

**PROCEEDINGS OF THE NATIONAL HEALTHCARE GROUP ANNUAL
SCIENTIFIC CONGRESS 2008**

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National Healthcare Group (NHG) Annual Scientific Congress 2008

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Message by Mr Michael Lim



Since its inception in 2002, the NHG Annual Scientific Congress has grown to become a leading platform for clinicians and researchers to share novel ideas, showcase research achievements and align best practices. Last year, we saw an unprecedented attendance of 3,500 delegates from Academia, Research Institutes and Healthcare Institutions. This year's Congress promises yet to be another exciting and enriching event!

Earlier this year, the National University Hospital merged with the NUS Yong Loo Lin School of Medicine and the Faculty of Dentistry to form the National University Health System, with its own governing board. Similarly, a new board has been appointed for the current Alexandra Hospital in anticipation of its move to Yishun in 2010. These important changes in governance herald an exciting era for Singapore in her attempt to bolster both academic medicine and collaborative clinical care.

As such, I'm glad that the National University Health System, Alexandra Hospital, Tan Tock Seng Hospital, Institute of Mental Health, National Skin Centre, and NHG Polyclinics have once again come together to organise the largest scientific Congress to be held annually and locally. It is a collective commitment to better our collaboration in research and medicine.

I am pleased to share that the total spending on research in NHG institutions increased from \$17.8 million in 2006 to \$21.2 million in 2007. Our researchers have also been awarded \$23.3 million of new funding in 2007. This is in addition to grants awarded directly to the Yong Loo Lin School of Medicine. I am proud to also share that since the last Congress in 2007, three of our top researchers have been awarded the Translational and Clinical Research (TCR) Flagship Programmes, worth approximately \$25 million each. The three flagship programmes are in Neuroscience, led by A/Prof Chong Siow Ann of the Institute of Mental Health, Metabolic Medicine led by A/Prof Chong Yap Seng of the National University Health System, and Infectious Disease led by A/Prof Leo Yee Sin of the Communicable Disease Centre at Tan Tock Seng Hospital. With the first programme being awarded to A/Prof Yeoh Khay Guan for Gastric Cancer in 2007, we have to date four of the five national TCR programmes being helmed by researchers in our group.

Together, we have made significant breakthroughs in our research. Dr Goh Boon Cher at National University Hospital successfully conducted Singapore's first "first in human" early cancer clinical trial. A team led by Professor Yoshiaki Ito at NUS Yong Loo Lin School of Medicine reported an important scientific finding that the absence or inactivation of the RUNX3 gatekeeper gene paved the way for the growth and development of colon cancer. Dr Gerald Tan from Tan Tock Seng Hospital became the first non-American to be awarded the prestigious Ferdinand C. Valentine Fellowship in Urologic Research from the New York Academy of Medicine. Gerald's research in prostate cancer and study in robotics and male infertility will be an excellent development for our research efforts.

We will continue our efforts to groom new talent for translational and clinical research. This will also be a key focus for our Congress, with a first of its kind "Research Career Development Fair" being organised for delegates. We will also see the graduation of our first batch of young clinician-investigators from the NHG-NUS Clinician Leadership in Research Programme. NHG will also officially launch its Investigator-Clinician Career Track at the Congress this year. This track is designed to support clinicians who wish to pursue research as their primary career.

In our pursuit of medical excellence, it is imperative that we translate research into tangible care for our patients. This can only be delivered effectively through an integrated and collaborative healthcare delivery system. I am therefore glad that we have come together to share the best that Science, Medicine and Lifestyle can offer! I extend my warmest welcome to you. May this event motivate you to continue innovating, and enriching our healthcare and lifestyles through science!

Chairman
National Healthcare Group

Message by Dr Lim Suet Wun



Welcome to the National Healthcare Group Annual Scientific Congress 2008!

This year, in keeping with NHG's vision of "Adding years of healthy life", we chose the theme "Science, Medicine & Lifestyle – Impact on Tomorrow's Health". This theme and the rich programme planned for this year's Congress reflect our belief in the importance of translating scientific research through clinical practice, into lifestyles that promote the long-term health of our population.

Our healthcare landscape is evolving, with an ageing population and rising chronic disease burden. To meet this need, we shall test new models and paradigms in providing care. Increasingly the focus should be in the community, where healthcare can be easily accessed by residents, especially the elderly. In his address to Parliament earlier this year on "Living Long, Living Well", Minister mentioned the practice of "Slow Medicine" for our Elderly. We shall have the honour of hearing from Dr Dennis McCullough, the author of Slow Medicine at our Congress this year. Dr Raymond Dubois President-Elect of the American Association for Cancer Research will deliver the keynote address. They are amongst many other speakers at the Congress who have contributed new science and medicine that will have an impact on tomorrow's health.

This year's Congress also sees the continued collaboration of our organising healthcare institutions, namely Alexandra Hospital, Institute of Mental Health, National Skin Centre, National University Health System, Tan Tock Seng Hospital and the NHG Polyclinics. This testifies to the importance of the Congress to our clinicians and researchers, and provides them with a platform to meet and share. We also welcome our collaborators from academia, industry and research institutes. Their participation enriches our science and practice of medicine.

Collaboration in science and medicine will be key to ensuring good health outcomes for our population. NHG is strengthening our disease management programmes and pro-actively establishing formal collaborative networks with community partners such as GPs. We have developed programmes for our patients that cover the major chronic diseases such as asthma, heart failure, stroke, osteoporosis, chronic obstructive pulmonary disease (COPD) and the end-of-life programme, with a total funding of \$39 million over the next five years. We have also recently joined hands with SingHealth, to establish the National DOT (Delivering on Target) Programme, initially involving our diabetes patients. This will eventually be expanded to include more diseases, and provide for better care integration nationwide.

I am therefore heartened that the organising committee this year, led by A/Prof Chong Yap Seng of the National University Health System, has managed to weave the programme together to ensure its relevance to our nation's fast-evolving healthcare and research agendas. This Congress is truly unique in that it is cross-disciplinary, cross-industry and provides for learning beyond our silos. Congratulations!

My warmest welcome to all delegates! A special welcome back to the majority of you who choose to join us again on this annual pilgrimage of sharing and learning!

**Chief Executive Office
National Healthcare Group**

Message by A/Prof Chong Yap Seng



On behalf of the Organising Committee, I extend my warmest welcome to you in joining us at the National Healthcare Group Annual Scientific Congress (ASC) 2008!

The NHG ASC, now in its 7th year, was originally conceived to give the medical and research communities a platform to explore multidisciplinary perspectives on the treatment of major diseases and disorders, and to facilitate the exchange of key research findings and sharing of best practices among the different professions in the healthcare community. Over the years, this event has attracted participants from other parts of Asia and the Pacific region, beyond our local healthcare fraternity. Last year's Congress saw 3,500 delegates at the Raffles City Convention Centre.

This year's Congress Theme of "*Science, Medicine & Lifestyle – Impact on Tomorrow's Health*" emphasises the importance of translating science into clinical practice while managing our lifestyle and environment to optimise health outcomes in the present and for the future. Topics covered at the Congress will span tracks involving "Lifestyle & Health", "Lifestyle Diseases", "Lifestyle Medicine", and "Career & Medicine". We will focus on the interplay between our lifestyles and its influence on our general health as well as on the synergy between research and medical care. The central roles of science and the understanding of lifestyles in healthcare delivery today, and its impact on health management for the future will be further emphasised.

Invited Speakers at the ASC

Besides providing the opportunity for our clinicians and researchers to showcase their work, leading international authorities and local experts have been invited to speak at the wide-ranging plenary sessions and symposia.

Our Keynote Speaker, Dr Raymond DuBois, President-Elect of the American Association for Cancer Research (AACR), is an internationally respected physician-scientist who has advanced deeper understanding of the molecular and genetic aspects of colon cancer. Dr DuBois brings with him a wealth of academic and clinical experience and his presence at the Congress will benefit both clinicians and researchers in the areas of cancer research and management.

Dr Dennis McCullough, NHG's Distinguished Visitor, will be presenting the NHG Lecture at the Congress Dinner. A geriatrician by training, Dr McCullough's passion for the elderly has led him to author the best-seller "My Mother, Your Mother: embracing "slow medicine" – the compassionate approach to caring for you aging loved ones".

Five plenary speakers have been invited for this year's Congress. They are Dr Michael Meaney, Director of the Programme for the Study of Behavior, Genes and Environment at McGill University; Dr Philippe Kourilsky, Chairman of the Singapore Immunology Network (SIgN), A*STAR; Dr Duane Gubler, Director of the Programme on Emerging Infectious Diseases, Duke-NUS Graduate Medical School; Dr John Kelly, President & Executive Medical Director of Lifestyle Health Education Inc. USA; and Dr Garret FitzGerald, Director of the Institute for Translational Medicine & Therapeutics at the University of Pennsylvania.

We have also a strong list of other overseas and local speakers who have been invited to conduct seminars and workshops at this year's ASC. I am excited about the programme and I am certain you will benefit much from interacting with these experts.

Special Events at the ASC

This year, the Committee has put together a spread of celebrations and special events that will bring unique flavours to the Congress.

For the first time, the 6th Singapore AIDS Conference will be held at the ASC. Invited speakers for this one-day conference include Mr Prasada Rao, Director of the Regional Support Team (Asia Pacific) for UNAIDS, and Professor Andrew Grulich, Head of the HIV Epidemiology & Prevention Programme at the National Centre in HIV Prevention and Clinical Research in the University of New South Wales, Australia.

The Association of Diabetes Educators (Singapore) will be anchoring this year's symposium at the ASC. A non-profit organisation, the ADES Symposium will include topics on HbA1c interpretation and management, and ADES-IDF Insulin therapy training.

The Tan Tock Seng Hospital Rehabilitation Medicine will be celebrating its 35th Anniversary at the Congress. Apart from its celebrations, the team will continue to engage in topics on the management of pain and spinal injuries, as well as the emphasis of rehabilitation medicine as the vehicle to recovery.

This year's Healthcare Leaders' Panel Discussion will be another crowd-puller as key leaders are once again invited to share their thoughts on healthcare in Singapore. The topic for discussion will be: "Optimising Life in the Third Age – Health Care in a Maturing Population".

In its second year of running, the NHG-NUS Clinician Leadership in Research (CLR) programme will showcase the progress of its first batch of clinician researchers as well as unveil its second intake of promising researchers. The NHG will also be awarding its first cohort of Investigator-Clinicians (IC) under the IC track programme. These two award ceremonies will be held at the Research Career Development symposium.

In tandem with the Research Career Development programme, the Research Career Development Fair will feature the various research career tracks made available at NHG. Sited at the Concourse, this Fair will present opportunities for discussion between established investigators and interested candidates.

With the aim of engaging the community, the Committee will be organizing two Public Forums. The first time at ASC, one public forum will cover Obesity in Youths, and the other on Research Ethics. The former is an extension of our collaborative efforts with the Health Promotion Board for this year's launch of the National Healthy Lifestyle Campaign.

As part of our continual efforts to raise funds for the ASC Charity Drive, the Committee has pulled together several fund-raising activities for the benefit of the TTSH Community Charity Fund, specifically in aid of HIV patients and their families. Proceeds from the sales of (1) Dr McCullough's book; (2) Congress Dinner tables; (3) Tickets to the Wine & Health track; and (4) Admission tickets to the Public Forums will be donated towards this year's ASC charity beneficiary.

With this exciting line-up of events and scientific tracks, the 2008 Congress promises to be a compelling and accessible platform for all healthcare professionals, research scientists, academics, and industry experts to share ideas, strategies, and experiences, with the common goal of delivering the highest quality of care and health to our patients and our community.

I look forward to seeing you at the NHG Annual Scientific Congress 2008 and wish all of you the best of health and life!

Organising Chairman
NHG Annual Scientific Congress 2008

NHG Doctor Award

NHGD1

A Prospective Randomised Crossover Study Comparing Video Endoscopic Autofluorescence Imaging Followed by Narrow Band Imaging with Standard Endoscopy for the Detection of High Risk Lesions in Stomach

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Aim: Autofluorescence Imaging (AFI) and Narrow Band Imaging (NBI) are new imaging techniques for detecting early neoplasia by endoscopy. This study is to determine whether combined AFI and NBI examinations improve the detection of preneoplastic lesions in the stomach in a high-risk population.

Methods: Patients aged 50 or above with dyspepsia were examined by both standard endoscopy (SE) and combined AFI/NBI techniques consecutively in a randomised sequence by two independent endoscopists at the same session. Suspicious lesions were biopsied. The histology was reported by pathologists who were blinded to the endoscopic findings.

Results: Sixty-five patients were recruited, 46.2% of whom were male. Mean (SD) age 61.7 (9.9), range, 50-91 years. One patient with advanced gastric cancer was excluded from the analysis. The number of targeted biopsy was 146 by combined AFI/NBI, compared to 82 by standard endoscopy ($P < 0.001$). Pathology was confirmed in 94.5% and 90.2% respectively. One case of dysplasia was found by both methods. In per patient analysis, 37 patients (59%) were diagnosed with intestinal metaplasia, in which, 31 patients were detected by AFI/NBI imaging, compared with 22 patients by SE ($P = 0.08$). Twenty-seven patients (43%) were diagnosed with gastric atrophy, 26 of them by combined imaging, 15 by SE ($P = 0.002$). In average, combined imaging took an extra of 15 minutes than SE.

Conclusion: AFI followed by NBI increase the detection of pre-malignant lesion of stomach by endoscopy. It will be useful for screening of gastric cancer especially in high-risk patients.

NHGD2

The Effect of Preoperative Counselling on Fear Caused by Visual Sensations During Phacoemulsification – A Randomised Controlled Trial

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Aim: To determine whether preoperative counselling on the potential intraoperative visual perceptions during cataract surgery helps reduce the fear experienced by patients during the surgery.

Methods: Patients undergoing cataract surgery (phacoemulsification) under topical anaesthesia were randomised to those who received additional counselling and those not counselled. Patients were interviewed postoperatively on their intraoperative experiences.

Results: Of 851 patients, 558 (65.6%) received preoperative counselling while 293 (34.4%) were not counselled. A lower proportion of the group which received additional preoperative counselling were frightened compared to the group not counselled

for perception of light (7/558 [1.3%] vs. 13/293 [4.4%], $P = 0.007$), colours ($P = 0.001$), movement ($P = 0.020$), flashes ($P = 0.072$) and instruments ($P = 0.599$). The mean fear score was significantly lower in the counselled group compared to the non-counselled group for light perception (0.03 vs. 0.12, $P = 0.002$), colours, ($P = 0.001$) movement ($P = 0.005$), and flashes ($P = 0.035$). Analysing separately by gender, the above findings were true of males whereas no significant association between fear and preoperative counselling was found for female patients. Preoperative counselling was a significant factor affecting fear after accounting for age, gender, operated eye and duration of surgery (multivariate odds ratio 4.3, 95% confidence interval 1.6 – 11.6, $P = 0.003$). More patients in the counselled group reported increased satisfaction as a direct result of their intraoperative visual sensations (433/558 [77.6%] vs. 141/293 [48.1%], $P < 0.001$).

Conclusion: Preoperative counselling on possible visual sensations during cataract surgery significantly reduces both the proportion of patients frightened and the mean fear score compared to patients not counselled. Patients counselled experienced greater satisfaction from their intraoperative visual experiences.

NHGD3

A Study on the Executive Function System in Pathological Gamblers

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Aim: Pathological gambling is a disorder characterised by an enduring pattern of uncontrolled self-destructive behaviours despite clear negative consequences. Neurocognitive functions and impulsivity have important relevance for the understanding and treatment of pathological gambling. This study investigated whether there were differences in the executive function system and impulsivity level between pathological gamblers and normal controls from an Asian community in Singapore.

Methods: A matched case-control design was used. Fourteen non-treatment-seeking pathological gamblers and 14 normal controls were carefully selected and recruited from the community. The subjects were administered a battery of neuropsychological tasks measuring executive functions in the area of mental shifting, updating and monitoring, and inhibition of prepotent responses. Impulsivity was measured using the self-reported Eysenck Impulsivity Questionnaire.

Results: No significant group differences were found for all the tasks of executive functions. However there were findings that suggest a trend towards poorer 'Shifting' ability in pathological gamblers. Pathological gamblers were found to have a significantly higher level of impulsivity compared to normal controls.

Conclusion: The pathological gambling group did not evince any significant impairment, relative to normal controls, on any of the measures of executive functions. However pathological gamblers were characterised by a high, self-reported, level of impulsivity. These findings suggest that psychosocial therapies may be readily provided to pathological gamblers without concern that their treatment and recovery will be hampered by impaired executive functioning. Treatment should also address impulsiveness in pathological gamblers, as elevated traits of impulsivity can negatively influence the course of the disorder.

YIA-BS1

Transplantation of a Bioengineered Serum-Free Derived Conjunctival Epithelial Equivalent for the Treatment of Severe Corneal and Ocular Surface Disease

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Aim: Severe cornea and ocular surface diseases are a major cause of blindness in the world. We describe the novel use of an autologous serum-free derived cultivated conjunctival tissue-equivalent for corneal epithelial replacement in these blinding conditions.

Methods: We conducted a prospective clinical trial involving autologous cultivated conjunctival transplantation for corneal and ocular surface disorders. Thirty-nine eyes of 38 patients underwent the procedure, of which 10 eyes were performed for corneal epithelial replacement. Conjunctival epithelial cells were ex-vivo expanded on amniotic membrane under serum-free conditions. Surgery 2 weeks later involved excision of the diseased tissue and transplantation of the cultivated tissue. Patients were followed-up with serial slit lamp examinations, and the tissue-equivalents underwent light and electron microscopy, and characterisation by immunohistochemistry.

Results: Ex-vivo expansion of conjunctival epithelial cells formed a confluent stratified epithelial sheet within 14 days. Transplantation of cultivated conjunctival equivalents for corneal epithelial replacement was successfully carried out in all 10 eyes. Transplanted grafts remained well-epithelialised. Visual improvement was achieved in 80% of eyes, with the transplanted epithelium remaining stable and healthy. A good functional and cosmetic result was achieved in all eyes. No significant complications were noted during the follow-up period of 15.67 ± 10.75 months. The cultivated epithelium demonstrated the normal conjunctival expression of cytokeratins 4 and 19.

Conclusions: Transplantation of a serum-free derived autologous cultivated conjunctival equivalent was successfully performed. This represents a promising novel method of corneal epithelial replacement in patients with severe cornea and ocular surface diseases where conventional treatment is usually unsuccessful.

YIA-BS2

Identification of Resistant Mechanism and Novel therapeutic Agents for Acute Myeloid Leukemia

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Aim: ABT-869, a multitargeted tyrosine kinase inhibitor, is under active phase I/II development in US and Singapore for AML and solid tumors. However, cancer cells could develop resistance. We aim to 1) dissect the molecular mechanism of resistance; 2) to identify the surrogate markers; 3) to discover novel drugs to reverse the resistance.

Methods: We established 3 isogenic resistant cell lines through prolonged exposure of ABT-869 to MV4-11 cells with FLT3 mutations. Genomic studies were performed to identify novel

mechanisms of resistance, surrogate markers. Resistant cells were used to screen novel therapeutic agents. New findings were validated in animal model.

Results: Gene profiling reveals up-regulation of FLT3LG (FLT3 ligand) and survivin, but down-regulation of SOCS1, SOCS2, and SOCS3 in MV4-11 resistant (R) cells. Hypermethylation of these SOCS genes leads to their transcriptional silencing. Survivin is directly regulated by STAT3. Stimulation of the parental MV4-11 cells with FLT3LG increases the expression of survivin and phosphorylated protein STAT1, STAT3, STAT5. Targeting survivin by shRNA in MV4-11-R cells induce apoptosis and augments ABT-869-mediated cytotoxicity. Sub-toxic dose of indirubin derivative (IDR) E804 resensitize MV4-11-R to ABT-869 treatment by inhibiting STAT signaling activity and abolishing survivin expression. Combining IDR E804 with ABT-869 shows potent in vivo efficacy in the MV4-11-R mouse xenograft model.

Conclusions: These results demonstrate that enhanced activation of STAT pathways and overexpression of survivin are the main mechanism of resistance to ABT-869, suggesting that the STAT pathways and survivin could be potential targets for reducing resistance developed in patients receiving FLT3 inhibitors.

YIA-BS3

Cellular Factors Involved in Mediating Vascular Leakage During Dengue Virus Infection

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Aim: Dengue virus (DV) is the etiological agent for the mild form, Dengue fever (DF) or in severe cases, Dengue Hemorrhagic Fever (DHF) or Dengue Shock Syndrome (DSS). In DHF/DSS, there is an increase in capillary permeability with its pathogenesis being poorly understood. Currently, there is no specific antiviral treatment available to treat patients with DV infection and they are only mainly given supportive treatment. Hence, the aim of this study is to identify host proteins which are involved in mediating vascular permeability in primary human endothelial cells during dengue virus infection.

Methods: Primary Human Umbilical Vein Endothelial Cells (HUVEC) was infected with DV2 at a multiplicity of infection (M. O. I.) 10. To assess the susceptibility of HUVEC to DV2, plaque assay and electron microscopy techniques were carried out. The expression level of various host genes specific to endothelial cell biology was then measured using real-time PCR array. A permeability assay model was also set up to assess vascular leakage in the endothelial cells. Mock-infected HUVEC was used as a negative control.

Results: HUVEC was susceptible to DV2 infection and several host genes in relation to endothelial cell biology were showed to have differential up- or down-regulation during DV-infection. Caspase 6 which is associated with apoptosis was up-regulated in the infected HUVEC. In addition, there was up-regulation of antiviral cytokine, chemokine, chemo-attractant molecules such as IFN- γ , CCL5, CX3CL1 and EDN2 in the DV-infected cells. These molecules may in turn affect molecules that are associated with cell migration hence, playing a role in vascular permeability.

Conclusion: Identification of host proteins will allow us to investigate further their roles in the pathogenesis of DHF/DSS. This will in turn enable us to identify potential therapeutic leads and better clinical management of patients suffering from DHF/DSS.

YIA-CR1

Genomic and Functional Characterisation of p53 Pathway in Human Myeloma Cell Line: Implications on Therapy with MDM2 Antagonist (Nutlin-3)

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Aim: Monoallelic 17p13 deletion (containing p53 tumor suppressor locus) is a recurrent cytogenetic abnormality in myeloma which correlates with poor prognosis. However, its impact on p53 function is unknown. We aim to define spectrum of abnormalities in p53 pathway and how they would affect therapeutic response to a novel MDM2 antagonist (nutlin-3).

Methods: Using Affymetrix U133A chip, we analysed gene expression of p53 and its transcriptional targets using human myeloma cell lines (HMCLs) which were also assessed for TP53 mutations. Basal p53 function was investigated by stimulating p53 and expression of its downstream targets MDM2, p21 and BAX using UV-irradiation and etoposide. Protein expressions were analysed through western blot analysis. Effects of non-genotoxic drug nutlin-3 were studied using flow cytometry.

Results: We observed unique protein expression profiles associated with different p53 abnormalities. Preliminary data showed etoposide induced expression of p53 targets but only in HMCLs expressing functional wild-type p53. UV-irradiation caused p21 and MDM2 repression while the apoptotic protein, BAX appeared unaffected. Nutlin treatment in HMCLs with wild-type p53 and normal mRNA expression activated p53 pathway, causing cell cycle arrest and apoptosis. Interestingly, MDM2 overexpression did not significantly hinder p53 function.

Conclusion: Current results supported our initial hypothesis that p53 function is inhibited in ways which are independent of p53 mutation. It also appears that p53 stimulation via ATM signalling is functioning normally while dysregulation in ATR pathway may lead to reduced MDM2 and p21 expression. In cells expressing functionally active wild-type p53, nutlin-3 would be an attractive therapeutic target.

YIA-CR2

Comparison of Incidence, Risks and Clinical Predictors of Contrast Induced Nephropathy Post Percutaneous Coronary Intervention in Emergency versus Non-Emergency Settings

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Background: Contrast nephropathy CIN post percutaneous coronary intervention (PCI) increases adverse clinical outcomes. We examine the risks and clinical predictors of CIN among patients undergoing PCI and the effectiveness of prophylactic treatment.

Methods: A cohort of 8798 patients who underwent PCI between May 1996 and April 2008 were enrolled. Patients were divided into 3 groups. A: patient with STEMI undergoing emergency PCI; B: patients with NSTEMI and C: patients without MI. Group B and C received prophylactic saline hydration and N-acetylcysteine treatment before elective PCI if they have baseline renal impairment.

Results: Mean age was 57.4 ± 11.1 years. 35.9% were diabetics. Incidence of CIN were 12.0%, 9.2%, and 4.5% ($P < 0.0005$) in

Group A, B, C respectively. CIN correlates with increased mortality (15.5% vs. 1.3%, $P < 0.0005$) at 1 month.

Significant risk predictors of CIN are: older age odds ratio (OR):1.53 ($P = 0.011$), female OR:1.91 ($P < 0.0005$), anaemia OR:2.49 ($P < 0.0005$), low systolic blood pressure, OR:2.39 ($P < 0.0005$), raised creatinine kinase, OR:1.07 ($P = 0.003$), abnormal LVEF OR:1.82 ($P = 0.003$), STEMI, OR:2.93 ($P < 0.0005$), insulin dependence diabetes, OR:2.32 ($P = 0.041$) and baseline renal impairment OR:4.22 ($P < 0.0005$).

Among group A, B and C: CIN occurred in 8.2%, 9.2% and 4.3% ($P < 0.0005$) in patients with normal baseline renal function (glomerular filtration rate (GFR) >60); 18.0%, 3.1% and 2.2% ($P < 0.0005$) in patients with mild renal impairment (GFR: 40-60); 30.0%, 28.6% and 14.8% ($P = 0.128$) in patients with severe renal impairment (GFR <40).

Conclusion: Pre-PCI prophylaxis is effective in reducing CIN in mild renal impaired patients but is less effective in the more severely renal impaired patients (GFR <40). Patients presenting with STEMI are the highest risk cohort that further measures need to be undertaken to prevent CIN development.

YIA-CR3

Natural Orifice Transluminal Endoscopic Surgery: Our Experimental Experience

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Introduction: Numerous experimental studies have been conducted to evaluate, explore, and develop Natural Orifice Transluminal Endoscopic Surgery (NOTES). The results have been varied ranging from mediocre to excellent. There are several challenges and limiting factors today for the progress of NOTES from closure technique to inadequate instrumentations. Aim of our study is to verify the feasibility of this new technique in a survival experimental model.

Methods: A total of 15 pigs (female, 30-40 kg, 5-7 months old) underwent NOTES procedures (peritoneoscopy, liver biopsy, oophorectomy, tubal ligation and cholecystectomy) via transgastric (n = 7) or transvaginal approach (n = 8). Closure of gastrotomy was done using endoclips (n = 4) or endoloops (n = 3) while colpotomy was left open. Adhesion and assessment of closure performed at necroscopy after 2 weeks.

Results: All the procedures were completed with a reduction of operating time by 30% after the initial experience. All animals survived 2 weeks and only 2 showed signs of peritonism in the early post-op period treated conservatively. At the necropsy, the gastrotomy closed with endoclips showed a good healing. A mean of 7 clips per animal (3-13) were fired with a mean closure time of 26.6 min (20-35 min). In 1 animal the gastrotomy was secured with laparoscopic suturing. A mean of 2 endoloops (1-3 endoloops) were required for gastrotomy closure. Average closure time was 23.3 minutes (17-28 min). Only in 2 animals mild to severe adhesion were reported at the necropsy in the gastrotomy group while no adhesion were reported in the transvaginal approach.

Conclusion: In our experience, experimental NOTES procedure is feasible and effective, Challenges are the triangulation and retraction due to lack of adequate instrumentation. Transvaginal approach seems to be safer than transgastric due to the difficulty in closing the gastrotomy.

YIA-QHSR1

Geriatric Screening at an Emergency Department Observation Unit Reduced Reattendance and Hospitalisation Rates

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Aim: To determine the effectiveness of a geriatric screening programme in an emergency department (ED) observation unit.

Methods: We screened patients aged 65 years or older admitted to an ED 24-hour observation unit for geriatric issues prior to discharge, and offered active intervention and onward referrals to those with positive findings. We conducted telephone follow-up at three months and compared ED reattendance, hospitalisation and fall rates against those of historical controls.

Results: Among 315 patients who received geriatric screening, 61.6% were female, 82.5% were Chinese, and mean age was 77 years. There were 172 patients in the control group. There were no significant differences in baseline characteristics between both groups.

Common positive findings included visual impairment (47.0%), fall risk (43.2%), incontinence (38.4%) and gait disorder (35.6%). Only 28.6% did not require significant intervention, while 19.0% declined and 52.4% received intervention, including physiotherapy (20.0%), ophthalmology review (14.9%), geriatric clinic referral (24.8%), and admission (10.2%).

Comparing those who received geriatric screening with controls at 3 months, the ED reattendance rates were 0.14 vs. 0.32 per patient, and hospitalisation rates were 0.10 vs. 0.21 per patient. The respective incidence rate ratios (IRR) were 0.45 (95%CI 0.29-0.69) and 0.45 (95% CI 0.27-0.77). The 3-month fall rates of the screening group compared with controls were 0.07 vs. 0.11 per patient, with IRR for falls was 0.68 (95%CI 0.36-1.52).

Conclusion: Geriatric screening by emergency nurses trained in geriatric care identified elderly patients with hidden unmet needs. Intervention reduced both 3-month hospitalisation and ED reattendance rates by 55%.

YIA-QHSR2

Cost Impact of Boarding Admitted Patients in the Emergency Department

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Aim: With hospital occupancy rates rising, admitted patients are increasingly being held in the emergency department (ED). This practice adversely affects care quality and channels resources away from emergency care. The study aimed to determine the amount and value of resources lost due to boarding in an acute care general hospital.

Methods: Data on 155,786 attendances at the ED in 2007 were retrospectively extracted from administrative databases to determine the number of boarding hours and the additional volume of procedures, radiology, and laboratory tests carried out for boarders. To estimate the incremental manpower resources deployed for boarders, a time and motion study was conducted during 15 day, evening, night and weekend shifts. The amount of time spent by emergency physicians, nurses and healthcare attendants performing direct and indirect care were documented.

Results: Boarding admitted patients from the ED beyond 120 minutes reduced the functional bed capacity of the ED by 57,710 hours and consumed 2,977 hours of staff time. We found no significant increase in the volume of procedures, radiology, and laboratory tests carried out for boarded patients. As a result of admission delays, the ED incurred \$450,822 in additional cost in 2007, which could have been used to provide emergency care for new patients.

Conclusion: The use of the ED as an extension of inpatient units diverted a substantial amount of resources away from providing emergency care. As the shortrun inpatient bed supply is relatively inelastic, strategies to improve patient flow and to optimise ED treatment capacity are essential.

YIA-QHSR3

Effect of Healthcare Access on Long-Term Survival Differences in African American and White American Men Receiving Definitive Treatment for Prostate Cancer: Results from 23,811 Men

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Aim: Prostate specific antigen screening has resulted in earlier detection and treatment of prostate cancer with resultant lower mortality rates. African American men have reportedly poorer disease and survival outcomes compared their white male counterparts. We report long-term survival of a cohort of 23,811 men with prostate cancer receiving definitive treatment, and evaluate the extent of treatment differences on survival disparities between these 2 groups.

Methods: The HMO Cancer Research Network (CRN) comprises data systems of 12 health maintenance organisations across USA. Data from all sites were used to identify characteristics of men diagnosed with prostate cancer between Jan 1990 to Dec 1998, including age, mean follow-up duration, tumor pathology, neoadjuvant hormone therapy, treatment modality, and co-morbidity score. Kaplan Meier survival curves were generated and compared using log rank tests. Cox proportional hazards method was used for analyses involving adjustments for potential confounding variables.

Results: In this cohort, the mean follow-up period was 6.6 years (median 10.1 years). 30% of African American men chose radical prostatectomy (n = 1082), 26% chose radiation (n = 948), and 44% chose watchful waiting (n = 1583), compared to 28% (n = 4774), 28% (n = 4923), and 44% (n = 7648) respectively in white Americans. Cancer-specific survival was better in African Americans compared to white Americans in all definitive treatment groups.

Conclusions: Using retrospective data from HMO databases, our study controls for access to healthcare between white and black Americans. Results of the African American cohort suggest that equal access to health services affects treatment selection, and ultimately long-term survival outcomes.

BO-AH1

Near-Infrared Raman Spectroscopy to Identify and Grade Gastric Adenocarcinoma

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Aim: Raman spectroscopy is a molecular vibrational spectroscopic technique that is capable of optically probing the biomolecular changes associated with diseased transformation. The purpose of this study was to explore near-infrared (NIR) Raman spectroscopy for grading adenocarcinoma from normal gastric mucosa tissues.

Methods: A total of 32 gastric tissue samples were collected from 20 patients who underwent gastrectomy operation. A rapid-acquisition dispersive-type NIR Raman system was utilized for tissue Raman spectroscopic measurements at 785 nm laser excitation. The histopathological examinations showed that 14 tissue specimens were normal, 6 were moderately-differentiated adenocarcinoma, and 12 were poorly-differentiated adenocarcinoma. Multivariate statistical techniques, including principal component analysis (PCA) and logistic regression (LR) were employed to develop effective diagnostic algorithms for discrimination of adenocarcinoma from normal, and identification of poorly-differentiated adenocarcinoma from moderately-differentiated adenocarcinoma.

Results: High-quality Raman spectra in the range of 800-1800 cm⁻¹ can be acquired from gastric tissue within 5 seconds. Raman signals related to proteins, lipids and nucleic acids are significantly different among normal and different grades of adenocarcinoma tissue. The PCA-LR algorithms yielded a diagnostic sensitivity of 83.3% and specificity of 85.7% for detecting adenocarcinoma from normal, and also achieved a diagnostic sensitivity of 91.7% and a diagnostic specificity of 50.0% for separating poorly-differentiated adenocarcinoma from moderately-differentiated adenocarcinoma.

Conclusion: The results of this exploratory study indicate that NIR Raman spectroscopy appears to have a potential for detecting and grading adenocarcinoma from normal gastric tissue based on the optical evaluation of spectral features of biomolecules

BO-AH2

Evaluating the Validity of a Nutritional Screening Tool in Hospitalised Older Adults

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Aim: The Tan Tock Seng Hospital Nutrition Screening Tool (TTSH NST) was locally developed from a younger population of hospitalised adults. It is unclear if the previously derived cutoff of 4 would apply to the elderly. The study aimed to determine the diagnostic utility and predictive validity of the TTSH NST in hospitalised older adults, a high-risk group for malnutrition and its sequelae.

Methods: We prospectively screened 281 newly admitted patients aged 61 to 102 years for nutritional risk using the TTSH NST. The Subjective Global Assessment (SGA) served as the reference standard for comparison of nutritional status. Length of hospital stay (LOS), modified Barthel Index (MBI) at discharge and six months, and 6-month mortality were analysed in relation to NST-ascertained nutritional risk before and after adjustment for age, gender, dementia,

depression, severity of illness and admission MBI using regression analysis.

Results: The prevalence of malnutrition was 35% based upon SGA. The optimal cutoff of the TTSH NST was 4, yielding sensitivity, specificity, positive and negative predictive values of 84%, 79%, 68% and 90% respectively (AUC = 0.87). The optimal cut-off remained at 4 even for patients aged >85 years (AUC = 0.85). Risk of malnutrition (as determined by TTSH NST) was predictive of 6-month mortality (adjusted OR: 2.2, *P* = 0.05), LOS (*P* < 0.05), and MBI at discharge (*P* < 0.05) but not at 6 months.

Conclusion: Our findings show that using a cutoff of 4, the TTSH NST is a valid screening tool with good diagnostic utility and predictive validity for detecting malnutrition in hospitalised older adults.

BO-AH3

The Effectiveness of Clinical Care Pathways in Psychiatric Rehabilitation

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Introduction: IMH set up a psychiatric inpatient unit offering a comprehensive eight-week rehabilitation program in 2003. A Clinical Pathway (CP) was developed in 2005 to ensure multidisciplinary patient centered care. This paper highlights the effectiveness of the CP in the rehabilitation program.

Methods: This is a retrospective audit of patients placed on the CP in 2006 and 2007. Data were electronically captured and analysed.

Results: There were 221 patients on CP in 2006 and 177 in 2007. More than two-thirds (70%) were in the 31 to 50 years age group. The racial distribution was consistent in both years and closely approximated the country's population. Length of stay increased from 47 days in 2006 to 59 days in 2007.

Compliance with CP requirements was 100%. There was compliance in setting treatment goals for patients, family education, psychoeducation delivery and social, vocational and psychological skills training.

In the area of clinical outcomes recorded, patients showed significant improvements in various social, psychological and occupational functioning such as activities of daily living (44% to 96%), domestic skills (47.1% to 84.5%), social skills (27.8% to 92.5%) and psychological skills (18.8% to 92.5%). Readmission rate (less than 28 days) was only 0.6% compared to the hospital's rate of 10%

Conclusion: The use of the CP in the rehabilitation program has ensured consistent and coordinated care for patients although 10% (2006) and 4.5% (2007) of them did not complete the program for psychological or social reasons. Resources were appropriately utilised and patients clearly benefited as evidence by the clinical outcomes.

