and knowledge. Improved behaviour is expected to lead to better glycaemic control and health outcomes.

This study sought to examine the effectiveness of the ESI programme in terms of knowledge, self-efficacy, behaviour, glycaemic and hypoglycaemic control and quality of life compared to a control group. The findings illustrated that the ESI programme was comparable to the current routine care. SMBG did not confer significantly better results compared to usual care in patients with Type 2 Diabetes Mellitus starting insulin treatment.

For both groups of patients, the results on the level of diabetes knowledge and self-care activities highlighted the need to examine how to improve these measures, especially among a group of patients with long-standing diabetes.

Emergency Medicine Study

OUTCOMES OF MEDICAL INTENSIVE CARE AND HIGH DEPENDENCY UNIT ADMISSION AMONG PATIENTS ADMITTED FROM THE EMERGENCY DEPARTMENT (ED) OF AN ACUTE CARE HOSPITAL IN SINGAPORE

Health Services & Outcomes Research (HSOR) & Tan Tock Seng Hospital (TTSH)

Studies have demonstrated that delays in Intensive Care Unit (ICU) transfer may prolong hospital length of stay, and increase ICU, in-hospital and 30-day mortality. The decision to admit, and when to admit to the ICU rests largely on the professional judgment of the Emergency Department (ED) or ICU physician. There is a need to evaluate the quality of these decisions as reflected by patient outcomes in the local context. Results may serve as a basis for the design of interventions to address the common causes of delays. Identification of potential consequences of delays may enable clinicians to design appropriate anticipatory management for critically ill patients.

The findings revealed that 30% of patients admitted to the Medical ICU (MICU)/ High Dependency Unit (HDU) within 24 hours of arrival at the ED were initially admitted to the general wards before being transferred. As the outcomes of

these patients were generally poorer than patients directly admitted to MICU/HDU, it may be useful to examine the extent to which the physicians' decisions, patients'/ caregivers' decisions as well as other factors such as the availability of facilities and resources would affect the timing of admission to MICU/HDU.



Dr Alan Tan

43m

@thefamilyman

Self-care treatment – it takes a lot of discipline and motivation to do this daily.

Infection Control

A DECISION ANALYSIS TO SUPPORT UNIVERSAL SCREENING FOR MRSA COLONISATION IN A LARGE ACUTE HOSPITAL IN SINGAPORE

Health Services & Outcomes Research (HSOR) & Tan Tock Seng Hospital (TTSH)

Methicillin-Resistant Staphylococcus Aureus (MRSA) is a rising public health threat in Singapore with significant in-hospital morbidity and mortality causing a range of infections. TTSH, a large acute hospital with 1,300 beds, planned for active surveillance through universal screening of all admitting patients and cohorting of MRSA colonised patients to reduce transmission and potential subsequent infections. Patients were screened with culture assay with 2-day turnaround time. During this waiting period, the colonised patients in the general ward were a source of transmission via healthcare workers. Subsequent transfers to a cohorted ward

were incomplete and increased exposure period to 3.5 days.

To reduce exposure and facilitate direct admission to the cohorted ward, rapid testing polymerase chain reaction (PCR) which is costlier was considered. To provide decision support on the choice of screening options, a collaborative study between TTSH and HSOR was conducted in 2011 to examine the cost effectiveness of using PCR. The study scope addressed the clinical outcome of infections volume, economics of incremental resource allocation and operational considerations.

We found that the PCR test cost is a high \$4.2 million. But the increase in the test cost due to PCR was offset by the savings in inpatient stay cost due to infections reduced. With PCR, the exposure period was reduced from 3.5 days to about 0.35 days. This in turn reduced infections by ~80 per year through the reduction in hospital acquired colonisation from 4% to 1.1%. Also, it was estimated that the cohort ward capacity had to be expanded from 100 beds to about 140 beds to directly house the admitting colonised patients.

“Using an infectious disease model, it was concluded that using the more expensive PCR was more cost effective than using screening cultures, which increased exposure period and hindered complete transfer.”

