



e-catalyst

ACCELERATING RESEARCH



Insights on RIE2020

Find out what our research leaders have to say about the new plans



The Transformative Journey of IMH Research

In this instalment of the 'NHG's Research Journey' series, the Institute of Mental Health (IMH) shares on their establishment of the Research Division and their areas of research focus. Find out [more](#)



Editor of British Journal of General Practice visits NHG Polyclinics
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LKCmedicine Announces Vice-Dean for Research

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NMRC AWARDS CEREMONY AND RESEARCH SYMPOSIUM 2016

RESEARCH FOR A BETTER FUTURE
23 February 2016



Congratulations to NHG NMRC Award Recipients

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RESEARCHERS' FEATURE



Dr Tey Hong Liang
Consultant
NSC



Dr Zhu Zhecheng
Operations Research Specialist
HSOR



Dr Zhao Ying Jiao
Senior Research Analyst
P&T Office



Ms Olivia Chng
Principal Optometrist
NHGEI

EDUCATION

Gaining Deeper Insights into Clinical Research Through Postgraduate Education

Qualité

Research Training Events

Congratulations to our 2015 NMRC Awardees

At the National Medical Research Council (NMRC) Awards Ceremony held in February 2016, 9 NHG clinicians listed below received their NMRC Talent Development Awards and Human Capital Awards.

NMRC Clinician-Scientist Award (CSA)

- **A/Prof Melvin Leow**
Senior Consultant, Endocrinology, TTSH

NMRC Research Training Fellowship

- **Ms Chin Lay Fong**
Occupational Therapist, Rehab - Therapy Svcs, TTSH
- **Dr Lee Eng Sing**
Family Physician, Consultant, NHGP
- **Mr Soh Wei Jie**
Psychologist, Child Guidance Clinic, IMH
- **Ms Tan Woan Shin**
Principal Research Analyst, HSOR
- **Dr Etienne Wang Cho Ee**
Consultant, NSC

We would like to take this opportunity to also congratulate the other NHG researchers who have received NMRC Talent Development Awards and Research Grants.

Clinician Scientist – Individual Research Grant – New Investigator Grant (CS-IRG-NIG)

- **Adj. A/Prof Rupesh Agrawal**
Consultant, Ophthalmology, TTSH
- **Dr Attilio Rapisarda**
Senior Research Fellow, Research Division, IMH

Clinician Scientist – Individual Research Grant (CS-IRG)

- **Adj. A/Prof Leong Khai Pang**
Senior Consultant, Rheumatology, Allergy and Immunology, TTSH

Clinician Scientist/ Clinician Investigator Salary Support Programme (CS/CISSP)

- **Adj. A/Prof Chia Chung King**
Senior Consultant, Gastroenterology, TTSH
- **Adj. A/Prof Lim Wee Chian**
Senior Consultant, Gastroenterology, TTSH
- **Dr Mark Chen**
Consultant, Clinical Epidemiology, TTSH

NMRC Transition Award (TA)

- **Dr Tey Hong Liang**
Consultant, NSC
- **Dr Colin Tan Siang Hui**
Senior Consultant, Ophthalmology, TTSH

Ministry Of Health (MOH) Healthcare Research Scholarship - Master of Clinical Investigation (MCI) Program

- **Dr Li Hao**
Associate Consultant, Otorhinolaryngology, TTSH

Health Services Research New Investigator Grant (HSR NIG)

- **Adj. A/Prof Chan Mun Yew, Patrick**
Chief of Service, Senior Consultant, General Surgery, TTSH
- **Dr Edimansyah Abidin**
Senior Biostatistician, Research Division, IMH
- **Dr Meng Fanwen**
Operations Research Specialist, HSOR

Clinical Trial Grant - Investigator Initiated Trials - Late Phase Scheme (CTG IIT-L)

- **A/Prof David Lye**
Senior Consultant, Infectious Diseases, TTSH

Clinician Scientist – New Investigator Grant (CS-NIG)

- **Dr Ng Tat Ming**
Inpatient Pharmacist, TTSH

Communicable Diseases Public Health Research Grant (CD-PHRG) (Commissioned Studies)

- **Dr Mark Chen**
Consultant, Clinical Epidemiology, TTSH

[Click here to know about the research projects of some of the above awardees.](#)
[To find out about NMRC Talent Development and Research Grants, please click here.](#)

Editor of British Journal of General Practice visits NHG Polyclinics



Professor Roger Jones (9th from left) together with members of NHGP Senior Management.