BO-BS1

Intrauterine Therapy of Haemophilia B: a Non-Human Primate Model of Fetal Gene Transfer using Self-Complementing Adeno-Associated Virus Serotypes 5 and 8

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Objectives: Intra-uterine gene transfer (IUGT) presents the

opportunity to correct a genetic disease in early fetal development, leading to sustained postnatal gene expression while capitalising on the immunological naïveté of the fetus. We tested the efficacy of adeno-associated vectors (AAV) to achieve long-term therapeutic levels of human Factor IX (hFIX) in a non-human primate model.

Methods: Time-mated cynomolgus macaques were serially monitored through ultrasonography. 1.3×10^{13} scAAV2/8-LP1-hFIXco vg/kg was injected into the intrahepatic vein of fetuses at 0.9 gestation, and delivered by Caesarean-section. Serial sampling of maternal, fetal and neonatal tissues was done to determine the vector bio-distribution, transgene expression (hFIX) and immune responses.

Results: Short-term maternal viraemia (10 vg/ μ L) occurred post IUGT, with widespread biodistribution in all maternal and infant system examined (11.3-0.54 vector copies/diploid genome). Treated animals showed sustained therapeutic postnatal hFIX levels (700% decreasing down to 100% at 1 month), with transgene expression limited to the liver. Immunological response to AAV capsid occurred rapidly, but only persisted in the infant.

Conclusions: Preliminary results demonstrated the high efficiency and safety of fetal transduction in macaques. Administration of 1.3×10^{13} vg/kg resulted in therapeutic levels of hFIX in the transplanted offspring. Ongoing research into earlier vector delivery, immunological response to vector challenge and toxicity will provide important preclinical data on which to design future trials.

BO-BS2

Development and Determination of the Efficacy and Safety of a Novel Drug-Eluting Absorbable Stent for Trachea Stenosis

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Aim: The aim is to develop and determine the efficacy and safety of a novel bioabsorbable stent for prevention of trachea stenosis.

Methods: Diathermy and acid were used to create stenosis in NZ white rabbits. 5 rabbits with 7 helical stents between 5.5 to 6.0 mm in diameter, made of several biodegradable polymers and their blends (currently used silicone stent for control), were developed and tested for mechanical strength, biocompatibility and degradation in vivo. Telescopic tracheoscopy was performed at weeks 1, 2, 3 and 4 after stents insertion.

Results: Acid and diathermy injury created trachea stenosis in 2 and 1 weeks respectively. All except one stent resulted in less mucus trapping, reduced trachea stenosis, and lowered respiratory distress. Some stents were found to be unstable. One totally degraded in 1 week and another one unraveled. A biodegradable co-polymer blended stent was most suitable, without granulation reaction and mucus trapping, and degraded within the planned timeframe.

Conclusion: Diathermy injury is effective in creating trachea stenosis in rabbits. The helical biodegradable co-polymer blended stent was the most biocompatible polymer for preventing trachea stenosis. It did not elicit granulations or mucus trapping commonly seen in current silicone stents used. Its self-degradation avoids the need for surgical removal under general anesthesia. A novel bioabsorbable stent for trachea stenosis has been developed.

BO-BS3

Nanotechnological Photo-Inactivation Platform – A Novel Antiviral Strategy for Dengue Virus

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Objective: The potential of a novel photodynamic therapy for virus inactivation is investigated. A novel near infrared light (NIR)-activated nanotransducer was adsorbed with zinc-phthalocyanine photosensitisers. Energy emitted by the excited photosensitiser is transduced by near oxygen molecules to produce radical species, which may be potentially virucidal.

Methods: Varying concentrations of nano-photosensitisers were mixed with dengue 2 virus, then exposed to NIR light at distances of 5 or 10 cm for 5 or 10 minutes. Plaque assay analysis of surviving virus titers was compared to untreated virus samples. Subsequently, dengue 2 virus-infected HepG2 cells (hepatocytes) were treated with nano-photosensitisers that were conjugated with antibodies specific for the dengue virus envelope protein (4 to 110 μ g/mL) and subjected to NIR illumination (10 cm for 5 minutes).

Results: Virucidal effect increased with higher nano-photosensitiser concentrations, at shorter distance and longer illumination from the NIR source. At all conditions, 2.2 mg/mL nano-photosensitisers caused complete virus inactivation. At 44 μ g/mL, virus titer reduction was >50%. Localisation of nano-photosensitisers to virus-infected cells was enhanced through conjugation with dengue virus-specific antibody, as shown by immunofluorescence microscopy. In addition, cell viability (MTT) assay showed that the photo-bleaching effect by NIR light on HepG2 cells was minimal.

Conclusion: This novel nanotechnology-based photodynamic therapy is shown to be effective in eradicating virus activity and has only mild effects on cells. It is a promising technology with important implications in treating virus-infected blood or cellular samples.

BO-PC1

Ethnic Difference in Cardiovascular Disease Burden by Framingham Risk Score – In Young Healthy Asymptomatic Singaporean Civil Servants

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Background: We wish to investigate the prevalence of cardiovascular (CVD) risk factors in a cohort of healthy asymptomatic Singaporeans using the Framingham Risk Score (FRS) and a novel race adjusted Singapore Risk Score (SRS).

Methods: We analysed 1605 healthy asymptomatic civil servants who underwent occupational health screening in our institution. Those with a BMI >27.5 kg/m² or suffering from diabetes were labelled as high risk regardless of the calculated FRS or SRS.

Results: Across the cohort, 91.0% were male; 57.3% were Chinese, 35.8% Malay, and 6.9% Indian. Mean age was 37.2 ± 8.2 years; High

CVD risk was identified in 411 (25.6%) of the total cohort. Prevalence of diabetics and Impaired Glucose Tolerance (IGT) were 1.7% and 2.3% respectively. 2.1% had newly diagnosed diabetes mellitus and 24.7% of their BMIs were >27.5 kg/m². With the FRS, 86.1%, 12.0% and 1.9% were at very low (<10%), intermediate (10-20%) and high (>20%) risk, respectively. With our novel SRS, the corresponding values were 92.0%, 6.0% and 2.1%. 0.8% Chinese, 3% Malay and 8.2% Indian were classified as high risk. High CVD risk was 2.9% and 3.2% in the FRS and SRS respectively, an increase. Among the high CVD risk subjects, only 8.1% Chinese, 16.0% Malays and 12.2% Indians were reclassified as having intermediate CVD risk using the recalibrated model.

Conclusions: High prevalence of obesity and diabetes which are modifiable CV risk factors in young Singaporeans results in an underestimation of CVD risk if FRS or SRS is used alone. A significant ethnic disparity in CV risk exists. Global risk estimation and ethnic-targeted intervention and prevention may be indicated.

BO-PC2

Knowledge and Misconceptions of Cancer among Community-living Adults in HDB Estate

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Aim: Many studies have shown that greater cancer knowledge is associated with greater adherence to cancer screening. Few studies have been conducted locally to ascertain common misconceptions and adequacy of knowledge towards cancer.

Methods: We studied the relationships between socio-demographics and screening, cancer knowledge, misconceptions of cancer and screening attitudes. Method used: A questionnaire survey of 480 eligible Singaporeans/permanent residents. Quantitative and qualitative data were analysed separately with statistical and thematic analysis respectively.

Results: Up to 50% of the study population was unaware that breast and colon cancer can be hereditary, less than 45% knew that modifiable lifestyle factors such as obesity, lack of exercise and lack of fruits and vegetables in the diet were risk factors for cancer and more than 50% of our respondents could not identify common modifiable lifestyle factors. 29% felt that cancer screening was only for symptomatic individuals. Determinants of high level of cancer knowledge included higher socio-economic status, having friends or relatives who have had cancer and knowing someone working in the healthcare service.

Conclusion: In Singapore, there is a high prevalence of lack of knowledge and misconception about cancer, cancer risk factors and warning signs. In order to tackle the increasing burden of cancer in Singapore, this lack of knowledge and misconceptions about cancer and cancer screening need to be addressed.

BO-PC3

A Cross-Sectional Study on Unwarranted Visits to the Accident and Emergency Department among Adult P3 Patients – Do We Know Why Patients Come?

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Aim: To determine the prevalence of unwarranted visits among non-emergency (P3) adult patients to the Accident and Emergency Department (ED) and the factors for such visits.

Methods: A cross-sectional survey was administered to patients above 21 years old, who were triaged as P3 by the triage nurse in a tertiary hospital ED for 1 week. Information on demographics, use of ED services, primary care physicians (PCP) and other treatment modalities, self-reported urgency and reasons for visiting the ED were collected. The opinions of 2 independent physicians (an ED consultant and a PCP) were used to determine if the visit was unwarranted or warranted. We analysed the association of specific factors between both groups.

Results: Of 593 eligible subjects, 316 had sufficient data for analysis. Almost 16% of all P3 patients attending the ED are likely to be unwarranted. This was associated with younger age ($P = 0.004$), higher education status ($P = 0.001$), being single ($P = 0.004$), foreign nationality ($P = 0.028$), SAF personnel ($P = 0.000$) absence of referral by PCPs ($P = 0.018$), use of non-western medicine ($P = 0.041$) company policies on private PCPs' medical certificate ($P = 0.002$) and ability to receive free or subsidised treatment ($P = 0.032$). The 3 most important reasons cited by unwarranted visitors were: proximity of residence to ED (15.2%), belief that ED had better facilities (13.0%) and that one is able to obtain earlier specialist appointment (8.7%).

Conclusion: Unwarranted visits could be an important contribution to overcrowding at the ED. We found that factors related to PCPs appear to affect the decision of such patients Younger, more highly educated patients were also more likely to have unwarranted visits.

BO-M1

Rapid Prenatal Diagnosis of Common Chromosomal Aneuploidies Using Quantitative Fluorescence PCR

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Aim: Aneuploidies of chromosomes 13, 21, 18, X and Y account for more than 80% of clinically-significant fetal genetic abnormalities. We aimed to develop a rapid quantitative fluorescence (QF)-PCR test to detect common fetal aneuploidies within 48 hours of sampling, as opposed to an average reporting time of 10-14 days by conventional karyotyping.

Methods: DNA from 1000 fetal samples (978 amniotic fluids, 14 chorion villi, 8 fetal blood samples) were analysed using QF-PCR that targeted 24 microsatellite markers located on chromosomes 13 (n=5), 18 (n=5), 21 (n=6), X and Y (n=8). There were 523 archived DNA samples stored before QF-PCR and 477 samples live samples where analysis was performed and results obtained within 48 hours of fetal sampling. Results were confirmed with their respective karyotypes.

Results: In 97.4% cases, ≥ 2 markers were informative for each chromosome. Sixty-three aneuploidies were identified in 45 archived samples (three Trisomy-13, twelve Trisomy-18, fifteen Trisomy-21, five Klinefelter syndrome, seven Turner syndrome, one XYY syndrome, two XXX syndrome) and 18 live samples (four Trisomy-

18, thirteen Trisomy-21, one Turner syndrome). All results were concordant with their respective karyotypes. Sensitivity (lower 95% CI, 92.8%) and specificity (lower 95% CI, 99.5%) of 100% were achieved in the analysis of all informative samples. The time taken from fetal sampling to results reporting was ≤ 48 hours for all 477 live samples.

Conclusion: We achieved our aim to release prenatal diagnostic results within 48 hours of fetal sampling using QF-PCR, thus alleviating parental anxiety and improving clinical management of high-risk pregnancies.

BO-M2

Ethnic and Gender Differences in the Prevalence of Cardiovascular Risk Factors in Asymptomatic Young Adults Attending an Occupational Health Screening Program in Singapore

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Aim: We aim to examine the prevalence of cardiovascular risk factors in asymptomatic young adults attending a health care screening program.

Methods: A cohort study involving 3512 members of Singapore's Civil Defence Services were screened during occupational health screening program between April 2006 and November 2007 in our institution.

Results: Mean age was 37.8 ± 3.8 years. 91.1% was male. There were 57.8% Chinese, 35.5% Malays, and 6.7% Indians. Racial distribution was comparable to published demographic data. Existing diabetes and hypertension were 2.1% and 7.0% in the cohort. Severe hyperlipidaemia (LDL >4.1 mmol/L) and diabetes were found in 30% and 3.3% respectively. 40% of diabetics were newly diagnosed. Malays have higher incidence of obesity defined as BMI >25 (58.6%, $P < 0.001$); diabetes (4.5%, $P = 0.009$); hypertension (8.8%, $P = 0.013$); and smoking (37.9% $P < 0.001$). Indians have the worst lipid profile: 38.5% has LDL >4.1 mmol/L, $P < 0.001$ and 19.2% has HDL <1.0 mmol/L, $P = 0.004$. Males have worse risk profiles of obesity (48.8% vs. 36.4% $P < 0.001$ has BMI >25), hypertension (7.4% vs. 3.2% $P = 0.005$), hyperlipidaemia (30.6% vs. 14.9% $P < 0.001$) and smoking (34.7% vs. 7% $P < 0.001$) compared to females.

Conclusions: Asymptomatic young men suffer from more cardiovascular risk factors than women. Male Malays are more likely to be smokers, morbidly obese, hypertensive, having impaired fasting glucose and lipid profiles. Indians suffer from the worst cholesterol profiles. A tailored primary prevention program to target these risk groups is needed. A significant minority was found to have moderate to high cardiovascular risk and screening for silent myocardial ischaemia may be indicated in these subjects.

BO-M3

Development and Validation of a Simple Clinical Risk Score that Predicts Risk of Colorectal Neoplasm in Asymptomatic Subjects

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Aims: To develop and validate a clinical risk score (RS) predictive of an individual's risk for colorectal neoplasm in Asia.

Methods: Data from consecutive colonoscopies performed on asymptomatic subjects participating in screening for colorectal cancer

were contributed from 17 centres in 11 Asian cities. Colorectal neoplasm was defined as carcinoma or advanced adenoma (adenoma with dysplasia or villous component or >1 cm). A RS was constructed using multivariate logistic regression. Validation was prospectively performed using an independent group of subjects.

Results: 860 asymptomatic adults undergoing screening colonoscopy constituted the development set. Mean age was 54 ± 11.6 years, 471 (55%) male and there were 9 ethnic groups (Chinese, Filipino, Indians, Indonesian, Japanese, Korean, Malay, Thai, Caucasian, others). 168 (19.5%) had colorectal neoplasm comprising adenoma or carcinoma, 31 (3.6%) had advanced neoplasm (cancer or high grade dysplasia, or villous adenoma, or >1 cm) and 9 (1.0%) had invasive cancer. Multivariate logistic regression showed that age >50 years, male gender, a positive family history in a first-degree relative and smoking were significant risk factors for colorectal neoplasm, with odds ratio (95% CI) of 3.2 (1.3-7.4), 2.3 (1.1-4.8), 3.2(1.3-7.7) and 1.8 (0.9-3.4) respectively. Based on this, a clinical RS (0-8) comprising points for age (0-3), sex (male = 1), family history (2) and smoking (2) was constructed. Validation of the RS was performed in an independent data set with 1892 subjects. Based on their RS, subjects were differentiated into average-risk (RS 0-1, n=539, 28.5%), moderate-risk (RS 2-3, 50.8%), high-risk (RS 4-5, 19.2%) and very high-risk (RS 6-8), 1.5%) groups. The relative risk of subjects in the high risk and very high-risk group was 4.1 fold (95% CI, 1.1-15.4) and 11.1 fold (95% CI, 2.1-57) that of the average-risk group respectively.

Conclusion: We have developed and validated a clinical risk score for colorectal neoplasm using age, gender, family history and smoking, which predicts the risk of colorectal neoplasm in asymptomatic subjects.

BO-M4

Reduced Glomerular Filtration Rate and Albuminuria are Both Independently Associated with Activation of the Tumor Necrosis Factor Alpha System in Singaporean Chinese Patients with Type 2 Diabetes Mellitus

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Aim: The involvement of chronic inflammation in albuminuria and renal function was investigated in a cross-sectional study of 320 type 2 diabetic Chinese patients from the Singapore Diabetes Cohort Study.

Methods: Plasma levels of TNF-A and its two cellular receptors, IL-6, and C-reactive protein (CRP) were measured. A composite TNF-A score was extracted using principal component analysis. Multiple linear regression analysis was implemented to evaluate the relationship between logACR (log albumin-to-creatinine ratio) and eGFR (estimated glomerular filtration rate) with the inflammatory parameters and other clinical covariates. GFR was estimated using the creatinine-based MDRD (Modification of Diet in Renal Disease) equation. A Bonferroni correction was applied based on the total number of variables entered into regression analyses.

Results: LogACR was significantly associated with TNF- score independently of eGFR even after taking into account multiple hypotheses testing (uncorrected $P < 0.001$, Bonferroni-corrected $P < 0.05$). Intriguingly, TNF- score was also significantly associated

with eGFR independently of logACR (uncorrected $P < 0.001$, Bonferroni-corrected $P < 0.05$). These findings were reiterated when the individual molecules of the TNF-A system were analysed separately instead of using the composite TNF-A score. No association was observed for IL-6 and CRP with either renal trait. Among the clinical covariates, diabetes duration was a significant predictor for logACR (uncorrected $P < 0.001$, Bonferroni-corrected $P < 0.05$) but not eGFR. On the other hand, age was significantly associated with eGFR (uncorrected $P < 0.001$, Bonferroni-corrected $P < 0.05$) but not logACR.

Conclusion: Activation of TNF-A system may potentially exert independent effects on logACR and eGFR in type 2 diabetes.

BO-N1

High Prevalence of Nocturnal Blood Pressure Non-Dippers in Patients with Diabetes Mellitus and Hypertension

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Aim: Hypertension is an established risk factors for progression of macrovascular and microvascular complications in diabetes mellitus. Cardiovascular risk is further increased in diabetic patients with nocturnal non-dipping (MAP night/day ratio > 0.9) and reverse dipping (MAP night/day ratio > 1.0). We therefore investigated nocturnal diurnal pattern, non-dipping and reverse dipping status in patients with diabetes and hypertension, through 24-hour ambulatory blood pressure profile.

Methods: A prospective study was done on random sample visiting the Diabetes Centre in Alexandra Hospital from October 2005 to January 2006. Ambulatory blood pressure monitoring was performed on 45 adults with diabetes and hypertension, using the Spacelabs 90217 monitor. Demographic and clinical data were obtained and analysed using descriptive statistics and presented as mean (SD) (unless otherwise stated).

Results: A total of 45 patients, men (N = 26) and women (N = 19) were included: mean age of 60 (11) years old, body mass index (BMI) Kg/m² of 26.5 (3.9). Sixty-four per cent of patients were on 2 or more antihypertensive agents and had fairly good glycaemic control, with mean HbA1c of 7.5 (1.2)%. Forty-four (97%) subjects revealed nocturnal non-dipping pattern. The median MAP night/day ratio is 0.9965 (95% confidence interval 0.9753-1.0014). Among all non-dippers, 34% of them are reverse dippers.

Conclusion: Abnormal diurnal blood pressure variation is very common in patients with diabetes and hypertension. Therefore, given the high prevalence of diabetes in Singapore, our observation may have important public health implication.

BO-N2

A Descriptive Study that Examines the Burden and Coping Strategies Experienced by Caregivers of Patients with Mental Illness in the Community

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Aim: The return of patients with mental illnesses to the community has been a great challenge to the mental healthcare delivery system. Often times, immediate caregivers are left to take care of these

patients without much support. This placed significant demands on the caregivers; and many experienced difficulties in managing the disruptive behaviours of these patients. This study aimed to examine caregivers' burden in caring for patients with mental illnesses and their coping strategies.

Methods: This study was conducted using non-experimental, quantitative, descriptive design. 150 caregivers were recruited conveniently from 3 outpatient clinics of a local mental health hospital over a period of three months. The Burden Assessment Scale was used to measure caregiving burden, while the Family Crisis Oriented Personal Scales (F-COPES) examined the coping strategies employed by these caregivers.

Results: Results indicated that caregivers experienced burden, whilst caring for people with mental illnesses. 31.3% of caregivers had burden scores above the 75 percentile. Majority of them felt trapped in their care-giving roles and experienced friction with people outside the households. Caregivers, who knew about available coping resources experienced lower level of burden. However, only 14.7% of the participants sought healthcare professionals' help.

Conclusion: Findings revealed that caregivers experienced burden but few sought the help of healthcare professionals. This suggests that caregivers may not be aware of the available resources or insufficient caregiver-centred resources were provided. This study highlights the need for mental healthcare professionals to design and publicise caregiver-tailored programs that will assist caregivers in reducing or coping more effectively with their burden.

BO-N3

Incentive Spirometry in Chronic Obstructive Pulmonary Disease COPD

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Aim: The aim of the study was to evaluate the effects of Incentive Spirometry (IS) on Severity of Dyspnoea (as measured by the Modified Medical Research Council Dyspnoea Scale) and Health-Related Quality of Life (as measured by the St George's Hospital Respiratory Questionnaire SGRQ) in patients with stable COPD

Methods: Twenty-one subjects with COPD were randomly assigned to an IS treatment group or to a Control group. Subjects in the IS treatment group received normal medical treatment and are trained to use IS 10 times hourly when awake for 3 months. Subjects in the Control group only received medical treatment. Measurements made included spirometry, pulse oximetry, completion of the SGRQ on Quality of Life, which had 3 subscales: symptom, activity and impact as well as a total score, and the Modified MRC Dyspnoea Scale to assess the severity of dyspnoea.

Results: The study showed a statistically significant difference in symptoms within the IS treatment group, mean score reduction from 58.90 (SD 26.31) to 34.80 (SD 16.63), $P = 0.016$. There was no statistical difference within the Control group, Comparison between the IS treatment group and Control group demonstrated statistically significant decrease in mean symptom score in the IS treatment group versus Control group; mean difference was -157.35 (95% CI -312.8 to -1.89), $P = 0.048$. There was, however, no significant difference in any change in pulmonary function and in the MRC Dyspnoea Scale between the 2 groups.

Conclusion: The use of IS appears to improve patient's quality of life QOL as measured by the SGRQ score.

BO-QHSR1

Planning Outpatient Appointment Schedules using Multiple Methods

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Aim: To study the performance of selected appointment strategies for specialist outpatient clinics with overbooking.

Methods: We built a discrete event simulation model and fed it with a typical specialist outpatient clinic's environmental parameters (such as consultation duration, probability of no-show and patients' lateness) with planned overbooking. Twenty schedules were generated randomly and 7 were modified from the literature. Thirty more schedules were produced using evolution concept, where good solutions were paired or mutated to spawn the next generation. The outcomes of each appointment schedule, namely clinic overtime and average patient consult waiting time, were plotted to identify the efficiency frontier. The results were analysed using data mining methods. We also ran the results against the scenarios where no patient defaulted (hence no planned overbooking).

Results: The best breed of results came from families of sequencing the repeat patients (with lower variability in consult duration) early, and placing 2 appointments on the first appointment slot. The first concept worked on the principle that variability should be deferred to the end as much as possible. The second concept was double booking the first slot for no-show and lateness. We also found that 20% no-show led to 5% to 30% performance degradation as compared to no patient defaulted and no overbooking was planned.

Conclusion: Uncertainty and variation caused waiting time and imperfect clinic utilisation. However, while the trade-off would be inherent, we showed that some appointment strategies would do better than the others. The methods could be tuned for a specific clinic.

BO-QHSR2

Development of Rapid Same-day Prenatal Diagnosis of Common Chromosomal Abnormalities (FlashFISH)

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Aim: We aimed to develop a rapid prenatal diagnostic fluorescence *in situ* hybridisation (FISH) method that releases accurate results within the same day of fetal sampling.

Methods: FISH of CEP/LSI probes targeting chromosomes (chr) 13/18/21/X/Y and DiGeorge syndrome were optimised to complete within 2h of fetal sampling using amniotic fluid (AF), chorion villus (CVS), and fetal (FB), cord, neonatal and adult blood samples. The optimised low-cost FISH (FlashFISH) was tested using AF (n = 215), CVS (n = 8) and FB (n = 3) in a blinded study. All results were validated with their respective karyotypes.

Results: Down (n = 13), Edward's (n = 1), Klinefelter (n = 1) and Turner's (n = 1) syndromes were identified in the blinded study. There were 105 female and 104 male fetuses. Results of FlashFISH in all but one sample were concordant with their karyotypes. The discordant sample showed two CEPX and one CEPY in 45/50 analysed amniocytes. However, cytogenetics reported 46,XX, with an extra long chr15p, also observed paternally. Quantitative fluorescence-PCR (QF-PCR) of both fetus and father did not detect sex chromosome aneuploidies. Further metaphase FISH analysis of chr15 and Y confirmed t(15q;Yq). Clinical implications of the female fetus with the chrY material remain unknown. Thus, this sample was excluded in statistical analysis.

Conclusion: We achieved our aim to release prenatal diagnostic results within 2h of fetal sampling using FlashFISH (n=225; 100% specificity, lower 95% CI, 97.8%). The release of prenatal diagnostic results within the same day as fetal sampling can alleviate parental anxieties and aid clinical management of affected pregnancies. The development and implementation of FlashFISH into diagnostic laboratories will complement QF-PCR in cases of discrepancies.

BO-QHSR3

Improving Breastfeeding Initiation, the CPIP Way, in National University Hospital

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Introduction: Singapore's breastfeeding rates are low. Less than 1% mothers were breastfeeding exclusively at 6 months in 2001. We believe that supporting mothers to initiate exclusive breastfeeding post-delivery will increase breastfeeding success.

Methods: The Clinical Practice Improvement Project (CPIP) methodology was used. A 9-member multidisciplinary team was formed. Our mission statement was 'To increase exclusive breastfeeding rates at discharge from postpartum ward 96 NUH, by 50% in 6 months'. Pareto voting demonstrated that main factors for low breastfeeding rates were insufficient antenatal breastfeeding education, disruptive hospital procedures, inadequate staff knowledge, maternal breastfeeding problems and perception of insufficient breastmilk. Our team implemented measures guided by the "Ten steps to successful breastfeeding" in UNICEF-certified Baby-Friendly-Initiative hospitals. These included lectures, bedside teaching, distribution of print and audiovisual materials for staff and family education. A new 24-hour breastfeeding help line provided additional breastfeeding support post-discharge. Weekly rates of breastfeeding were prospectively collected.

Results: After 6 months ending January 2008, we achieved our goal. Mean exclusive breastfeeding rates at discharge increased from 39% to 59%. Presence of team leaders to motivate staff and institution of consistent processes in the maternity ward were effective measures. Obstacles were conflicting work demands on staff, low rooming-in rates and dependence on freely available infant formula.

Conclusion: Despite achieving our target, our exclusive breastfeeding rates are below the minimum 75% required for UNICEF Baby-Friendly-Initiative status. To enable sustainment of results and spread to other maternity wards, higher authorities will need to commit resources for baby-friendly maternity services.

BO-S1

Usefulness of Computer Tomography Scans in Evaluation of Patients with Ingested Foreign Body

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Aims: This study aims to determine if CT scans negative for foreign body impaction can be relied upon to decide if a patient requires further investigation by oesophagoscopy. This would allow clinicians to minimise unnecessary patient exposure to the risks associated with oesophagoscopy without exposing the patients to the risk of a missed impacted foreign body.

Methods: This is a retrospective case chart of patients admitted to NUH over the period 2005-2006 for ingested foreign body. Case files were reviewed and patients who underwent preoperative CT scan followed by oesophagoscopy were identified. The results of the CT scan as well as the oesophagoscopy findings of these patients were analysed.

Results: There was a total of 229 patients who had rigid oesophagoscopy for ingested foreign body during this period. Of these, 52 patients who had CT scans done before the endoscopy. Based on our analysis, the sensitivity of CT scan was 100%; specificity was 75%. The positive predictive value was 90%. The negative predictive value of CT scan was 100%. All patients with negative CT scans had no complications on follow-up.

Conclusion: CT scan appeared to be sensitive and specific in investigation of patients with ingested foreign body. It also has a high negative predictive value may allow it to be the sole investigation in these patients. However, we caution the direct interpretation of this data as the number of negative CT in this study was small. Based on this data, a prospective study with close monitoring of patients with negative CT can be designed to accrue more patients to answer this query.

BO-S2

Early Return of Continence in Obese Men following Robotic-assisted Radical Prostatectomy Employing Total Anatomic Reconstruction of the Bladder Neck

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Aims: Obese men reportedly experience significantly delayed return of urinary continence following robotic-assisted radical prostatectomy (rRP) compared to their non-obese counterparts. We report our results with obese patients undergoing the Cornell technique of total anatomic reconstruction after rRP.

Methods: Between January 2005 and March 2008, 67 obese men who underwent rRP without modifications, versus a cohort of 36 obese men of similar age and clinicopathological disease characteristics who underwent total bladder neck reconstruction during surgery. Obesity was taken as body mass index (BMI) > 30. These results were then compared against previously published results of non-obese patient cohorts. Data collection using IPSS, IIEF and EPIC questionnaires were obtained before surgery and at 1, 6, 12, 24 and 52 weeks follow-up.

Results: Patients were grouped according to technique - those without modifications (group 1) against those who underwent anatomic reconstruction of bladder neck (group 2). In group 1, the obese patients took significantly longer to recover urinary continence compared to their non-obese counterparts in the first three months following surgery (38.7% versus 53.3% continent at 12 weeks, $P < 0.05$). In group 2, all patients demonstrated significantly earlier recovery of continence compared to group 1, regardless of their BMI (35.8% versus 6.6% continent at 1 week, 77.5 versus 23.6% at 6 weeks, 85.8% versus 38.7% at 12 weeks, and 95.9% versus 57.1% at 24 weeks, $P < 0.01$).

Conclusions: Total bladder neck reconstruction during robotic-assisted prostatectomy augments early continence recovery irrespective of BMI, results being most striking in obese men.

BO-S3

Resource Utilisation in Non-Operative Management of Solid Organ Injury in Blunt Abdominal Trauma

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Aim: Majority of trauma patients with solid organ injury from blunt abdominal trauma (BAT) are managed non-operatively. This review examined the utilisation of critical resources, namely requirement for blood transfusion, requirement for Intensive Care Unit (ICU) management and overall length of stay (LOS) in such patients.

Methods: Consecutive cases of BAT in the hospital's trauma registry admitted over 6 years with CT proven injury of the liver, spleen and/or kidneys managed non-operatively were reviewed. Resource utilisation was correlated with the severity and multiplicity of solid organ injuries sustained as well as the overall injury status of the patient based on the Injury Severity Score (ISS).

Results: Results showed that the Injury Severity Score (ISS), analysed in 3 bands - namely 3-15, 16-30 and >30, correlated positively with blood requirement and ICU admission ($P < 0.05$). LOS peaked in the group of patients with ISS 16-30 and dropped after that. This was likely due to a greater proportion of patients with ISS >30 died. The grade of organ injury based on American Association for the Surgery of Trauma (AAST) grading system and the number of organs injured did not appear to correlate significantly with utilisation of the named resources.

Conclusion: ISS correlated well with the named resource utilisation while the number of abdominal organs injured and the AAST grade did not appear to influence the degree of resource utilisation. ISS may be useful to help plan resources required for management of trauma patients.

BP-AH1**Molecular Epidemiology in Nephropathy Secondary to Type 2 Diabetes**

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Aim: Nephropathy secondary to type 2 diabetes (DN) is a leading cause of end-stage renal disease. Antibody based detection of urinary albumin excretion is currently the standard of care. However, it is increasingly recognised that up to 30% of diabetic subjects with moderately advanced renal impairment do not develop significant albuminuria (using antibody based detection method). Hence, there is a need to identify novel urinary biomarker for the detection of DN. We hypothesised that subject with and without DN exhibit differential urinary polypeptide pattern.

Methods: In this preliminary study, we investigated the early morning urine sample polypeptide pattern of healthy (H) individuals (N = 10) and longstanding type 2 diabetic (>10 years) subjects with normo-albuminuric DN (normal urinary albumin excretion but elevated serum creatinine, N = 10). The subjects were frequency-matched for ethnicity, gender, age and smoking status. Urine samples were subjected to standard 1 and 2-D gel electrophoresis (to explore global changes in the urinary proteome associated with normo-albuminuric DN) and stained with Coomassie Blue. Target spots were cut from gel, destained and digested in-gel with trypsin. Tryptic peptides were extracted and analysed on the quadrupole time-of-flight mass spectrometer (Q-ToF-2) with capillary for in-depth proteome coverage.

Results: Four spots were identified as differential polypeptide excretion in DN (absent in H). Mass-spectrometry analysis suggested these to be human serum albumin complexed with (1) myristic acid and tri-iodobenzoic acid and (2) crystal structure of the Ga module albumin. The remaining two spots were albumin isoforms CRA_c and CRA_h.

Conclusion: Normo-albuminuric DN appeared to excrete modified albumin species, which conceivably escape detection from standard antibody based method. Further study to validate this preliminary observation is needed to guide the development of laboratory method suitable for the detection of urinary biomarker in special sub-group of DN.

BP-AH2**Expression of p27^{Kip1} Protein in Colorectal Cancer (CRC) and its Prognostic Significance**

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Aim: p27^{Kip1} belongs to the *Cip/Kip* family of cyclin dependent kinase (CDK) inhibitor proteins which inhibits cell cycle progression. p27^{Kip1} is suggested to be a tumour suppressor and is increasingly known as a prognostic marker in different cancer types. In this study, we examined the expression of p27^{Kip1} and its prognostic significance in colorectal cancer.

Methods: Tissue microarrays (TMA) were constructed from primary

tumour tissue of 408 colorectal cancer patients from the National University Hospital of Singapore. Patient follow-up ranged from 1 - 210 months (median, 47.7 months). The expression of p27 protein was analysed immunohistochemically using anti-human p27^{Kip1} antibody (clone SX53G8; Dako, Denmark). The p27 protein expression was scored according to staining intensity and percent positively stained nucleus.

Results: Multivariate Cox regression analysis demonstrated that p27 protein expression ($P = 0.018$), and Dukes staging ($P = 0.005$) were independent prognostic factors. Nuclear accumulation of p27 was detected in 67.4% of colorectal adenocarcinomas. Lack of p27 expression was associated with worse overall survival (HR = 2.16; 95% CI, 1.62 – 2.89, $P > 0.001$). Lack of p27 protein expression in Dukes B and C patients showed the highest hazard risk ratios (HR = 3.84, 95% CI = 2.42 to 6.11, $P > 0.001$ and HR = 2.23, 95% CI = 1.14 to 4.38, $P = 0.02$, respectively) when compared to patients with p27 protein expression.

Conclusion: Assessment of p27 protein expression can be a useful prognostic marker in Dukes B and C colorectal cancer patients.

BP-AH3**Prevalence, Risk Factors and Outcomes of Malnutrition in Hospitalised Older Adults**

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Aim: Despite the rapidly ageing population in Singapore, there is limited data on malnutrition prevalence in older adults. The study aimed to determine the prevalence of malnutrition and to identify the associated risk factors and outcomes in hospitalised older adults.

Methods: Newly admitted non-terminal patients aged ≥ 60 years were recruited from an acute geriatric medicine unit. Nutritional status was assessed using Subjective Global Assessment (SGA) upon admission. Risk factors such as swallowing impairment, poor appetite, body mass index (BMI), weight loss, serum albumin, dentition, polypharmacy, functional status, dementia, depression and other clinical diagnoses were assessed. Nutritional status (by SGA) was analysed against length of hospital stay (LOS), modified Barthel Index (MBI) at discharge and 6 months, and 6-month mortality, before and after adjustment for age, gender, depression, dementia, severity of illness and admission MBI using regression analysis.

Results: The sample comprised 281 patients with the following characteristics: mean age 81.3 ± 7.6 years; 44% male; 83% Chinese; 33% dementia. SGA identified 35% as malnourished. Swallowing impairment, loss of appetite, weight loss, serum albumin, BMI, functional status, depression, dementia, cancer and urinary tract infection were significantly associated with malnutrition (OR range: 1.0-10.7, adjusted for age and gender). Malnutrition was predictive of LOS (adjusted $P < 0.05$) and 6-month mortality (adjusted OR: 3.3, $P < 0.05$).

Conclusion: The local prevalence of malnutrition in hospitalised older adults is significant. Malnutrition is predictive of longer LOS and 6-month mortality. Identifying associated risk factors will help to detect patients who require further nutrition assessment and intervention.

BP-BS1

A Novel Function of Poly (ADP-Ribose) Polymerase-1 in Modulation of Autophagy and Necrosis under Oxidative Stress

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Aim: Under oxidative stress, poly(ADP-ribose) polymerase-1 (PARP-1) is activated and contributes to necrotic cell death through ATP depletion. On the other hand, oxidative stress is known to stimulate autophagy, and autophagy may act as either a cell death or cell survival mechanism. This study aims to explore the regulatory role of PARP-1 in oxidative stress-mediated autophagy and necrotic cell death.

Methods: *Bax*^{-/-} *Bak*^{-/-} mouse embryonic fibroblasts (MEFs) were treated with hydrogen peroxide (H₂O₂) with different incubation time. Flow cytometry and confocal microscopy were performed to evaluate cell viability and punctation distribution of GFP-LC3. siRNA treatment was performed to knockdown specific target proteins. Western blot was used to measure the changes of protein expression.