Integrated Care Management

EFFECTIVENESS AND COST IMPACT ANALYSIS OF A POST ACUTE CARE AT HOME (PACH) PROGRAMME

Health Services & Outcomes Research (HSOR) & Tan Tock Seng Hospital (TTSH)

With a rapidly ageing population, the burden on hospital resources is expected to increase. To reduce the pressure on inpatient wards, a new initiative called the Post Acute Care at Home (PACH) programme was offered to patients discharged from TTSH. This is a home-based post-acute-care service run by a multidisciplinary team of doctors, nurses, therapists and dieticians. In 2011, TTSH collaborated with HSOR to evaluate the effectiveness of PACH in reducing hospital readmissions and costs to the health system.

Two groups of patients were recruited into this study. The intervention group consisted of 409 patients who received PACH services for an average of 3 months after their discharge from the hospital. The control group consisted of 201 patients who declined PACH or who lived outside of TTSH's catchment area. The costs of hospitalisation, emergency department visits, specialist outpatient clinic visits, polyclinic visits, and PACH home visits were calculated and analysed.

We found that patients enrolled in the PACH programme had lower mortality and there was no difference in costs incurred by patients in the PACH programme and those in the control group.

However, hospital re-admissions were higher among PACH patients. These findings reflected the challenges faced when conducting programme evaluation in the local setting.

NATIONAL HEALTHCARE GROUP PRIMARY CARE SURVEY

Health Services & Outcomes Research (HSOR) & Tan Tock Seng Hospital (TTSH)

In the unveiling of the proposed national primary care master plan in early August 2011, three new models of care were mooted to support and enhance the effectiveness, clinical expertise and capacities of general practitioners (GPs) in managing patients with chronic diseases, namely the Family Medicine Centre (FMC), the Community Health Centre (CHC), and the Medical Centre (MC).

In 2011, TTSH collaborated with HSOR in developing the NHG Primary Care survey to understand GPs' perceptions towards these three new entities. Specifically, the survey aimed to establish a profile of our community service partners, the services that they use, and their perceptions towards the new infrastructures or models of care. The survey also studied initial knowledge, attitude and tangible expectations to a new health policy initiative within 3 months of its initial launch.

A total of 64 GPs primarily within the catchment area of TTSH, completed the survey. Amongst the services that GPs use, the most frequently referred out service category was diagnostics, followed by chronic disease management.

When asked where GPs were referring these services to, 65% of the services being used were referred to other service providers, 20% to specialist outpatient clinics and 10% to polyclinics. Of the three new institutions, the awareness was highest for the CHC (69%), followed by the FMC (36%), and the MC (22%). When asked about their willingness to refer patients to the CHC and MC, GPs were very supportive. For the FMCs, while it did not have a high awareness rate, 65% of GPs who were aware of it were willing to collaborate in a FMC venture.

Regarding services that GPs valued most, “diabetic screening”, “rehabilitative services”, and “dietician services” were the top three services for the CHC. For the MC, the GPs chose “cardiology”, “gastroenterology”, and “ophthalmology” as the three most important disciplines.

“The GPs were generally receptive to the CHC and MC. The FMCs appeared to be less well-received possibly due to a lack of awareness. The study suggested that with increased awareness, more GPs could possibly be more receptive to this new model of care.”

Nephrology

RIGHT-SITING CHRONIC KIDNEY DISEASE (CKD) CARE – A SURVEY OF KNOWLEDGE AND PRACTICES AMONG GENERAL PRACTITIONERS IN SINGAPORE

Health Services & Outcomes Research (HSOR) & National Healthcare Group Polyclinics

Chronic kidney disease (CKD) is an emerging public health problem and has led to increasingly congested specialist outpatient clinics. Efforts are being made to right-site care of CKD (stage 1 to stage 3) patients to primary care physicians. This study aimed to identify factors influencing screening and management of CKD among private general practitioners (GPs) in Singapore, to plan programme(s) to encourage their participation in the care of patients.

A survey, developed in collaboration with experts in nephrology and general practice, was conducted among GPs registered in the NHG GP Partner database. The questionnaire covered knowledge about screening tests for CKD, awareness of CKD guidelines, confidence in managing CKD stage 1 to stage 3 patients, and their opinions about right-siting CKD care from specialist outpatient clinics to primary care.

Obstacles to CKD management listed by the GPs included the lack of patient trust, experience and communication with the specialist, and inability of the patient to pay. Motivational drivers of GPs towards CKD management included access to patient information, co-management and more interaction with renal physicians,

and adequate remuneration for the time spent in managing CKD.