Professor Roger Jones, Emeritus Professor of General Practice at King's College London and Editor of the British Journal of General Practice, visited NHGP from 1 to 5 February 2016 under MOH's Health Manpower Development Plan (HMDP) – Visiting Experts (VE) scheme. During the visit, organised by NHGP Clinical Research Unit, Prof Jones met with NHGP's Senior Management to discuss primary care research and NHGP's work and initiatives in primary care. Prof Jones visited Bukit Batok Polyclinic and Family Medicine Academy and conducted lectures and workshops on Research Methodologies

and Medical Writing, and spoke at the Medical Forum. These sessions were well-attended by NHGP staff and colleagues from other healthcare institutions who found the sessions interesting and enlightening.

Prof Jones was impressed by the polyclinics' "well-trained medical workforce" and the potential for clinical and health services research afforded by the polyclinics system. He enthused that Singapore has great potential in primary care research which will not only be of value locally, but could have international significance. He shared various potential Unique Selling Point (USP) topics such as chronic disease and diabetes management that NHGP could embark on, and added that having a structured primary

care academic career track could boost research in primary care.

It is widely recognised that strong primary care is essential in a cost-effective healthcare system. The evidence base needed for delivering high-quality care in family medicine needs to be built through research in family medicine and primary care.

Prof Jones' visit has added impetus to the building and development of primary care research in Singapore. The insights gained and relationships forged during this visit stand us in good stead as we continue advancing family medicine and primary care research in NHGP.

A big Thank You to all who have supported and contributed to making this visit a success!

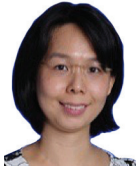
Contributed by **NHG Polyclinics**

Insights on RIE2020

On 8 January 2016, Prime Minister Mr Lee Hsien Loong unveiled the Research Innovation and Enterprise (RIE) 2020 plan - a S\$19 billion five-year plan crafted to support local research efforts, including Health and Biomedical Sciences as one of the 4 core domains for support.

Click [HERE](#) to read more about RIE2020.

Here are what some of our research leaders have to say about this news:



Asst Prof Tang Wern Ee
Head, Clinical Research Unit
National Healthcare Group Polyclinics

It is heartening to see the government's commitment to research, development and innovation through the RIE2020 plan, with the biggest share of 21% of the budget being allocated to the Health and Biomedical Sciences domain. Timely investment in research in healthcare challenges such as the ageing population and the increasing prevalence of chronic diseases may very well provide solutions that will improve the health of our population and economy.



A/Prof Mark Tang
Director of Research
National Skin Centre

This is a much needed shot in the arm for biomedical research in Singapore and creates more opportunities for all of us. I hope that it will not only encourage more clinicians to embark on research career tracks, but also to stimulate more cross disciplinary and collaborative research among the four core technological domains, especially in dermatology-related projects.



Adj. A/Prof Leong Khai Pang
Clinical Director, Clinical Research & Innovation Office
Tan Tock Seng Hospital

Researchers in hospitals should include an obvious clinical application in our projects. As there is an emphasis in RIE2020 to develop local companies, showing public-private collaborations in our proposals will strengthen our case. I think that the plan is good for research and we should applaud it. If we are capable of producing good research, I do not doubt that we will lack funding over the next five years.