Results: First we observe that H₂O₂ induces necrotic cell death in *Bax*^{-/-} *Bak*^{-/-} MEFs through a mechanism involving PARP-1 activation and ATP depletion. Next, we provide evidence that autophagy is activated in cells exposed to H₂O₂. More importantly, we identify a novel autophagy signaling mechanism linking PARP-1 to the activation of AMP-activated protein kinase (AMPK), leading to the suppression of mammalian target of rapamycin (mTOR) and stimulation of autophagy. Finally, we demonstrate that autophagy plays a cytoprotective role in H₂O₂-induced necrotic cell death as suppression of autophagy by knockdown of autophagy-related gene ATG5 or ATG7 greatly sensitises H₂O₂-induced cell death.

Conclusion: These findings demonstrate a novel function of PARP-1: promotion of autophagy via the AMPK-mTOR pathway to enhance cell survival in cells under oxidative stress.

BP-BS2

Immunomodulatory Properties of Fve

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Fve is a 12.5 kD fungal immunomodulatory protein from an edible mushroom *Flammulina velutipes*. We had determined the three dimensional structure of Fve, which showed that Fve is a homodimer, each monomer consists of an N-terminal α -helix followed by a fibronectin type III-like domain with immunoglobulin like-fold structure. This immunomodulator was shown to stimulate the expansion of murine T and NK cells in vivo. In this study, we investigate the immunomodulatory properties of Fve on human T cells. Results from the flow cytometric analysis show that Fve induces the production of human IL-2, IFN- γ , TNF- α/β but not IL-17A, IL-4 and IL-13. The co-stimulatory molecules 4-1BB, OX-40 and CD27 but not co-inhibitory molecules CTLA-4 and PD-1 are up-regulated. Interestingly, Fve totally down-regulates chemokine receptor CCR5 whereas up-regulates CXCR3 on human T cells. We further demonstrate that human functional blocking antibody of CD2 inhibits the production of IFN- γ and TNF- α/β , the down-regulation of CCR5, and the proliferation of T cells upon Fve stimulation. In addition, GF109203X, a PKC inhibitor, but not SB203580 (p38 inhibitor), SP600125 (JNK inhibitor) and PD98059 (ERK inhibitor), greatly suppresses the up-regulation of OX-40 and 4-1BB, inhibits

the induction of TNF- α and IFN- γ , and abrogates Fve-mediated proliferation of T cells. These data suggest that Fve triggers a CD2-dependent T cells activation through PKC signaling pathway. Hence, this molecule could have pharmaceutical potential to be exploited in drugs design or vaccines development.

BP-BS3

Effect of Fc γ RIIIa Polymorphism on Antibody Dependent Cellular Cytotoxicity towards Neuroblastoma mediated by Natural Killer Cells and hu14.18 Humanised anti-GD2 Antibody

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Aims: Natural Killer (NK) cells can kill tumour cells by antibody-dependent cellular cytotoxicity (ADCC) when their surface Fc γ RIIIa receptors are bound and cross-linked by tumour-specific IgG. A single nucleotide polymorphism within the IgG binding region of Fc γ RIIIa gives rise to Fc γ RIIIa^{158Val} and Fc γ RIIIa^{158Phe} alleles which possess different affinities for IgG, affecting the efficacy of NK cell-mediated ADCC. Neuroblastoma can be targeted by NK cell-mediated ADCC via hu14.18, a humanised monoclonal antibody specific for GD2 antigen up-regulated on neuroblastoma. We aimed to: (i) Determine the Fc γ RIIIa^{Val158Phe} polymorphism frequency in the Singaporean Chinese population. (ii) Evaluate the activity of NK cells from V/V versus F/F individuals against neuroblastoma in presence of hu14.18.

Methods: We genotyped 93 Chinese individuals for the polymorphism by sequencing genomic DNA. NK cells were purified from V/V and F/F individuals and co-cultured with IMR-32 neuroblastoma cell-line in absence or presence of hu14.18. NK cell activity was measured by performing ELISA assays for IFN- γ in the culture supernatant and killing of neuroblastoma was measured using DELFIA assays.

Results: The following Fc γ RIIIa genotypic frequencies were observed in our sample population: 13.95% (V/V), 31.40% (F/F), 54.65% (V/F) – conforming to Hardy-Weinberg equilibrium ($P = 0.44$). V/V individuals exhibited 2.2 times greater cytotoxicity and IFN- γ secretion than F/F individuals in co-cultures of NK and IMR-32 cells containing 10 μ g/mL hu14.18.

Conclusion: Our results suggest that NK cells from F/F individuals mediate less potent ADCC responses against neuroblastoma targets in-vitro. Genotyping for the Fc γ RIIIa^{Val158Phe} polymorphism will identify individuals who might benefit from dose escalation during hu14.18 immunotherapy for neuroblastoma.

BP-PC1

Attitudes Towards the Elderly Among Medical Students in Singapore

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Aim: As Singapore's medical students will be caring for an increasing proportion of elderly patients due to Singapore's rapidly ageing population, they need to possess the correct attitude toward the elderly and not have an ageist attitude. We thus sought to assess their attitude toward the elderly.

Methods: We conducted a one-day cross-sectional study among 225 first-year and 135 third-year medical students at the National University of Singapore using the Kogan's Attitudes Toward Old People Scale (KOP). The score indicating a neutral attitude was 102, with lower scores indicating more negative attitudes. There were also questions on demographics, household income, and choice of future specialty.

Results: 98.2% of first year and 99.2% of third year medical students had a positive attitude toward the elderly. There were no significant differences ($P > 0.05$) in mean KOP scores between genders (1st year: 137.4 (female) vs 133.5 (male); 3rd year: 139.3 (female) vs 137.4 (male)), race (1st year: 135.7 (Chinese) vs 129.6 (non-Chinese); 3rd year: 138.4 (Chinese) vs 137.2 (non-Chinese)), income (1st year: 134.8 (<\$2000) vs 135.3 (≥\$2000); 3rd year: 134.1 (<\$2000) vs 138.6 (≥\$2000)), and future choice of specialty (1st year: 133.3 (Family Medicine) vs 135.3 (non-Family Medicine); 3rd year: 137.8 (Family Medicine) vs 138.3 (non-Family Medicine)).

Conclusion: Singapore's medical students have a positive attitude toward the elderly which augurs well for Singapore's ageing population. Possible reasons include the tradition of respect for the elderly among East Asians and the active role of the elderly within the family in Singapore.

BP-PC2

Improving the Diabetic Retinopathy Screening Rate in Choa Chu Kang Polyclinic

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Aim: Diabetic retinopathy is the leading cause of blindness in Singapore. In CCK polyclinic, only 76.4% of diabetic patients had eye screening in July 2007. The project aimed to increase this percentage to 100 % in 6 months.

Methods: A survey of patients followed by team discussion identified as causes for low DRP rate: (i) long waiting time; (ii) no standardised documentation when DRP is due; (iii) lack of patient awareness

Interventions were carried out: (i) to decrease waiting time by advising clinicians to pair DRP appointments with a visit requiring a non-fasting test (HbA1C) booked at off-peak hours, (ii) searching for DRP information was standardised using CDMR (Chronic Disease Management Registry). Hands-on training of clinicians were conducted and process to train new clinicians were put in place. Poster reminders to check DRP status with a step-by-step guide to access CDMR were posted in consultation rooms. Generation of monthly CDMR usage statistics and retraining of clinicians were done, if necessary (iii) actual retinal photos were provided to help clinicians educate diabetic patients on the importance of DRP.

Results: Overall, there was an improvement in the DRP rate from 76.4% to 86.2% in March 2008. Monthly CDMR usage statistics in CCK showed sustained increase in clinicians' usage from 18 counts in September 2007 to 318 in March 2008 signifying compliance to our intervention.

Conclusion: Ensuring diabetic patients undergo annual eye screening is important but may be overlooked by busy clinicians. A change in process to make it easier to offer DRP is needed and requires verbal and visual reinforcements. A process to monitor compliance to intervention and addressing cause of non-compliance is key to success of project.

BP-PC3

Impact of a Primary Care Podiatrist Clinic on the Provision of Diabetic Foot Care in a Polyclinic

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Aim: To evaluate the impact of providing regular podiatric service in primary care and the foot-care training of polyclinic nurses by the podiatrist on diabetic foot screening assessments by nurses and polyclinic foot-care referral patterns.

Methods: Study subjects were diabetic patients followed up at Toa Payoh Polyclinic who had diabetic foot screening performed by polyclinic nurses or were referred to the podiatrist stationed at the polyclinic from September 2002 to September 2004. Sociodemographic characteristics, duration of diabetes, comorbidities, foot assessment reports, laboratory reports, glycaemic and blood pressure control in 2002 and 2004 were obtained from medical records review. Data was analysed using SPSS version 15.

Results: The data of 1037 patients attending the polyclinic in 2002 and 1224 patients in 2004 who fit eligibility criteria was analysed. There were no significant differences in age, gender, race, duration of diabetes, presence of hypertension, retinopathy, nephropathy, glycaemic and blood pressure control between the 2 groups of patients. While the prevalence of patients assessed by the nurse to have a "high risk foot" increased from 22.9% in 2002 to 38% in 2004 (OR 2.07 95%CI 1.72-2.49), the rate of referrals to hospital podiatrists and specialists decreased from 5.5% in 2002 to 0.9% in 2004 (OR 6.67 95%CI 0.83-52.6) and from 1.2% in 2002 to 0.5% in 2004 (OR 2.38 95%CI 0.89-5.00) respectively.

Conclusion: An onsite podiatrist reduced the number of polyclinic referrals to hospital podiatrists and specialists and provided training which improved the proficiency of polyclinic nurses in conducting diabetic foot screening and providing diabetic foot care.

BP-M1

A Comparison of Cardiologist versus Noncardiologist Care of Acute Decompensated Heart Failure

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Aim: Studies from western countries had suggested that cardiologists might provide better heart failure (HF) care than noncardiologist. This study sought to determine the differences in the pattern of care and outcomes in patients hospitalised with HF in an Asian multiracial setting by medical specialty

Methods: We evaluated 345 patients admitted to National University Hospital, Singapore; in 2004 with a discharge diagnosis of HF. Records for patients were reviewed with respect to profiles, diagnostic testing, treatment and clinical outcomes. The main outcome measures were all-cause mortality and HF readmissions at 30 days, 6 months and 12 months

Results: Compared with noncardiologists' patients (n = 67), cardiologists' patients (n = 278) had higher prevalence of ischaemic heart disease (78% vs. 45%), previous myocardial infarction (44% vs. 19%), hyperlipidemia (84% vs 48%), recruitment into the heart

failure program (36% vs 6%), had a low (<50%) ejection fraction (76% vs 42%) (All $P < 0.001$), and had functional class III or IV at admission (64% vs 46%, $P = 0.04$). More than 90% in both groups had ejection fraction evaluation and there was no difference in the use of stress testing or cardiac catheterisation. At discharge, more cardiologists' patients received β -blockers (59% vs 35%, $P = 0.001$), digoxin (40% vs 26%, $P = 0.043$), antiplatelets (83.6% vs 64.3%, $P = 0.02$), statins (75.6% vs 39.3%, $P < 0.001$) and warfarin (in those with atrial fibrillation, 61.5% vs 11.1%, $P = 0.009$). Patients in the cardiology group had lower all-cause mortality at 30 days (3.2% vs 10.6%, $P = 0.019$), but not at 6 or 12 months. No differences in length of stay and readmission rates were observed.

Conclusions: In this Asian tertiary hospital setting, cardiologists appear to provide more evidence-based care for HF inpatients compared to noncardiologists but this did not appear to translate into better overall clinical outcome probably due to differences in HF severity.

BP-M2

Glucose Monitoring During Initiation of Ketogenic Diet in Children with Refractory Epilepsy

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Aim: Fasting is often required when starting ketogenic diet (KD) used in the management of intractable epilepsy in children. Monitoring of the serum glucose is mandatory to avoid hypoglycaemia. We reviewed the need for routine glucose monitoring from the time of admission, and also analysed patient factors that could predispose to hypoglycemia.

Methods: All paediatric patients who initiated KD had their capillary glucose prospectively monitored every 4-6 hourly, using Accucheck[®] monitor. One third of the ketogenic diet was provided when the urine ketone showed ++ in Combur test[®] strips after sufficient fasting. The amount of KD was progressively increased till full portion if the urine ketone remained ++.

Results: Fifteen patients between 1 to 13 years of age were initiated on KD. Ten patients (67%) fasted for 17 hours or less, 2 patients (13%) fasted for 22 hours, and 3 patients (20%) fasted for 40 hours, before the urine ketone showed ++. One patient's glucose level fell below 2.2 mmol/L (hypoglycaemia) after 32 hours of fasting. This was a patient who had failure to thrive. Two patients had glucose level at 2.3 mmol/L and one at 2.6 mmol/L after 26 hours when they were already on one-third portion of ketogenic diet.

Conclusion: Our study revealed a stable trend of capillary glucose level results in the first 20 hours of fasting during initiation of KD. However, there was a need for closer glucose level monitoring for patients who had concomitant failure to thrive or who did not take the KD well.

BP-M3

Ethnic Differences in Coronary Artery Calcification in Singapore

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Aim: In Singapore, studies have shown that compared with Chinese, the age-standardised event rates of myocardial infarction (MI) are 2-

fold and 3-fold higher for Malays and Indians respectively. We aim to evaluate whether this difference is related to ethnic differences in the prevalence of coronary artery calcification (CAC).

Methods: We identified 625 eligible patients from a single center registry. All had no prior clinical coronary artery disease. A retrospective review of their medical records and cardiac computed tomography scans was carried out.

Results: There were 468 Chinese, 84 Indians and 73 Malays. Compared with Chinese, Indians had a significantly higher prevalence of smoking, hypertension, hypercholesterolemia, diabetes and Malays had a significantly higher prevalence of smoking and diabetes. Compared with Malays, Indians had a significantly higher prevalence of hypercholesterolemia. Mean age of Chinese was significantly higher than that of Malays but not Indians. Compared with Chinese whose prevalence of CAC (score >0) was 52%, Malays had a significantly lower prevalence of CAC (36%, $P = 0.01$) and Indians had a trend towards a lower prevalence (45%, $P = 0.28$). Prevalence of CAC was not significantly different between Indians and Malays. After controlling for age and cardiac risk factors, Malays had a strong trend towards lower CAC prevalence when compared with Chinese ($P = 0.08$).

Conclusion: Despite Indians and Malays having higher MI rates and more cardiac risk factors, they have a trend towards lower CAC prevalence when compared with Chinese. Further research is needed to assess the predictive value of coronary calcium in different ethnic groups.

BP-N1

Diabetes Group Patient Education Program: Using Evaluation of Participants' Knowledge Score and Clinical Outcomes to Guide Evaluation of Program Effectiveness

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Introduction: We recently initiated a group diabetes self-management program: Skills for Life (SFL), for patients from our diabetes centre. To guide further development of program content, we used a validated diabetes knowledge test (DKT) to evaluate understanding of key aspects of diabetes and self-management.

Methods: A prospective study was done on participants attending SFL from November 06 to 07. SFL consists of two sessions - Diabetes-Must-Know interactive discussion and a practical session on effects of food and exercises on blood glucose. DKT was administered before and after SFL. HbA1c and lipid were measured before and within 6 months after SFL. Paired t-test was used to analyse test-scores, HbA1c and lipid profiles.

Results: Mean knowledge test-scores revealed significant improvement (9.24 vs 10.5, $P = 0.00$) in the 92 participants. Significant difference was seen between questions relating to diabetes diet ($P = 0.05$), glycated haemoglobin ($P = 0.01$), glucose monitoring ($P = 0.03$), hypoglycaemia ($P = 0.03$), exercise ($P = 0.00$), infection ($P = 0.00$) and sick day ($P = 0.02$). However, no significant difference seen in questions on free food, fats contents, unsweetened fruit juice, foot care, nerve disorder and diabetes complications.

Post SFL, HbA1c decreased by mean of 0.52 mmol/L ($P = 0.00$), LDL Cholesterol by 0.14 mmol/L ($P = 0.08$) and triglyceride by 0.79 mmol/L ($P = 0.43$). HDL cholesterol was increased by 0.31 mmol/L ($P = 0.00$).

Conclusion: Dynamic interactive group patient education, together with hands-on practical activities could enhance knowledge retention and diabetes self care capability.

BP-N2

Outcome of Complex Biliary Surgery Using Clinical Carepath

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Aim: Evaluate the outcome for post operation care two years after implementing carepath for complex biliary surgery.

Methods: A standardise biliary pathway protocol was developed by Biliary Surgery Carepath Committee. The protocol details the fluid management, medication, physiotherapy, nutrition, surgical drains & tubes management, laboratory investigations, discharge planning and patient and family education. The pathway was piloted in the 4th quarter of 2005 to identify any problems in the utility of the protocol and revisions were made. All patients with biliary operations other than laparoscopic and open cholecystectomy were included. Recruited patients have either choledochotomy or bilio-enteric bypass. Data from January to December 2005 were used as historical control data. Prospective data on patient length of stay (LOS), morbidity rate and mortality rate were collected.

Results: One hundred and thirty-six consecutive patients were recruited and managed according to biliary carepath protocol from January 2006 to December 2007. There were 63 males and 73 females (1:1). The median age is 62 years (16-94) 67% of our patients have one or more co-morbidities. The median ASA Score is II (I-IV). When we compared the 2005 pre-implementation data with 2006 and 2007 post-implementation data, the morbidity rates were 16% and 10% respectively ($P < 0.01$). Infective complication was the commonest. Mortality rates dropped from 4% ($n = 55$) to zero ($n = 136$). The length of stay shortened significantly by 33% from median 9 days (3-60) to 6 days (1-40), ($P = < 0.01$).

Conclusion: Biliary Carepath reduces LOS, morbidity and mortality rate of complex biliary operations. The protocol ensures a more efficient and consistent post-operation care and thus minimizing postoperative complications and allowing patients to return home early.

BP-N3

Right-Siting of Suitable Patients Directly from Emergency Department to Step-Down Care Institutions

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Aim: To describe our experience with direct transfers of patients from the emergency department (ED) to step-down care institutions.

Methods: Stable ED patients who would benefit from a limited period of physiotherapy and rehabilitation are identified for transfer directly to a step-down facility. Exclusion criteria included: unstable cases, acute medical or surgical illness, diagnostic issues, long-term social issues, recurrent recent hospital admissions, respiratory cases and infections. A team of emergency nurses trained in geriatric care coordinated each transfer. Patient demographics and diagnoses were analysed. An audit of complications and ED reattendance was performed.

Results: Fifty-one patients were transferred over 10 months from July 2007 to May 2008. 43 (84.3%) were female, and the median age

was 79 (range, 60-98). 32 (62.7%) patients were transferred for lumbar spondylosis and compression fractures. Other diagnoses included: head injury (13.7%), lower limb injury (9.8%), osteoarthritis of knee (3.9%), upper limb injury (3.9%), other contusions (3.9%) and pubic ramus fracture (2.0%). No patients were transferred back from the step-down unit to the ED for complications.

Conclusion: Currently there are limited disposition options for elderly patients presenting to the ED. We have identified a group of ED patients with minor illness or injury who would benefit from subacute care. The zero reattendance is probably attributed to the stringent screening by the geriatric emergency nurses. In order to optimise similar right-siting efforts, the shortage of subacute beds needs to be addressed.

BP-QHSR1

Measuring Patient Satisfaction with the CAHPS® Hospital Survey in an Observation Unit

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Aim: Patient satisfaction is becoming an important indicator of quality of care. Tan Tock Seng Hospital (TTSH) has set up an Observation Unit (OU) to monitor and discharge patients within a 24-hour period. The aim of this study is to measure patient satisfaction of the OU using the CAHPS® Hospital Survey.

Methods: The prospective study consisted patients discharged between July and October 2007. Anonymous surveys were self-administered or through family or staff. The 28-question survey rated patients' satisfaction with physicians' and nurses' communication (listening carefully, courtesy and respect, explaining things), responsiveness of hospital staff, availability of medicine and discharge information, cleanliness and noise level of the environment, pain control, and overall rating. A 4-category Likert scale was used, except in the overall rating (10-point scale). Patients were satisfied if they answered usually (3) or always (4).

Results: Of the 271 patients surveyed, satisfaction was 93% to 97% for questions concerning physicians' and nurses' communication, cleanliness, and pain control. Higher educated patients were more satisfied with physicians' and nurses' communication than lower educated patients ($P < 0.05$). 58% to 62% of patients were satisfied with availability of medicine and discharge information. 88% rated a 7 or higher of the OU. Lower educated patients gave a higher rating than higher educated patients ($P < 0.05$).

Conclusion: Poor provider-patient communication and lack of information can be dissatisfying factors. While OU patients are satisfied with their provider-patient communication, further improvements in providing information about medicines and discharge will help to increase overall patient satisfaction.

BP-QHSR2

Modelling and Forecasting Daily Attendances at Emergency Department Using Time Series Analysis

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Aim: To forecast daily attendances at Emergency Department (ED), Tan Tock Seng Hospital (TTSH) to aid in resource planning.

Methods: Time series analysis was carried out on daily patient attendances at the ED, TTSH from 1 July 2005 to 31 March 2008. Attendances were stratified into three patient acuity categories (PAC); viz, PAC1, PAC2 and PAC3 in decreasing order of acuity. Time series methods of exponential smoothing and autoregressive integrated moving average (ARIMA) were separately applied to each PAC, and the best-fit model was selected. Data of the first 24 months were used for training, tested on the following 6 months' data, and validated on the remaining 3 months' data. Independent variables included in the model were: day of the week, month of the year, public holiday, pollution standard index (PSI); average daily temperature and average daily relative humidity. Statistical analyses were carried out using SPSS version 15.

Results: The daily PAC1 attendances were relatively stable, and were significantly correlated with PSI. The daily PAC2 and PAC3 attendances showed seasonal fluctuations and were significantly correlated with public holidays, with that of PAC3 negatively correlated with PSI. After applying the models to validate, all models were able to successfully forecast daily attendances. The mean average percentage errors (MAPE) of prediction were 16.9%, 6.7%, 8.6% and 4.8%, respectively for PAC1, PAC2, PAC3 and overall.

Conclusion: Time series analysis is a valuable tool in predicting demand at the ED. This in turn is critical for staff roster planning and resource management.

BP-QHSR3

Small Area Estimation of Sparse Disease Counts

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Aim: In the field of disease mapping, little has been done to address the issue of analysing sparse datasets. We hypothesised that by modelling two disease outcomes simultaneously, one would be able to better estimate the disease with a sparse count.

Methods: We tested this hypothesis utilising Bayesian models, studying both birth defects and caesarean section using data from two large, linked birth registries in New South Wales from 1990 to 2003. We compared four spatial models across seven birth defects: Spina Bifida, Ventricular Septal Defect, OS-Atrial Septal Defect, Patent Ductus Arteriosus, Cleft lip and or Palate, Trisomy 21 and Hypospadias. Models were compared using a range of tools, including the Deviance Information Criteria (DIC).

Results: Compared to birth defects, caesarean section counts were around 100 fold-larger, with about 263,199 episodes across the study region. For three of the birth defects, the shared component model with a zero-inflated Poisson (ZIP) extension performed better, having a lower DIC. However, the model did not work well for the other defects. With Spina Bifida, the ratio of relative risk associated with the shared component was 2.82 (95% CI: 1.46-5.67), indicating that the unobserved risk factors common to both diseases (i.e. Spina Bifida and Caesarean) have a stronger association with Spina Bifida, a picture that fits clinically.

Conclusion: We found that the shared component models are potentially beneficial, but only if there is a reasonably strong spatial correlation in effects for the study and referent outcomes.

BP-QHSR4

Elderly Patients with Postural Hypotension in the Emergency Department – Does My Patient Need Intervention?

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Aim: Postural hypotension in an elderly patient is a significant finding. However, it is sometimes incidental and not always clinically significant. We studied elderly patients with postural hypotension, and looked for factors that may predict the need for intervention.

Methods: Patients aged 65-and-above in the 24-hour ED observation unit were screened for geriatric issues prior to discharge. Those found to have postural hypotension were subanalysed. Demographics, characteristics of postural hypotension and likely causes were examined.

A comparison was made between patients who were discharged versus those who needed treatment and follow-up, to determine predictors of need for intervention.

Results: Of 315 patients who received geriatric screening, 51 (16.2%) had postural hypotension. The most common causes were sepsis (27.5%), diabetes (27.5%), dehydration (25.5%) and medications (21.6%). No obvious cause was found in 12 (23.5%) patients. Only 13 (25.5%) were discharged without intervention or follow-up.

When comparing discharged against intervention patients, there was a significant difference in age ($P = 0.009$), basic activities of daily living (ADL) score ($P = 0.006$) and instrumental ADL score ($P = 0.002$). It was also significant if the systolic BP dropped below 100mmHg ($P = 0.41$), if there was a history of falls ($P = 0.002$), and if the postural hypotension was reproducible ($P = 0.28$) or symptomatic ($P = 0.038$).

Conclusion: Postural hypotension in elderly ED patients usually requires treatment and follow-up. The following factors predict a need for intervention: increasing age, lower ADL scores, a systolic BP drop below 100mmHg, a history of recent falls, and if the postural hypotension was reproducible or symptomatic.

BP-S1

Preliminary Results of Lymphaticovenular Anastomosis: A Novel Treatment for Secondary Lymphedema

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Aim: Lymphedema of the limbs secondary to previous lymphadenectomy is a common clinical problem that is underappreciated and inadequately treated. Traditional treatment includes combination of compression stockings, arm elevation and physiotherapy. The advent of supermicrosurgery has permitted the development of subdermal lymphaticovenular anastomosis (LVA) as a possible therapeutic alternative. Combined with compressive therapy, some centers have shown promising results for treatment of lymphedema.

Methods: The authors prospectively followed up a series of 15 patients who have long-standing lymphedema resulting from previous

lymphadenectomies. These patients underwent LVA (5 upper- and 10 lower limbs). Patent blue dye was administered intradermally for localisation of lymphatics, and microsurgical LVA was performed with 12/0 nylon sutures under an operating microscope. Patients had predetermined limb circumferences measured pre- and post-operatively at 3 months. Comparison was made between the pre- and post-operative circumferences, as well as the control limb.

Results: No morbidities or mortalities were incurred. Significant reduction of limb girth was noted at 3 months postoperatively. Based on these preliminary results, LVA has been shown to be a safe, rapid and efficacious treatment modality for lymphedema in addition to traditional treatment modalities. The mean reduction in the upper limb circumference was 5.8, 7.6, 9.1, 9.0 cm (wrist, forearm, elbow and arm respectively); the mean reduction in lower limb circumference is 5.2, 7.5, 7.2, 8.5 cm (ankle, lateral malleolus, knee and thigh respectively).

Conclusion: Our preliminary data suggests that lymphaticovenous anastomosis is a safe, and effective treatment for both upper and lower limb lymphedema.

BP-S2

Maggot Debridement Therapy: Our Initial Experience and Factors Influencing Outcome

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Aim: In recent years, there has been resurgence in the use of maggot debridement therapy (MDT) for chronic wounds. The aim of our study is to report on our experience with MDT, our patients' perception and to assess factors likely to influence outcome.

Methods: In the period between March and May 2008, patients with wounds that seemed suitable for MDT were referred to our MDT wound nurse. A total of 14 patients with 15 wounds were treated with MDT using a standardised treatment protocol. The patients' biographic data (age, gender, co-morbidities including diabetes and peripheral vascular disease status), wound characteristics and significant investigations results were obtained from the patients' case notes. The patients were also questioned on their perception on MDT after completion of treatment. The clinical outcomes (granulation area and limb survival) of the patients were then evaluated.

Results: In total, 7 of 15 wounds (47%) had a successful outcome. All of which required only 3 or less applications. Factors that negatively influenced outcomes included presence of diabetes mellitus and peripheral arterial disease and heel ulcers. Majority of the patients experienced minimal discomfort during the therapy.

Conclusion: MDT is a safe and effective treatment option for patients with chronic wounds. Although the number of patients in our study is small, our results help us to refine our MDT treatment protocol by allowing us to identify and therefore excluding patients who are less likely to have positive outcome.

BP-S3

Efficacy of Ultrasound, Fine Needle Aspiration Cytology and Frozen Section in the Diagnosis of Thyroid Malignancies

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Aim: The aim of this study is to evaluate the efficacy of ultrasound, fine needle aspiration cytology (FNAC) and frozen section in the diagnosis of thyroid malignancies.

Methods: The medical records of all the patients who underwent thyroid surgery in Tan Tock Seng Hospital General Surgery Department from January 2005 to December 2007 were retrospectively reviewed using a standardised data collection template. Results of the ultrasounds, FNACs and frozen sections were compared with the final histological diagnosis.

Results: A total of 112 patients underwent thyroid surgery in the 3-year study period. Thyroid malignancy constituted 34 (30%) of all patients who underwent thyroid surgery. The most popular diagnostic tools used were ultrasound (81%), FNAC (69%) and frozen section (59%). The sensitivity of ultrasound, FNAC and frozen section were 41.4%, 86.4% and 68.8% respectively. FNAC was shown to be a superior diagnostic test in detecting malignancy compared to ultrasound ($P = 0.02$). FNAC was able to pick up 53% of thyroid cancers missed by ultrasound. Frozen section was able to pick up 33% of thyroid cancers that were missed by both ultrasound and FNAC.

Conclusion: Ultrasound as a sole diagnostic test for thyroid nodules has limited value in ruling out malignancy. FNAC should form the mainstay of investigation for thyroid nodules as it has been shown to be more superior to ultrasound. Combination of ultrasound, FNAC and frozen section will improve the detection rate for malignancy.

AH1

Successful Establishment of a Preimplantation Genetic Diagnosis Program in Singapore

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Aim: Preimplantation genetic diagnosis (PGD) is a procedure in which early embryos created by *in vitro* fertilization (IVF) techniques are tested for the presence of a heritable disease. Embryos determined to be unaffected are selected for implantation into the uterus. Thus at-risk couples embark on a pregnancy knowing that their child will be born unaffected. We report on the successful establishment of a PGD program in Singapore.

Methods: Couples at risk of having offspring affected with specific disorders were invited to participate and counseled about IVF and PGD. Developing embryos were biopsied to remove 1-2 blastomeres, which were then subjected to single cell genetic testing. Polymerase chain reaction (PCR) methods were used for mutation detection and/or polymorphic marker analysis of monogenetic disorders. Guided by the assay results, 1 to 2 unaffected embryos were selected for transfer back into the uterus.

Results: To date, a total of 16 single cell molecular diagnostic tests have been developed for 6 monogenic disorders, including alpha- and beta-thalassaemia, Werdnig-Hoffman infantile spinal muscular atrophy, hemophilia A, Herlitz junctional epidermolysis bullosa, and neurofibromatosis type 1. A human leucocyte antigen (HLA) marker panel has also been developed to enable preimplantation tissue typing (PTT). Twenty-two PGD cycles from 17 cases have been completed, the majority of which were for alpha- and beta-thalassaemia testing. Five successful births of unaffected children have been achieved.

Conclusion: With the successful experience of PGD in the past few years, PGD is now a viable alternative option to prenatal diagnosis for at-risk couples in Singapore.

AH2

Improving the Efficacy of Nutritional Supplementation in Elderly Patients

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Aim: Protein-energy malnutrition delays wound healing, extends length of stay (LOS), increases complications and readmission rate. Identification of patients at risk of malnutrition, together with early intervention, may prevent further deterioration of nutritional status. The main objective of this research is to study the efficacy of delivering nutritional supplements to malnourished elderly patients using 'nutrition as medication' (Med Pass) program. The secondary aim is to ascertain the acceptance of such a program by nursing staff.

Methods: Forty malnourished geriatric patients (Age = 82.4 y ± 9.1 y; Height = 1.55 m ± 0.08 m; Weight 35.5 kg ± 5.9 kg; BMI 14.8 ± 2.3; Male = 10; Female = 30; baseline albumin 32.6 g/L ± 5.0 g/L) either received mid meal supplements (n = 20) or 60 ml of a 2 kcal/ml supplement, given 4 times a day at medication rounds (n = 20). Outcomes measured included comparison of supplement and hospital food consumption changes. Patients' LOS was also monitored. Nursing staff (n = 20) were surveyed using a short qualitative

questionnaire midway through the study to assess their acceptance of the Med Pass program.

Results: Patient compliance with the Med Pass program was excellent compared with current practice. The consumption rate of 80% in the intervention group is significantly different from 53% in the control group ($P = 0.002$, 2-tailed *t*-test). There is no significant difference in LOS and hospital food consumption between the 2 groups ($P = 0.161$ and $P = 0.832$ respectively, 2-tailed *t*-test). The survey of nursing staff showed that none found it difficult to dispense the 2 kcal/ml supplement. Seventy-five percent of the nurses felt that it was an effective means of supplementing patients while the remaining 25% felt that it was the same as before.

Conclusion: The Med Pass program is an acceptable and effective means of delivering nutritional supplements to malnourished elderly, thereby attenuating deterioration in their nutritional status.

AH3

Validating the Use of Falls Behavioral Scale for Older People in Singapore

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Aim: Falls in the elderly are widely documented as a major economic, social and healthcare problem. Research revealed that the elderly make behavioral and cognitive adaptations in their everyday life that helps prevent or predispose them to falls. The 30-item Falls Behavioral (FaB) Scale for Older People, developed in Australia, assesses the presence of risky behaviors and presents falls prevention strategies. This study aims to investigate the validity and reliability of the FaB Scale when piloted with Singaporean community-dwelling elderly to better understand the falls prevalence rate and risk factors.

Methods: An expert panel of 9 healthcare professionals evaluated the content validity of the FaB Scale. One hundred and five community-dwelling elderly who are 65 years and above completed the FaB Scale, SF-36 Health Survey and demographic data.

Results: The mean age of the 105 elderly was 75 years with 34% living alone or in group homes. With 85% of them being community ambulant, prevalence of self-reported fall rate was 38.1%. The expert panel reviewed that the FaB Scale is a tool with high content validity of 0.88 for determining the presence or absence of protective strategies when applied in the Singapore context. 1 item was modified and another item suggested for re-wording. The construct validity supported that elderly use more protective strategies as their age increases ($r_s = -0.684$, $P < 0.05$) and when their physical mobility declines ($r_s = 0.205$, $P < 0.05$).

Conclusion: Future research could explore further modification and generation of culturally relevant FaB items in order to screen for Singaporean elderly with increased fall risks.

AH4

Estimation by Watson Equation is Lower Than Bioimpedance Analysis for Total Body Water in Male Chronic Kidney Disease Patients

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Aim: Total body water (TBW) and the proportion of water to lean mass changes with chronic kidney disease (CKD) due to salt and water retention, and poorer protein intake. TBW is estimated from

equations using demographic and anthropometric data or measured using bioimpedance analysis (BIA). We compared estimated TBW by different equations with BIA TBW.

Methods: We prospectively recruited 50 patients with CKD (stratified by estimated glomerular filtration rate (GFR)) but no significant edema (54% males, with mean age 60.0 ± 11.7 years; GFR 52.6 ± 27 ; height 160 ± 9 cm; weight 67.7 ± 14 kg). Absolute glomerular filtration rate (GFR in mL/min) was measured by ^{99m}Tc -DTPA and TBW (in liters) by multi-frequency BIA using the Bodystat Quadscan 4000 (Isle of Man, British Isles). TBW was estimated using Hume and Watson equations and compared with BIA-measured TBW using Bland-Altman analyses, grouped by gender. We performed statistical analyses with JMP IN (Cary, NC, USA).

Results: There was no difference in mean TBW by Watson, or Hume to BIA-TBW in female patients (29 ± 3.2 , 28.5 ± 3.3 , 28.8 ± 3.8 respectively; $P = \text{NS}$). In male CKD patients, there was no difference in mean Hume-TBW (40.5 ± 4.4) and BIA-TBW (41.1 ± 4.7 ; $P = \text{NS}$). However, mean Watson-TBW (39.8 ± 5.2) was lower than BIA-TBW, and the mean difference was 1.3 L 95% CI 0.57-2.1 ($P = 0.0013$).

Conclusion: In male CKD patients, Watson equation derived TBW is lower than BIA measured TBW, but Hume derived estimations is not different. The clinical impact of this difference needs to be studied further.

AH5

Cognitive Profile and Quality of Life of Schizophrenia Patients Experiencing Passivity

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Aim: Although abnormal spatial processing has been observed in schizophrenia patients with passivity, there is a paucity of studies which specifically examine the cognitive impairments associated with passivity, a distressing symptom which can be found in up to 10-20% of patients with schizophrenia. Based on extant literature, we hypothesise that passivity in schizophrenia is associated with cognitive deficits involving visuo-spatial function, poorer insight, more severe psychopathology and lower quality of life compared to those without passivity.

Methods: Clinical rating scales evaluating severity of psychopathology, level of insight and quality of life were administered to 127 schizophrenia patients (43 with passivity). Neuropsychological testing of executive function, attention, visuo-spatial and verbal working memory was also performed. We tested for group differences with the student t-test for normally distributed data.