Professional Communication

PATTERNS OF INTERPROFESSIONAL COMMUNICATION IN AN ACUTE HOSPITAL

Health Services & Outcomes Research (HSOR) & Tan Tock Seng Hospital (TTSH)

Communication among healthcare workers has often been singled out as key to quality healthcare delivery. In 2010, TTSH collaborated with HSOR in a project to study the interprofessional communication patterns among doctors and nurses in the wards. We collected data using participant observations in the General Medicine (GM), General Surgery (GS), and Intensive Care Unit (ICU) wards, as well as 42 semi-structured interviews with doctors and nurses of varying levels of seniority.

We found two main patterns. Firstly, interprofessional communication among doctors and nurses were limited in the wards and even during ward rounds. Doctors spent an average of 25% talking with fellow doctors whereas nurses spent an average of 19.17% talking with fellow nurses in the wards. In contrast, the proportion of time doctors and nurses spent communicating with each other was much lower at 1.4%, 0.7% and 7.7% in GM, GS, and ICU respectively. Secondly, both doctors and nurses spend 26.3% of their time on computer doing administrative work (eg. clerking patients, updating case notes, etc), which was slightly more than the 25.1% of time they spend on patients.

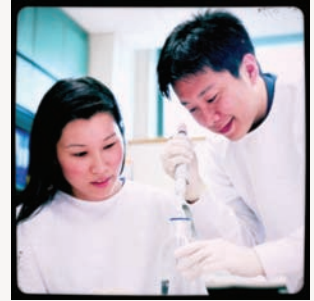


Dr Alan Tan

@thefamilyman

12m

Thanks Joey for this great lab shot of me with Dr Angela. Love it to bits!



“Some lessons that we learned from this study was that to build a team-based care system, socialisation of healthcare workers via interprofessional education may be necessary, and that the centrality of the IT system should be leveraged to facilitate face-to-face communication between doctors and nurses.”



Research Manpower Development Platforms

Collaborative Exchange

I had a fruitful meeting today. I met with Jeremy Fong from Health Services Authority (HSA) and Guo Pei Ling from the Clinical Research Coordinator Society (CRCS) to discuss on three major forums which we will be jointly hosting. These forums will focus on educational opportunities, clinical industry trends and regulatory updates.

It was just three years ago that I attended my first CRCS forum and to date it is one of the most memorable one for me. First and foremost, I get a chance to meet and mingle with people from different fields and specialisations as well as from various institutions. In fact, that was where I met Jeremy.

The forum attracted a mean of 300 participants from pharmaceutical, academic and healthcare institutions. The speaker used several examples to illustrate his points with other specialties which attracted a wide range of participants. Many questions were raised during the intriguing panel of discussions. Both speakers gave

insightful and valuable information from their points of view which in turn won the applause of many. All in all, the forum had truly been an inspiring one.

The upcoming event would be held at the same location where I attended mine. Hence, when the opportunity came for me to organise this event, I was delighted. Everything seems to come in a full circle. I wasted no time contacting HSA and CRCS to plan the details, and most importantly, finding the speakers.

This would not be the first time I have collaborated with Jeremy and Pei Ling. As such, it has been a breeze outlining our goals, expectations and plans we have for the forum.

We hope these forums will bring greater understanding and benefits to the participants in their respective fields of specialisation. Most importantly, we want this forum to be an inspiring one for the participants and pass on the message to their fellow colleagues.

Today, the NHG Office of Human Research Protection Program (OHRPP) maintains an effective human research protection programme, accredited by the Association for the Accreditation of Human Research Protection Programme Inc. (AAHRPP) and co-organised the Asia Pacific Research Ethics Conference in conjunction with the Public Responsibility in Medicine & Research (PRIM&R). The office also has in place continuing education initiatives such as sending for the Certified IRB Professional (CIP) assessment program.

Eileen Ng

RESEARCH & DEVELOPMENT OFFICE
OFFICE OF RESEARCH SUPPORT ADMINISTRATOR

Collaborative Exchange

NATIONAL HEALTHCARE GROUP

Singapore Health & Biomedical Congress

The Singapore Health & Biomedical Congress (SHBC) is the largest local scientific medical meeting, attracting more than 2,000 delegates from Singapore and Asia Pacific. The aim of the congress is to provide a platform for sharing and discussion of ideas and strategies in clinical research, innovation breakthroughs and treatment for the betterment of patient care.