Prof Russell Gruen
Vice-Dean (Research) & Professor of Surgery, Lee Kong Chian School of Medicine
Director, Nanyang Institute of Technology in Health & Medicine (NITHM), Nanyang Technological University

The 18% jump from RIE2015 budget shows a clear commitment from the Singapore government in the development of the Health and Biomedical Sciences and ultimately, the advancement of human health and wellness. The RIE2020 plan is a boon to translational research and as a medical school, we will continue to perform transformative research, create synergistic partnerships with healthcare and industry partners, and conduct world-class education.

LKCmedicine Announces Vice-Dean for Research

On 1 February 2016, Lee Kong Chian School of Medicine (LKCmedicine) announced the appointment of Professor Russell Gruen as the new Vice-Dean for Research. Prof Gruen takes over from Professor Philip Ingham FRS, who took on the role in January 2014.

Prof Gruen has been a Consultant in the Department of General Surgery at Tan Tock Seng Hospital since his arrival in Singapore in August 2015. He is also the Director of the Nanyang Institute of Technology in Health and Medicine (NITHM), a university-level interdisciplinary research institute of Nanyang Technological University (NTU). Through his roles in LKCmedicine and NITHM, he oversees strategic initiatives that leverage on scientific, clinical, and engineering expertise to develop technological solutions to tackle health and medical challenges.

Prof Gruen's experience in clinical research and medical service for 25 years gives him valuable insights into human health systems, from the molecular and cellular level, to the organisation and delivery of health services. His research work is highly translational, in particular, his work in severe injury management including innovations for injury prevention, control of bleeding, management of traumatic brain injury, and how trauma systems are best organised to provide time-critical care and promote long-term recovery.

Prior to joining the School, Prof Gruen was a trauma surgeon at The Alfred, Australia's busiest trauma centre, Professor of Surgery and Public Health at Monash University, Director of the Australian National Trauma Research Institute, and a Lancet Commissioner in Global Surgery. In these roles, he established



significant national and international collaborations, and led worldwide healthcare improvement efforts. He will continue this effort in his new roles in NTU, LKCmedicine and NITHM, and bridge bench-to bedside research by fostering a culture of collaboration between engineers, researchers and clinician-scientists in NTU and NHG.

The Transformative Journey of IMH Research

In this instalment of the 'NHG's Research Journey' series, the Institute of Mental Health (IMH) shares on their establishment of the Research Division and their areas of research focus.

In 2000, the Research Division in IMH had just three people on staff with a couple of cubicles and a single workbench in a space shared with another department. It was established with an Institutional Block Grant (IBG) from the National Medical Research Council (NMRC) and had a simple strategy - **to leverage and focus on the existing strengths as the single national tertiary mental health treatment centre with a wide range of clinical expertise serving a huge patient population.**

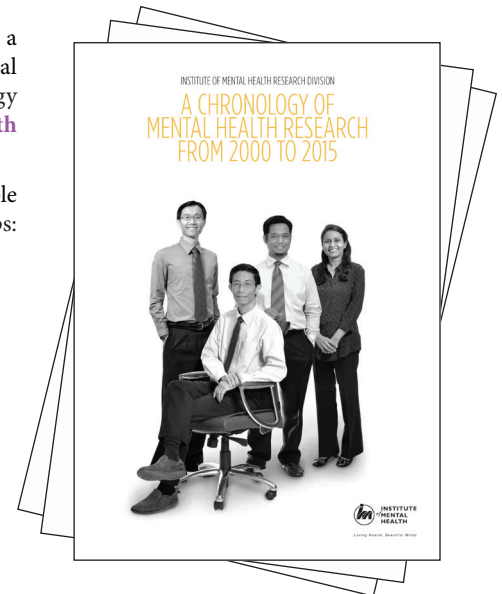
Progressively, the Division grew from strength to strength and now comprises of 50 staff from multiple fields and disciplines, working on many different projects, and spread across two main research groups:

Mental Health Policy Studies

- Research that addresses the real-world questions faced by people living with mental illness, their families, providers, payers and policymakers
- Generating and communicating findings to policy makers and stakeholders
- Examples of nationwide studies are the "Singapore Mental Health Study" and "Well-being of the Singapore Elderly (WiSE) study"