Results: Both groups with and without passivity were comparable in terms of age, gender, years of education and parental education and duration of illness. Patients with passivity reported more negative symptoms, had poorer insight in the awareness of their own delusions and reported a lower quality of life (physical domain). Neuropsychological testing revealed that patients with passivity had lower spatial span backward and total scores.

Conclusion: These findings confirmed our hypothesis and suggested that visual-spatial working memory may be a vulnerability characteristic of the passivity phenomenon. Passivity, more severe psychopathology, poorer insight and neurocognitive deficits may all contribute towards the reported lower level of quality of life in schizophrenia patients, thus requiring more research on specific target measures to improve their clinical status.

AH6

Mental Rotation in Relation to Sex in Schizophrenia

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Aim: The neurodevelopmental hypothesis of schizophrenia proposes deviation from normal brain development as a possible cause. Sex differences in schizophrenia are well established and sexual dimorphism in laterality may provide clues to the neurodevelopmental origin. The neuroendocrine component has been proposed to relate to the neurodevelopmental origin and sex differences. This study aims to investigate patterns of reduced sexual dimorphism in spatial ability and disturbance in prenatal androgen/estrogen balance.

Methods: Vandenberg & Kuse's Mental Rotation Task (MRT), in which males outperform females, was administered to patients (21 male and 22 female) and healthy controls (21 male and 23 female). Index and ring fingers were measured to obtain second digit to fourth digit ratio (2D : 4D), a potential retrospective marker of the in-utero hormonal environment.

Results: Analysis of covariance was conducted. With age controlled, all patients showed significantly poorer MRT performance. Males outperformed females in both groups. No significant interaction was found. With ethnicity controlled, male patients had lower 2D : 4D on the right hand and patients showed non-significant higher 2D : 4D trend. 2D : 4D was not associated with MRT performance in both groups.

Conclusion: Male and female patients with schizophrenia are impaired in spatial ability. Normal sexual dimorphism is preserved and not reduced. The lack of significant results here could be due to small sample size. Although the 2D : 4D results were not significant, they approached the direction of the hypotheses. In particular, the higher 2D : 4D trend may suggest neuroendocrine dysfunction that may disturb early foetal brain development, but may not be reflected in spatial ability.

AH7

Incidence and Treatment of Benign Paroxysmal Positional Vertigo in Traumatic Brain Injury Patients

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Aims: To determine the incidence of benign paroxysmal positional vertigo (BPPV) and evaluate the treatment efficacy of BPPV in traumatic brain injury (TBI) patients.

Methods: All consecutive TBI patients admitted to a tertiary rehabilitation center over an 8-month period were screened for BPPV. Dix-Hallpike test was used to screen for anterior and posterior semicircular canals involvement. Roll test was used to screen for horizontal semicircular canals involvement. Canalith repositioning treatment (CRT) was used to manage canalithiasis form of BPPV. Liberatory maneuver (LM) was used to treat cupulolithiasis form of BPPV.

Results: Thirty-one TBI patients were screened for BPPV. 87.1% of them were suitable to undergo screening only when they were less agitated (Rancho level 5 to 10). Of the 31 TBI patients screened, 40% were confirmed to have BPPV. 38.5% of the BPPV cases involved multiple canals. All the BPPV cases were treated successfully with an average of 1 CRT. One patient required 2 LM in addition to CRT to

resolve the BPPV. There was no report of recurrence of symptoms at 3 months.

Conclusion: Forty percent of TBI patients in this study had BPPV. Thus, it is important to screen for BPPV in TBI patients in view of the high incidence. The screening for BPPV is recommended to be part of the standard physiotherapy assessment of all TBI patients when they are suitable to undergo screening using positional tests. CRT is efficacious in the management of BPPV in TBI patients.

AH8

E-Nutrition: The Way Forward

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Aim: The Internet is a gateway to limitless health information and patients are increasingly accessing medical content on the Internet (Diaz, 2002, Silberg, 1997, Bower, 1996). In addition, an internet-based self-management of patients with chronic illnesses had shown to achieve significant clinical benefits (McMahon, 2005, Tate, 2003). Our aim is to develop an online nutrition consultation web system to manage patients with chronic diseases.

Methods: Needs assessment was conducted using focus groups and online surveys to find out what patients look for in an interactive website for managing their condition. Other factors that were considered in its conceptualisation included patient confidentiality, customisation and cost. An external web-designer vendor was engaged to assist in the development.

Result: A majority of our respondents (65%) from our needs assessment (n = 48) would like to read about the latest, credible nutrition information, healthy recipes as well as recipes for different disease conditions and wanted a website that was easy to navigate.

A specially-designed secure and confidential website with username and password login was subsequently developed. Themed nutrition articles, healthy diet and disease-specific recipes were uploaded. Supermarket tours, hawker trails and cooking demonstrations were included as part of the membership. E-nutrition was officially launched on 16th October 2007.

Feedback from members and dietitians was positive with regard to website navigation and function, as well as the information provided.

Conclusion: The first local online nutrition consultation, E-nutrition is an alternative avenue for members to take control of their health at their own convenience. Further research into members' health outcomes will determine the efficacy and effectiveness of E-nutrition.

AH9

Managing Acute Decompensated Heart Failure Patients in Tan Tock Seng Hospital

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Aim: Heart failure (HF) is ranked 6th in Singapore as the principal cause of hospitalisation and death. In 2007, Tan Tock Seng Hospital (TTSH) received a quarter of heart failure hospitalisations in Singapore. HF patients are managed by a multi-disciplinary team of doctors, case managers and pharmacists in TTSH in the areas of Emergency Department Trauma Center (EDTC), inpatient, outpatient heart failure clinic (HFC) as well as telemanagement upon recruitment into the HF program with the objectives of reducing unscheduled

readmissions, length of stay and morbidities.

Methods: We reviewed a total of 1104 patients discharged with ICD 428.0, 428.1, 428.9 from January to December 2007. Clinical outcomes monitored were care path utilisation, patients discharged with ACE-I/ARB and beta-blockers, percentage of patients receiving discharge instructions, left ventricular ejection fraction (LVEF) assessment and smoking cessation counseling.

Results: In 2007, care path utilisation was 93% while eligible patients discharged with ACE-I/ARB and beta-blockers were 94% and 79% respectively. Ninety-nine percent of patients had LVEF assessment and had received smoking cessation counseling in-hospital while 98% were given discharge instructions. The average length of stay (ALOS) was 6 days. For unscheduled 30 days readmission, the rate was 8.2%. Comparing with the Acute Decompensated Heart Failure National Registry (Adhere Registry), the largest heart failure registry in USA, TTSH performed better in the outcomes of drug prescription of ACE-I/ARB (94% vs 69%), beta-blockers (79% vs 59%), LVEF assessment (99% vs 82%), discharge instructions (98% vs 28%), smoking cessation (99% vs 31%) and ALOS (6 days vs 8 days).

Conclusion: The positive clinical outcomes were the result of the adoption of a disease management approach to the management of chronic heart failure patients in TTSH since 2002.

AH10

MRSASelect™ Media In Routine Isolation of MRSA

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Aim: Routine isolation of methicillin-resistant *Staphylococcus aureus* (MRSA) involves time-consuming cultures followed by biochemical procedures. Positive cultures may be missed amidst mixed bacterial growth. We studied the use of MRSASelect™ (Bio-Rad, USA), a selective and differential media for MRSA isolation, and compared between active and passive surveillance in routine cultures.

Methods: A total of 218 specimens: 106 wound-swabs, 70 sputum-specimens and 42 urines; were tested (24 March-11 April 2008). Wound-swabs wetted with sterile saline, sputum-specimens and concentrated urine sediments were inoculated onto MRSASelect™ plates, streaked and incubated at 37°C for 24 hours in ambient air. Plates were examined for the presence of small, mauve-colored colonies indicative of MRSA. These colonies were identified using Gram stain, catalase and staphaurex agglutination; doubtful agglutination results were confirmed by tube coagulase. We compared these against routine method; swabs cultured on blood, MacConkey and phenylethyl alcohol plates; sputum cultures on blood and chocolate plates, and urine cultured on cysteine lactose electrolyte-deficient plates. Smooth, creamy white, raised, round staphylococci-like colonies were identified as described above and then plated onto MRSASelect™ for confirmation.

Results: The time taken for active and passive surveillance was 1-2 days and 2-3 days respectively. MRSA isolation was 14/106 (13%) in wound, 13/70 (18%) in sputum and 2/42 (4%) in urine specimens using the MRSASelect™ plate versus 10/106 (9%), 6/70 (8%) and 0% with routine methods.

Conclusion: Active surveillance using MRSASelect™ in routine cultures increased detection rate by up to 10% and shortened the

turnaround time for positive reporting by a day; decreasing reporting time and improving infection control efficacy.

AH11

Technical Evaluation of Cobas 121 System for POCT Potassium & Sodium in a Primary Healthcare Center

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Aim: The study aims to evaluate the technical performance of sodium and potassium on the Cobas 121 system in an attempt to mitigate some of the pre-analytical factors contributing to artefactually raised potassium results as well as facilitate diagnosis and management of patients in a primary healthcare setting.

Methods: Serum and plasma samples obtained from 100 patients attending Toa Payoh Polyclinic were drawn in plain SST II and lithium heparinised tubes respectively. Specimens were concurrently measured for sodium and potassium on the Cobas 121 analyzer located in the polyclinic (Roche Diagnostics, Switzerland) and the Modular SWA chemistry analyzer (Roche Diagnostics, Switzerland) located at Alexandra Hospital.

Results: Precision studies were conducted using 3 levels of quality control materials over 20 days. Intra-day precision coefficient of variations (CVs) for potassium and sodium ranged from 0.18%-0.48% and 0.16%-0.36% respectively. Inter-day CVs for potassium and sodium ranged from 0.39%-1.36% and 0.4%-0.52% respectively.

Linear regression data for serum potassium and serum sodium were $0.99 + 0.05$ ($r = 0.99$) and $0.80 + 27.0$ ($r = 0.73$) respectively, and for plasma potassium and plasma sodium, $0.94 + 0.06$ ($r = 0.90$) and $0.81 + 26.0$ ($r = 0.74$) respectively.

Bland Altman plots on serum and plasma potassium showed a difference of 0 to 0.2 mol/L with a negative bias, when compared to Modular SWA analyzer.

Conclusion: Our results showed acceptable correlation for both serum and plasma potassium results obtained on the Cobas 121 analyzer compared to the SWA analyzer. Plasma and serum sodium concentrations were slightly lower on the Cobas 121 but were not deemed to be of sufficient clinical significance to impact patient management. Our study thus suggests that the Cobas 121 analyzer may be used for point-of-care testing for electrolytes in a primary healthcare setting.

AH12

Pharmacist-Physician Collaborative Management In Optimising Antihypertensive Therapy for Chronic Kidney Disease Patients

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Aim: The optimisation of antihypertensive and antiproteinuric agents such as angiotensin-converting-enzyme inhibitor (ACEI) and angiotensin-receptor-blocker (ARB) for chronic kidney disease (CKD) patients is hampered by the long appointment interval between physician visits. This study aims to determine if a pharmacist-

physician collaboratively managed clinic will benefit CKD patients in achieving systolic blood pressure (SBP) goal ≤ 130 mmHg and the time taken to achieve target SBP.

Methods: CKD patients with nephropathy and/or uncontrolled BP were referred to the pharmacist-run clinic to titrate ACEI and/or ARB followed by other antihypertensive drugs based on patient's home BP, clinic BP, serum creatinine and potassium results. Baseline SBP was taken from the last doctor's visit. Time to target SBP was taken as time from the first pharmacist visit till patient's home or clinic SBP was ≤ 130 mmHg.

Results: Seventy-five patients (40 male, 35 female, average age 64 ± 11 years) with a baseline glomerular-filtration-rate 38 ± 23 mL/min and SBP 151 ± 23 mmHg attended the pharmacist-run clinic. The CKD distribution was 4% (stage 1), 11% (stage 2), 41% (stage 3), 37% (stage 4) and 7% (stage 5). Sixty-one per cent ($N = 46$) achieved target SBP with the average time to target SBP 1.71 ± 2.17 months. This was statistically significant for CKD stage 4 patients with the percentage achieving target SBP increase from baseline 18% to 64% ($P < 0.05$).

Conclusion: The pharmacist-physician collaboratively managed clinic helped CKD patients achieve the SBP goal ≤ 130 mmHg within an average 1.71 ± 2.17 months and even benefited late CKD stage 4 patients.

AH13

Association of ELMO1 and PVT1 with Diabetic Nephropathy in Chinese

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Aim: Studies have shown that genetic determinants are important for diabetic nephropathy (DN). Recent genome-wide association studies among Japanese and Pima Indians suggested engulfment and cell motility 1 gene (ELMO1) and plasmacytoma variant translocation gene (PVT1) conferred susceptibility to DN. We attempt to replicate the observation among Chinese by testing the association of the relevant ELMO1 and PVT1 SNPs with DN secondary to type 2 diabetes.

Methods: Two hundred and fifty case-control pairs of Chinese subjects with long standing type 2 diabetes (> 10 years) discordant for nephropathy are subjected to genotyping using TaqMan SNP assay.

Results: Cases and controls were similar in distribution of gender, age, duration of diabetes and HBA1c. The allele frequency of the 3 SNPs (rs741301 [ELMO1], rs2720709 and rs2648875 [PVT1]) did not differ significantly between both cases and control - rs741301 T $>$ C: cases T = 0.668, C = 0.332 and control T = 0.706, C = 0.294 ($P = 0.23$); rs2720709 G $>$ A: cases G = 0.522, A = 0.478 and control G = 0.561, A = 0.439 ($P = 0.25$); rs2648875 A $>$ G: cases G = 0.603, A = 0.397 and control G = 0.553, A = 0.447 ($P = 0.15$). Using Quanto freeware, we estimated that our study has approximate 80% power to detect a relative risk of 1.45 (rs741301), 1.43 (rs2720709) and 0.70 (rs2648875) conferred by the minor allele, respectively.

Conclusion: Our results suggest that the SNPs for both ELMO1 and PVT1 do not confer significantly increased susceptibility to nephropathy secondary to type 2 diabetes in the Chinese population.

AH14**Drug Use Evaluation of Meropenem in National University Hospital**

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Aim: Meropenem is a valuable treatment option for patients with severe bacterial infections and consumption has increased over the years in National University Hospital (NUH), leading to concerns about the development of bacterial resistance. This study aims to retrospectively review the appropriateness of meropenem use and draw up a guideline for its optimal use.

Methods: Adult (≥ 18 years) inpatients identified via the pharmacy database as having received meropenem between January and June 2007 were randomly selected and their medical records reviewed and compared against criteria developed based on current published guidelines. A guideline for the use of meropenem would be developed based on the evaluation outcome and published literature. Meropenem should only be used if first-line agents are inappropriate and as part of culture and sensitivity guided treatment, except in neutropenic sepsis, severe nosocomial sepsis and meningitis.

Results: In our study cohort of 98 cases, General Medicine (27.6%), Renal (21.4%) and Gastroenterology (11.2%) were the largest users of meropenem. Urinary tract infection (31.6%), sepsis (25.5%) and community-acquired pneumonia (17.3%) were the most common indications for meropenem use. However, only 11 cases (11.2%) fulfilled all our drug use criteria. Inappropriate use was mainly due to the absence of appropriate culture and sensitivity data (72.0%), inappropriate empiric indications (68.4%) and lack of confirmation of infection eradication (54.1%).

Conclusion: In view of the high rate of inappropriate use of meropenem in NUH, pharmacists should be alert while reviewing the medication records and intervene when necessary. At the same time, the importance of appropriate antibiotic use should be emphasised to prescribers to reduce the development of antibiotic resistance.

AH15**Procedural Learning Ability as a Cognitive Deficit of Tardive Dyskinesia**BT ANG², LS COLLINSON², J TAY¹, SA CHONG¹¹Research Division, Institute of Mental Health/Woodbridge Hospital, Singapore, ²Psychology, National University of Singapore, Singapore

Aim: Tardive Dyskinesia (TD) is a movement disorder which has been postulated to be due to altered basal ganglia functioning. Procedural learning ability (PL), the unconscious learning through practice, relies on intact basal ganglia functioning. This study aims to examine the differences in the age-related decline in PL ability and performance between healthy participants and patients with and without TD using a Computerized Pursuit Rotor Task (CPRT). The hypotheses include (1) Schizophrenia patients without TD perform better than TD patients on CPRT, (2) Healthy participants show better motor learning than patients without TD, (3) Older normal participants performed worse than younger TD patients.

Methods: Thirty-three patients, diagnosed with schizophrenia, from the Institute of Mental Health and 20 healthy participants participated in the study. TD was diagnosed using Abnormal Involuntary Movements Scale (AIMS). Each participant was assessed individually on 3 consecutive days on 4 blocks of CPRT, Stroop test and SDMT.

Results: After controlling for age and the Time on Target (TOT) for

Trial 1, the trial block by age group interaction and the condition group by trial block interaction term were both significant. Results also showed that the performance between the Young TD patients did not differ significantly from the older normal participants and revealed that condition group alone could explain for 21% of the variance in the magnitude of learning.

Conclusion: The establishment of procedural learning ability as a cognitive deficit is important in the future discovery of a potential marker of TD. Age alone cannot account for the occurrence of TD.

AH16**Improving Medication Safety in Nursing Homes**

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Aim: To study the impact of weekly medication reviews on medication safety in nursing homes.

Methods: Intervention data was collected from May to July 2007 (Phase 1) before the introduction of weekly medication review services in a nursing home. This formed the baseline data for the identification and resolution of medication-related problems prior to the service. From August 2007 to April 2008 (Phase 2), weekly medication reviews were conducted by a pharmacist visiting the nursing home. During this period, interventions were collated and compared against baseline data using chi square tests to assess its impact on preventable medication errors.

Results: Average number of monthly interventions during Phase 1 and Phase 2 were 35 and 16 respectively. Percentage of interventions accepted by physicians and nurses were 83% (Phase 1) and 89% (Phase 2). The major clinical outcomes achieved via acceptance of interventions for Phase 1 and Phase 2 study were better management of chronic disease (63%) and avoidance of adverse drug reaction (51%). The overall trend in frequency of intervention types and clinical outcomes achieved during Phase 1 and Phase 2 study were significantly different ($P < 0.01$). A greater number of Phase 2 interventions were associated with clinical outcomes which improves patient safety.

Conclusion: Weekly medication reviews by a pharmacist improves patient safety through prevention of potential adverse drug reactions which could result in hospitalisations. This service can lead to better medication management practices at nursing homes. Ongoing medication reviews are essential in improving medication safety in nursing homes.

AH17**Variable Number Tandem Repeats in The Promoter Region of The TPMT Gene Does Not Influence Enzyme Activity**

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Aim: Thiopurine Methyltransferase (TPMT) catalyzes the S-methylation of thiopurine drugs. Mutations in the open reading frame (ORF) of the TPMT gene have been shown to associate with decreased TPMT activity. However, a few western studies have shown that increasing variable number tandem repeats (VNTRs) ($> *V5$) in the promoter region correlates with low activity. Our aim is to determine whether genetic variants may influence TPMT phenotype.

Methods: One hundred and thirty-two healthy donors with TPMT

activity measured (High: $n = 118 > 10$ units; Low: $n = 14 < 10$ units) were genotyped for 3 commonly reported Asian TPMT variants (*3C, *3A, *6) and VNTRs using PCR, RFLP and Genescan (ABI 3100). We further genotyped on 343 children treated on thiopurine therapy. Sequencing of the TPMT gene was carried out in all controls (< 10 units) or cases documented for thiopurine sensitivity but no TPMT variants detected.

Results: Only 8 of the 14 low activity controls harbor TPMT variants. VNTR allele frequencies in low and high activity cohorts show 46.4% vs 61% (*V4); 50% vs 32.6% (*V5); 3.6% vs 6.4% (\geq *V6). In the 344 patients, 25 harbor TPMT variants. In patients with and without TPMT variants, VNTR allele frequencies show 58% vs 45.6% (*V4); 32% vs 47.8% (*V5); 10% vs 6.6% (\geq *V6). Sequencing of the TPMT gene did not reveal any novel mutations.

Conclusion: Our results did not correlate with western studies, VNTRs does not influence TPMT phenotype in our population.

AH18

Technical Evaluation of Parathyroid Hormone in Beckman Coulter Access2 Immunoassay System

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Aim: Parathyroid Hormone (PTH) is a heat-labile analyte that has a short half-life. A study was conducted to evaluate the technical performance of intact PTH on an immunoassay system, the Access2 (Beckman Coulter, USA), at the Outpatient Laboratory, National University Hospital (NUH).

Methods: The assay is a one-step sandwich chemiluminescence immunoassay. Over a period of 28 days, the precision, correlation, linearity and interference studies were carried out to assess method performance. The stability of PTH in different temperatures and blood collection tubes were also determined.

Results: Precision of PTH at concentrations of approximately 5 and 25 pmol/L yielded the following: intra-run coefficient of variation (CV) of 2.9% and 1.6%; intra-day CV of 3.7% and 7.8%; and inter-day CV of 4.4% and 6.3% respectively. Correlation with the current Centaur method (Siemens, USA) gave a correlation coefficient (r) of 0.967 using linear regression. There was no significant assay interference caused by hemoglobin, bilirubin and lipemia. The assay was linear with a 100% recovery of PTH. This met the manufacturer's claim. Stability of PTH in serum, heparin and EDTA plasma was done at 4°C over 3 days. Plain versus heparin tube gave an r value of 0.994. It was found that PTH concentration rapidly decreased by at least 10 to 15% at room temperature when samples were not promptly analysed.

Conclusion: PTH assay on the Access2 Immunoassay System is suitable for routine laboratory testing to aid clinicians in the investigation of calcium-related disorders. Laboratory staff and phlebotomists alike must take extra precautions when handling specimens for PTH testing to minimize pre-analytical variables.

AH19

Technical Evaluation of The Abbott I-STAT and The Osmetech OPTI CCA Point of Care Blood Gas Instruments With The Roche Omni C S PANG, PY HENG, A OMAR, MS WONG

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Aim: To ascertain the performance differences of 2 point-of-care blood gas instruments against the laboratories main blood gas analyzer, specifically in the measured parameters of pH, pO₂ and pCO₂.

Methods: A mixture of patient samples and quality control material were run on all 3 blood gas analyzer systems. A linear regression analysis was done in addition to a Bland-Altman plot. Imprecision was studied by running a number of replicates over a fixed period of time.

Results: The Abbott I-Stat yielded a recovery of $y = 1.0316x - 0.2317$, $y = 1.0251x - 4.2379$ and $y = 0.9797x + 0.2948$, for the parameters of pH, pO₂ and pCO₂ respectively. The Osmetech OPTI CCA yielded a recovery of $y = 1.1033x - 0.7539$, $y = 1.0123x + 3.3088$ and $y = 1.0982x - 3.5733$ for the parameters of pH, pO₂ and pCO₂ respectively. The correlation coefficients or R values for pH, pO₂ and pCO₂ for the I-Stat versus the OPTI CCA were 0.9752 vs 0.9919, 0.9907 vs 0.9926 and 0.9881 vs 0.9932 respectively.

Conclusion: Both the Abbott I-Stat and the Osmetech OPTI CCA point-of-care instruments yielded performances that are comparable to the analyzer found in the main laboratory. Acceptable correlation is found in all 3 measured parameters of pH, pO₂ and pCO₂. Additionally, both instruments have the added features of being able to be interfaced with Laboratory Information System for administrative oversight of the test system.

AH20

Impact of Pharmacists' Counseling on Patients with Asthma

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Aim: Asthma is a serious global health problem and a common chronic respiratory condition in Singapore. The estimated number of asthma sufferers in Singapore is around 20% in school children and 5% in adults. This study seeks to test the hypothesis that patients who receive specialised asthma counseling from a pharmacist will show improvement in knowledge about their condition and medications, and improve their asthma control.

Methods: Patients were recruited when they came for their regular check ups for their asthma condition. They attended a session with a pharmacist, during which the Asthma Control Test, 'Assessment of Patient's Knowledge' questionnaire and 'Assessment of Compliance' Form were administered, inhaler technique was assessed and a specialised counseling session was given. Patients were also given a copy of Health Promotion Board's patient information booklet on asthma for self-reading. Follow up and a repeat of this session were done 4 to 12 weeks later.

Results: A total of 112 subjects were recruited and 103 subjects completed both sessions. Ninety-one (89%) subjects showed significant improvement in their knowledge on the disease, triggering factors, medications, precautions and importance of compliance ($P < 0.05$). Female patients show a significant improvement in knowledge ($P = 0.004$). Only 22 (21%) subjects showed significant improvement in their inhaler techniques ($P = 0.029$). 71 (69%) subjects showed significant improvement in their Asthma Control Test ($P < 0.05$).

Conclusion: Asthma counseling by pharmacists improves the patients' knowledge on the disease process, medications, and inhaler technique,

and their asthma control. Ideally, all patients with asthma should receive specialised counseling from a pharmacist at regular intervals.

AH21

Technical Evaluation of Sebia Capillars 2 for HbA₂ and HbF

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Aim: The Capillars 2 is an automated, multitasking capillary electrophoresis system which uses 8 capillary tubes for multiple and simultaneous hands-free electrophoretic separation at high speed. It supports fully automated electrophoresis sequencing, from the primary sample tube right through to the final electrophoretic profile. We evaluated the technical performance of the Capillars 2 in our laboratory.

Methods: Imprecision was established over 10 days for each capillary using manufacturer's control material. Two hundred and ninety-eight patient samples from routinely requested thalassaemia screens were used to correlate with our current analyzer Variant Express (Bio-Rad Laboratories, USA).

Ratios of dilution of a high and a low sample were prepared for HbA₂ and HbF to verify linearity. Reference range was established using 188 normal subjects.

Results: Total imprecision was 0.1% for HbA and 2.0% for HbA₂. Correlation obtained was Sebia CE = 1.014 (Variant) - 0.42, $r = 0.963$. CE was able to identify 16 samples as HbE heterozygous; 2 samples as HbE homozygous and 1 HbJ which could not be identified on Variant Express. Linearity of HbA₂ = $0.992x - 0.298$, $r = 0.999$. Linearity of HbF = $1.005 - 0.214x$, $r = 0.999$. The 95% percentile reference range for HbA₂ in our population is 1.9-3.0%.

Conclusion: The Capillars 2 correlated well with our current system. Very good precision and linearity was obtained. The analysis is fast and user-friendly with intelligent software. Major advantage of the Capillars 2 is the ability to separate HbA₂ and HbE, and identify an HbH and HbJ without the extra step of acid gel electrophoresis.

AH22

Patient Reported Outcomes Towards Medication In Clinical Trials

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Aim: The aims of the study were to explore the subjective effects of an antipsychotic trial medication in a psychiatric setting.

Methods: Patients were administered the Drug Attitude Inventory (DAI) scale and interviewed about their experience with trial medication. The interviews were conducted twice: (1) while patients were participating in the clinical trial and (2) 1 month after they completed the trial.

Results: Preliminary data on 21 patients was analysed. 71% (15) of the patients were males and 29% (6) were females. There were no differences in the attitudes towards the trial medication when the patients were participating in the trial. However, 1 month after completion of trial, significantly more male patients expressed that they felt strange, 'doped up', on medication ($\chi^2 = 5.2$, $P < 0.05$). They also felt that medication made them feel tired and sluggish ($\chi^2 = 5.6$, $P < 0.05$), experienced physical tiredness ($\chi^2 = 16.8$, $P < 0.001$) and they took medication even when they did not fall ill ($\chi^2 = 7.3$, $P < 0.05$).

Conclusion: The results highlighted that these are significant gender differences in the DAI after the completion of the trial. The more negative attitudes after completion of the trial could affect unmet benefits as perceived by the males. It is important for psychiatrists and their patients, to achieve a better understanding of one another's expectations and reach concordance before initiation of the trial.

AH23

Evaluating the Effectiveness of an Educational Module for Patients with Schizophrenia in Improving Understanding of Key Concepts of a Hypothetical Trial

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Aim: Schizophrenia is often associated with cognitive impairment and ethical concerns have been raised with regard to the patient's ability to understand the informed consent process and in making informed decisions. The aim of this study was to assess if a trial-specific educational module would help potential subjects understand key concepts of clinical trials.

Methods: Subjects were presented with a hypothetical randomised placebo controlled trial. A questionnaire was subsequently administered to assess subjects' understanding. Subjects who failed to obtain a perfect score were then presented with a self-explanatory educational module about the hypothetical trial. A re-assessment within the same visit was performed to see if there was any improvement in their scores.

Results: The mean standard deviation (SD) age of the participants was 35.5 (10.16) years. Of the participants, 60% were males and 40% were females. Five obtained perfect scores on their first attempt while the rest had to undergo the educational module. First attempt scores of remaining subjects showed that there were major lapses in the understanding of the concept of placebo (69.5%), duration of the trial (68.4%) and frequency of trial visits (67.4%). However, significant improvement ($P < 0.05$) was observed for all 3 key concepts with improvement of 42.1%, 44.2% and 51.6% respectively.

Conclusion: The use of a trial-specific educational module can enable subjects to improve their understanding of key concepts related to the trial and result in improved consent taking in this vulnerable population.

AH24

Using Prospective Preference Assessment to Enhance Enrollment in Clinical Trials in Schizophrenia Research

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Aim: Among the most important challenges in achieving a successful conduction and outcome of a clinical trial are under enrollment and selective enrollment. This study aimed to elicit reasons and motivations for participation (or refusal) in a proposed double-blind randomised controlled hypothetical trial.

Methods: A total of 100 patients with schizophrenia, who were able to read and understand English, were recruited. A hypothetical trial was described to the patients supplemented with an educational module where necessary. The patients completed a self-administered questionnaire elicited the reasons for their willingness to participate in the hypothetical trial.

Results: The mean age of the cohort was 35.5 years. There were 60 (60%) males and 40 (40%) females. The main motivation factors for participation are "The possibility that I might get well" (67%), "Free consultation" (62%) and "I'm helping other patients like myself" (58%). The main concerns expressed for reluctance to participate were "I do not know if the new drug is safe" (83%), "I do not like to be used for an experiment" (62%) and "The study is too time consuming" (48%). Willingness to participate was significantly associated with younger age ($P < 0.05$), higher educational level ($P = 0.03$) and amount of the inconvenience fees ($P = 0.02$).

Conclusion: The results identified the main motivation factors and concerns for participation in clinical trials. For the entire group, financial motive were less important than the desire to help oneself and others.

AH25

Management of the Mentally Ill by General Practitioners in Singapore

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Aim: This study determined the practice patterns and common limitations or perceived difficulties for treating patients with mental illnesses from a representative sample of general practitioners (GPs) through a nationwide cross-sectional survey.

Methods: A random sample of 768 clinics was selected from a sampling frame of all GP clinics in Singapore obtained from the Ministry of Health. Survey forms were mailed to selected clinics along with an information letter. Completed forms were personally collected from the clinics to ensure a higher response rate.

Results: A response rate of 62.1% was achieved for the survey. 68.6% of the GPs reported that they were managing patients with some form of mental illness. Amongst these GPs, the vast majority (90.7%) felt that most of their patients with mental illnesses were more comfortable receiving treatment from them than from a psychiatrist because of their familiarity with their GPs. Addiction disorders and schizophrenia emerged as the top 2 conditions that GPs felt less equipped to manage. The most common reason reported by GPs for not managing or having difficulty in managing mentally ill patients in general practice was that such patients tend to require more consultation time (71.6%). Other reasons included unfamiliarity with psychotropic medications and the need for more knowledge in managing such patients.

Conclusion: Estimating the proportion of GPs who were managing patients with mental illnesses and understanding their limitations are important for constructive engagement of GPs for the care of the mentally ill in the community.

AH26

Foetal Hormones: Germ of the Schizophrenic Brain

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Aim: This exploratory study investigates the theory that aberrant in utero testosterone-to-oestrogen (T/O) exposure is a possible cause for abnormal brain development in schizophrenia. Its theoretical basis stems from the neurodevelopmental hypothesis which proposes that brain disturbances are possible causes for the illness. These disturbances are proposed to occur through the mechanism of neuroendocrine dysfunction. In this present study, finger length patterns (FLP) were used as a marker for T/O, while empathising/systemising quotients (E/S) served as a marker for neurodevelopment respectively. The following hypotheses were tested: (1) FLP patterns and E/S will be atypical in schizophrenia. (2) There will be an association between FLP pattern and E/S.

Methods: FLP, E/S, and Test of Nonverbal Intelligence (TONI-3) were measured in 31 participants with DSM-IV schizophrenia (diagnosis < 5 years), 33 science students, and 31 arts students. For greater homogeneity, the inclusion criteria included Chinese ethnicity, heterosexuality, and no history of drug abuse or broken fingers.

Results: Controlling for age, education, and IQ, a multivariate analysis of covariance revealed an interaction between sex and group for FLP, where normal sex differences were reduced in schizophrenia. Conversely, schizophrenics and controls did not differ on E/S, though schizophrenics had thinking patterns similar to arts rather than science students. Finally, no relationship between FLP and E/S was found.

Conclusion: Inferring from the expected FLP observed, it suggests that aberrant T/O initiates neurodevelopmental trajectories in foetuses toward the schizophrenic brain. However, the nature of its impacts on brain development is not captured by the psychological markers in this study.

AH27

Evaluation of Oxoid's Chromogenic Denim Blue Agar for Detection of Meticillin-Resistant *Staphylococcus aureus* within 24 hours in Screening Samples

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Aim: Early detection of Meticillin Resistant *Staphylococcus aureus* (MRSA) carriers is of the utmost importance for the adaptation of infection control strategies; the purpose of this study was to evaluate a new chromogenic agar that requires shorter incubation period to enable the early reporting of MRSA

Methods: Swabs from the nose, axilla and perineum from each of 39 known MRSA carriers were vortexed together in 3 ml saline for half a minute. The liquid suspension was inoculated onto Oxoid's Chromogenic MRSA Denim Blue agar (DBA) and Biomedica's Mannitol salt agar containing 6 ugms/mL Cefoxitin (MSA) using a 10 ul loop. Both plates were incubated in ambient air at 35°C; the DBA was read after 20 hours incubation and the MSA after 24 hours; MSA plates negative for MRSA were re-incubated for an additional 24 hours. For DBA, denim blue colonies are presumptive positive for MRSA. Identification was confirmed with Staphaurex® test; dubious results (if any) were confirmed with tube coagulase test. For MSA, yellow colonies are presumptive positive for MRSA. Identification was confirmed with tube coagulase test and Staphaurex®.

Result: Using DBA, MRSA was identified from 100% of the evaluated samples within 24 hours (Day 1). Using MSA, none was identified on Day 1, 51% on Day 2 and the remaining on Day 3 or beyond.

Conclusion: The reduced time to detection of MRSA with decreased technologist workload using the chromogenic medium is an advantage; further evaluation is required to address the sensitivity and specificity of this medium.

AH28

Pre-analytical Automation: Using Pre-analytical Technology to Give Rapid, Reliable Laboratory Results

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Aim: With the current state-of-the-art technology, pre-analytical errors still account for approximately 70% of laboratory errors. Common pre-analytical errors include insufficient specimens, wrong specimen collection containers, specimen contamination, specimens without or with wrong labels, specimens sent in unsuitable conditions, delayed specimen dispatch, broken or torn labels on tubes.

Methods: Current workflow starting from patient arrival to actual procedure time in a phlebotomy room in a specialist outpatient clinic was studied using value stream mapping tools. With minimal change to the workflow, Robo 585 (Techno Medica, Japan) which is a specimen tube labelling and preparation system was introduced. A new term called serum volume metrics (SVM) was created and assigned to laboratory tests and panels in Clinical Chemistry, Hematology, Molecular Diagnostics. A "laboratory friendly" barcoded label containing information on patient name, NRIC, order of specimen draw and special collection conditions was also designed. A phlebotomist merely had to scan the laboratory accession number that was pre-generated into the Robo software and the correct number and type of specimen collection tubes required would then be dispensed into a tray for the phlebotomists to perform venepuncture.

Results: During this 20-day trial period, 1687 laboratory accession numbers across laboratory disciplines were tested. This is equivalent to about 4000 tubes being labeled and dispensed by the Robo system. Each request varies from a simple 1 to a complex 8 specimen collection containers. Results show a reduction in errors, aids phlebotomists in inventory management and reduce troubleshooting time.

Conclusion: Pre-analytical automation can help to minimize human errors, maximize efficiency, be more cost effective and improve patient safety.

AH29

A Retrospective Review on Outcomes Following Distal Radius Fractures

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Aim: Distal radius fracture is a common hand injury. This study aimed to evaluate outcomes and explore variations related to patients' age, complications, fracture severity (AO classification) and management.

Methods: We conducted a retrospective review of distal radius fracture patients who attended occupational therapy in 2007. Outcome measures included wrist ROM, grip strength and patient-rated wrist evaluation questionnaire (PRWE) to assess functional abilities. Descriptive analysis was used for patient demographics and outcome results.