The themes and scientific tracks of each SHBC, aligned with the current healthcare and research landscape, were close to the hearts of many. Aside from the scientific track, programs such as parallel satellite conferences, awards and scientific poster competitions were also organised. Parallel

satellite conferences such as “Primary Care Forum”, “Health Services Research” and “International Ophthalmology Congress” brought more dynamics and robustness in the congress discussions, while the awards and poster competitions rewarded clinical researchers with distinguish achievements.

THE INAUGURAL SHBC 2010

12-13 November 2010

Suntec Singapore International Convention and Exhibition Centre

With a strong emphasis on integrated care, the theme of the SHBC 2010 was “Improving Health in Our Community – A Holistic and Integrated Approach”. The comprehensive scientific programme included some key topics on community-based medicines, integrated medical care services, health services research and biomedical research. The topics promulgated the congress’s aims in

enabling healthcare staff to build on their own strengths and capacities, integrate ideas with biomedical research and to promote integration of different healthcare disciplines, enhance healthcare quality and deliver medical care to the door-step of patients.

In partnership with National University Health System (NUHS), the 1st SHBC attracted 2,600 delegates from Singapore and Asia Pacific as well as 250 keynote, international and local distinguished speakers.

SHBC 2011

11–12 November 2011

Suntec Singapore International Convention and Exhibition Centre

With the focus on setting up a Regional Healthcare System and promoting cross-collaboration, the theme of SHBC 2011 was “Shaping our Regional Healthcare System – Innovation, Education, Research”.

As the Regional Health System (RHS) for the central region of Singapore, NHG is now a patient-centric healthcare ecosystem comprising partners from primary, acute and step-down care sectors working together to deliver integrated healthcare services for patients. Being a RHS will redefine the way we provide patient care and collaborate with our partners and other stakeholders.

The conference topics promulgate an integrated care through innovation and technology, excellence in education and constant search for relevance in our research activities in medical sciences and the psychosocial aspects of health to the patients and population.

SHBC 2011 was graced by Guest-Of-Honour – Minister for Health, Mr Gan Kim Yong, in which he also presented the awards for the prestigious Singapore Clinician Investigator Award as part of the SHBC 2011.

The event was successfully organised by NHG in collaboration with three other Regional Healthcare Systems in Singapore (*Alexandra Health (AH)*, *JurongHealth (JH)* and *Eastern Health Alliance (EHA)*).

The 2nd SHBC attracted 2,200 delegates from Singapore and Asia Pacific as well as 175 keynote, international and local distinguished speakers.

Asia Pacific Research Ethics Conference (APREC)

The Asia Pacific Research Ethics Conference (APREC) is the first Asia-Pacific platform focusing on Human Subject Protection in research, jointly organised by the Office of Human Research Protection Program (OHRPP) and the Public Responsibility In Medicine And Research (PRIM&R) in the USA.

THE 1ST ASIA PACIFIC RESEARCH ETHICS CONFERENCE (APREC 2010)

16-18 September 2010

Orchard Hotel, Singapore

APREC 2010 hosted more than 60 distinguished speakers and over 300 delegates from 22 countries.

There were 4 concurrent tracks at the conference, catering to the differing needs and interests of participants. The tracks covered areas in topics such as the Institutional Review Board, Industry and Clinical Research Professionals, Regulatory Issues in Research and Hot Topics in Research.

THE 2ND ASIA PACIFIC RESEARCH ETHICS CONFERENCE (APREC 2012)

7-9 March 2012

Grand Copthorne Waterfront Hotel, Singapore

APREC 2012 hosted more than 80 distinguished speakers and over 300 delegates from 27 countries.

The theme for APREC 2012, 'Bridging Cultures, Enhancing Research', was conceptualised to reflect recognition of the complex and diverse research environments across cultures in the Asia-Pacific region.

The spectrum of the conference was expanded to include more tracks for a larger faculty of delegates and speakers. There were 6 tracks including 2 new ones covering areas in Quality Management & Quality Improvement in Research

and Population Requiring Additional Protection.

Through APREC, NHG has committed itself to advancing high standards of ethical research conduct and strives to be at the forefront of building research ethics capabilities in the Asia-Pacific region.