Translational and Clinical Research

- Research that contributes to the basic understanding of the disease process and enables earlier intervention through the development of better means of identifying individuals in imminent danger of developing psychosis
- Raise awareness of mental health issues
- Educating community mental health partners to help identify and support people at risk



IMH's Research Book documenting the institution's research efforts in the past 15 years. [Click here to read more.](#)

IMH also has a Clinical Trial Unit (CTU) which was set up in 2003 with the aim to **facilitate the conduct of interventional studies in psychiatry within IMH based on the highest ethical and scientific standards and in a timely and cost effective manner.** It provides administrative and clinical support and serves as a point of contact for all industry-sponsored and PI-initiated clinical trials conducted in IMH.

Studies are also regularly undertaken by the allied health, nursing and clinical departments to better understand mental illnesses and their treatments in order to improve the quality of life of the patients. The various departments work independently and collaboratively when needed, leveraging on the strengths within and outside the Institution.

For more information on research in IMH, please click [here](#).

Contributed by **IMH Research Division**

Modelling the Changing Landscape of Hepatitis C Treatment

I joined the NHG Pharmacy and Therapeutics (P&T) Office after completing my post-graduate studies in health economics at the National University of Singapore (NUS) in 2010 and have been involved in conducting health technology assessment (HTA) to appraise the various aspects – benefits, risks and costs – of new and existing health technologies. My work provides me the opportunity to use and develop my skills in systematic review, network meta-analysis and decision analytic modeling.

I am currently leading a research collaboration with the Division of Gastroenterology & Hepatology, National University Health System (NUHS) to identify the most cost-effective strategy of hepatitis C virus (HCV) treatments in Singapore.

Chronic hepatitis C is a major cause of liver disease. Rapid advances in treating HCV infection over the last few years have seen new generations of all-oral direct-acting antivirals (DAAs) quickly replacing

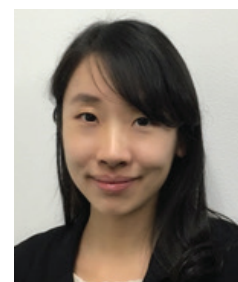
conventional therapies. The all-oral DAAs strategies are well tolerated and have near-perfect sustained virological response (SVR) rates. However, their high cost poses a significant financial challenge.

Our study showed that all-oral DAAs therapy was considered cost-effective given the substantial health benefit generated in HCV-infected patients. However, the resources needed to treat eligible patients will be significant and unsustainable. An alternative approach is to apply value-based treatment. Therefore, we evaluated the impact of genotype guided and roadmap (a tailored algorithm using predictive markers to guide treatment) therapy.

This model-based HTA provides insights on optimising hepatitis C management by adopting value-based treatment strategy. All-oral DAAs therapy is reserved for cirrhotic, treatment-experienced patients and those with suboptimal response or intolerant to interferon. This helps

to mitigate the total cost to healthcare systems and make available all-oral DAAs to those who need them most.

With every collaboration with local institutions, be it Tan Tock Seng Hospital (TTSH), Institute of Mental Health (IMH) or NUHS, I cherish the knowledge gained and the opportunities to build and strengthen the relationships and to contribute in improved decision making for better outcomes.



Dr Zhao Ying Jiao
Senior Researcher Analyst
P&T Office, Group Corporate Development
National Healthcare Group

Itching for Insights into Itch

Dr Tey Hong Liang, a FY2013 Clinician Leadership in Research (CLR) Programme Awardee, shares on his completed work under the Programme and plans for continuing his research in his interest areas.



Dr Tey Hong Liang
Consultant and Clinician Researcher
National Skin Centre

I took up the Clinician Leadership in Research (CLR) Programme in 2013 and it has been a fruitful experience. My research project under the programme was on primary localised cutaneous amyloidosis (PLCA), a **dermatosis prevalent among the Southern Chinese** and South Americans but rare in the Caucasians (Figure 1). One of my clinical and research interest is in Itch and I see that PLCA, in which itch is frequently present, provides for a good disease model to study chronic pruritus.