Results: Forty-eight patients had complete assessment results at 3 months post-injury. The patients' average age was 51 years. Falls (77.1%) was the most common cause of injury. 64.6% of fractures were managed conservatively. The average values for wrist ROM were as follows: supination 82°, pronation 83°, palmar-flexion 49°, and dorsiflexion 59°. Grip strength averaged at 50.9% of unaffected hand. Finger stiffness (10.4%) was a common complication. PRWE showed that 79.2% of patients had minimal or no pain. As for functional limitations, 54.2% had minimal to none, 31.3% mild and 14.5% moderate to very severe. Increased average grip strength and better PRWE scores were observed with surgical management while ROM outcomes were similar. There were no consistent differences in physical outcomes for different fracture severity and age. PRWE scores were better among the older patients.

Conclusion: Most patients have relatively good recovery, minimal pain and activity limitation 3 months post-injury. Further prospective research with a larger sample size is recommended to evaluate the effect of complications and fracture severity. This will help to streamline intervention for patients' early return to function. In addition, with an ageing population, education on fall prevention will be a crucial part in occupational therapy.

AH30

Differences in Local Distribution of Grey to White Matter on Magnetic Resonance Imaging Axial Brain Slices in Schizophrenia

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Aim: The human brain has been extensively studied quantitatively in terms of its intracranial volume, and volumes of grey and white matter on magnetic resonance imaging (MRI). However, local relationships between grey and white matter within and across MRI individual slices have not been studied adequately in schizophrenia. This study aimed to evaluate any differences in grey-white matter ratio, as a function of slice location, between schizophrenic patients and healthy controls.

Methods: The partial volumes of grey and white matter within each voxel were estimated, with modulation to adjust for deformation to a stereotactic Montreal Neurological Institute space, based on a unified segmentation framework model. The grey-white matter ratio was determined in each axial slice of T1-weighted magnetic resonance images of 64 healthy controls and 91 patients. Functions of the grey-white matter ratio were estimated and between-group differences were identified using functional data analysis.

Results: The functional form of the grey-white matter ratio across slices was consistent across individuals, with extrema having anatomical correspondence. Analyses revealed that patients showed lower grey-white matter ratio in the region between the cerebellum and the anterior commissure ($P = 0.002$), but higher grey-white matter ratio in the slices spanning the lateral ventricles ($P = 0.001$). These variations accounted for 5% of the total variation.

Conclusion: A novel approach was employed to compare group differences. Despite the small functional variations, the consistency in functional form of the grey-white matter ratio may allow or augment current detection of differences between schizophrenic patients and healthy controls.

AH31**Adiponectin Measurement****FPL TEOH^{1,2}, HI NG^{1,2}, N YOU^{1,2}, SK ONG¹, S SETHI^{1,3}**¹Laboratory Medicine, National University Hospital, Singapore, ²School of Life Science and Chemical Technology, Ngee Ann Polytechnic, Singapore, ³Yong Loo Lin School of Medicine, National University of Singapore, Singapore**Aim:** Adiponectin/Acrp30 is a protein hormone secreted by adipose cells. It has been shown to play an important role in glucose regulation and fat metabolism, such as insulin sensitisation and stimulation of β -oxidation in tissues. We evaluated adiponectin measurement using enzyme-linked immunosorbent assay (ELISA).**Methods:** Fasting (10–12 hours) blood specimens were collected from 35 volunteers (9 males, 18 females) with known personal particulars collected via venipuncture (CLSI H3-A5) at NUH blood donation centre. Specimens were clotted at room temperature for 1 hour, centrifuged (Eppendorf-5860, Germany) at 3000 rpm for 5 minutes, sera aliquoted and stored at -70°C . Adiponectin measured with ELISA Otsuka (B-Bridge International, Japan) used pre-treated sera (5 min at 100°C) and read at 450 nm. Precision, linearity and recovery were studied.**Results:** Adiponectin levels varied with body-mass-index (18.5–22.9, mean = 3,372 ng/mL; 23.0–27.4, mean 2,620 ng/mL, $P < 0.95$), gender (female mean 3,078 ng/mL; male mean 2,829 ng/mL), age (15–30 years, mean adiponectin 3,244 ng/mL; 31–55 years, mean adiponectin 2,812 ng/mL). Individuals with diabetes mellitus and relatives of diabetics ($n = 5$) displayed higher adiponectin levels than non-diabetics. The interday precision (CV) ranged from 0.1% to 9.8% at 1,890 to 5,752 ng/mL. Levels of pre-treated specimens stored for 4 days at -70°C , compared well with freshly treated specimens. Linearity studies showed a recovery of 98% to 110% at a range 1,696 to 3,994 ng/mL.**Conclusion:** Decreased serum adiponectin was detected with increasing body-mass-index ($P < 0.05$), males (0.8% lower adiponectin than females) and older individuals. Technically the Otsuka kit was precise, linear and easy to perform. Clinical utility of adiponectin in management of patients with diabetes mellitus is being studied.**AH32****Evaluation of the Use of Total Parenteral Nutrition in an Acute Care Hospital****AV LIM, MS KAVITA**

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Aim: The aim of this study was to review the use of total parenteral nutrition (TPN) and evaluate the appropriateness of referrals for its usage in an acute care hospital.**Methods:** We conducted a retrospective review of data collected within a 6-month time period. The nutrition support database maintained by the Nutrition Support Team's dietitians was used to determine the appropriateness of TPN administration among patients in an acute care setting. Patient and process variables were also reviewed.**Results:** Forty patients were referred to the Nutrition Support Team, with a total of 42 TPN sessions in the 6-month period. The mean patient age was 67 years. The majority of referrals (95%) were initiated by the General Surgical Unit with the primary team doctors deciding on the need for TPN. TPN was on average administered on the 12th day of admission and the average length of TPN duration was 12 days. Among the cases referred to the Nutrition Support Team,

31% had been started on TPN by other doctors for an average of 6 days. The appropriateness of TPN administration was determined according to guidelines by the American Society of Parenteral and Enteral Nutrition and the hospital's ICU Handbook. In total, 26% of cases referred were deemed to have an inappropriate indication for TPN.

Conclusion: In summary, the primary team doctors were the main decision makers for the commencement of TPN. The inappropriate use of TPN is still present. Proper guidelines should be developed and implemented hospital wide to assist in ensuring appropriate TPN usage.**AH33****Breast Compression for Mammography: How Much is Enough?****L CORTEZ, U JACQUELINE, J GONZALES, A FOO**

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Aim: The aim of this study was to derive an optimal compression force for the cranio-caudal (CC) and medio-lateral oblique (MLO) views to be used by mammographers in NHG Diagnostics. This optimal compression force should cause minimal discomfort without compromising image quality.**Methods:** The study was conducted in 2 phases: (a) Phase 1: Data Collection. Mammographers in 3 NHGD centres participated in the data collection. Correlations between compression force, discomfort and breast thickness were analysed together with feedback from the Reading Centre on the diagnostic quality; (b) Phase 2: Trial Implementation. Mammographers of the same centres in Phase 1 study used the recommended range of compression force from Phase 1 for all breast types and thickness. The same data parameters were collated for analysis.**Results:** There were fewer instances of overzealous compression resulting in painful mammograms. There was no increase in feedback from the Reading Centre for non-diagnostic images due to inadequate compression.**Conclusion:** The range of compression force to be used for CC and MLO views in mammography are recommended for use by all mammographers in NHG Diagnostics. This provides a guide for new mammographers.**AH34****Effectiveness of Physiotherapy for Low Back Pain****TS NG**

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Aim: This study was an evaluation of the effectiveness of physiotherapy for low back pain in the local setting.**Methods:** A prospective study was conducted in the physiotherapy department in National University Hospital from November 2007 to March 2008. Patients with low back pain with or without radiculopathy and who are English literate were included in the study. Patients with spinal fracture, spinal surgery and untreated psychiatric disorders were excluded. Patient demographic information, medication intake, types of physiotherapy modalities and number of sessions of physiotherapy were recorded. The primary outcomes were pain intensity using verbal numeric rating scale and success/failure of physiotherapy. Success of physiotherapy in this study was defined as achievement of set treatment goals of pain relief and/or regaining normal function. A total of 84 patients (64.3% male, 53.7% female; mean age 42.6 years; 31% acute, 26.2% subacute, 42.9% chronic)

completed the study.

Results: Individualised patient education and exercises were given to all patients. Manual therapy was applied most frequently, followed by electrical stimulation, traction, then heat therapy. The mean number of sessions taken to complete a course of physiotherapy is 4.4. Eighty-one percent of patients were successfully managed. Nineteen percent of patients reported minimal or no change with physiotherapy. There was a significant reduction in pain intensity of 2.8 points with physiotherapy ($t = 11.02$, 95% CI 2.32–3.33, $P < 0.0001$). This improvement is clinically significant. The minimally clinical important difference for visual numeric rating scale is 1.4.

Conclusion: Physiotherapy is effective in reducing pain in patients with low back pain within 5 sessions. A majority of patients achieved the treatment goals set. A randomised controlled trial to assess the effectiveness will be the next step forward.

AH35

E-Nutrition: Improving Health Outcomes via an Online Nutrition Consultation Web System

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Aim: Clinical benefits such as improved diabetes control (HbA1c) and weight loss can be achieved through a web-based care management system. Our aim was to improve patients' health outcomes through an online nutrition consultation web system — E-Nutrition.

Methods: After E-Nutrition was launched in October 2007, patients who were motivated to achieve positive health outcomes, literate in English and had access to Internet were invited to be members of E-Nutrition. The membership, which lasted 6 months, included 3 face-to-face consultations, unlimited online consultations, access to healthy recipes, nutrition articles, and participation in supermarket/hawker tours and cooking demonstrations. The online consultation required members to submit their latest health results, dietary reports and encouraged members to post any nutrition-related queries.

Results: A total of 11 members were recruited in 7 months. All members were recruited for weight management, of which, 3 aimed to improve their glycaemic control and 5 aimed to improve their lipid profile as well. Six members have since completed the 6-month membership. Five members had achieved between 7% and 10% weight loss while 1 member had slight (4%) weight gain. Five members adopted healthier eating habits and increased their physical activity.

Conclusion: E-Nutrition is an effective way of improving patients' health outcomes. It provides an alternative way to develop positive behavioural changes in patients. This may be a potential approach for other health professionals in primary and secondary healthcare settings to consider in the future. Further research is required to determine the efficacy of E-Nutrition.

AH36

Occupational Rehabilitation in Physical Setting: Outcome and Service Development

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Aim: Work is an important part of a person's life. Occupational

therapists help patients to return to productive living after illness or injuries. This was a pilot study on the outcome of patients who underwent work rehabilitation in NUH. The intention was to look into the outcome and further refine the work rehabilitation services in NUH.

Methods: The work rehabilitation service in NUH was established based on literature, local culture and the existing system. All the patients who attended work rehabilitation would go through work capacity evaluation, vocational counselling and work hardening. Outcome measures on patient's employment status upon discharge were collected.

Results: The patients who underwent work rehabilitation in NUH mainly suffered upper limb injuries including fractures, tendon cut, crushed hand injuries and digit replantation.

Forty-five percent of the patients returned to normal duty in their original jobs, 27% returned to work with changes of job duties/tasks, 9% had no clear plans, 7% required further skills training in other vocational centres, 6% were seeking new jobs, and 6% were sent back to their home countries after settlement of insurance claims. The average number of therapy sessions was 3 to 6. We found that local workers were not keen to attend regular work rehabilitation sessions due to cost issues. We spent more time on counselling and job exploration with the patients instead of work hardening.

Conclusion: Due to cultural and system differences, it was difficult to carry out traditional work rehabilitation services which involved intensive work hardening in Singapore. It is recommended that more emphasis be given to the psychosocial component and work readiness while carrying out work rehabilitation. This is the trend for work rehabilitation programmes in other overseas centres. As the sample size in this study was small, further study is recommended to establish evidence for work rehabilitation.

AH37

Can You See What I See?

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Aim: Artifacts in radiographic images have great impact on image quality and may deteriorate diagnosis value. This study was for us to share our experience in coping with a variety of artifacts that we encountered while using the computed radiography system for the past 2 years.

Methods: Radiographic images acquired at NHGD centres over the past 2 years were extracted from the PAC system and examined for image quality. Artifacts were identified and traced to specific components of the CR imaging chain. The radiographers worked very closely with the service engineer to determine the sources of those artifacts.

Results: The images artifacts were categorised as horizontal streak, vertical streak, black/white lines, grid lines, tiny white spot and images noise. The potential sources of the artifacts were imaging plates fault, IP reader fault, laser printer fault, light leak, scatter, operator error and airborne dust.

Conclusion: Knowing the possible sources of the artifacts will assist in quick identification and troubleshooting and help to prevent future occurrences. A consistent and regular quality control programme could help to minimise image artifacts.

AH38**Ensuring Repeated X-rays do not Repeat — Taking Out the Guesswork**

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Aim: The introduction of the computer radiography (CR) system is said to reduce the amount of repeats due in inaccurate exposure factors. This is because CR systems carry a wider latitude so they can better tolerate inaccuracies in the setting of exposure factors by radiographers. However, there is a limit to what the CR can put up with. Therefore in some cases, repeat X-rays are still required to obtain an image of good diagnostic quality. The aim of this study was to determine the relationship between exposure factors (kilovolts peak [kVp] and milliampere seconds [mAs]) and the Exposure Index (EI) values on the Carestream CR 850 system. Once the relationship is established, the radiographer can use the formula to accurately determine the exposure factors to achieve the desired EI value. The desired or the targeted EI value for each anatomical region is usually pre-defined by the vendor. This value or range of values when achieved would mean that the image is of good diagnostic quality and the radiation dose would also be in line with the ALARA principle.

Methods: A phantom was used to perform the tests to establish the relationship between EI and exposure factors.

Results: It was found that doubling the exposure caused the EI value to increase by approximately 300. Likewise, halving the exposure causes the EI value to decrease by approximately 300.

Conclusion: Since the mAs portion of the exposure factors is known to contribute to the main bulk of radiation dose to patients, a higher kVp technique could be employed. This is because by increasing kVp, the mAs can be reduced to achieve the desired EI, without compromising the required contrast and density of X-ray images. Using the above relationship, radiographers can accurately perform repeats when required, achieving images of optimum diagnostic quality, taking out the guesswork in determining exposure factors.

AH40**Role of Cytokeratin 19 in Regulation of Breast Cancer Cell Motility**

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Aim: The aim of this study was to investigate how cytokeratin 19 (CK19) regulates cell motility in breast cancer.

Methods: Expression of CK19 in the established transfectant BT549/ck19 cells was verified by RT-PCR and Western blotting. Wound healing activity and transmembrane ability were assayed for cell motility.

Results: We verified the expression of CK19 in transfectant BT549/ck19, not in control transfectant BT549/EV, by RT-PCR and Western blotting. Wound healing assay indicated that CK19 expression inhibited cell spread and movement. Furthermore, the transmembrane ability of BT549/ck19 was significantly decreased by more than 2-fold, compared to the control, as tested using cell migration assay. As focal adhesion kinase (FAK) is the key kinase in modulating cell

motility, we showed that CK19 reduced the expression of FAK at both RNA and protein levels.

Conclusion: CK19 attenuates cell motility by, at least partly, downregulating FAK expression in breast cancer. Our results demonstrated the interaction of cytokeratin and FAK pathway in the regulation of cell motility.

AH41**Preferred Activities for Diabetes Patient Group Exercise Programme**

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Aim: The aim of this survey was to explore patients' interests and preferences prior to the commencement of group exercise activities.

Methods: We conducted a survey on convenient sample of 189 patients visiting the Diabetes Centre at Alexandra Hospital from October to December 2007. Participants completed a set of questionnaire while waiting for their turns to consult the doctors. Only English-speaking patients participated in the survey.

Results: The participants consisted of 56.6% males and 64% Chinese, 19.6% Indian and 14.8% Malay. Participants' age ranged from 19 to 78 years with the majority in their 50s (34.9%). Most participants acknowledged that exercise was important (72%), but only 22.2% exercised daily, 15.9% exercised 3 times per week and 23.3% exercised less than 3 times per week. Walking was a popular current physical activity (43.3%), and 53.9% of participants exercised more than 30 minutes per session. Although 66.1% did not specify reasons for not exercising, 12.7% had attributed not exercising to having no time, 6.9% to knee problems, 3.2% to no companion and 1.1% did not know the types of appropriate exercise. More patients would consider starting exercise individually (56.6%) than group activities (30.7%). With the option of joining a group exercise programme, 45% were interested, of which 44.7% preferred brisk walking, 21.1% gymnasium activities, 5.8% preferred jogging and 28.4% preferred a combination of exercises.

Conclusion: Brisk walking is the preferred option for consideration of increasing physical activity in people with diabetes. It is also a safer form of exercise, given the associated comorbid conditions often present in people with Type 2 diabetes.

AH42**Large Scale CD8+ T-Cell Depletion Using Magnetic Cell Sorting Technique for a Pilot Trial Study on Pre-emptive CD8+ T-cell Depleted Donor Lymphocyte Infusion Following Non-myeloablative Stem Cell Transplantation for Acute Myeloid Leukaemia or High Risk Myelodysplastic Syndrome**

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Aim: In this pilot study, donor lymphocytes from healthy donors were harvested. Large scale CD8+ T-cell depletion were performed on the donor lymphocytes using magnetic cell sorting (MACS) technique for the purpose of maintaining the low incidence of GVHD, reducing disease relapse and improving overall transplant outcome. The depleted donor lymphocytes were cryopreserved in separate bags, each at a cell dose of 10×10^6 CD4+ T-cell. The aim of this

retrospective study was to analyse our institution experience in performing CD8+ T-cell depletion on donor lymphocytes using the CliniMACS®.

Methods: Six healthy donors underwent PBSC harvest. A total of 7 donor lymphocytes harvest were performed. To prevent platelet aggregation, the products were washed once with running buffer. A total of 2×10^{10} nucleated cells were labelled with CD8 Microbeads. Excess CD8 Microbeads were removed by washing twice with the running buffer. This was followed by a separation step through CliniMACS®. The products were evaluated at 3 points with flow cytometry, pre-depletion fraction, labelled fraction and depleted fraction, to identify the number of T-cell subsets (CD3+, CD4+ and CD8+), B-cell (CD19+) and NK cell (CD16+/56+).

Results: The collected products had a median cell count of 324.21×10^8 (range 176.17–395.10). Before depletion, the mean lymphocytes count was 68.45×10^8 (median, range 41.80–97.72), median CD4+ T-cell count was 28.87×10^8 (range 11.81–43.88) and the CD8+ T-cell count was 21.33×10^8 (range 11.86–24.95). After the depletion procedure, the products had a median cell count of 249.30×10^8 (range 135.11–331.58). The median CD4+ T-cell in the depleted products were 22.95×10^8 (range 11.45–26.96) with a median percent recovery of 89.47% (range 61.44–96.95%). The median CD8+ T-cell fraction remaining in the depleted products were 2×10^6 (range 0.43–29) accounting for a median log depletion of 3.09 (range 1.70–3.48).

Conclusion: Magnetic cell sorting technique with CliniMACS® is an effective method for large scale CD8+ T-Cell depletion of donor lymphocytes. This method yielded a median percent recovery of 89.47% of CD4+ T-Cell and with median depletion log of 3.09 for CD8+ T-Cell.

AH43

Single versus Double Platform CD34 Enumeration Between Two Major Bone Marrow Transplant Centres in Singapore

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Aim: For bone marrow transplantation, consistent laboratory evaluation of cell dose in the graft is essential. While most clinical laboratories use standardised equipment and procedures for haematology counts, different methods of CD34+ cells calculation (single/dual platform) are used. This study was designed to evaluate the comparability of the different CD34 enumeration methods performed at National University Hospital (NUH) and Singapore General Hospital (SGH).

Methods: A total of 94 PB (n = 43) and PBSC (n = 51) from patients and healthy individuals were exchanged. White blood cell counts were performed using automated haematology analysers. CD34+ cells were measured by sequential gating using the dual platform calculations in SGH and single platform calculations in NUH. Three parameters, %CD34, total nucleated cell (TNC) and absolute CD34 (Abs CD34), were analysed using the Bland and Altman Plot.

Results: For PB, %CD34 was 0.14 (median 0.01–3.15, mean difference 0.01596, 95% CI [–0.03819, 0.07012]), TNC ($10^3/\mu\text{L}$) was 22.96 (median 0.30–121.30, mean difference –1.8652, 95% CI [–5.1598, 22.0859]) and Abs CD34 (μL) was 27 (median 0.97–158.77, mean difference 8.4630, 95% CI [–5.1598, 22.0859]). For PBSC, %CD34 was 0.55 (median 0.07–5.74, mean difference –

0.001346, 95% CI [–0.04676, 0.04406]), TNC ($10^3/\mu\text{L}$) was 249.21 (median 50.28–473.65, mean difference –23.9662, 95% CI [–35.618, –12.3135]) and Abs CD34 (μL) was 1,412.70 (median 246.37–5,878.72, mean difference –114.6388, 95% CI [–242.0397, 12.7622]).

Conclusion: Our study showed that there was remarkable agreement between both platforms for %CD34 and Abs CD34 in PB and PBSC. TNC in PB ($<100 \times 10^3/\mu\text{L}$) for both methods showed remarkable agreement whereas in PBSC ($>100 \times 10^3/\mu\text{L}$) disagreement was observed. The dual platform consistently gave a lower count with mean difference of –23.9662 and 95% confidence interval of (–35.6188, –12.3135).

AH44

Clinical-Scale Production of Allogeneic Natural Killer Cells for Immunotherapy: Preliminary Experience in Heavily Pre-Treated Paediatric Patients with Advanced Acute Myeloid Leukaemias

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Aim: In killer-cell immunoglobulin-like receptor (KIR) ligand mismatched haploidentical haematopoietic stem cell transplants, donor natural killer (NK) cells express inhibitory NK receptors (KIRs) that recognise missing self-HLA Class I molecules on recipient cells mediating NK alloreactivity thereby exerting “NK versus leukaemia” (NKvL) effects. In contrast, the functions of activatory NK receptors and mechanisms controlling these and the final balance leading to NKvL are less clear. Technology now provides refined options in NK grafts engineering providing opportunities to elucidate these. We report our preliminary experience in testing the feasibility of clinical-scale production of allogeneic NK cells for the treatment of heavily pre-treated paediatric patients with advanced acute myeloid leukaemias (AML).

Methods: Two types of NK cell enrichments were performed on non-mobilised peripheral blood mononuclear cell apheresis collections with a cell selection system (CliniMACS, Miltenyi): (1) a 2-step procedure of CD3 depletion followed by CD56 selection to obtain “purified” NK cell and (2) a single-step CD3/ CD19 depletion to “enrich” NK cells.

Results: Since 2006, 3 patients with advanced AML received a total of 4 NK cell therapies from non-KIR ligand mismatched parental donors. For the CD3 depleted/CD56 selected “purified” NK cell products (n = 2), the mean purity, recovery, and viability were 99.6%, 63.9%, and 96.5 %, respectively. The depletion log for CD3 and CD19 were 4.59 and 2.59, respectively. For the CD3/ CD19 depleted NK cell “enriched” products (n = 2), the mean purity, recovery, and viability was 44.63%, 82.9%, and 95%, respectively. The depletion log for CD3 and CD19 were 4.21 and 3.43, respectively. Total processing times were 12 and 8 hours for the ‘purified’ and ‘enriched’ NK cell products, respectively. NK cells were infused fresh and 2 patients received subcutaneous IL-2 after NK cells.

Conclusion: Clinical-scale production of NK cells with minimal contamination of T and B cells is feasible. CD3 depletion/ CD56 selection results in higher NK cell purity but lowers NK cell recovery and requires longer processing time when compared to CD3/CD19 depletion alone. Studies comparing the functional activities of the NK cells in these products may provide guide to the ideal NK graft for clinical applications.

AH45**Density Gradient Centrifugation in a Closed Bag System — A Modified Method for Efficient Red Cell Depletion of Apheresis Stem Cell Products****TG SOH, J MAH, S KEE, LK TAN***Laboratory Medicine, National University Hospital, Singapore*

Aim: Transplanting a leukopheresis product (LP) of major blood group incompatibility predisposes the recipient to acute haemolytic reaction. This can be prevented by simply removing the red cell in the LP. Conventionally leucopheresis products of major blood group mismatch are red cell depleted in an opened system. This increases the chances of microbial contamination as the products are exposed to the environment. The aim of this study was to evaluate the efficiency of red cell (RC) depletion in a closed bag system, keeping the LP in a closed system and therefore reduces the chances of microbial contamination.

Methods: A total of 12 apheresis blood from healthy apheresis platelet donor were used. The haematocrit for each product was adjusted to $25\% \pm 5\%$. The product was carefully layered onto an equal volume of ficoll in a transferred bag. The product was centrifuged at 400 g for 30 minutes at room temperature with no brake. The plasma, the mononuclear cell layer and the ficoll were extracted out after the centrifugation. The depleted product was washed twice with 0.9% normal saline to remove the excess ficoll. Full blood count was performed on the product — Pre-RC Deplete, Post-RC Deplete and RC Waste, to determine the cell recovery. Specific gravity of the products were also measured — Post-RC deplete, First Wash and Second Wash, to determine the efficiency of ficoll removal from the products.

Results: The products collected had a median cell count of 18.48×10^8 (range 2.19–28.56) and median red cell mass of 24.64 mL (range 21.14–29.00 mL). After RC depletion, the depleted products had a median cell count of 12.97×10^8 (range 1.66–18.68) with a median percent recovery of 68.27% (range 59.07–82.48%). The median residual red cell mass was 0.32 mL (range 0.24–0.65 mL). The median percent recovery of granulocytes and mononuclear cells in the depleted products were 48.96% (range 8.96–93.64%) and 71.95% (range 56.35–81.62%) respectively. The median specific density of the red cell depleted products before washing was 1.045 (range 1.042–1.048). The median specific gravity of the products after the first wash was 1.009 (range 1.005–1.016). After the final wash, the specific gravity of all the products was 1.005.

Conclusion: Red cell depletion using the ficoll density gradient centrifugation in a closed system is an effective method for removal of contaminating red cell in LP. This method yielded a median percent recovery of 68.27% and 71.95% of white cells and mononuclear cells respectively with median residual red cell mass of 0.32 mL. Washing the red cell depleted products twice with normal saline is sufficient to remove all the excess ficoll in the product — specific gravity of 0.9% normal saline is 1.005.

AH46**Evaluation of Antibodies to TSH Receptor (Anti-TSHR) Assay on COBAS e411 (ROCHE) Immunoassay Analyzer****B SAW, S SAW, S SETHI***Laboratory Medicine, National University Hospital, Singapore*

Aim: Hyperthyroidism in Graves' disease (autoimmune hyperthyroidism) is caused by auto-antibodies to the TSH receptor (TSHR),

and measurement of these TSHR antibodies (TRAb) can be useful in disease diagnosis and management. The purpose of our study was to evaluate the Roche TRAb assay on Cobas e411 Immunoassay Analyzer by comparing its performance against our current ELISA (EUROIMMUN) assay.

Methods: Roche TRAb assay was the competitive electrochemiluminescence immunoassay (ECLIA) which utilised solubilised porcine TSH receptor and human thyroid stimulating monoclonal TSHR autoantibody M22. The M22 antibody in the assay competed with the binding of auto-antibodies from the patient samples (TRAb) to the porcine-TSH receptor of the reagent. Sera from normal subjects ($n = 47$, fT4 11.5–21.4 pmol/L, TSH 0.67–2.96 mIU/L), blood donors ($n = 20$), Graves disease ($n = 52$), and other thyroid diseases ($n = 61$) were tested for TRAb on Cobas e411.

Results: Intra- and inter-assay imprecision was determined in 3 serum pools (mean 2.82, 12.11 and 37.71 IU/L). Total precision CVs for within-day and between-day were 1.24–8.32%. Correlation studies ($n = 120$) showed Cobas e411 = 1.14 ELISA + 2.1; $r = 0.923$. TRAb values of normal subjects ($n = 47$) ranged from <0.30–1.80 IU/L and 20 blood donors were tested as all negative (<0.9 IU/L). Parallelism study produced a good linear relationship. The assay is unaffected by haemolysis (Hb 400 mg/dL, recovery +4.5%), icterus (bilirubin 24 mg/dL, recovery +2.15%) and lipemia (triglycerides 1,295 mg/dL, recovery –3.52%).

Conclusion: The performance of Roche TRAb assay is comparable with ELISA (Euroimmun) assay. Random access analyser with shorter assay time of 27 minutes appeared to be the advantage of Roche Cobas e411 TRAb assay.

AH47**Case Studies: Neuromodulation Using Interferential Current to Treat Colorectal Dysfunctions in Both Adult and Children****C TSAI***Physiotherapy, Rehabilitation Centre, National University Hospital, Singapore*

Aim: Constipation and soiling in adults and children may have organic or behavioural causes. The purpose of the present study was to investigate the effect of neuromodulation using interferential current to treat constipation and soiling in 1 adult and 1 child with possible organic cause.

Methods: A 9-year-old child with history of anorectal malformation managed by Malone's procedure, presented with over 6 months of faecal soiling as well as lack of spontaneous defaecation. A 28-year-old female presented with both bladder and bowel dysfunctions following a road traffic accident. Since the accident, she suffered from at least 4 years of chronic constipation and faecal incontinence. Neuromodulation using interferential current was applied 2 to 3 times per week for both patients, using 4 surface electrodes, 2 to the paraspinal area of T9–10 to L2 and 1 to either side of the anterior abdominal wall beneath the costal margin.

Results: Interferential current increased the frequency of spontaneous defaecation in both adult and child. Episode of soiling was stopped for the adult and was reduced for the child.

Conclusion: These results suggest that neuromodulation using interferential current has a beneficial effect on colorectal dysfunctions. Further trials using larger numbers of patients are needed to confirm this benefit, as well as to investigate the mechanisms of its effectiveness and the ideal parameters.

AH48**The Use of Three Primer Sets with Highly Conserved Sequences to Improve Human Papillomavirus Detection by Direct PCR-Sequencing****GH LEOW, LL CHIU, ESC KOAY***Laboratory Medicine, National University Health System, Singapore*

Aim: The objectives of this study were to (a) improve the detection rate of human papillomavirus (HPV) genotypes by direct PCR sequencing, using archived biopsy materials, which has been formalin-fixed and paraffin-embedded and (b) find whether certain HPV types are linked to squamous cell carcinoma of the genital tract and specific epidermodysplasia verruciformis-associated HPV types are found in cutaneous cancers.

Methods: HPV DNA was extracted from the archived paraffin embedded tissue sections. Three sets of primers (2 are degenerative primers) were designed to target the L1 open reading frame (ORF) region allowing the detection of a broad spectrum of mucosotropic HPV genotypes. Direct sequencing was carried out on samples with positive HPV infection, using the ABI BigDye v3.1 reagents and the ABI3130 Prism® Genetic Analyzer. The sequence assigned was compared to the GeneBank database.

Results: The positive detection rate was only 54% (19 out of 35 samples analysed) when we used only 1 set of degenerative primers (FAP59/FAP64) targeting the L1 ORF. With the addition of 2 other sets of primers, (a) GP5+/GP6+ which enabled the detection of 23 mucosotropic HPV genotypes, and (b) CP65/CP70, which detected the potentially novel epidermodysplasia verruciformis-associated HPV subtypes found in certain skin cancers, we achieved better detection rates, due to the broader spectrum of HPV types included. The positive detection rate of the same 35 samples increased to 66%. The 35 cases that we received for HPV typing included cases of dysplasia of cervix, carcinoma in cervix uterus and epidermodysplasia verruciformis.

Conclusion: The results of our clinical validation in trying out the use of 3 sets of primers simultaneously, with the aim of increasing diagnostic sensitivity, show that using the combination of these primers enables detection of a broader spectrum of HPV genotypes, and minimises the potential of false negative results.

AH49**Assessing Cancer-related Fatigue in Breast Cancer Patients Treated in National University Hospital****HP GAN, YP WONG, SW LIM, LM POH, PT KOH, T JENNIFER, SF LIM***Pharmacy, National University Hospital, Singapore*

Aim: The primary objective of this project was to assess fatigue in breast cancer patients receiving adjuvant chemotherapy at National University Hospital. The secondary objective was to evaluate the management of fatigue in this group of patients.

Methods: This study was a non-randomised prospective study. Breast cancer patients receiving adjuvant chemotherapy were recruited. Patients self-administered questionnaires to assess their fatigue level. The questionnaire contained 14 items from the Fatigue Symptom Inventory, 10 items from the Functional Assessment of Cancer Therapy-Breast, and 1 additional item to assess the patient's fatigue level.

Results: Five out of the 7 patients showed an increase in their fatigue level a week or 2 after their chemotherapy. This might be because of

anaemia. Three patients reported an increase in their fatigue level 1 week before their second cycle of chemotherapy and 2 patients have a baseline fatigue score that was much higher than the subsequent weeks after their chemotherapy. This may be attributed to anxiety before the commencement of treatment. One patient has filled up all the 8 questionnaires. The fatigue score for the third cycle was generally better than for the first cycle. The patient may have tolerated the chemotherapy better. Due to the small sample size, it was not possible to conclude that there was a significant difference in the fatigue level based on the different breast cancer regimens.

Conclusion: The prevalence of cancer-related fatigue is high and should not be taken lightly. Pharmacists play a significant role in educating the patients, their family members and caregivers regarding fatigue and its management.

AH50**Improving Anti-coagulation Counselling by Evaluating the Educational Video Compact Disc****EH TAN, YS SAW***Pharmacy, National University Hospital, Singapore***Aim:**

The aims of this study were to (a) evaluate of the "Knowing Warfarin" video compact disc (VCD) in shortening the pharmacist's counselling time in both inpatient and outpatient settings in warfarin-naive patients, (b) make improvements to VCD by assessing the adequacy and comprehensibility, and (c) identify major concerns of warfarin-naive patients.

Methods: Warfarin-naive patients in the wards were randomised into the VCD arm and the non-VCD arm. Pharmacist-patient interaction time was noted, and scored using Checklist #1. The VCD arm also did a survey on the VCD. Upon follow-up at the NUH ACC, all patients were scored using Checklist #2.

Results: The VCD did not seem to significantly shorten the average pharmacist's counselling time in the inpatient and outpatient settings. In the wards, the VCD patients scored poorer than the non-VCD patients but the reverse occurred upon ACC follow-up. Perhaps the VCD did provide patients with an audio-visual impact, enabling retention of new information in the long run. However, VCD counselling alone was insufficient and more clarity was required for optimal patient education.

Conclusion: The "Knowing Warfarin" VCD is a useful adjunct to counselling warfarin-naive patients as it provides a good overview and background, setting the stage for interactive pharmacist-patient counselling sessions. It provides an audio-visual impact to the patient which helps in the retention of information and consolidation of facts to memory. The recommendation is to supplement the VCD with a quick pharmacist-patient interaction time to re-emphasise important counselling points, which would add to the adequacy of the whole counselling session.

AH51**Association of Organoleptic Odour Score with Volatile Sulphur Compounds in Adult Periodontal Patients****LP LIM¹, KM CHANG², FBK TAY², YH CHAN³***¹Faculty of Dentistry, National University of Singapore, Singapore, ²Dental, Alexandra Hospital, Singapore, ³Yong Loo Lin School of Medicine, National University of Singapore, Singapore*

Aim: Organoleptic odour scoring (direct nasal detection) of bad

breath is a practical method used in evaluating halitosis in daily practice. The aim of this study was to correlate organoleptic scoring with (a) halitosis as assessed by the level of volatile sulphur compounds using commercial gas chromatography equipment and (b) periodontal parameters.

Methods: Forty-seven adult volunteers with periodontal disease were recruited for the study. Clinical examinations were carried out in the following sequence: assessment of volatile sulphur compounds (VSC), organoleptic scoring, and full mouth periodontal examination. Three volatile sulphur products (hydrogen sulphide, dimethyl sulphide and methyl mercaptan) were analysed using portable gas chromatography equipment. Organoleptic score fall into 5 categories: 0—not detectable, 1—very mild, 2—moderate, 3—moderately severe, 4—severe, and 5—very severe. Periodontal examinations included checking the presence of plaque, bleeding on probing, subgingival and supragingival calculus, probing depths and loss of clinical attachment. Analyses were carried out using SPSS 15.0. Descriptive statistics and non-parametric statistical analyses were performed.

Results: There was a significantly lower level of total VSC, hydrogen sulphide and methyl mercaptan in patients presenting with organoleptic score in the lower range category (score 0–1) as compared with those having moderate to severe organoleptic scores ($P < 0.05$). No significant differences in the periodontal parameters were found between the groups ($P > 0.05$).

Conclusion: The findings reflect a positive relationship between organoleptic scores with VSC. While organoleptic scores could be a practical method of assessing halitosis in clinical practice, the lack of significant association with periodontal parameters implies that other factors may also be associated with halitosis.

AH52

Patients' Views on Medication Counselling in NUH Outpatient Pharmacy

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Aim: To provide more patient-oriented services, this project aimed to explore patients' views and satisfaction towards medication counselling in NUH outpatient pharmacy.

Methods: A 10-day survey was done at NUH pharmacy retail 1. Illiterate patients were excluded. Data were analysed according to responses to each question. Where there was a logical link, data from pairs of questions was cross-tabulated to investigate the relationship. Chi-square test of association with Pearson's coefficient ($\chi^2 = 0.05$) was used to test statistical significance.