Clinical Research Coordinator Society Forums

The Clinical Research Coordinator Society (CRCS) collaborated with the Clinical Research Professionals (CRP) and the Health Services Authority (HSA) to host 3 major forums on educational opportunities, clinical industry trends and regulatory updates in August 2011 and December 2011 & 2012 respectively. Each forum attracted a mean of 300 participants across pharmaceutical, academic and healthcare institutions.

Inaugural Research Leadership & Management Forum

The Research Leadership & Management Forum was launched at the Asia Pacific Research Ethics Conference in March 2012. This executive networking platform is aimed for key opinion leaders to network and share their strategic views for the imperative issues in the local research industry. Over 60 leaders attended this inaugural forum to hear from Professor Stephen Smith, Founding Dean, Lee Kong Chian School of Medicine.

The Inaugural Singapore TCR Flagship Symposium

On 6 October 2010, National Medical Research Council (NMRC) hosted the Inaugural Singapore Translational and Clinical Research (TCR) Flagship Symposium at Singapore Marina Mandarin Hotel. The symposium facilitated the connection between researchers from various disciplines by providing and creating opportunities for the sharing of ideas across disciplines.

The Institute of Mental Health (IMH) was honoured to take part in the symposium. 2 sessions on (1) Devices, Biomarkers and Diagnostics (2) Therapeutics and Clinical Trials were chaired by A/Prof Chong Siow Ann & A/Prof Chong Yap Seng. Dr Jimmy Lee did a presentation on “Biomarkers in Psychosis” and Dr Swapna Verma presented on “Cognition in Schizophrenia: A Randomised Controlled Trial”.

The 2nd Singapore TCR Flagship Symposium 2011

The 2nd TCR Flagship Symposium was held on 7 October 2011. This was a strategic initiative by the National Medical Research Council (NMRC) and Ministry of Health (MOH), to facilitate networking with the academic and industry sectors. The Institute of Mental Health (IMH) was invited to be part of the symposium. The Neuroscience TCR dialogue session was chaired by A/Prof Chong Siow Ann. Dr Jimmy Lee gave a presentation on

“The Neuroscience TCR Programme in Schizophrenia and Related Psychoses - Updates after 3 years.”

“Recruitment of participants for 2 of the 3 studies that made up this programme has been completed – this includes a single site clinical trial.”

First Dengue Research Updates Seminar on “Dengue Research and its Impact on Clinical Practice”

The first of a series of Dengue Research Updates Seminars organised by the STOP Dengue team and the Environment Health Institute, National Environment Agency was held on 11 June 2011.

“The seminar provided updates on the latest progress in the STOP Dengue research initiative, which focused on optimising early diagnosis, prognosis and case management for adult dengue infection. More than 140 participants, including general practitioners, researchers and other healthcare professionals, attended the seminar.”

In conjunction with the seminar, a public exhibition on dengue, graced by Minister for Health, Mr Gan Kim Yong, was held at Tan Tock Seng Hospital’s Atrium to commemorate the inaugural ASEAN Dengue Day on 15 June 2011.

Inaugural ASEAN Dengue Day

STOP Dengue team made a mark on the inaugural ASEAN Dengue Day on 15 June 2011 with A/Prof Leo Yee Sin, Lead Principal Investigator, speaking about the Translational Clinical Research on Dengue.

“Singapore and nine other Association of Southeast Asian Nations (ASEAN) members, together with Minister for the Environment and Water Resources, Dr Vivian Balakrishnan, and the World Health Organization’s Regional Director for the Western Pacific, Dr Shin Young-soo, inaugurated this day in a ceremony.”

This was followed by a symposium attended by the local and international scientific community and public health practitioners.

STOP Dengue at the 60th American Society for Tropical medicine and Hygiene Annual Meeting in Philadelphia

Between 4-8 December 2011, STOP Dengue team once again made a strong

showing at the pre-eminent international conference for tropical diseases, with over 3000 attendees from developing and developed countries.

At the mid-point of its five-year funding cycle from the National Medical Research Council, STOP Dengue researchers delivered four poster and two oral presentations on clinical research findings from our various studies on adult dengue disease in Singapore.