The pathophysiology of itch in PLCA is unknown. The aim of the project was to investigate if small-fibre neuropathy, which results in reduction of intra-epidermal nerve fibres (IENF) and abnormalities in quantitative thermal sensory testing (QST), is present in PLCA. We recruited 20 Chinese patients (10 males) and 20 ethnic-, gender- and age-matched controls. After filling in a questionnaire, they underwent QST assessments to determine their warm detection threshold and heat pain threshold at the typical lesional sites of the disease (upper back, extensor arms and shins). Concurrently, serum was obtained to evaluate the levels of interleukin(IL)-31. Lesional skin biopsies were performed and the specimens were stained for IENF, IL-31 and its receptor's

subunits (IL-31RA and OSMR β), and nerve growth factor and its receptor (TrkA). The stained histological slides were compared with those of age-, gender-, ethnic-, and site-matched normal skin obtained from archival paraffin-embedded specimens.

We found that the warm detection thresholds at all body sites measured to be significantly higher in patients compared to controls, and these values correlated with the intensities of itch the subjects experienced ($r=0.59$; $p<0.01$). The patients' biopsies revealed lower IENF counts ($p<0.001$) and the use of 3 different nerve stains (PGP9.5, BIII-tubulin and Neurofilament-200) produced the same observation. The patients' specimens also demonstrated increased epidermal expression of OSMR β ($p<0.001$) and IL-31RA ($p=0.002$); on the other hand, interleukin-31, NGF and TrkA stains were not significantly increased. The patients' serum IL-31 levels were not significantly higher than those of the controls. The main limitation of the study is that the controls for the QST differed from those of immune-histochemical analyses.

We concluded from the study that **small fibre neuropathy is present in PLCA**. Pruritus in PLCA is likely associated with hypersensitivity of cutaneous nerve fibres, which may be related to an increased expression of epidermal IL-31 receptors. We therefore posited that **targeting IL-31 receptors may be a therapeutic approach for itch in PLCA**. The study has been accepted for publication in the *British Journal of Dermatology*.

Concurrently, we further investigated the pathophysiology of PLCA, a process which is very poorly understood. We checked for the association of human leukocyte antigen with the disease, which turned out negative. My collaborators for the above projects are from



Figure 1.
Primary localised cutaneous amyloidosis (PLCA), the lichen amyloidosis clinical subtype. Itch is present in over 60% of patients and the symptom can be debilitating.

the Temple University School of Medicine, Philadelphia, USA (Gil Yosipovitch and Leigh Nattkemper), National Skin Centre (Dwi Pramono and Virlynn Tan), and the Singapore Immunology Network, A*STAR (Ren Ee Chee and Shen Meixin).

Besides itch, my research interests are in skin imaging, hypohidrosis, medical dermatology and the applications of microneedles.

Currently, I have the opportunity to pursue these interests with support from the National Medical Research Council (NMRC) Transition Award (TA) that I received in 2015.



Dr Tey received the National Medical Research Council (NMRC) Transition Award (TA) at the NMRC Awards Ceremony 2016.

We have revamped our website!

To serve you better, the [NHG Research Website](#) has undergone a revamp!

While we've finished with this revamp, we are still making minor tweaks to our content. If you have any feedback, do drop us an email at OHRPP@nhg.com.sg.

Broadening Horizons with Microsimulation



Dr Zhu Zhecheng
Operations Research Specialist
Health Services & Outcomes Research (HSOR)
National Healthcare Group

In 2014, I was awarded the Health Manpower Development Programme (HMDP) to further develop my training in **microsimulation (a simulation technique that focuses on the detailed activity of each individual within a system)**.

My research interest in recent years has been in **modelling chronic disease progression at both individual patient and population levels**. While access to NHG's rich data

sources allows us to map out past chronic disease trajectory retrospectively, a more interesting question would be - how would a patient progress in the future, given his/her past history and current state. I had previously attempted to build some Monte Carlo simulation models, but realised that it did not fit the purpose especially when the complexity of the problem grew.