Results: A total of 334 survey forms were distributed with 282 survey forms collected giving a response rate of 84.4%. Respondents were equally divided into those who "need" or "don't need" medication counselling. The top reason for "don't need" medication counselling was "already know". 66.7% respondents on their "first visit" to NUH pharmacy "need" medication counselling ($P < 0.007$). Respondents who felt information was "too little" often "need" counselling ($n = 20$, 69% within Amount of Information, $P < 0.006$). Those who felt that time spent was "too short" often "need" medication counselling ($n = 15$, 68.2% within Time Spent, $P < 0.004$). Half of the respondents preferred counselling time to be less than 5 minutes ($n = 136$, 51.1%). Most felt "time spent" and "amount of information" provided was "just right". Side effects and food drug-related issues remained the most sought after advice. Of the 58 respondents (22.1%) who expressed problems, "privacy of conversation" was the most common

issue ($n = 23$, 39.7%). Overall, most respondents were satisfied with our medication counselling ($n = 203$, 82.9%).

Conclusion: Pharmacists should identify patients who need counselling, especially those who are visiting NUH pharmacy for the first time. Most patients prefer counselling to be brief yet informative and not rushed. Discussion of private or sensitive medical issues should be more discreet. This can be taken into consideration when designing pharmacy counters in future.

AH53

Molecular Evaluation of Fecal Microbiota Signatures Focused on *Bifidobacteria* species, *Clostridia* species and *Escherichia coli* in Infants with Eczema

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Aim: Studies have suggested that selective microbial targets prevail in the fecal microbiota of allergic infants, and certain species of *Bifidobacteria* may promote allergy while others may be protective. This study aimed to evaluate and compare quantitatively and qualitatively the composition of stool microbiota of infants with eczema and their matched controls.

Methods: Infants with eczema ($n = 6$) and their matched (for age, gender, mode of delivery, breastfeeding) controls ($n = 6$) were selected from the placebo group of a cohort of at-risk infants participating in an ongoing randomised double-blind placebo-controlled trial on the protective effects of supplemental probiotics (first 6 months) on eczema and allergies. Analysis of fecal bacteria and clinical examinations were conducted serially at birth, 1, 3, and 12 months. Fluorescence in situ hybridisation flow cytometry (FISH-FC) were employed to monitor fecal microbiota signatures focused on 6 major *Bifidobacteria* species, *Clostridia* species and *Escherichia coli*. The relative abundances of specific *Bifidobacteria* species were expressed as percentages of total *Bifidobacteria* to provide standardisation to the FISH-FC assay.

Results: Infants with eczema were found to harbour significantly more *Bifidobacterium breve* at 1 month (mean = 19.53%) as compared to control (mean = 2.62%) groups (P value = 0.037). There was no difference in the relative abundance of the remaining targets at all time points studied.

Conclusion: Despite the small sample size, our data suggest that the relative abundance of selective microbial target in the fecal microbiota of infants may influence the development of eczema.

AH54

Comparative Study on Serum Indices of LX-20PRO and Visual Evaluation in Assessing Sample Integrity

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Aim: We aimed to determine a better method in detecting interfering substances in laboratory diagnostic testing using serum as testing specimen medium. The interfering substances under consideration were haemoglobin, bilirubin, and lipids. Reporting such interferences would aid clinicians in determining the level of analytical errors in blood tests. This study assessed the agreement between visual

evaluation and automated serum index measurement.

Methods: Visual evaluation of 869 serum samples were compared with serum indices obtained from LX-20PRO (Beckman Coulter). The data were collected for 5 days by 3 staff assigned in different days. Presence or absence was reported in cases of icterus and lipemia samples. In evaluating haemolysis visually, a colour chart was used with the corresponding haemoglobin values for each level of haemolysis. We adopted the equivalent index values for each haemolysis grade.

Results: The kappa coefficient obtained were 0.50 for haemolysed samples, -0.01 for icteric samples, and 0.21 for lipaemic samples. The visual evaluation rates were as follows: 11.85 % haemolysis detected from 869 samples, 11.51% icterus, and 0.46% lipaemia. Serum index rates were: 11.62% by haemolytic index, 97.12% icteric index, and 2.76% lipaemic index. Discrepancies were observed between slight haemolysis reported by the analyser and non-haemolysis reported visually. Discrepancies were also observed between slight lipaemia and slight icterus analysed by the LX-20 when compared visually.

Conclusion: Serum index is a better alternative to visual evaluation. Visual evaluation gives variable and unreliable results. Consideration should be made on its use in assessing sample integrity.

AH55

Cross-sectional Study Comparing Self-reported Disability, Fear Avoidance Beliefs and Pain Intensity in Two Categories of Patients with Low Back Pain

TS NG

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Aim: This study compared self-reported disability, fear avoidance beliefs and pain in 2 categories of patients with (1) non-specific low back pain and (2) low back pain with radiculopathy or spinal stenosis. This categorisation is recommended by American College of Physicians/American Pain Society Low back Pain Guidelines Panel.

Methods: A prospective study was conducted in the physiotherapy department in National University Hospital from November 2007 to March 2008. Data were obtained from standard examination of patients presenting to the department with acute, subacute or chronic low back pain with or without radiculopathy. A total of 84 patients (male 64.3%, female 53.7%; Chinese 77.4%, Malay 10.7%, Indian 9.5%, Others 2.4%; mean age 42.6 years, SD 17.0 years, range 16 to 82 years) completed the study. Self-reported disability using the Oswestry Disability Index (OQI), fear avoidance beliefs using the fear avoidance beliefs questionnaire (FABQ) and pain intensity using visual analogue scale and demographic information were collected.

Results: Patients in both categories had similar disability, fear

avoidance beliefs and pain intensity. The mean ODI for category 1 and 2 were 21.0 (range 0 to 64) and 21.5 (range 2 to 56) respectively. FABQ for physical activity/work were 15.0/16.7 and 17.9/16.7 in category 1 and 2 respectively. The mean pain intensity was 4.7 and 5.4 in category 1 and 2 respectively.

Conclusion: Disability, fear avoidance beliefs and pain intensity do not appear to be higher in patients with radiculopathy. Further studies can look into other confounding factors such as duration of symptoms or psychosocial factors such as social support and coping skills, which may differentiate the categories.

AH56

Functional Outcome for Persons with Traumatic Brain Injury Following an Inpatient Rehabilitation Programme in a Rehabilitation Hospital

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Aim: The aim of this study was to identify and characterise demographics, injury variables and functional outcome in persons who sustained traumatic brain injury and underwent an inpatient rehabilitation programme in a rehabilitation hospital which has a specialised brain injury unit.

Methods: We performed a retrospective, descriptive study using data from the existing database of the rehabilitation hospital. One hundred and nineteen inpatients admitted between June 2006 and May 2008 were included in this analysis. Demographics, injury variables and functional outcome (functional independence measure) were analysed.

Results: Ninety-eight inpatients (82.4%) were male. The 2 main mechanisms of injury were road traffic accidents (48.7%) and falls (40.3%). The mean age at injury was 45.9 years (median 43 years, range 15–86 years, SD 19.8 years). The mean Glasgow Coma Scale score at admission was 11.0 (SD 5.0). The mean length of stay in the inpatient rehabilitation hospital was 37.8 (SD 45.7) days. One hundred and two inpatients (85.7%) were discharged home and 11 (9.2%) were discharged to nursing home. The mean FIM score was 52.7 (SD 25.3) at admission and 72.0 (SD 29.5) at discharge. The difference between admission FIM and discharge FIM was significant ($P < 0.001$). The mean change in FIM score was 19.3 (SD 26.7). The differences for both FIM motor subscore and FIM cognitive subscore at admission and discharge were also significant ($P < 0.001$).

Conclusion: Patients with traumatic brain injury do benefit from the specialised inpatient rehabilitation programme with significant functional gains and a high rate of return to home. It is recommended that these subjects be followed up at 6 and 12 months post-discharge to understand the rate and pattern of community reintegration.

BS1

Multiparameter Analysis of Blood Plasma Lipids for Early Detection of Epithelial Ovarian Cancer

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Aim: Epithelial carcinoma of the ovary is a leading cause of death in women with gynaecological malignancies. Currently, only about 20% of cases are diagnosed during the early stages, when survival rates are high. Thus, there is a need for reliable diagnosis of early stage cancers. We hypothesised that multiparameter lipid analysis, as opposed to single markers such as lysophosphatidic acid or cancer antigen 125 (CA-125), leads to a dramatic increase in predictive power.

Methods: Using electrospray ionisation mass spectrometry, we quantified the plasma concentrations of 360 lipid species (glycerophospholipids and sphingolipids) in a case-control study of 158 women with ovarian cysts and 53 healthy control women.

Results: Using multivariate statistical analysis and supervised learning based on support vector machines, we were able to differentiate controls from patients, and benign from malignant forms of tumours, with sensitivities and specificities well above the existing clinical diagnostic (CA-125) levels. The negative predictive value for discrimination of malignant from benign forms exceeds 90%. Detailed comparison, using the Kruskal Wallis test, revealed a subset of approximately 80 lipid species which were sufficient to describe more than 99.9% of the variances between the different sets of cases and controls. In addition, we identified choline-lipid and sphingolipid metabolism as 2 major contributing pathways in our classifier.

Conclusion: This is the first time a comprehensive multiparameter lipid biomarker was successfully evaluated for the classification of a major human cancer and in a semi-clinical setting. This approach will be applicable not only in diagnosing ovarian cancers but also in other diseases implicated with aberrant lipid metabolism.

BS2

Ultrastructural Analysis of Dengue Virus-infected Human Primary Endothelial Cells

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Aim: Dengue virus (DV) is a mosquito-borne virus belonging to the *Flaviviridae* family. In severe DV infection, plasma leakage can lead to dengue haemorrhagic fever (DHF) or dengue shock syndrome (DSS). The pathogenesis of DHF/DSS is largely unknown and it is believed that endothelium may play a role in mediating DHF/DSS. Thus, better understanding of how DV replicates in primary human endothelial cells will allow us to elucidate the host-virus interactions during DHF/DSS. Using transmission electron microscope (TEM) as a tool, the study aimed to document the replication cycle of DV in human primary endothelial cells.

Methods: Primary human umbilical vein endothelial cells (HUVEC) were infected with DV2 at a multiplicity of infection of 10. The cells

were then harvested at different time points (3-, 4-, 5-, 6- and 7-days) post infection. They were then fixed and processed for TEM. Mock-infected HUVEC were used as a negative control.

Results: At day 3 post infection, DV2-infected cells showed distinct viral replication complexes (proliferation of rough endoplasmic reticula, double membrane vesicles and convoluted membrane structures) in the cytoplasm which were absent in the negative control group. The infected HUVEC displayed cytopathic effect and virus particles were packaged into vesicles by day 5 post infection. At day 7 post infection, extensive cell death (mainly apoptosis — obvious nuclei fragmentation) was observed with large amount of virus progeny released out of the DV2-infected cells. The advanced virus induced cell death in the primary HUVEC which may contribute to the loss of functional endothelial integrity.

Conclusion: The ultrastructural analysis of the replication cycle of DV in primary HUVEC under the TEM had contributed to better understanding of the interaction between host and viral factors and the mechanism of disrupting endothelial integrity upon infection. This will in turn facilitate the development of anti-viral strategies against this pathogen.

BS3

***Lactobacillus rhamnosus* GG as an Intravesical Immunotherapeutic — A Comparison with Immucyst BCG**

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Aim: ImmuCyst[®] is a freeze-dried preparation made from the Connaught strain of BCG. Its use as an immunotherapeutic is the current gold standard for treating superficial bladder cancer. However, patients often suffer debilitating side effects, making the need for alternatives pertinent. Oral administration of *Lactobacillus* preparations to bladder cancer patients have proven useful and safe. As such, our aims were to (1) compare *L. rhamnosus* strain GG (LGG) and BCG, as an adjuvant intravesical agent in an orthotopic bladder cancer model, and (2) determine the systemic and surrounding immunomodulatory events following LGG therapy.

Methods: Bladder tumours were induced in female C57BL/6 mice using poly-L-lysine and MB49 cells stably transfected with the human prostate specific antigen. Controls received 100 µl PBS instillations while ImmuCyst[®] and Lyo LGG received ImmuCyst[®] and lyophilised LGG preparations respectively. Therapy was administered once a week and the mice were sacrificed 1 day after the last instillation. Bladders and lymph nodes were collected for protein (antibody array) and mRNA (real-time PCR) analysis. A separate group of mice were sacrificed after 2 Lyo LGG instillations for immunohistochemistry.

Results: 88.9% and 76.9% of Lyo LGG and BCG mice were cured respectively, compared to 20% in controls. Lyo LGG elevated lymphotactin levels in the bladder while lowering osteopontin's. It also significantly upregulated TNF α expression in the local lymph nodes. There were also visibly more neutrophilic and macrophage infiltration in Lyo LGG mice than controls.

Conclusion: LGG was as efficacious as ImmuCyst[®] in treating bladder cancer.

BS5**Comparative Profiling of T-helper Genes in Mediating Immunopathogenesis of Dengue Virus Infection**

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Aim: During dengue virus (DENV) infection, the role of T helper (Th) genes is not entirely clear. Elucidating the Th-genes that are activated during DENV infection can provide insights into the immunopathogenesis of DENV infection which remains unclear even till today.

Methods: RT-PCR array profiling platform was used to identify genes that were differentially regulated during DENV infection. Eighty-four genes related to the 3 classes of Th genes were monitored in dengue 2 virus-infected human T-cells, monocytes and hepatocytes. This array includes cytokine genes representative of helper T cells, transcriptional factors that regulate the expression of cytokines as well as genes involved in the antimicrobial humoral response.

Results: In this study, 20 Th-related genes that may contribute to the molecular basis of DENV pathogenesis were identified using the RT-PCR arrays. The observation of the few similar Th-related gene regulation between the 3 cell lines suggested that the DENV triggered Th gene expression that was cell-type dependent. Nevertheless, genes inducing cell activation and inflammation (GM-CSF, RANTES, TLR6) were found to be significantly upregulated in both K562 and Jurkat cells. TLR6 was chosen to be further validated based on the RT-PCR result. TLR6 mRNA and protein level were upregulated in DENV-infected cells. Expression of IL-6, downstream of TLR6, was also upregulated in DENV-infected cells.

Conclusion: Comparative profiling of Th genes in different human cell types in response to DENV has provided novel insights into the molecular mechanisms behind the observed pathology in DENV infection and haemorrhage.

BS6**Mechanisms and Key Regulators in the Mobilisation of Human Fetal Mesenchymal Stem Cells from the Bone Marrow**P VIJAY¹, M CHOOLANI¹, J CHAN¹, YC LIM²*¹Obstetrics and Gynaecology, National University of Singapore and National University Hospital, Singapore, ²Pathology and Physiology, National University of Singapore, Singapore*

Aim: Human fetal mesenchymal stem cells (hfMSC) are able to home and migrate systemically to injured tissue. However, the mechanism governing this is not known. In this study, we aimed to elucidate the key factors involved in this phenomenon.

Methods: hfMSC were subjected to flow-cytometry for expression of integrins and cellular adhesion molecules (CAM), and perfused over CAM-coated coverslips or endothelium (HUVEC) using a parallel plate flow system to assess interactions under defined flow conditions. hfMSC were also treated with TNF- α as a mobilisation signal for bone marrow recruitment.

Results: hfMSC expressed high levels of β 1 integrin and CD44 (99%), while α 4 integrin was lowly expressed (17%). hfMSC can roll, arrest and spread on recombinant VCAM-1-coated coverslips as well as TNF- α -activated endothelial cells through interactions with α 4 β 1 integrins, with transmigration across endothelial monolayer

within 30 to 45 minutes of binding. There were significant interactions between the passage number and treatment temperature on the expression of various integrins. The pretreatment of hfMSC with TNF- α for 24 hours significantly inhibits the interactions of hfMSC with VCAM-1 and/or endothelial cells under defined flow conditions.

Conclusion: hfMSC transmigrate endothelial barriers through α 4 β 1 / VCAM-1 interactions. In addition, hfMSC retention in the bone marrow may be mediated through similar interactions, and is mobilised by exposure to soluble systemic factors such as TNF- α released in response to injury. Strategies to upregulate α 4 β 1 integrin, such as by physical temperature methods, may result in improved cellular migration and homing of hfMSC to areas of tissue injury.

BS7**In Vivo Tracking of Human Fetal Mesenchymal Stem Cells with Microgel Iron Oxide Particles in a Rat Cortical Stroke Model**ESM LEE¹, J CHAN², B SHUTER¹, LG TAN², BC LIU³, G DAWE⁴, J DING⁵, SH TEOH⁶, MKC TAM³, M CHOOLANI², SC WANG¹*¹Diagnostic Radiology, National University of Singapore, Singapore, ²Obstetrics and Gynaecology, National University of Singapore, Singapore, ³Mechanical and Aerospace Engineering, Nanyang Technological University, Singapore, ⁴Pharmacology, National University of Singapore, Singapore, ⁵Materials Science and Engineering, National University of Singapore, Singapore, ⁶Mechanical Engineering, National University of Singapore, Singapore*

Aim: *In vivo* MRI imaging allows cellular tracking after transplantation. In this study, we generated novel biocompatible microgel-encapsulated iron oxide particles (MGIO) for MRI tracking of labelled-fetal mesenchymal stem cells (hfMSC) in a clinically relevant rat stroke model.

Methods: MGIO (diameters 87–765 nm) were generated by precipitation of iron oxide nanoparticles within precursor microgel. hfMSCs were labelled by incubation with MGIO and tested for iron loading, osteogenic, adipogenic and chondrogenic differentiation, and gene expression. A photothrombotic cerebral cortical stroke model was created, and MGIO-labelled hfMSCs were injected contralaterally into the periventricular white matter, and intravenously, with cyclosporine as immuno-suppressant. The rats were imaged before and serially up to day 12 with a standard 1.5T scanner. MR results were compared against immunohistochemistry of brain sections.

Results: hfMSC demonstrated a 3-fold greater uptake of MGIO than Ferucarbotran ($P < 0.001$), without affecting differentiation and proliferation capacity, allowing detection of 100 cells *in vitro*. The cortical infarct was visible on MRI pre-transplantation and showed increasing hypointensity between 2 and 12 days post-injection, suggesting hfMSC migration from the injection site in both contralateral and systemic cell delivery routes. In contrary, immunohistochemistry showed presence of ED1+ cells in graft periphery and infarct, corresponding to MR hypointensity.

Conclusion: MGIO is taken up by hfMSC efficiently, allowing for high-resolution tracking in an *in vivo* stroke model through MRI of clinical relevance. However, xenograft rejection was present with label transfer to endogenous macrophages. Animal model selection and histological confirmation is critical to stem cell migration studies by MRI.

BS8

A Study of the Transition Zone Eyelid Margin Using Differentiation Markers and Label-retaining CellsHY ZHU^{1,2}, R BEUERMAN^{1,2}¹Singapore Eye Research Institute, Singapore, ²Ophthalmology, Yong Loo Lin School of Medicine, National University of Singapore, Singapore

Aim: Clinical observations show that the breakdown of the mucocutaneous junction (MCJ) at the eyelid margin leads to a dysfunctional interchange of dissimilar epithelium. These patterns of cellular organisation require that the local stem cells be efficiently managed. While stem cell regeneration offers new perspectives in reconstructive surgery, knowledge about the location of the conjunctiva stem cell is at present lacking. This study was to investigate differentiation profiles of epithelia forming the eyelid margin, the location of label-retaining cells in the eyelids and cell proliferation in response to wound in the conjunctiva epithelium.

Methods: Balb/c mice were used. The expression of cytokeratin1/10 and cytokeratin4 in eyelid tissues was investigated using immunohistochemistry. A 1 x 2mm² conjunctival epithelium was scrapped off. The mice received 5-bromo-2'-deoxyuridine (BrdU) injection intraperitoneally twice daily for 2 consecutive days and were sacrificed on the third day. Cell proliferation was assessed by BrdU incorporation using immunohistochemistry. Label-retaining cells were evaluated by immunohistochemistry in the eyelid of the mice that received BrdU for a week and were sacrificed after 12 weeks.

Results: BrdU label-retaining cells resided in the meibomian gland ducts and meibomian glands. Cytokeratin1/10 was specifically expressed in the skin epidermis and cytokeratin4 in the conjunctiva epithelium. Cell proliferation following wounding was more active in the meibomian gland than meibomian gland duct; the least active was palpebral conjunctival epithelium.

Conclusion: The eyelid margin mediates interactions between 2 epithelial cells with different stem cell origin. Conjunctival progenitor cells may reside in the meibomian gland or gland duct.

BS9

Induction of Allergic Airway Inflammation by House Dust Mite Allergen Specific Th2 Cells in Mice

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Aim: Allergic diseases such as allergic asthma are mediated by Th2 cells. However, the pivotal roles of allergen specific Th2 cells in the induction of allergic lung inflammation have not been fully elucidated. We aimed to elucidate the immunopathological roles of allergen specific Th2 cells in allergic airway inflammation.

Methods: A well-characterised major dust mite allergen, Blot5, specific Th2 cell line was established from the splenocytes of the Blot5 epicutaneous sensitised mice. The immunopathological roles of the cell line were assessed *in vivo* by adoptive cell transfer approach. Naïve mice were received Blot5 specific Th2 cells intravenously followed by intranasal challenge with Blot5. The responses of recipient mice were analysed by immunological and histochemical methods.

Results: A long term TCRVβ3⁺ Blot5 specific Th2 cell line producing high levels of IL-4, IL-5, IL-13 and IL-10 but not IFN-γ was

established. These CD44^{high}CD62L⁻ Th2 cells showed upregulation of CTLA-4, ICOS, OX40, 4-1BB, CD27 but not CD40L upon Blot5 stimulation. After intranasal challenge with Blot5, Th2 cells recipient mice developed Blot5-specific IgG1 and IgE, airways eosinophilia and mucus production of the Goblet cells. In addition to the donor Th2 cells, the cellular infiltrate consisted of CD4⁺, CD8⁺ T cells and NK cells of the recipient mice. Such cellular inflammation could be suppressed by dexamethasone intervention.

Conclusion: Blot5 specific Th2 cells play a central pathological role in mediating allergic airway inflammatory responses resembling those seen in humans. This animal model is particularly useful for screening of novel therapeutics for asthma and allergy.

BS10

Development of FRET Technology as a Novel Rapid Detection Platform for Dengue Infection

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Aim: Fluorescence resonance energy transfer (FRET) involves energy transfer mechanism between 2 chromophores. In this study, we aimed to develop a novel FRET system consisting of NS2B-NS3 peptide cleave site of the dengue virus between the green fluorescent protein (GFP) and yellow fluorescent protein (YFP) pair for rapid detection of dengue virus replication.

Methods: The FRET-NS2B-NS3-protease cleavage site was first cloned into mammalian expression vector and transfected into a number of human cell lines (that are susceptible to dengue virus infection) to detect for the excitation of the FRET system. Stable cell lines expressing the FRET system was obtained and subjected to dengue virus infection at different multiplicity of infection of 0.1, 1 and 10. The presence green or yellow fluorescence emitted from the mock or virus-infected cells were detected using either epifluorescence microscope or fluorescence plate reader.

Results: In the presence of dengue virus infection, the cleavage of NS2B-NS3 protease site by NS3 protease produced during dengue replication will result in the separation of the GFP-YFP pair. Hence, only green fluorescence was detected in the infected cells. In contrast, yellow fluorescence was observed in the mock-infected cell lines. The specificity of these results was further confirmed by infecting these FRET stable cell lines with a non-related picornavirus, enterovirus 71. No cleavage of the FRET protein pair was observed.

Conclusion: In a nutshell, we have developed a novel platform for rapid detection of dengue replication and infection based on FRET technology. Hence, the development of FRET system for rapid dengue virus detection will enable us to screen for antiviral drugs that could specifically inhibit the protease action of dengue virus.

BS11

Isolation and Characterisation of Mesenchymal and Endothelial Stem Cells from Human Umbilical Cord Tissue: A Comparison of MethodsCN MATTAR^{1,2}, MCHONG², ZY ZHANG², LG TAN², MCHOLANI^{1,2}, J CHAN^{1,2}¹Obstetrics and Gynaecology, National University Health Systems, Singapore, ²Obstetrics and Gynaecology, Yong Loo Lin School of Medicine, National University of Singapore, Singapore

Aim: Mesenchymal and endothelial stem cells are promising

candidates with which to develop new cell-based therapeutic strategies in transplant and regenerative medicine. The human umbilical cord and cord blood offer a potentially rich source of these cells which are easily harvested and less ethically contentious compared to fetal stem cells. We investigated the efficacy of isolating putative mesenchymal stem cells (MSC) and endothelial progenitor cells (EPC) from umbilical cord-derived tissue using various methods.

Methods: Mononuclear cells were harvested from umbilical cord blood (UCB) and cultured in DMEM or IMDM supplemented in 20% fetal bovine serum (FBS). The cells were isolated using plastic adhesion or prospective isolation with magnet-activated cell sorting to improve the purity of the seeded cells with either CD45 depletion or CD105/CD271 enrichment. Fibronectin was employed to improve adhesion. Perivascular cells were isolated from umbilical cord arteries by enzymatic dissociation and cultured in alpha-MEM supplemented with 15% FBS. Isolating EPC from cord blood involved culturing the mononuclear cells in endothelial growth medium (EGM-2) supplemented with 10% FBS, on collagen-coated plates to improve adhesion. Immunocytochemistry was employed to demonstrate the expression of typical MSC and EPC markers.

Results: Adhesion selection in DMEM supplemented with 20% fetal bovine serum (FBS) allowed for a higher recovery of putative MSC from UCB. Adherent cells adopted a fibroblastic morphology. The use of fibronectin did not improve recovery rates and the MACs process contributed to poorer yield, possibly because of mechanical damage to the cells. Pericytes harvested from perivascular cord tissue also adopted a fibroblastic morphology during culture. These putative MSC from both sources were capable of expansion, expressed typical MSC markers including vimentin, and demonstrated the potential to differentiate along bone, fat and cartilage lineages. Putative endothelial progenitor cells harvested from UCB adopted cobblestone morphology, expressed endothelial markers CD31, CD144 and von Willebrand Factor, took up acetylated low-density lipoproteins and formed tubular networks when transferred to Matrigel. Colonies were capable of rapid expansion to generate mature endothelial cells.

Conclusion: Mesenchymal and endothelial stem/progenitor cells were thus successfully isolated from umbilical cord blood and periarterial cord tissue using a variety of techniques. The potential use in regenerative medicine, particularly for bone tissue engineering and in the treatment of tissue ischaemia, is apparent. Work in progress includes the optimising the cell harvesting and expansion protocols.

BS13

Tumour-initiating Ability of Side-population of an Ovarian Cancer Cell Line

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Aim: Cancer stem cells have recently been isolated from several tumours including the prostate, breast and brain. We hypothesised that cancer stem cells of ovarian cancer are enriched in the side-population (SP), and aimed to investigate their ability to initiate tumours when xeno-transplanted into immunodeficient mice.

Methods: Ascitic fluid cells from ovarian adenocarcinomas were plated in myelocult medium to determine clonogenicity. Fluorescent-activated cell sorting was also done for them and an ovarian adenocarcinoma cell line, TOV-112D. The sorted SP and non-SP of the cell line were injected into the peritoneum of 10 female NOD-

SCID mice (10⁵ SP and non-SP per mouse in duplicates and 10⁴ SP and NSP per mouse in triplicates). Controls comprised mice injected with 10⁶ TOV-112D cells or medium without any cells.

Results: Cells from ascitic fluid formed a small number of colonies 11 ± 2 (SEM, n = 5) after plating 10⁵ cells per petri dish, suggesting self renewal property. We report identification of a side-population of 0.5 ± 0.4% (n = 3) and 0.2% in the cellular fraction of ascites and TOV-112D cell line respectively. Transplantation of 10⁶ TOV-112D resulted in large tumours (14.7 g and 13.8 g) after 45 days, while there were no tumours found in mice injected with either the SP or non-SP cells after 60 days. Analysis of tumours revealed a similar frequency of SP cells.

Conclusion: Cancer stem cells if present are not enriched in the SP of TOV-112D. Similar experiments need to be carried out with cells from ascitic fluid and primary tumours to illustrate if the above results are a true representation.

BS14

Smoking Comparison: Canadian Intensive Regimen Versus ISO3308 Regimen

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Aim: Currently, cigarette mainstream smoke yields are measured by ISO3308 regimen. There has been much dispute over the inaccuracy of this regimen in reflecting smoker exposure. Thus, an “intense” smoking regimen, Canadian intensive regimen, more comprehensive and similar to human smoking was introduced. This study compared cigarette mainstream-smoke yields generated by “intense” regimen and ISO3308 regimen.

Methods: Mainstream smoke yields comprising carbon monoxide(CO) and particulate-phase matter (particulates: nicotine, water, “tar”) of 10 cigarette brand-samples were determined through smoking on a 20-linear-port semi-automated smoking-CO analyser (Cerulean SM450, UK) under the “intense” regimen (puff volume = 55.0 mL, 2 puffs/min, 3 cigarettes smoked per run/port) and ISO3308 regimen (puff volume = 35.0 mL, 1 puff/min, 5 cigarettes smoked per run/port). Each smoking run analysed 4 cigarette samples and controls (CORESTA-approved CM5-cigarette). The “intense” regimen analysed purely mainstream smoke while the ISO3308 regimen analysed a mixture of mainstream smoke and atmospheric air. CO was analysed by non-dispersive infra-red technique. Particulates deposited on filter-disc attached to each port was determined gravimetrically, extracted with isopropanol for determining nicotine and water using flame ionisation detector and thermal conductivity detector respectively by gas chromatography (Agilent-7683, Singapore). “Tar” was calculated by subtracting nicotine and water from particulate-phase matter.

Results: The “intense” regimen generated 18%, 187% and 382% more smoke volume, CO and particulate-phase matter respectively (i.e. increased 80% nicotine, 1,941% water and 247% “tar”) than ISO3308 regimen.

Conclusion: Higher cigarette mainstream smoke yields of CO and particulate-phase matter are associated with increased smoke volume as reflected by the Canadian intensive regimen. These data conclude that mainstream smoke deliveries to smokers are higher with increased puff volume and frequency.

BS15

Comparison of TaqMan SNP and Pyrosequencing Approaches for High Throughput GenotypingHZ KOH^{1,2}, CS SIM^{1,2}, SK ONG¹, ML CHONG³, SS NG³, R SOONG³¹Laboratory Medicine, National University Hospital, Singapore, ²School of Life Sciences and Chemical Technology, Ngee Ann Polytechnic, Singapore, ³Oncology Research Institute, National University of Singapore, Singapore

Aim: TaqMan SNP genotyping and pyrosequencing are 2 methods used for genotyping. TaqMan SNP genotyping is based on the detection of fluorescence emitted upon hybridisation and extension of allele specific probes. Pyrosequencing is based on detecting light emitted from a nucleotide extension coupled reaction. In this study, we assessed and compared the accuracy and benefits of the 2 methods.

Methods: Eighty DNA samples from healthy donors were genotyped for methylene tetrahydrofolate receptor (MTHFR) C677T, Factor II and Factor V variants using both TaqMan SNP and pyrosequencing. The methods were compared with respect to their speed, convenience, cost and the closeness of their reported genotype frequencies to those reported in validated HapMap data.

Results: The TaqMan SNP assay took 2 hours and cost SGD2.30 per sample. The pyrosequencing assay took 3 hours and cost SGD4.00 per sample. The MTHFR genotype distribution matched between TaqMan SNP and pyrosequencing analysis. For Factor V, the frequency of GG and AG variants was 84% and 16% for TaqMan SNP genotyping and 97% and 3% by pyrosequencing respectively. The frequencies from pyrosequencing better matched those reported in the HapMap database (GG, 100%). For Factor II, all samples (80/80, 100%) cases were clearly wild-type based on pyrosequencing, it was difficult to determine Factor II genotypes using TaqMan SNP as there was no clear distribution of fluorescent signals.

Conclusion: The speed, cost and convenience of the TaqMan SNP assay support its use but the accuracy from the sequence readout of pyrosequencing, especially at genotype loci of low variability, suggests it might be of more value overall.

BS16

Non-invasive Prenatal Diagnosis: CD147, a Novel Cell Surface Marker for the Enrichment of Fetal Erythroblasts from the Maternal BloodAP MAHYUDDIN¹, HM ZHANG¹, S PONNUSAMY¹, SK HON², K CHAUDHURI², A VENKAT², M CHOOLANI¹¹Obstetrics and Gynaecology, Yong Loo Lin School of Medicine, National University of Singapore, Singapore, ²Obstetrics & Gynaecology, National University Hospital, Singapore

Aim: A novel surface marker (CD147), which is present on both fetal erythroblasts (FNRBC) and adult erythrocytes (RBC), was identified from previous data and tested for its efficiency in the enrichment of FNRBC from the maternal blood for non-invasive prenatal diagnosis using fluorescence-activated cell sorting (FACS).

Methods: FACS was used for sorting of FNRBCs spiked in adult RBCs samples (n = 5). Model mixtures were prepared with FNRBC:RBC ratio of 1:50 and incubated with anti-human CD147 monoclonal antibody conjugated with FITC. Next, the cells were sorted according to gated parameters into different tubes, P2 (FITC-bright/high side scatter value) and P3 (FITC-bright/low side scatter

value). The cells were pelleted down and resuspended into appropriate volume for cell count. The cells were cytopspun onto slides and stained to determine purity.

Results: As both cell types express CD147 (strongly expressed on FNRBC and weakly expressed on adult RBC), FNRBC were gated from adult RBCs based on their difference in fluorescence intensity and side scatter profile. The results of FACS separation gave comparable recovery rates (45.5%) as in immunomagnetic cell sorting (previous data), but had significantly higher FNRBC purity of approximately 5-fold in P2 (64.9%) and 2-fold in P3 (20.3%) ($P < 0.05$).

Conclusion: We identified a novel surface marker (CD147) on FNRBC and demonstrated its usefulness in FACS sorting of FNRBC from adult RBC. The high purity and comparable recovery rates suggest that CD147, when used in combination with other markers, is useful for the enrichment of first trimester FNRBC from maternal blood in non-invasive prenatal diagnosis.

BS17

Restoring Hepatitis B Virus Specific Immunity with T Cell Receptor Re-directed LymphocytesAJ GEHRING¹, AT TAN^{1,2}, ZZ HO¹, S KOH¹, AX SHAO³, SG LIM², MK MAINI⁴, H STAUSS³, A BERTOLETTI^{1,2}¹Hepatic Infectious Diseases, Singapore Institute for Clinical Sciences, A*STAR, Singapore, ²Medicine, Yong Loo Lin School of Medicine, National University of Singapore, ³Department of Immunology, Royal Free Hospital, Royal Free and University College Medical School, UK, ⁴Division of Infection and Immunity, University College of London, UK

Aim: Current therapies of chronic hepatitis B suppress but do not eliminate the virus. Sustained virus control requires the presence of adaptive immunity, but attempts to restore hepatitis B virus (HBV) specific immunity in chronic patients with therapeutic vaccine had little success likely because of the level of T cell exhaustion associated with chronic infection. The aim of this study was to develop a strategy able to engineer functional HBV-specific T cells in lymphocytes of chronic HBV patients.

Methods: We selected HBV-specific CD8⁺ cells from patients able to resolve HBV infection. The T cell receptor (TCR) specific for a dominant HBV core 18-27 (HBc18-27), HLA-A0201 restricted epitope, was cloned. TCR alpha/beta chain DNA was inserted into an expression vector for gene transfer into primary T cells from both healthy and chronically infected patients. Expression of the introduced TCR was measured using flow cytometry and intracellular cytokine staining was performed to validate their functional profile.

Results: Primary human T cells expressed the introduced HBc18-27 specific TCR as early as third day post transduction as evidenced by V beta and pentamer staining. TCR re-directed T cells presented a similar functional profile of HBV-specific CTL found in patients who resolved the infection. TCR can be introduced into both CD8 and CD4 T cells, indicating that both helper and CTL response can be efficiently reconstituted.

Conclusion: Introduction of T cell receptors associated with resolution of disease in lymphocytes of chronic HBV patients results in the functional restoration of HBV-specific helper and cytotoxic T cells providing the basis of a new, patient specific, cellular therapy for HBV chronic infection.

BS18**Cytokeratin 19 Attenuates the Expression of Endoplasmic Reticulum Protein 29 in Breast Cancer — A Characteristic of Tumour Cell Dormancy?****D ZHANG^{1,2}, ESC KOAY^{1,2}**¹Laboratory Medicine, National University Health System, Singapore,²Pathology, National University Health System, Singapore

Aim: Cytokeratin 19 (CK19) is a marker of disseminated tumour cells in breast cancer. Expression of CK19 may play a role in maintaining tumour cell survival in blood (cell dormancy) and developing recurrent metastatic disease. This study aimed to elucidate the CK19-mediated downstream molecules and to understand the possible mechanisms driving cells into dormancy.