The Lead Principal Investigator, A/Prof Leo Yee Sin, Clinical Director of the Communicable Disease Centre (CDC) and Head of Infectious Disease at Tan Tock Seng Hospital (TTSH) presented research findings on hepatitis in dengue as well as results from a safety trial of dengue vaccines. Initial results from a prospective adult dengue cohort from TTSH validating diagnostic and prognostic criteria were presented by Dr Victor Gan from CDC, TTSH, together with a case control study of dengue deaths in Singapore. Collaborating on clinical datasets, Dr Roman Carrasco from National University of Singapore (NUS) gave an oral presentation on the cost of dengue in Singapore and the economic implications in planning for dengue vaccine rollout.

NTU-TTSH Workshop with College of Engineering: Distributed Diagnosis and Home Healthcare (D2H2)

This is the third in a series of Nanyang Technological University-Tan Tock



Seng Hospital (NTU-TTSH) workshop organised by the TTSH Clinical Research Unit and NTU College of Engineering with a focus on distributed diagnosis and home healthcare (D2H2). The workshop was held in TTSH on 31 August 2010. This workshop aimed at bringing together Engineering Faculties from NTU, TTSH administrators and clinicians for a brain storming session via oral presentations,

and informal dialogue on how the D2H2 concept can work for the hospital. The gist of the D2H2 concept is to offload non-acute chronic patients from the centralised hospital-based care to decentralised home-based care so that the hospitals can have greater capacity to handle acute and emergency cases. More than 80 participants attended the workshop.



Eileen Ng

@wonderleen

Showing Pei Ling NHG's CSCS brochure and was wondering if we wanna do something similar for the CRCS event programme sheet.

24m

NTU-TTSH Workshop with College of Biological Sciences: Workshop on Immunology, Infectious Diseases and Neuroscience

This is a Nanyang Technological University-Tan Tock Seng Hospital



(NTU-TTSH) workshop organised by TTSH Clinical Research Unit and College of Biological Sciences with a focus on immunology, infectious diseases and neuroscience. The workshop was held in NTU on 8 March 2011. The workshop provided a platform for linking NTU investigators with TTSH clinic practitioners to develop strategic research programmes in the area of immunology, infectious diseases and neuroscience.

In 2010-2011, other than workshops conducted in collaboration with Nanyang Technological University (NTU), Tan Tock Seng Hospital (TTSH) Clinical Research Unit (CRU) hosted visitors from Vietnam, Japan and Korea. This is in addition to the hosting of the different pharmaceutical companies and clinical

research organisations on TTSH research infrastructure and capabilities, including:

- i. Visit from Family Health International (FHI) Vietnam – Ho Chi Minh City, Vietnam on 16 September 2010;
- ii. Visit from University Hospital Clinical Trial Alliance (UHCT) – Japan on 25 February 2011;
- iii. Meeting on sharing of research capabilities with NTU College of Engineering;
- iv. Visit from Pusan National University Hospital Clinical Trial Center – Korea on 27 May 2011. (*an MOU was signed*);
- v. Visit to Pusan National University Hospital Clinical Trial Center – Korea in November 2011

Research Admin Roundtable

2011/12 marks the leap year in strengthening of NHG and NTU collaboration, numerous NHG-NTU joint workshops were held. Apart from the NTU-TTSH workshops held collaboratively with College of Engineering and School of Biological Sciences as described above, other workshops held were the 6th NTU-TTSH Robotics Assisted Surgery Workshop and the NTU-IMH Research Workshop on Neurosciences. In November 2011, NTU also hosted the NHG's networking platform for research executives – the "Research Admin Roundtable", for the first time.



Enhancement & Recognition

The Office of Human Research Protection Program (OHRPP) is committed to the promotion of continual education for the Domain Specific Review Board (DSRB) secretariat.

One of my key roles is to ensure that staff's knowledge of ethics is constantly upgraded and expanded. Certified IRB Professional (CIP) is one fine example of the many programs being offered.

Today, I am meeting with two Clinical Research Unit (CRU) administrators, Crystal Tay from Jurong Health Services (JHS) and Ng Lay Choon from Dover Park Hospice (DPH). This would be our first meeting since we last met during the 2nd Asia Pacific Research Ethics Conference (APREC) at the Grand Copthorne Waterfront Hotel back in March 2012.

Apart from sharing with them on the CIP program, I also feel privileged to be able to work with them and provide efficient ethics review of research protocols. For one, JHS being the newest institution thus this would be a pioneering effort. Secondly, DPH, where my late grandfather spent his last few fulfilling moments in the company of dedicated team of healthcare professionals and volunteers.