Believing that microsimulation could be a promising analytical approach to model disease progression at individual patient level, I contacted Professor Federico Giroi, a world leading expert in microsimulation and Associate Professor in Population Health at the School of Medicine, University of Western Sydney and embarked on a one-month attachment with him.

My attachment was split into two trips - June 2015 and March 2016. After sharing the preliminary Monte Carlo model and results with Prof Giroi and his team, he pointed out some unrealistic assumptions and blind spots in the model. In the follow-up discussions, Prof Giroi and his team **provided useful insights**

on how to improve the existing model and how microsimulation could be applied to solve the problem. Aside from discussions on the disease progression problem, Prof Giroi and his team also **shared their relevant project experience**, for example, a microsimulation model of cancer patients based on a large scale survey, a trajectory clustering algorithm based on graph theory, a matching algorithm to expand a certain cohort to the whole population, etc.

In the last few months, I have modified the disease progression simulation model by reconsidering the assumptions, and updating the projection algorithm as advised by Prof Giroi. My second trip has two objectives - **to further discuss on the simulation model, and to seek further collaboration opportunities that would hopefully lead to grant applications in future**.

HMDP has given me a chance to meet new mentors, learn new skills and broaden my horizons. I can foresee that what I have learned and am going to learn will help my research in the next few years significantly.

Comparison of Stability and Variability of Corneal Thickness Measurements between Ultrasound Pachymetry, Orbscan Ilz, Galilei Scheimpflug Analyzer and Visante Anterior Segment Optical Coherence Tomography in Asian Eyes

Ms Olivia Chng received sponsorship from the Common Education Fund by the Clinical Research and Innovation Office (CRIO) of Tan Tock Seng Hospital (TTSH), to present her work at the XXXIII Congress of the European Society of Cataract and Refractive Surgeons (ESCRS) in Barcelona, Spain, 5 - 9 September 2015. She shares her research work in corneal thickness measurement here.

The measurement for central corneal thickness (CCT) is becoming more vital in the recent years. It is a crucial piece of information in many areas, for example during pre-LASIK assessment, where it is required to ensure sufficient corneal thickness so as to avoid postoperative complications such as ectasia, for detection of corneal pathology associated with corneal thinning and to discriminate between keratoconus and contact lens induced corneal thinning.

It has also become a necessary evaluation for patients with glaucoma. Intraocular pressure (IOP) measurement is an important measurement in monitoring glaucoma progression. Studies have shown that corneal thickness is an important factor in determining accuracy of IOP measurements. Actual IOP readings may be underestimated in patients with thinner CCT and overestimated in patients with thicker CCT. Thus, there is a

need to look for a high repeatability with low intra-observer and inter-observer variation of CCT measurement.

Our purpose of this study is to compare the consistency of CCT readings between the Ultrasound pachymetry, Orbscan Ilz, Galilei-Dual Scheimpflug analyzer and Visante Anterior Segment Optical Coherence Tomography (ASOCT) in Asian eyes. In our prospective study, 75 patients (150 eyes) had their CCT measured in the following order:

- 1st - Orbscan Ilz (Bausch & Lomb)
- 2nd - Galilei-Dual Scheimpflug analyzer G2 (Zeimer)
- 3rd - Visante ASOCT (Carl Zeiss)
- 4th - US-1800Echoscan

Ultrasound pachymetry (Nidek) Patients who have undergone any corneal surgery, diagnosed with any form of corneal pathology, poor fixation and use of soft contact lens in the past 3 days or hard lenses in the past 2 weeks were excluded from this study.