Methods: The human breast cancer cell line BT549 was transfected with a CK19-expression construct and stable clones were selected. Differentially expressed proteins in BT549/EV (control) and BT549/CK19 were analysed using gel-based proteomics. Expressions of identified proteins were further investigated by RT-PCR and Western blotting in several breast cancer cell lines and clinical breast tumour specimens.

Results: We established a stable clone expressing CK19 by serial dilution and antibiotics selection. CK19 expression reduced cell growth and restructured cell cycle by reprogramming cells from S-phase into G0/G1 phase. CK19 increased p38MAPK, and decreased FAK expression in the BT549/ck19 cells. Proteomic studies revealed that CK19 enhanced expression of Hsp27, but significantly reduced expression of endoplasmic reticulum (ER) proteins, e.g., ERp29 and PDI. RT-PCR indicated that CK19 attenuated ERp29 by reducing its transcription. Furthermore, we found that ERp29-specific transcription factor Sp1 was also decreased in the BT549/CK19 cells. Western blotting analysis in clinical specimens showed that CK19 was inversely correlated to the levels of ERp29 and Sp1.

Conclusion: CK19 is a potential factor driving tumour cells into the dormant state. Its expression affected the activity of ER by decreasing ERp29 and PDI. CK19-mediated dysfunction of ER system could be a possible mechanism or a physiological state in dormant tumour cells.

BS19**Andrographolide Sensitises Cancer Cells to TRAIL-Induced Apoptosis via p53-Mediated DR4 Upregulation****J ZHOU¹, GD LU¹, CS ONG², CN ONG¹, HM SHEN¹**¹Community, Occupational and Family Medicine, Yong Loo Lin School of Medicine, National University of Singapore, Singapore, ²School of Chemical & Life Sciences, Singapore Polytechnic, Singapore

Aim: Andrographolide (Andro), a diterpenoid lactone isolated from a traditional herbal medicine *Andrographis paniculata*, is known to possess anti-inflammatory and anticancer activity. In this study, we attempted to investigate the anticancer potential of Andro by detecting its sensitisation effect on tumour necrosis factor (TNF)-related apoptosis-inducing ligand (TRAIL)-induced apoptosis in cancer cells.

Methods: We used DAPI staining to detect apoptotic cell death, western blot and reverse transcription-PCR to determine the involvement of apoptotic-related proteins, flow cytometry to detect the cell surface expression of death receptors and intracellular ROS accumulation, and transient transfection and siRNA technology to confirm the role of p53 in Andro-sensitised apoptosis.

Results: First, we found that pretreatment with Andro significantly enhanced TRAIL-induced apoptosis in various human cancer cell lines, including TRAIL-resistant cells. Next, we suggested that such sensitisation was achieved through transcriptional upregulation of death receptor 4 (DR4). We further explored the underlying mechanism and found that p53 played an essential role in DR4 transcriptional activation. Andro was capable of activating p53 via increased p53 phosphorylation and protein stabilisation, a process mediated by enhanced reactive oxygen species (ROS) production and subsequent c-Jun N-terminal kinase (JNK) activation. Pretreatment with an antioxidant (N-acetyl cysteine) or a JNK inhibitor (SP600125) effectively prevented Andro-induced p53 activation and DR4 upregulation, and eventually blocked the Andro-induced sensitisation on TRAIL-induced apoptosis.

Conclusion: Taken together, these results present a novel anticancer effect of Andro and support its potential application in cancer therapy to overcome TRAIL resistance.

BS20**Systolic and Diastolic Recovery in Chronic Ischaemic Myocardium is Supported by Structural Stability of Microvessels****WSN SHIM^{1,2}, SY LIM¹, YC GU¹, HC ONG¹, T CHUA³, SC CHUAH³, P WONG³**¹Research and Development Unit, National Heart Centre, Singapore,²Surgery, National University of Singapore, Singapore, ³Cardiology, National Heart Centre, Singapore

Aim: We hypothesised that combining angiotensin-1 (ANG-1) or angiotensin-2 (ANG-2) with vascular endothelial growth factor (VEGF) promotes maturation of neoangiogenic microvessels that results in improvement of myocardial perfusion and contractile function in ischaemic myocardium.

Methods: Swine chronic myocardial ischaemia was created by placing Ameroid constrictor around the proximal left circumflex coronary artery. Animals (n = 6 per group) were randomised to receive intramyocardial injection of AdVEGF, AdVEGF+AdANG-1, AdVEGF+AdANG-2 or control AdNull vector in the ischaemic segment 4 weeks after onset of ischaemia. At week 8, myocardial tissue contractility was quantified using stress echocardiography and immunohistomorphometric analysis was performed to determine arteriole growth and vascular development.

Results: Regional myocardial perfusion recovered 4 weeks following VEGF+ANG-1 (+18.2%) treatment, but not VEGF+ANG-2 or VEGF despite significantly increased arteriolar density in both VEGF+ANG-1 (20.9±0.9 arterioles/mm², P=0.02) and VEGF+ANG-2 (21.3±1.0 arterioles/mm², P=0.007) groups as compared to VEGF alone (17.3±0.9 arterioles/mm²). Peak regional systolic myocardial tissue velocity deteriorated in VEGF (-20.1%) and VEGF+ANG-2 (-10.6%) treated groups while systolic function improved in VEGF+ANG-1 (+23.4%) group with concurrent recovery (+43.6%) in diastolic performance. Contractility improvement was associated with maturity of the vasculature reflected by arterial enlargement and tight VE-cadherin/ β -catenin interactions between nascent vascular endothelial cells in response to VEGF+ANG-1.

Conclusion: Structural stability of functional neovascularisation of ischaemic myocardium contributes to systolic improvements. Maturity and functionality of intramyocardial microvessels involve coordinated regulation of complementary angiogenic factors.

BS21

Investigating the Use of Polycaprolactone Films for Vascular Tissue EngineeringMSK CHONG¹, J CHAN¹, SH TEOH², CN LEE³¹Obstetrics and Gynaecology, National University of Singapore, ²Mechanical Engineering, National University of Singapore, ³Surgery, National University of Singapore, Singapore**Aim:** The aim of the study was to engineer vascular tissue using novel polycaprolactone films and umbilical cord tissue-derived stem cells.**Methods:** High-strength, ultra-thin polycaprolactone (PCL) films were fabricated and modified to incorporate bioactive molecules onto the material surface. Four sample groups were studied: pristine PCL films (group PCL), polyacrylic acid-grafted films (PCL-PAAc), CD34-antibody conjugated films (PCL-34) and collagen-grafted films (PCL-Col). Subsequently, the films were evaluated for biocompatibility based on cytocompatibility and haemocompatibility. Endothelial progenitor cells (EPC) and umbilical cord-derived mesenchymal stem cells (MSC) were seeded onto the modified films. Cell adhesion, viability and phenotype were assayed using immunocytochemistry. Haemocompatibility was measured by studying the clot formation, platelet adhesion and contact activation of whole blood (measured by thromboelastography) in response to the modified materials. EPC and MSC were co-cultured on reverse sides of PCL films to demonstrate the generation of vascular analogues.**Results:** Confocal microscopy of the cytoskeletal structures indicated that MSC attached well to PCL-PAAc, and that EPC attached best to PCL-34 and PCL-Col. High viability of both cell types were ascertained on the respectively modified films, and expression phenotype was retained. Modified PCL film demonstrated improved haemocompatibility as indicated by reduced blood coagulation index, reduced platelet adhesion and delayed clot formation in TEG assays. EPC and MSC were successfully co-cultured in representative intimal and adventitial compartments.**Conclusion:** PCL films represent a feasible scaffold for use in vascular tissue engineering. Future work involves detailed mechanical testing and *in vivo* studies in small animal models of vascular grafting.

BS22

E-Selectin-B Cell Interactions Under Defined Flow Conditions is Mediated by L-Selectin and β 1-IntegrinJR LIN¹, SM CHONG², YC LIM^{1,3}¹Pathology, Yong Loo Lin School of Medicine, National University of Singapore, Singapore, ²Department of Pathology, Faculty of Medicine and Health Sciences, UAE University, UAE, ³Physiology, Yong Loo Lin School of Medicine, National University of Singapore, Singapore**Aim:** E-selectin expression is induced on activated endothelial cells by pro-inflammatory signals. E-selectin and its ligands mediate the initial tethering and rolling of leukocytes on endothelium. Compared to neutrophils and T cells, the mechanism(s) underlying B cell-E-selectin interactions is not fully elucidated. This study aimed to identify the E-selectin ligands expressed on B cells that mediate interactions with E-selectin under defined flow conditions.**Methods:** Flow cytometry was used to characterise the adhesion molecules expressed on the surface of a B lymphoma cell-line, NB-DLB-1. NB-DLB-1 cells interactions with E-selectin were ascertained using the parallel plate flow chamber system. Adhesion molecules

that could mediate E-selectin interactions were identified in function blocking assays.

Results: Cultured NB-DLB-1 cells expressed various known E-selectin ligands (CLA, PSGL-1, L-selectin and CD44) and integrin subunits (α 4, α L, β 1 and β 2). Under defined flow conditions, NB-DLB-1 cells interacted with E-selectin in a shear-dependent manner. Pretreatment of NB-DLB-1 cells with function blocking antibodies to L-selectin or β 1-integrin (alone or in combination) significantly reduced these interactions as compared to non-blocking controls. Interestingly, E-selectin ligands on NB-DLB-1 cells were mostly sialic acid-dependent, but a minority was independent of sialylation.**Conclusion:** Our data suggest L-selectin and β 1-integrin are putative E-selectin ligands on NB-DLB-1 cells. This is the first time that β 1-integrin has been shown to interact with E-selectin under defined flow conditions. As neoplastic lymphoma cells often retain the adhesive properties of normal B cells, these E-selectin ligands may have important physiological roles in B cell recruitment to sites of inflammation.

BS23

Optimisation of Bioplex-200 SNP Detection System, a Potential Technology for Non-Invasive Prenatal Diagnosis of Thalassaemia Using Fetal DNA in Maternal PlasmaS BAIG¹, SSY HO², SH KOO³, S PONNUSAMY¹, LL SU², A BISWAS², E LEE³, M CHOOLANI²¹Obstetrics & Gynaecology, National University Hospital, Singapore,²Obstetrics & Gynaecology, National University of Singapore, Singapore,³Pharmacology, National University of Singapore, Singapore**Aim:** Currently available prenatal diagnostic tests require invasive procedures that carry a small but significant risk of miscarriage. The discovery of 3% to 6% cell-free fetal DNA in maternal plasma (FDMP) was a major breakthrough towards achieving non-invasive prenatal diagnosis (NIPND). Thalassaemia remains a significant public health concern in Southeast Asia. We hypothesised that Bioplex-200, a microsphere-based suspension array technology is ideal for rapid and reliable single nucleotide polymorphism (SNP)-based NIPND of thalassaemia.**Methods:** A panel of 6 SNPs located within common ^{-SEA}, ^{-THAI} and ^{-FIL} deletions of alpha-globin gene were selected based on local population diversity. PCR was carried out targeting these SNPs using reaction parameters simulating clinical scenario of FDMP (1:50 mixture of 0.1 ng/ μ L DNA template of known genotypes, corresponding to 2% FDMP). PCR products were then subjected to allele-specific primer extension, hybridisation and detection by flow cytometry.**Results:** We were able to detect 1 target copy in every 50 background copies at 0.1 ng/ μ L DNA mixtures, representative of the minute amount of fetal DNA in a high background of maternal plasma (approximately 20 copies per mL of maternal plasma). The mean fluorescence intensity of minor target in major diluent was markedly higher than that of the noise levels. This was essential for accurate detection of fetal DNA in maternal plasma.**Conclusion:** Bioplex, being highly sensitive, specific, accurate, cost-effective and rapid, is a useful diagnostic tool for SNP-based NIPND of thalassaemia. The detection of paternally-inherited fetal SNPs in maternal plasma will exclude unaffected mothers from unnecessary invasive prenatal testing.

BS24

Integration of Transplanted Human Cardiomyocyte-like Cells in Infarcted MyocardiumWSN SHIM^{1,2}, G TAN¹, YY CHUNG¹, SY LIM¹, L QIAN¹, E SIM², P WONG¹¹Research and Development Unit, National Heart Centre, Singapore, ²Surgery, National University of Singapore, Singapore

Aim: Cell therapy improves cardiac function by repairing infarcted cardiac muscle and enhancing angiogenesis in ischaemic myocardium. We investigated the fate of differentiated human cardiomyocyte-like cells (CLCs) and undifferentiated mesenchymal stem cells (MSCs) in a rat myocardial infarction model.

Methods: Bone marrow stem cells were isolated from sternum of 42 patients undergoing coronary artery bypass grafting surgery. Myocardial infarction was created by ligating left anterior descending coronary artery of Wistar rats 1 week before cell transplant. Five million CM-DiI-labelled CLCs, CFDA-labelled MSCs or serum-free medium were injected into the peri-infarcted regions of myocardium. Hearts were explanted 6 weeks after cell transplant for histology studies to track the fate of transplanted cells as well as structural changes in the infarct.

Results: Transplanted CLCs migrated to mid-myocardium and endocardium that showed high levels of collagen V expression while MSCs were mainly found localising to vascular structures in infarcted regions that were abundant in collagen I matrix. In contrast, CLCs were located near intact cardiac myofibres with some CLCs integrated into the syncytium and showed cross-striation of I-band and A-band of cardiac α -actinin and β -myosin heavy chain respectively.

Conclusion: MSCs showed propensity to co-localise with collagen I in smooth muscle actin and von Willebrand factor stained vessel structures in the infarct. Transplanted CLCs were located together with collagen V matrix in peri-infarcted and intact myocardium. Pre-differentiation of stem cells to cardiomyocyte-like cells may help their engraftment into cardiac syncytium as functional cardiomyocytes.

BS25

Study of the Interactions Between Immunomodulatory Protein Fve and Dendritic CellsY DING¹, SV SEOW¹, CH HUANG¹, KY CHUA^{1,2}¹Paediatrics, Yong Loo Lin School of Medicine, National University of Singapore, Singapore, ²Immunology Program, Yong Loo Lin School of Medicine, National University of Singapore, Singapore

Aim: Our previous data showed that an immunomodulatory protein Fve has potent adjuvant properties. Co-administration of HPV Type-16 E7 protein and Fve could enhance E7-specific humoral and cellular immune responses for control of HPV-associated cervical cancer in a mouse model. To further investigate the underlying mechanisms, we aim to explore the interaction of Fve and dendritic cell *in vitro* and *in vivo*, and evaluate the role of Fve-stimulated T cells in the innate immunity.

Methods: For *in vitro* evaluation of DC-Fve interaction, mouse BM-DCs were stimulated by either PBS or Fve for 16 hours. For *in vivo* evaluation, C57BL/6 mice were injected intravenously with either PBS or Fve for 12 hours. The Fve-stimulated BM-DCs and splenic DCs from injected mice were subsequently analysed by functional

assays. Purified BM-DCs or splenic DCs were pulsed with the OVA₃₂₃₋₃₃₉ peptide or SIINFEKL for 2 hours. Pulsed DCs were then co-cultured with OT-II CD4⁺ T cells or OT-I CD8⁺ T cells, respectively, for 72 hours. The surface markers of DCs were stained and analysed by flow cytometry while T cell proliferations were assayed by ³-Thymidine and cytokine profiling were performed by enzyme-linked immunosorbent assay. For T-DC interaction, naïve T cells were pre-stimulated by Fve for 24 hours and then co-cultured with DC in a Transwell system. The surface markers of DCs were analysed by flow cytometry after 12 hours.

Results: Fve significantly upregulated MHC-II, CD86 on the splenic DCs *in vivo* but not on the BM-DCs *in vitro*. However, Fve pre-stimulated T cells could help to upregulate the surface markers of BM-DCs in a cell-cell contact manner. *In vivo* Fve stimulated splenic DCs induced IL-2 and IFN- γ production by transgenic CD4⁺ and CD8⁺ T cells.

Conclusion: Fve could stimulate dendritic cell maturation *in vivo* and naïve T cell may play a helper role in the maturation of DCs.

BS26

Tooth Recycling — The Role of Cell-Based Therapy on the Critical-sized Periodontal Defect in Replanted Canine TeethDV DO¹, TO CHUNG¹, V SAE-LIM¹, TT PHAN²¹Restorative Dentistry, Faculty of Dentistry, National University of Singapore, Singapore, ²Surgery, School of Medicine, National University of Singapore, Singapore

Aim: The aim of this study was to evaluate histologically the effect of periodontal cell dipping and cell-sheet wrapping on replacement root resorption of delayed-replanted canine teeth.

Methods: Thirty-nine canine roots were used. Four roots each in the negative control and the positive control groups were endodontically treated, extracted and replanted immediately and after 1-hour bench-dry. The remaining experimental roots were extracted for periodontal fibroblasts explant. The latter was subcultured with a medium containing 200 μ g/mL of ascorbic acid. These experimental roots were then endodontically treated, root surface denuded, sterilised with ultraviolet light and conditioned with 17% EDTA. The treated experimental roots were either dipped in a 30-minute suspension of 1×10^7 cells or cell-sheet wrapped. The cell-coated roots were subsequently replanted according to a submerged protocol. After 6 and 12 weeks of observation, the roots and the jaw bone were harvested, step-serially sectioned and histomorphometrically evaluated. Statistical analysis was performed.

Results: Roots in the negative control group showed complete healing with the regenerated periodontal ligament tissue. Roots in the positive control group showed varying degrees of adverse outcome of replacement root resorption. The experimental roots in both cell dipping and cell sheet groups showed a dense ring of connective tissue around the roots with no evidence of replacement root resorption or inflammatory root resorption.

Conclusion: Application of a periodontal cell dipping or cell-sheet wrapping could prevent replacement root resorption in delayed-replanted canine teeth. This study implicates the role of cell-based therapy on critical-sized periodontal defects which could potentially be exploited in tooth recycling and/or transplantation.

BS27

Mucocutaneous Junction of Eyelid and Lip Mediates Separation of Two Dissimilar Epithelia: A Study of the Transition Zone Using Epithelial Cell MarkersAK RIAU¹, VA BARATHI¹, RW BEUERMAN^{1,2}¹Singapore Eye Research Institute, Singapore, ²Ophthalmology, Yong Loo Lin School of Medicine, National University of Singapore, Singapore

Aim: Clinically, the breakdown of the tissue boundaries in the mucocutaneous junction (MCJ) of eyelid can lead to cicatricial complications of the Stevens-Johnson syndrome, ocular cicatricial pemphigoid and dry-eye syndrome. Similarly, the breakdown of MCJ in the lip can lead to actinic cheilosis. In this study, the expression of various epithelial cell makers in the mouse eyelid and lip was investigated in order to understand the nature of the interactions of mucosal and skin epithelium in the formation and maintenance of MCJ.

Methods: Cryosections of eyelid and lip tissue from normal mice were examined immunohistochemically with cytokeratins (CKs): CK1, CK4, CK5, CK6, CK10, CK13, CK14, and CK19; filaggrin; involucrin; and connexin 43.

Results: The expression pattern varied across the MCJ, with the absence of CK1, CK10 and filaggrin in the mucosal epithelium and CK4, CK6 and CK13 in the skin epidermis. CK5 and CK14 were consistently expressed in full-thickness of skin, MCJ, and mucosa. CK19 was expressed basally, while involucrin-positive cells were found superficially in skin, MCJ, and mucosa. Connexin 43 was present in the MCJ, skin and labial mucosa but little to no expression was seen in the palpebral conjunctiva.

Conclusion: The origin and distribution of mucosal progenitor cells in the eyelid may be different than those in the lip. The results also suggest complex regulatory mechanisms maintain the epithelial boundaries.

BS28

Distinct NF- κ B Components are Deranged in Primary and Recurrent Pterygium: New Molecular Targets for Therapy

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Aim: Pterygium is a common ocular surface disease manifesting as a fibrovascular conjunctival outgrowth that invades the cornea, causing visual disturbance and irritation. Mechanisms of this disease may involve processes such as proliferation, angiogenesis, epithelial mesenchymal transition (EMT), and inflammation. Nuclear Factor (NF)- κ B, a transcription factor involved in these biological processes, has not been investigated in pterygium. Elucidating the role of the NF- κ B pathway in the pathogenesis of pterygium was the goal of this study.

Methods: Patients undergoing primary or recurrent pterygium excisions were studied. The U133A GeneChip was used to analyse gene expression, and immunohistochemistry and western blots were performed to evaluate various NF- κ B members. To investigate the role of NF- κ B in cell proliferation, cultured human corneal epithelial cells were treated with inhibitors of IKK, an upstream positive regulator of NF- κ B.

Results: Transcripts of p65 were upregulated in primary pterygium and downregulated in recurrent pterygium. Transcripts of p100 and c-Rel were upregulated, but I κ BKAP, a scaffolding protein regulator of NF- κ B, was downregulated in recurrent pterygium. p65, p50 and

p100 were present in pterygium epithelium on immunohistochemistry. Inhibition of IKK1/2 for 24 hours increased proliferation of epithelial cells.

Conclusion: Alteration of the NF- κ B pathway may trigger epithelial cell dysfunction, such as excessive proliferation, possibly leading to pterygium formation or recurrence. Specific molecules that regulate NF- κ B may be useful to treat early pterygium or prevent recurrence after surgical excision.

BS29

Laser Effect on Contact Angle and Surface Free Energy of Natural Enamel

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Aim: The susceptibility of a tooth to caries is dependent on its surface properties (contact angle and surface free energy), which may dictate the biofilm formation on enamel. Laser-induced retardation of enamel demineralisation has been confirmed but the effect on bacterial colonisation remains unknown. Therefore, this study was purposed to evaluate the effect of laser on the contact angle and surface free energy of intact natural human enamel.

Methods: Six sound adult incisors were selected. Er:YAG laser (100mJ-5Hz-5seconds) were applied on 2 spots of each tooth. Contact angles were measured by the sessile drop technique on the 2 spots using a goniometer before and after laser treatment. Water, formamide and diiodomethane were used as probe liquids. The surface free energy was derived from contact angle and separated into dispersion and Lewis acid-base component comprising the electron-donor and electron-acceptor parameters. Laser effects on contact angle and surface free energy were evaluated by paired sample t-tests.

Results: The contact angle of water-enamel increased from 64.54° (11.53) to 66.37° (7.93) ($P=0.673$). The contact angle of formamide-enamel decreased from 61.63° (6.91) to 57.55° (4.70) ($P=0.177$). The contact angle of diiodomethane-enamel increased from 49.35° (3.43) to 54.35° (3.93) ($P=0.001$). Indicating non-polar van der Waals forces and giving information mainly on hydrophobic interaction, dispersive surface energy γ^D decreased from 34.61 (1.99) to 31.81 (2.34) mJ/m² after laser treatment ($P=0.001$). Involving non-dispersive forces and relating to hydrophilic interactions, non-dispersive surface energy γ^{AB} decreased from 7.75 (6.86) to 3.87 (2.99) mJ/m² ($P=0.171$). The total surface energy γ^{Total} decreased from 42.36 (7.89) to 35.68 (2.59) mJ/m² ($P=0.023$).

Conclusion: Laser treatment may be promising in inhibiting the bacterial colonisation on human enamel.

BS30

Phospholipase D Isoforms in Human Ocular Surface: Importance in Pterygium Disease FormationJ CHEW¹, L TONG^{1,2}, RW BEUERMAN^{1,3}¹Singapore Eye Research Institute, ²Singapore National Eye Centre, Singapore, ³Ophthalmology, Yong Loo Lin School of Medicine, National University of Singapore,

Aim: Pterygium is an ocular surface disease of unknown etiology characterised by fibrovascular proliferation and advancement of tissue onto the cornea, resulting in irritative symptoms, visual dysfunction and cosmetic blemish. Phospholipase(PL)-Ds are members of an important class of enzymes involved in inflammation

and differentiation. In corneal epithelial cells, these enzymes play a role in wound healing, and they may suppress apoptosis and increase cell motility. We investigated the presence of PLD subtypes in native ocular surface tissue and pterygium.

Methods: This study involved paired un-involved conjunctival and pterygium tissues from 6 patients. Reverse transcription semi-quantitative and quantitative PCR were performed to assess transcript levels for PLD1-5 in normal conjunctiva and pterygium tissue. Immunofluorescent staining and Western blot using antibodies against PLD1/2 were performed.

Results: PLD1, 2, 3 and 4 transcripts were detected in normal conjunctiva tissue, and types 2, 3 and 4 were upregulated in pterygium. Immunofluorescent staining showed the presence of PLD1/2 in normal cornea, conjunctival and pterygial epithelia. In normal cornea and conjunctival epithelia, the expression was mainly localised to the nuclei of the basal and suprabasal epithelial cells, whereas in pterygium, this expression was limited to the cytoplasm and peri-plasma membrane regions. Western blot confirmed the presence of PLD1/2 in proteins extracted from pterygium and conjunctiva tissue.

Conclusion: PLD subtypes are present in human ocular surface epithelium. Since there is differential regulation of PLD in pterygium, we hypothesize that phospholipase-D may be involved in pterygium pathogenesis, and intervention in PLD pathways may reduce horizontal migration of pterygium.

BS31

Visceral and Subcutaneous Adipocytes from Obese Asian Subjects Showed Differential Inflammatory Cytokines and Receptors Gene Expression

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Aim: Adipocyte secretes a wide spectrum of inflammatory cytokines which profoundly influence metabolic processes. Evidence suggests that visceral adipose tissue showed dense macrophage infiltration and is particularly pro-inflammatory. We tested the hypothesis that site-specific adipocyte shows differential inflammatory cytokines and receptors gene expression.

Methods: Subcutaneous and visceral adipose tissues were obtained during bariatric surgery from obese Asian subjects. Adipocytes from visceral (test) and subcutaneous (control) tissue were isolated and cultured *in vitro*. Total RNA was extracted and reverse transcribed to cDNA with random primers. PCR array was performed on a panel of 84 human inflammatory cytokines and receptor (RT² Profiler™ PCR Array) genes using real-time PCR. Fold change in gene expression was calculated using $2^{-\Delta\Delta Ct}$.

Results: Differential gene expression (>2-fold change) was observed between visceral and subcutaneous adipocyte. Six chemokines were upregulated and 4 were downregulated. The genes upregulated in visceral adipocyte were chemokines(C-C motif) ligand 21, CCL21 (3.5 fold); chemokines (C-C motif) receptor 5, CCR5 (2.1 fold); CCL7 (2.9 fold); chemokines (C-X-C motif) ligand 13, CXCL13 (3 fold); CXCL11 (2.1 fold); and interleukin-1 α , IL-1 α (2.1 fold). The member of IL-1 family, IL1F7 (-2.4 fold); IL13 (-2.2 fold); IL5 (-9.7 fold) and chemokine CCL24 (-4.8 fold) were downregulated.

Conclusion: Our data revealed enhanced expression of chemokines ligand (CCL21, CCL7, CXCL13, CXCL11), chemokines receptor (CCR5) and IL-1 α in visceral adipocyte. These adipocyte-derived

chemokines may attract macrophage infiltration. The consequent paracrine crosstalk between macrophage and adipocyte in visceral adipose tissue may accentuate its pro-inflammatory properties.

BS32

Culture of Meibomian Gland Confirmed by Meibum Lipids Staining

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Aim: Meibomian glands are responsible for the secretion of meibum lipids, substances that prevent evaporation of the eye's tear film, prevent tear spillage over the eyelid margin, and provide structural and refractive integrity to the ocular surface. The aim of this study was to establish a culture for meibomian gland to study meibomian gland function at cellular level.

Methods: Tissue was isolated by microsurgical dissection. Both ductal and acinar elements were separated by subsequent microsurgical manipulation, followed by enzymatic digestion in 0.25% collagenase A and 0.6U/ml dispase II, at 37°C for 3 hours. Epithelial outgrowth was derived from tissue fragments using Type I collagen coated culture dishes in medium. To determine whether the cultured cells produced lipid, colonies were stained with oil-red-O (ORO). The distribution of cytokeratin (CK) 14 was immunohistochemically confirmed *in vivo* and *in vitro*. Lipid and ultrastructure were observed by transmission electron microscopy.

Results: Three to 4 days after the primary culture of excised fragments of meibomian gland, a monolayer of cells was observed growing from the tissue fragments. When the primary culture had grown to a subconfluent monolayer, they were subcultured. The cells were confluent by day 8 and appeared cobblestone-like. After 2 weeks, a frothy appearance was seen in the cells. Both P0 and P1 cells contained lipid droplets in the cytoplasm, and were positively stained with ORO. CK14 was also positively stained in the cultured cells.

Conclusion: This culture system will allow future exploration of the regulatory mechanism of meibomian gland differentiation at the cellular level.

BS33

Do Stem/Progenitor Cells Exist in Human Breast Milk?

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Aim: We have previously demonstrated the presence of cells bearing stem/progenitor markers. We aimed to isolate these cells, characterise them and explore their potential to proliferate and differentiate.

Methods: A cellular fraction of human breast milk (HBM) was collected by centrifugation, and FACS sorted for side-population or CD133-positive cells. Both positive and negative fractions were characterised for epithelial and non-epithelial lineage markers via flow cytometry. Their potential to differentiate and proliferate was investigated with various specific culture media.

Results: Side-population was found at an average of $1.8 \pm 0.4\%$ (SEM, n = 18) and CD133-positive cells made up $1.7 \pm 0.5\%$ (SEM, n = 10) of the cellular fraction of breast milk. Expression of CD45,

lin, CD105 and CD326 differed between SP and NSP ($5.7 \pm 2.3\%$ vs $12.7 \pm 4.6\%$, $37.8 \pm 17.8\%$ vs $5.7 \pm 1.5\%$, 27.9 ± 9.9 vs 6.5 ± 4.4 and 50.6 ± 8.6 vs 18.1 ± 6.0) but only the difference in CD326 was significant ($P = 0.25, 0.26, 0.32$ and 0.02 respectively). In the case of CD133⁺ and CD133⁻ cells, considerable differences were noted for CD45 and CD105 (4.2 ± 1.9 vs 8.2 ± 2.1 and 2.8 ± 1.3 vs 13.0 ± 1.8) although they were statistically insignificant ($P = 0.21$ and 0.09 respectively). The sorted cells neither developed mammospheres nor formed haematopoietic colonies when placed in an established medium.

Conclusion: Despite the existence of both SP and CD133 cell types in HBM, there is no evidence that they fulfill any of the stem cell criteria for clonogenicity and differentiation. We speculate that these markers may have identified progenitor and other differentiated cell types instead.

BS34

Endothelial Progenitor Populations from Fetal Tissue

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Aim: This study aimed to identify and characterise endothelial progenitor cells (EPC) from mid-gestation haematopoietic tissue.

Methods: Following gradient centrifugation to remove red blood cells, 2 different methods of isolation were employed. Using adhesion selection, EPC were isolated from fetal blood by culturing the mononuclear cells (MNC) on collagen-coated plates, in an endothelial growth medium. Endothelial cell colonies with extensive proliferative potential were generated after 2 weeks. EPC were obtained from fetal liver using immunoselection. CD133 positive cells (FL133⁺) were isolated from fetal liver MNC using magnetic affinity cell separation. FL133⁺ populations were expanded in a cytokine cocktail for 2 weeks and transferred to an endothelial differentiation medium. All putative EPC were evaluated for expression of endothelial markers as well as tube forming capacity in Matrigel. The ability of these cells to rescue ischaemic tissue was studied in a mouse model of hind limb ischaemia.

Results: Two different EPC populations were successfully isolated from fetal tissue. The cells expressed endothelial markers and showed great capacity for expansion. EPCs were able to rescue ischaemic tissue by increased vascularisation.

Conclusion: Fetal EPC are capable of extensive expansion and generation of endothelial cells. These cells represent a potential cell source for regenerative therapy of ischaemic tissue. Future work involves understanding the mechanism of action and improving the purity of the populations.

BS35

Structure and Function of the Porcine Retina Embolised by Microspheres

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Aim: The purpose of this study was to investigate the effects of embolisation of the inner retinal capillary circulation in the pig using fluorescent microspheres of 10 and 15 μm in diameter.

Methods: The effects of embolisation on the structure of the retina have been investigated by light and electron microscopy and on

function by electrophysiology. Gene expression of angiogenic factors has been quantified by RT-PCR and the distribution of such factors in the embolised retina by immunohistochemistry. Using a transcarotid arterial in-house manufactured cannula that can deliver microspheres to the origin of the artery supplying blood to the eye, we have developed a reliable model of retinal capillary closure with some of the features of pre-proliferative diabetic retinopathy.

Results: The major features of the embolised retina are degenerative changes and both intra-cellular and extra-cellular oedema affecting the inner to mid retina with relative sparing of the outer retina and RPE. Functionally there is a reduction in the scotopic b-wave of the electroretinogram and in some eyes a degree of reduction in the a-wave. Embolisation of the retina resulted in an early upregulation of the hypoxia inducible factor-1 (HIF-1 α), VEGF and nitric oxide synthase and a later upregulation of VEGF receptors.

Conclusion: The model is proving useful for the study of some of the consequences of retinal capillary closure such as those that occur in pre-proliferative diabetic retinopathy.

BS36

Cellular Uncertainty — Fuel for Carcinogenesis?

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Current evidence supports genetic instability as the underlying mechanism behind carcinogenesis, yet the reason for it remains unknown. Molecular interactions which obtain genetic information from DNA sequences constitute as cellular measurement processes that are subject to uncertainty. Measurement uncertainty at the cellular level, cellular uncertainty, results in imprecision of the recognition, replication and transfer of genetic information, leading to intrinsic genetic instability in all biological cells. In this paper, a model for amplified genetic instability in cancer cells is proposed using the concept of cellular uncertainty. It is suggested that sources which contribute to cellular uncertainty include the Heisenberg Uncertainty Principle, thermodynamic fluctuations, and the Observer Effect. Mechanisms of uncertainty reduction exist either to restore genetic fidelity through DNA repair systems, or to avoid the possibly deleterious consequences through redundancy in genetic information as well as mutation suppression. Finally, it is hypothesised that the cancer cell is a complex emergent structure in which the underlying altered molecular signaling network is attributed to aberrant genetic information as a result of amplified measurement uncertainty. Measurement uncertainty may be enhanced as a result of increases in quantum and thermodynamic fluctuation, or due to failure of uncertainty reduction mechanisms. In conclusion, there is suggestive evidence that uncertainty is a fundamental property of molecular measurements on genetic information, the amplification of which predisposes to amplified genetic instability and cancer development.

BS37

An In Vitro Study on Fluoride Release from Various Dental Composites

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Aim: This study aimed to investigate the fluoride release profile of 4 dental restoratives, and interaction with artificial saliva, distilled water and citric acid by measuring pH change of the solutions.

Methods: The materials studied were a giomer (Beautifil II [BF]), a

compomer (Compoglass F [CF]), a nano-composite (Filteck Z350 [FZ]) and a micro-filled composite (Inten-S, [IS]). Thirty-six specimens for each material were produced according to manufacturers' instructions, and divided into Group 1 fluoride release and Group 2 pH measurement. Eighteen of them were randomly selected for each group and subdivided into 10 mL of Fusayama's artificial saliva, distilled water and citric acid of pH 3 at 37°C for 1, 3, 5, 7, 14 and 28 days. The amount of total and free fluoride ions released from the materials was measured by ion-selective electrode; the solution pH was examined using a pH electrode (Sartorius Professional Meter PP25-P11). Data were subjected to ANOVA/Scheffe's test at 0.05 significance level.

Results: CF showed significantly higher amounts of total and free fluoride released in all the solutions over time than others, ranging from 0.09 to 6.00 ppm. The total amount of fluoride release in BF significantly increased after conditioning in CA, where pH rose from 3.40 to 5.38. Greater amount of fluoride was found in the materials conditioned in CA than other solutions.

Conclusion: The nature of fluoride incorporated in the dental materials affects the amounts of free and total fluoride ions released from the materials. It also influences interaction between materials and their surrounding liquids.

BS38

Water Sorption and Solubility of Resin-Based Dental Materials

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Aim: The purpose of this study was to investigate the water sorption and solubility of resin-based dental restorative materials.

Methods: The materials evaluated included a giomer (Beautifil II [BF]), a compomer (Compoglass F [CF]), a nano-filled composite (Filtek Z350 [FZ]) and a micro-filled composite (Inten-S [IS]). Thirty-six specimens for each material were produced according to manufacturers' instructions and then subjected to a water sorption test based on the ISO4049 requirements. The specimens were stored in distilled water and citric acid of pH 3 at 37°C for a period of 1, 7 and 30 days. Data were subjected to 1-way ANOVA/ Scheffe's test at 0.05 significance level.

Results: CF significantly showed the highest level of water sorption ($31.39 \pm 8.36 \mu\text{g}$) and solubility ($61.56 \pm 12.21 \mu\text{g}$) after conditioning in CA for a day. At 30 days of conditioning in DW, BF had significantly less water sorption than CF and FZ.

Conclusion: The degree of water sorption and solubility is material dependent, which appears to be influenced by the composition of resin.

BS39

An In Vitro Study on Wear Resistance of Dental Restoratives

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Aim: This study aimed to examine wear resistance of 5 dental restoratives and interaction with distilled water by investigating with Fourier transform infrared spectrometer (FTIR).