The CIP credential encourages personal growth and professional development and strengthens the quality of administration and regulatory compliance within OHRPP.

This collaboration is more than just about imparting and sharing our knowledge on the various national and international certification and accreditation programs best suited for the staff of these institutions. It is above all an exchange of priceless wealth of knowledge that will only bring greater understanding between NHG DSRB and the institutions moving forward.

Emily Yeo

RESEARCH & DEVELOPMENT OFFICE
DOMAIN SPECIFIC REVIEW BOARD ANALYST

Enhancement & Recognition

SoCRA: Certification Program for Clinical Research Professionals

The NHG Research & Development Office (RDO) successfully invited the Society of Clinical Research Associates, Inc (SoCRA) to proctor the internationally recognised Certification Program for Clinical Research Professionals (CCRP) to validate and accredit Clinical Research Coordinators (CRC) who were able to demonstrate professional competency.

This was held in conjunction with the 2nd Asia Pacific Research Ethics Conference (APREC) at the Grand Copthorne Waterfront Hotel from 7-9 March 2012. The aim of this certification program is to accredit CRC or professionals with at least 2 years of relevant experience in clinical research, and who are able to demonstrate professional competency in this area.

A total of 24 participants attended the Certification Preparation and Review course on the 6th March while 21 candidates took the Certification in Clinical Research Professional (CCRP) examination offered by SoCRA the following day. The proctor was Ms Susan Devine, Senior Manager of the Clinical Trial Support Unit of Hematology/Oncology at the Hospital for Sick Children in Toronto, Canada.

Besides the certification course and program, NHG also had the privilege of having Ms Devine share her over thirty years of experience in managing and conducting clinical trials in the area of paediatric haematology, oncology and bone marrow transplant at the 19th Clinical



SoCRA participants 2012 with SoCRA Proctor Ms Susan Divine (front row 3rd from left)



Research Coordinator Society (CRCS) Forum. Ms Devine shared on the topic ‘Investigator’s Delegated Responsibilities at the Site’, which was followed by a panel discussion session.

Representatives from the pharmaceutical industry, regulatory boards, and institutions were present to discuss site and clinical trial conduct issues. The topics addressed at the forum included Subject Eligibility, the Informed Consent Process (*including informed consent for vulnerable populations*) and Proper Documentation.

The Certified IRB Professional (CIP) Program

The Office of Human Research Protection Program (OHRPP) is committed to the promotion of continual education for the Domain Specific Review Board (DSRB)

secretariat, to ensure that staff’s knowledge of ethics is constantly upgraded and expanded. An important opportunity for Institutional Review Board (IRB) staff to advance and demonstrate their competence would be via the CIP program.

The CIP program was developed in 1999 by Public Responsibility in Medicine and Research (PRIM&R) and tests candidates’ knowledge in four major areas: Foundations and concepts of IRB practice, Organisational and personnel knowledge, IRB functions and operations, and Records and reports.

At the last CIP examination in March 2012, OHRPP was proud to have yet another of its staff Ms Felicia Wong attain CIP certification. The CIP program is open to individuals involved in IRB activities, with at least 2 years of relevant IRB experience.



Eileen Ng

@wonderleen

31m

Great to be working with Jeremy and Pei Ling again. We had a blast with the last APREC event we organised back in 2010.

The CIP credential strengthens the professional administration of IRBs and validates an individual's professional experience and competency in IRB/HRPP administrative practices. In addition, the CIP credential encourages personal growth and professional development and strengthens the quality of administration and regulatory compliance within OHRPP.

First Public Healthcare Institution to Receive WDA's Approved Training Organisation Accreditation for Clinical Research Education

The National Healthcare Group (NHG) has been accredited by the Singapore Workforce Development Agency (WDA) as an Approved Training Organisation (ATO) for clinical research education.

This makes NHG RDO the first and only public healthcare institution in Singapore to be accredited.

Spearheaded by the Research and Development Office, Office of Research Support, NHG received the approval for the Proper Conduct of Research-Basic II (PC102) program to be conducted as an approved course under the Workforce Skills Qualification (WSQ) Clinical Research Framework established in 2010 as a manpower development initiative in clinical research in March 2012.

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A group of 6 individuals from various National Healthcare Group institutions starts their day, each with different roles and task at hand. What drives them together through research and sharing a common goal? Follow them for a day and experience our collaborative journey with our partners.

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