Ms Olivia Chng
Principal Optometrist
NHG Eye Institute @ Tan Tock Seng Hospital

From our results, Visante ASOCT CCT readings were closest to those measured with Ultrasound pachymetry but demonstrate consistent underestimation against Ultrasound pachymetry. The Orbscan Ilz and Galilei analyzer CCT readings have better agreement but they consistently overestimate CCT measurements as compared to those measured with Ultrasound pachymetry. Thus, we should be more cautious when using only one instrument as the only tool for CCT measurement. It is necessary for clinicians to be aware of these discrepancies when using these instruments for measuring CCT. Perhaps, Ultrasound pachymetry may not be the "gold standard" that we claim it to be anymore.

Gaining Deeper Insights into Clinical Research Through Postgraduate Education



Ms Veron Lu
Senior Research Executive
Research Department
National Skin Centre

As I progressed in my career in Clinical Research, it became clear to me that this was what I wanted to do professionally. My basic degree was in Science and although I have gained on-the-job experience and training in research matters over the past few years as a Senior Research Executive at the National Skin Centre, I felt the need to be equipped

with specialised skills to better contribute to clinical research. Therefore, after much careful consideration, I decided to embark on the **Edinburgh Napier University's Master of Science in Clinical Research**, a 2-year course that is nationally accredited under the **Singapore Clinical Research Workforce Skills Qualifications (WSQ)** framework which I completed in February 2015.

It was not an easy decision returning to the books after such a long hiatus, and having to juggle both school and work concurrently. However, I was energised by the new learning experiences and knowledge I would gain through this course, which is in line with my passion for clinical research.

While I strongly believe in the benefits of clinical research, my daily involvement with patient volunteers in clinical trials reinforced my belief on the importance of **good research ethics and patient protection**. This course

allowed me to gain deeper insights into the **regulatory, legislative and clinical governance** framework of clinical research in Singapore. We were encouraged to critically evaluate the safety and ethical considerations in research projects and I also learnt more about the **design of research studies, research methodology and biostatistics**. There were practical modules in the course such as **Clinical Research – Practice** and **Work Based Learning** in which practical solutions to the many problems, complexities and challenges in clinical research were shared. By interacting with fellow coursemates from different research institutions and industries, there were many opportunities to explore different perspectives and solutions.

Armed with this foundation, I hope to contribute even more significantly to the research community and patients as I believe that clinical research is an integral part of **evidence-based medicine** and **good clinical care**.

Qualité (Issue 22, Feb 2016) – Education to Facilitate High Standards of Research Conduct

Alteration of Local Death Reporting Requirements (Exempt & Expedited Studies)

~ Find out about the changes in the local death reporting requirements for exempt and expedited studies.

Data Collected Prior To Subject Withdrawal - To Keep or To Discard?

~ Read more to understand how to handle collected data of participants who had chosen to withdraw from study participation.

Click [here](#) to read your full issue of *Qualité* (Issue 22, Feb 2016) or visit www.research.nhg.com.sg (Resources → *Qualité* Newsletter)

Research Training Events

Date	Training Programme	Course Provider
Ongoing	Proper Conduct of Research Online – Basic I, II & III (PC101, PC102 & PC103) Workshop	NHG Research & Development Office
26 Apr 2016	Research Preparatory & Study Design Seminar	
27 Jun 2016	Basic Access for Research	Tan Tock Seng Hospital (TTSH) CRIO
14 Jul 2016	Subject Recruitment & Follow-up and Safety Reporting Seminar	NHG Research & Development Office
18 Jul 2016	To start a Research Project : HOW?	Tan Tock Seng Hospital (TTSH) CRIO
27 – 29 Jul 2016	Biostatistics Course (Basic & Intermediate)	NHG Research & Development Office
16 – 17 Aug 2016	Project Management for Clinical Research Professionals Workshop	
23 Aug 2016	Grant Writing and Management Seminar	
15 Sep 2016 (AM)	Manuscript Writing and Poster Presentation Workshop	

*Dates are subject to changes without prior notice

For registration and full details on courses by:

~ NHG Research & Development Office, please visit www.research.nhg.com.sg (Training & Education → Register for Courses and Other Events)

~ TTSH CRIO, please contact Ms Jennifer Teo (Jennifer_hp_teo@ttsh.com.sg)

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