Methods: The materials studied were a micro-filled hybrid (AElite All-Purpose Body [AE]), a giomer (Beautifil II [BF]), a compomer (Compoglass F [CF]), a nano-composite (Filteck Z350 [FZ]) and a micro-filled composite (Inten-S, [IS]). Three specimens for each material were produced according to manufacturers' instructions. The customised wear machine was a reciprocating compression-sliding system where the materials were moved and worn back-and-forth against a stainless steel flat-ended counter-body of 1 mm in diameter at 100 cycles/min in distilled water. Roughness Ra and Ry of the wear tracks were measured by a surface roughness tester (Mitutoyo, SJ-400) after 5,000, 10,000 and 20,000 cycles. FTIR (PerkinElmer, Spectrum 100) was used to examine chemical changes in the materials' surface. Data were subjected to ANOVA/Scheffe's test at 0.05 significance level.

Results: For all materials except IS, Ra and Ry after 10,000 cycles were significant higher (0.42 ± 0.06 vs $2.9 \pm 0.26 \mu\text{m}$). No significant changes in roughness were found in IS after 20000 cycles. BF showed significantly higher Ra values after 10,000 and 15,000 cycles (0.47 ± 0.72 vs $2.80 \pm 0.69 \mu\text{m}$). For each material, no difference was found in the FTIR spectrums between each cycle except that the peak of C=C became less distinguished.

Conclusion: Within the limitation of this study, IS showed better wear resistance than other materials after 20,000 cycles in distilled water. The materials showed little chemical change after wear but increased surface roughness.

BS40

Cardiomyogenic Differentiation of Adult Human Mesenchymal Stem Cells in Embryonic Cardiomyocytes-Conditioned Medium

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Aim: This study aimed to induce cardiomyogenic differentiation of adult human mesenchymal stem cells with embryonic cardiomyocytes-conditioned medium.

Methods: Bone marrow-derived adult human mesenchymal stem cells (hMSCs) were cultured for 5, 7, 14 and 21 days in the cultural medium derived from a rat embryonic cardiomyocyte (eCM) cell line, H9C2. The potential cardiomyocyte phenotypes acquired by hMSCs were characterised by immunofluorescent microscopy assay. Two major steps in cardiomyogenesis were analysed: (1) expression of cardiac gene transcriptional factors, GATA4 and Nkx2.5, and (2) expression of cardiac contractile proteins (α -actinin) and formation of sarcomeric structures.

Results: Treated hMSCs showed slowed growth from day 14 onwards, enhanced nuclear translocation of GATA4 and Nkx2.5 from day 5 to 14, and emerged nascent sarcomeric structures in their cytoplasm (represented by α -actinin staining) from day 7 onwards.

Conclusion: Safe and effective pre-transplantation differentiation of adult hMSCs is highly desirable in future cardiac stem cell therapy. Our preliminary study, for the first time, showed that eCM-derived conditioned medium could induce the cardiomyogenic differentiation of adult hMSCs. In future, identification of key molecules in the conditioned medium may contribute to a clinical applicable protocol.

BS41

Development of a PCR Assay for the Rapid Detection of *Salmonella* Enterica SerovarsMI ISMAIL^{1,2}, C CHEANG^{1,2}, LM NG², JWP TEO², RTP LIN²¹School of Life Sciences & Chemical Technology, Ngee Ann Polytechnic, Singapore, ²Laboratory Medicine, National University Hospital, Singapore

Aim: Enteric (typhoid or paratyphoid) fever is a systemic infection caused by *Salmonella enterica*, including *S. enterica* serotype Typhi (*S. typhi*) and serotype Paratyphi (*S. paratyphi*). These fevers remain a serious public health problem especially in developing countries. Diagnosis and identification of *Salmonella* serovars based on culture is time-consuming, taking several days for a result. And the Widal test which has been traditionally employed as a rapid serological screening test is not without its controversy. As an alternative, polymerase chain reaction (PCR)-based molecular testing could offer a highly specific, sensitive and quick diagnosis of salmonellosis hence allowing the prompt clinical treatment of the infection. Our aim is to develop a PCR assay for the rapid detection and identification of *S. enterica* serovars.

Methods: PCR primers targeting *Salmonella* genus-specific or serovar-specific gene regions were selected from several published sources or designed based on previously published data. For development and evaluation of the assay, PCR using individual primer sets was performed on 6 ATCC *S. enterica* serovars, 4 *S. enterica* clinical isolates and 8 non-*Salmonella* gram-negative bacteria species.

Results: Our experimental results showed that PCR with *Salmonella* genus-specific, *S. typhi*-specific and *S. paratyphi* A-specific primers specifically amplified their respective serovars. The robustness of this assay would be assessed by further testing with 91 *S. enterica* clinical isolates. Other serovar-specific primers will also be assessed in order to enable differentiation of other clinically important serovars such as *S. typhimurium*, a close genetic relative of *S. typhi*.

Conclusion: Following this work, a multiplex PCR could be developed in the future to allow a simple and rapid diagnosis of *Salmonella* infection, particularly of *S. typhi* and *S. paratyphi* A.

BS42

Development of Educational DNA Fingerprinting KitGH CHAN^{1,2}, HX NG^{1,2}, SK ONG¹, J EE³¹Laboratory Medicine, National University Hospital, Singapore, ²School of Life Science and Chemical Technology, Ngee Ann Polytechnic, Singapore, ³Genecet Biotechnologies Private Limited, Singapore

Aim: This study aimed to design a kit to teach primary school students on DNA fingerprinting using dyes to simulate DNA fragments.

Methods: Nine loading dyes (0.8% w/v) were prepared with 30% glycerol and 0.5 M EDTA buffer. A 10 µL dye solution was loaded into a well in 1.5% agarose gel. Electrophoresis was conducted at 100V using 1X tris-acetate-EDTA buffer for 20 minutes. Using the retardation factor (R_f) of each dye e.g. xylene cyanol is logged at 1.5 cm from the well, suitable loading dyes with clear difference in R_f (Orange G: 3.6, Cresol Red: 2.2) were selected for mixing based on the theme of the kit e.g. murder kit. A final run was performed to verify that mixture of loading dye did not overlap after electrophoresis. A total of 4 combinations of dyes were packed into the kit along with ready-to-melt agarose gel, teachers' instruction manual, activity sheets for students and electrophoresis buffer.

Results: Dye bands separation was at sufficient distance upon run of

20 minutes. Diffusion of dye bands were observed after leaving the gel to stand for 10 minutes. Feedback from the primary school students showed enjoyment and interest in experimentation.

Conclusion: Further optimisation is necessary to maintain sufficient resolution of simulated DNA bands for at least 45 minutes. Possible improvements to kit include increase of agarose gel concentration, using an alternative electrophoresis buffer, post-electrophoresis treatment of gel, or use of new variations and types of dyes e.g. food dyes.

BS43

Low Level Methylation of Some Tumour Suppressor Genes in Nasal Polyps and Normal Nasal MucosaCW LI¹, Q TAO², YT PANG³, DY WANG¹¹Otolaryngology, National University of Singapore, Singapore, ²Department of Clinical Oncology, Chinese University of Hong Kong, Hong Kong, ³Otolaryngology, National University Hospital of Singapore, Singapore

Aim: This study aimed to evaluate the promoter methylation status of some common tumour suppressor genes (TSGs) in nasal polyps (NPs), a common benign outgrowth with inflammatory characteristics.

Methods: In this study, 24 nasal polyps and 10 controls of normal inferior turbinate (IT) mucosa were studied for the methylation status of 7 TSGs (p16, RASSF1A, SOCS1, TSLC1, SHP-1, CDH1, and DAPK1), using methylation-specific PCR.

Results: Methylation was not detected for 3 genes (p16, RASSF1A and SOCS1) in all samples. A tissue-specific methylation of SHP-1 was detected in all NPs and IT samples. Moreover, a low level methylation of TSLC1, CDH1 and DAPK1 was found in NPs and IT tissues, but with no difference in the frequencies of methylated cases. Detailed methylation analyses using bisulphite genomic sequencing revealed that at most only 10% of the DNA molecules were methylated for these genes. Low level methylation of CDH1 was also detected in PBMC from NP and control groups. Although a correlation ($P=0.015$) between CDH1 promoter methylation and its expression level in NP tissues was noticed, no correlation was found between TSG promoter methylation and infiltration of eosinophil and CD8+ T cells in NPs.

Conclusion: NPs are benign outgrowth not associated with methylation of p16, RASSF1A, SOCS1, which are frequently linked with tumour cell proliferation. Low level methylation of TSLC1, CDH1, and DAPK1 occurs in normal turbinate mucosa and NPs. Whether there is any other NP-specific methylated gene needs further investigations.

BS44

ERp29 Enhances Cell Invasion and Correlates with Tumour Progression in Breast CancerIF BAMBANG¹, D ZHANG^{1,2}¹Pathology, National University Health System, Singapore, ²Laboratory Medicine, National University Health System, Singapore

Aim: This study aimed to investigate the role and mechanism of ERp29 in breast cancer progression.

Methods: ERp29 expressions in breast tumours were performed by Western blotting and immunohistochemistry. ERp29-expressed transfectant MB231/erp29⁺, ERp29-silenced transfectant MB231/erp29⁻ and their respective controls MB231/ev and MB231/nc were selected by continuous incubation in medium with G418. Cell invasions of these transfectants were assayed using QCM cell invasion

method. Differentially expressed genes involved in cell invasion were carried out by PCR array and validated by both RT-PCR and Western blotting.

Results: ERp29 was highly expressed in ER-negative (vs -positive, $P = 0.016$) or HER-2-positive (vs. -negative, $P = 0.03$) breast tumours. Moreover, its expression was significantly increased in tumours with stage III ($P = 0.028$), or tumours with size of >5 cm ($P = 0.036$). However, ERp29 was not correlated to lymph node metastasis. *In vitro* study showed that cell invasion activity was highly increased in MB231/erp19⁺ cells (vs control MB231/ev) and decreased in MB231/erp29⁻ (vs control MB231/nc). ERp29 expression deregulated a group of genes involved in cell invasion. Of note, MMP3 and Kiss-1 were upregulated whereas CDH1 was downregulated in the MB231/erp29⁺ cells.

Conclusion: ERp29 is associated with aggressive phenotype and increased cell invasion in breast cancer by regulating cell invasion-related gene expression. It is a potential prognostic factor in clinical evaluation of breast cancer progression.

BS45

Human Leukocyte Antigen (HLA)-B Genotyping and Novel Alleles in the Singapore Population

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Aim: The purpose of this study was to establish the high-throughput HLA-genotyping platform as an integral component of the Singapore blood transfusion and transplantation clinical service programmes, and to document novel HLA genotypes in our local population and any population-based differences.

Methods: Genomic DNA was extracted from the peripheral blood leukocytes. HLA-B of class I was genotyped by PCR-DNA sequencing-based typing (PCR-SBT). Sequence-specific primers were used for PCR amplification, followed by sequencing and analysis using the ABI 3130 Prism[®] Genetic Analyzer. Genotypes of assayed samples were assigned by comparing the sequences to the HLA-B database in the UK-based public domain (<http://www.anthonynolan.org.uk/HIG/lists>) and the database in the Australia-based Assign SBT software.

Results: We performed HLA-B genotyping from 560 non-redundant case samples. Of the specimens, 28 were homozygous in their HLA-B alleles, and 183 had 2-5 different allele types in HLA-B. Importantly, several novel alleles were found in the local population. One novel allele had a single nucleotide mismatch with B*1301+B*400201: a unique T (not C) at position 760 in exon 4 resulting in a unique codon TTT (not CTT) at this location in HLA-B. The other novel allele had a single mismatch with B*510101+B*5401: a unique A (not C/G) at position 89 in exon 2 resulting in a unique codon AAG (not AGG or ACG) at this location in HLA-B.

Conclusion: PCR-SBT is a reliable and high-throughput technology in HLA genotyping. The 2 novel HLA-B alleles detected in this preliminary study on our local population is a primer for further work on a larger study population, as their documented existence would be valuable in building our specific population-based HLA genotypes.

BS46

Antibody Array-Based Proteomic Study for Biomarker Discovery in Keratoacanthoma and Squamous Cell Carcinoma of the Skin

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Aim: Unlike squamous cell carcinoma (SCC) which has aggressive behaviour, keratoacanthoma (KA) is another epidermal tumour characterised by its propensity for spontaneous regression. The aim of this study was to identify the differentially expressed proteins between KA and SCC and to evaluate their potential as biomarkers.

Methods: Total proteins were extracted from formalin-fixed, paraffin-embedded tissue sections from histologically-confirmed KA and SCC from the archives of cases diagnosed at the Department of Pathology, and differentially expressed proteins were investigated with antibody arrays including 60 cell cycle-associated molecules. Western blotting and immunohistochemical staining were performed using the specific antibodies in a panel of clinical specimens.

Results: We have identified a group of cell cycle-related proteins which were differentially expressed in KA and SCC. Of note, we found the level of p45skp2 (S-phase kinase associated protein 2) was highly increased, whereas those of BRCA1, Chk, GADD34, Rb2 and Rbx1&2 were decreased in SCC. Western blotting and immunohistochemistry studies demonstrated that p45skp2 was progressively increased from KA (regressive state) to KA (active state) and SCC. In contrast, Rb2 (retinoblastoma-like protein 2), a checkpoint molecule regulating cell division from G0 to early G1, was significantly reduced in SCC, compared to different types of KA.

Conclusion: Cell cycle-associated proteins, Rb2 and p45skp2, are differentially expressed in KA and SCC. Downregulation of Rb2 and upregulation of p45skp2 could be the molecular basis of enhanced cell division in SCC and with further investigation, may develop into predictive biomarkers for skin tumour progression.

BS47

The Role of Vimentin in Replication of Dengue Virus

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Aim: In viral infection, the formation of viral replication sites often results in rearrangements of cellular membranes and cytoskeletons. Studies have shown the involvement of vimentin in the replication of viruses by forming cage around the viral aggregates. The aim of our study was to confirm the involvement and role of vimentin in dengue virus replication as well as the possibility of vimentin being an antiviral approach.

Methods: In order to establish the involvement of vimentin in dengue viral replication, a novel tandem affinity pull-down assay was carried out with HepG2 cells which stably expressed the dengue NS4A protein. Immunofluorescence microscopy was also carried out with Huh7 cells infected with dengue 2 virus at various time points (6 hours to 4 days post infection) for localisation of viral protein and host proteins.

Results: Results of our tandem affinity pull-down assay confirmed the association between vimentin and dengue virus NS4A protein.

This association was further been confirmed by wild-type infection of dengue 2 virus in Huh7 cells where immunofluorescence assay had not only showed the co-localisation of dengue 2 replication complexes along vimentin filaments but also the rearrangement of vimentin filaments during the course of infection.

Conclusion: Our studies confirmed that vimentin associates with dengue NS4A. The rearrangement of vimentin filaments observed in the wild-type infection also implies that vimentin could possibly have an important role in the replication of dengue virus. Hence subsequent work using inhibitors as well as RNA interference could be carried out to further elucidate the precise role which vimentin plays in the replication of dengue virus infection as well as the possible anti-viral approach.

BS48

Study of Mechanical Properties of POP Fractions for the Simulation of Mechanical Strength of Calcium Phosphate Cement to be Used with Cancellous Bone in a Fracture Fixation

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Aim: Bone graft and bone substitutes have been used in fracture fixation be it in normal or osteoporotic bone for a long time. However, the rate of bone healing is a very slow process and it inhibits the mobility of patients. The biological bone cement, calcium phosphate, was thus introduced in fracture fixation application. It is however very costly when a huge amount (more than 10 cc) of calcium phosphate cement is needed in a fracture fixation. Plaster of Paris (POP: calcium sulphate hemihydrate) has been the nominated compound to simulate calcium phosphate cement as it offers a similar material at an economic cost. Unfortunately, the mechanical strength of POP varies widely when it is mixed with distilled water. The aim of this project was to evaluate the mechanical properties of an appropriate fraction of POP so that it could be used to simulate the mechanical strength of calcium phosphate cement.

Methods: The fractions of POP used included 1:1, 1:2, 2:1, 3:4, and 4:3. The fractions were based on equal weight of POP to volume of water ratio, e.g. 1 gram of POP to 1 mL of distilled water for 1:1 ratio. POP specimens came in the size of 8 mm in diameter and 16 mm in length for mechanical evaluation (compression and flexural [3-point] testings). The rate of compressive test was 5 mm/sec and the rate of flexural (3-point) test was 2 mm/sec.

Results: The POP fractions varied from 68.14 N to 509.29 N in compression and 9.14 N to 204.10 N in flexural. 2:1 POP fraction had the highest value in compression and flexural. There were other concerns with the mixture of 2:1 POP fractions because of the inconsistent results. This was due to the time in the specimen preparation. The protocol of mixing need to be carefully considered in order to ensure the consistency of the result in the study.

Conclusion:

BS49

Differential Expression of Genes in Mouse Sclera after Induction of Myopia

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Aim: The aim of this study was to investigate the regulation of scleral

fibroblast in mice after induction of experimental myopia.

Methods: We induced experimental myopia for 6 weeks in Balb/cJ by wearing of -10 Dioptre spectacle lens with and without atropine treatment, or a plano lens was attached on postnatal day 10 over the right eyes. Left eyes were used as contra-lateral controls. At 8 weeks, sclera from myopic and control eyes without and with atropine treatment (100 uM for 4 weeks) were immediately frozen as individual tissues in liquid nitrogen. Six weeks after induction of myopia, mouse sclera was subject to expressions array analysis (Affymetrix). Extracted RNA used for real-time polymerase chain reaction (PCR) and protein was used for Western blot analysis.

Results: Micro-array studies of mouse sclera following the induction of myopia showed significant upregulation of Transglutaminase-2 (TG-2), TG-5, Collagen5a3 (Col5a3), Mitogen-activated protein kinase 8 (MAPK8), Transforming growth factor- β 1 (TGF- β 1), Matrix metalloproteinase-14 (MMP-14) and MMP-19 as compared to control at 6 weeks after induction. After treatment of the experimental eye with atropine, the expression of these extra cellular matrix (ECM) related genes was downregulated. The expression levels of these genes were quantified by real-time qPCR and found to be consistent with array results.

Conclusion: Expression of ECM-related gene level and protein level were differentially regulated in the myopic mouse sclera as compared to their contralateral control sclera. The results suggest a basis for action of atropine on scleral fibroblasts to reduce axial elongation which is the cause of myopia.

BS50

Role of Calcium Signaling in Hyperosmolarity-induced Corneal Epithelial Cell Death

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Aim: Hyperosmolarity is a major mechanism for ocular surface damage in dry eye disease, leading to loss of barrier function. Previous studies have shown that hyperosmolar stimulation increased apoptosis, transglutaminase (TGM) 1 and 2 proteins, as well as transamidase activity. We aimed to evaluate, in a human corneal epithelial cell culture model, whether hyperosmolar stimulation induces cell death via calcium-related signaling.

Methods: Cultured human corneal epithelial cell line (HCE-T) was used. Addition of sodium chloride was used to induce hyperosmolarity. A tetrazolium reduction assay (MTS) was used to evaluate cell viability/proliferation, terminal-deoxynucleotidyl nicked end-labelling (TUNEL) for apoptosis, immunofluorescence for caspase-3 activation, and a colorimetric microassay to measure TGM activity.

Results: Corneal epithelial cell viability was reduced in hyperosmolar medium with positive TUNEL staining and active caspase-3 detected. At 24 hours, hyperosmolar medium induced an increase in cellular transamidase activity compared to non-stimulated control. Since cellular transamidase enzymes require calcium for activation, we tested conditions which can increase cytosolic calcium for their cellular effects. Two such conditions are: A23187, a calcium ionophore and thapsigargin, an endoplasmic reticulum calcium pump inhibitor. A23187 or thapsigargin was found to reduce cell viability.

Conclusion: Increased cellular calcium may mediate the increase in transamidase activity in corneal epithelial cells. Since increase in

cellular calcium is a common pathway after stressful stimuli, this may be the mechanism for corneal epithelial apoptosis after hyperosmolar stimulation. Protection against calcium fluxes in the ocular surface may be useful in the treatment of dry eye.

BS51

MicroRNA Profiling in Patients with Impaired Fasting Glucose

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Aim: MicroRNAs are small non-coding RNA molecules that are found in all living organisms. Recognised as microregulators of gene expression, microRNA (miRNA) levels have been shown to vary in the deranged metabolic conditions. The role of microRNA in the pathogenesis of abnormal glucose homeostasis is currently not well understood. In this preliminary study, we compared the miRNA expression in patients with impaired fasting glucose (IFG) and healthy subjects with normal glucose homeostasis.

Methods: In our institution's staff healthscreen, 632 consented to have their blood and urine samples collected for research related to diabetes mellitus (DM). Total RNA (2 to 5 µg) from the peripheral blood was size fractionated and the small RNAs were extended with a poly(A) tail at 3'-ends and tagged with Cy3 fluorescent dye. Hybridisation was performed overnight on a µParaflo microfluidic chip (target miRNA from miRBase 10.0). Hybridisation images and signal intensities were analysed using TIGR multiple experimental viewer software. miRNA profiling was done for 6 subjects, each with untreated DM, IFG and normal controls. IFG was defined as fasting glucose 5.6–6.9 mmol/L, DM defined as >6.9 mmol/L or known to have DM.

Results: The preliminary data comparing the miRNA profiles of those with normal and IFG were presented. The miRNA profile showed significant differences between the normal (control) and patients with IFG. About 50% of the miRNAs were downregulated. Among them, miRNA paralogs, miR-103/107 that has been implicated in lipid/energy metabolism was significantly downregulated. Notably, the expression of let-7 family of miRNAs was also downregulated.

Conclusion: MiRNA profiling from peripheral blood from patients with impaired glucose homeostasis could prove to be a useful tool in understanding the molecular events and pathogenesis of DM and its complications.

BS52

Suppression of Allergen-Specific IgE Production by Oral Administration of Recombinant *Lactobacillus Plantarum* in Mice

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Aim: Food-grade probiotics are generally regarded as safe for human consumption. They are shown to exert health promoting effects on human. In this study, we aimed to evaluate the effects of recombinant LAB in the suppression of Th2 immune responses.

Methods: Recombinant *Lactobacillus plantarum* (rLp) was generated by electrotransforming with plasmid pSIP-412 carrying the cDNA of

a major mite allergen Blo t 5. The expression of Blo t 5 was induced by peptide Sakacin P. Bone marrow-derived dendritic cells (BMDCs) were pulsed with heat-killed rLp for 24 hours. The culture supernatants were collected for cytokine ELISA and the phenotype of BMDCs were analysed by flow cytometry. C57BL/6 mice were fed with 10¹⁰ cfu live rLp for 3 consecutive days per week over 3 weeks before intraperitoneal injection with Blo t 5 in alum. Sera were collected for antibodies analysis by ELISA.

Results: Approximately 40 µg/10⁹ cfu of intracellular Blo t 5 was produced after 4 hours Sakacin P induction. rLp-pulsed BMDCs showed up-regulation of MHC II, CD40, CD80, CD86 and secretion of cytokines, IL-6, IL-10 and TNF-α. Mice fed with rLp showed significant production of Blo t 5-specific IgG2c and suppressed the production of Blo t 5-specific IgE upon Blo t 5/alum challenge.

Conclusion: Recombinant lactobacilli are potentially useful for the modulation of allergic immune response by eliciting Th1-biased immune response. Further studies are required to address their clinical application in allergic diseases.

BS53

Lipidomic Analyses of Mouse Brain After Chronic Antidepressant Treatment — A Link Between Antidepressants and Long Chain Fatty Acids?

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Aim: Antidepressants have been shown to bring about changes in lipid composition and phospholipidosis. Similarly, studies done in depressed patients exhibited lipid abnormalities as well. Hence, the effect of chronic antidepressant treatment and its association with adaptive changes in brain lipids is of interest to us.

Methods: We used 4 antidepressants of 2 different pharmacological classes, namely, selective noradrenergic reuptake inhibitors (maprotiline, reboxetine) and selective serotonin reuptake inhibitors (fluoxetine and paroxetine) for this project. Each antidepressant was administered at a dose of 10 mg/kg (IP) for a 4-week period to Balb/C mice. Subsequently, lipidomics was performed on various brain parts to obtain a lipid profile. Comparisons of relative abundance of lipids were made between treatment and control groups. Their differences were determined statistically using Student's t test.

Results: We observed statistically significant reduction in phosphatidylcholines in mice frontal cortex extracts with a corresponding increment in lysophosphatidylcholines. However, the same results were not reproduced in the hippocampal extracts. This suggested a role for phospholipase A₂ activity in the frontal cortex in response to antidepressant treatment. The increase in lysophosphatidylcholine content might be due to an increased breakdown of phosphatidylcholine since lysophosphatidylcholine is formed by hydrolysis of phosphatidylcholine by the enzyme phospholipase A₂. Relative abundances of the other lipids were not appreciably changed.

Conclusion: The findings showed that antidepressant treatment affects phosphatidylcholine/lysophosphatidylcholine compositions in the brain, especially the cortex. These changes in lipid composition may in turn affect cellular signaling/ membrane protein function.

PC1

Knowledge and Practice of Household Mosquito Breeding Control Measures between a Dengue Hotspot and Non-Hotspot in Singapore

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Aim: To compare the knowledge and practices of household mosquito-breeding control measures between a dengue hotspot (HS) and a non-hotspot (NHS).

Methods: 800 households were randomly sampled from HS and NHS areas, and an NEA questionnaire was administered to heads of the household. Interviewers were blinded to the dengue status of households. We included subjects aged above 16 years, who were communicative and currently living in the household. Chi-square test was used to compare proportions and multiple logistic regression to adjust for socio-demographic differences between both areas.

Results: The overall response rate was 59.0% (n = 472). There were significant differences in gender, educational level, employment status and housing type between HS and NHS (all $P < 0.05$). NHS residents were less knowledgeable in 6 anti-mosquito breeding actions: changing water in vase/bowls [AOR (adjusted OR) = 0.20 (0.08–0.47), $P < 0.01$], adding sand granular insecticide to water [AOR = 0.49 (0.31–0.71), $P < 0.01$], turning over pails when not in use [AOR = 0.39 (0.17–0.89), $P = 0.02$], removing flower pot/plates [AOR = 0.35 (0.18–0.67), $P < 0.01$], removing water in flower pot/plates [AOR = 0.36 (0.17–0.75), $P < 0.01$] and putting insecticide in roof gutters [AOR = 0.36 (0.13–0.98), $P = 0.04$]. HS residents reported better practice of only 2 mosquito-breeding control measures: changing water in vases or bowls on alternate days [AOR = 2.74 (1.51–4.96), $P < 0.01$] and removing water from flower pot plates on alternate days [AOR = 1.95 (1.01–3.77), $P = 0.05$].

Conclusion: More HS residents were knowledgeable and reported practicing mosquito-breeding control measures than NHS residents. However, a knowledge-practice gap still existed.

PC2

Screening for Diabetes in Hypertensive Patients in a Primary-Care Outpatient Setting: A Retrospective Study

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Aim: A ‘high-risk’ approach to diabetes (DM) screening may be more appropriate compared to general population screening. In public primary-care clinics in Singapore, hypertensive patients are routinely screened for other risk factors including DM. Our study aims to assess the incidence of DM from such a screening method among hypertensive patients and characteristics of these patients.

Methods: Hypertensive patients on follow-up in public primary-care clinics undergo an annual blood investigation (hypertension panel) consisting of biochemical measurements. We performed a retrospective case-notes review of the investigation results of these

patients in Choa Chu Kang polyclinic. Diagnosis of DM or pre-DM (IFG/IGT) were based on national clinical practice guidelines.

Results: A total of 4,943 hypertensive patients underwent the panel test between December 2004 and December 2005. Three hundred and seventy-one were excluded (236 previously diagnosed to be diabetic and pre-DM and 135 were not on anti-hypertensive medications) leaving 4,572 patients. A total of 4,191 (91.6%) patients had normal venous glucose (< 6.0 mmol/L), 194 (4.2%) were newly diagnosed with DM and 187 (4.1%) were pre-DM. Compared to normal patients, newly diagnosed DM patients had higher BMI ($P < 0.001$), systolic blood pressure ($P < 0.05$), triglycerides ($P < 0.001$) and lower HDL ($P < 0.05$). For pre-DM patients, they were more likely to have higher total cholesterol ($P < 0.05$) and LDL ($P < 0.05$) compared to the normal group.

Conclusion: Screening for DM in hypertensive patients in an Asian primary-care setting showed an incidence of almost 10% with abnormal glucose metabolism. Both newly diagnosed DM and pre-DM patients appeared to have increased risk factors compared to the non-DM group.

PC3

A Cross-Sectional Study of ‘Non-Emergency’ Adult Patients Visiting the Emergency Department in a Tertiary Hospital: Why Do They Come? Who are They?

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Aim: Emergency Departments (ED) in Singapore have seen a rise in the number of patient visits. This study seeks to determine the factors influencing patients’ decision to visit the ED and the socio-demographic profile of such patients.

Methods: A cross-sectional survey was administered to patients above 21 years old who were triaged as ‘non-emergency’ or P3 by a trained ED triage-nurse in a tertiary-hospital ED over 1 week in January 2008. Information on demographics, socio-economic status based on housing type, health beliefs, use of primary care physicians (PCP), knowledge of and attempts to seek other treatment modalities, past usage of an ED, self-reported urgency and reasons for visiting the ED were collected.

Results: Of the 593 eligible subjects, 404 (response rate: 68.1%) had sufficient data for analysis. The most frequently cited reasons for visiting the ED include: “facilities are better” (66.0%), “my condition requires ED attention” (57.3%) and “ED physicians can provide better care” (51.7%). Patients’ “most important reason” for visiting the ED were: “my condition requires ED attention” (17.3%), “referred by PCP” (15.6%), “ED physicians can provide better care” (10.9%) and proximity (8.2%). The top 3 chief presenting complaints were accident and trauma (21.8%), orthopaedic (18.0%) and gastrointestinal (16.0%).

Conclusion: Frequently cited reasons for visiting the ED include self-perceived urgency, satisfaction with ED physicians and facilities, and the impression that they could obtain an earlier specialist appointment. Further studies could address these issues to reduce the patient load in the ED setting.

PC4

Preliminary Report on the DIMES Study: Semantic Understanding of Diabetes Mellitus in Singapore using Ontologies S SETHI^{1,2}, SK ONG¹, Y CHEN³, D POO³

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Aim: To conduct research into the use of data-mining techniques such as ontologies for the semantic understanding of diabetes mellitus in Singapore.

Methods: Analysis of National University Hospital (NUH) LIS database (11182 records; year 2003-2007) of diabetes mellitus patients diagnosed on fasting plasma glucose ≥ 7.1 mmol/L criterion. Each data set was anonymised with a unique number. Data field included patient's demographic, fasting glucose, HbA_{1c} and lipids (cholesterol, LDL-C, HDL-C, triglycerides). Exploratory study on descriptive and predictive modelling was constructed using Microsoft Excel and SPSS 15.0 for cleaning and statistical analysis.

Results: Descriptive modelling indicated that in diabetic subjects, the mean \pm sd fasting glucose is 9.7 ± 3.3 mmol/L (n = 5186), HbA_{1c} is $8.1 \pm 1.8\%$ (n = 1307), total cholesterol is 5.2 ± 1.1 mmol/L (n = 3271), LDL-C is 3.2 ± 1.0 mmol/L (n = 3273), HDL-C is 1.18 ± 0.40 mmol/L (n = 3403) and triglycerides is 1.9 ± 1.7 mmol/L (n = 3453). 40% of NUH patients have HbA_{1c} $\leq 7.0\%$ and 60% has LDL-C ≤ 2.6 mmol/L. Overall, 25% has both HbA_{1c} and LDL-C within control. The ethnic Malay subjects have highest fasting glucose, HbA_{1c}, total cholesterol and LDL-C, followed by ethnic Indian and Chinese. Chinese subjects have the highest HDL-C. The Indian male has higher fasting glucose than female, Malay females have the highest HbA_{1c} and females have higher LDL than males. For predictive modelling, ANOVA analysis at $P < 0.05$ correlation are: a) increase of 0.009 mmol/L monthly change rate/year older of fasting glucose, and b) fasting glucose of Chinese female (versus Chinese male) tends to increase at a faster rate.

Conclusion: Database mining tools appear to be able to define the theoretical foundation for the development of clinical decision support systems to assist in the management of diabetes mellitus.

PC5

Self-Wound Management Programme

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National Healthcare Group Polyclinics

Aims: This project aims to empower our patients and their caregivers in self wound management and enhance the role of the Assistant Nurse as an educator.

Methods: One Assistant Nurse is assigned as the Self Wound Management Nurse (SWMP) nurse. She screens and recruits patients for the programme according to a set of criteria.

The participant can be either the patient or the caregiver. Participants take 2 to 3 sessions of 30 minutes with the nurse to achieve competency in wound dressing. In the first session, the nurse demonstrates the dressing procedure and educates the participant on wound care using a resource file. Topics include normal wound healing, types of tissue involved in a wound, signs and symptoms of wound infection, do's and don'ts of wound care and nutrition. In the

second and third sessions, the participant, in return, demonstrates to the nurse who ensures confidence and proficiency.

Once competency is achieved, the patient visits the clinic for dressing in between self-dressings, depending on the frequency of dressing change and wound condition. The nurse's priority is to monitor the wound for complications without infringing on the convenience of the patient.

Any patient with adverse events, such as wound infection or wound breakdown, are taken off the programme and referred to the clinic doctor or back to the referring healthcare worker for evaluation.

Results: The participants reported that nurse teaching is easy to understand and that the programme was beneficial as a new skill is learnt. The participants also experienced a reduction in clinic visits and non-dependence on general practitioners, resulting in time and cost savings. Some participants suggested including all patients in the programme in view of the benefits. There is an increase in the sense of control and empowerment for the patients, especially those with chronic wounds and experiencing recurrent wounds.

Unfortunately, participation rate is low. Between March 2007 and February 2008, there was only an average of 16 participants per month.

Conclusion: Reasons for the low uptake of SWMP include unsuitable cases, a significant portion of patients who were not keen for self-care and defaulters (participants who did not complete competency assessment).

Despite the low number of participants, the project has achieved its aim of patient empowerment, judging from the positive feedback. The Assistant Nurses experienced a sense of satisfaction in seeing the participants benefit from the programme.

The wound care resource file used in patient education has been made accessible to all nurses in the organisation via a common storage drive, thus promoting the sharing of teaching materials in the various clinics.

PC6

Improving the Control of LDL-Cholesterol Levels in Diabetic Patients in Ang Mo Kio Polyclinic.

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Aim: For diabetic patients without coronary heart disease, their risk of coronary heart disease events is the same as non-diabetic patients with established coronary heart disease. LDL-Cholesterol is a major risk factor for coronary heart disease. A large proportion of Diabetic patients in Ang Mo Kio Polyclinic have not achieved their target LDL-Cholesterol level of < 2.6 mmol/L. This project aimed to increase the percentage of diabetic patients in Ang Mo Kio Polyclinic with LDL-Cholesterol < 2.6 mmol/L from 29.9% to 60% within 6 months.

Methods: We conducted a patient survey, doctor survey and case sheet audits to determine the root causes of the problem. Our audits showed that doctors had varying management practices and were less likely to treat and review diabetic patients with elevated LDL-Cholesterol levels as these levels approach the target of < 2.6 mmol/L. We found that the main causes of the problem were (1) Doctors forget to review and treat high LDL-Cholesterol in diabetic patients, (2) Absence of a standardised workflow for the management of high LDL-Cholesterol level in diabetic patients. Interventions implemented were (1) Reinforcing to clinic staff the current undesirable management

of LDL-Cholesterol in diabetic patients and the importance to achieve targets via a clinic talk, (2) Placing visual reminders in consultation rooms on the target LDL-Cholesterol level of <2.6mmol/L for diabetic patients. After 4 months, the proportion of diabetic patients with LDL-Cholesterol <2.6mmol/L was measured. After four months, the proportion of diabetic patients with LDL-Cholesterol <2.6mmol/L was measured.

Results: After providing a talk to reinforce the importance on achieving LDL-Cholesterol targets and providing visual reminders, the proportion of diabetic patients with LDL-Cholesterol <2.6mmol/L increased from 29.9% in August 2007 to 42.2% in March 2008.

Conclusion: Reinforcing the importance of LDL-Cholesterol control in diabetic patients to doctors and providing visual reminders increased significantly the proportion of diabetic patients achieving their target LDL-Cholesterol level of <2.6mmol/L.

PC7

To Improve Diabetes Care in Clementi Polyclinic

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Aim: In the 2004 National Health Survey, the prevalence of diabetes was 8.2% among adult Singaporeans aged 18 to 65 years old. It is associated with considerable mortality and morbidity from chronic complications (MOH CPG). The aim of this project is to reduce HbA1c by 1% for 80% of the patients with HbA1c of >8% in 6 months in Clementi Polyclinic.

Methods: The team has identified 4 main factors that have contributed to diabetic patients having poorly controlled diabetes:

- i. Suboptimal treatment management
- ii. Patients' fear of medicine and injection
- iii. Patients' non-adherence to medicine dosage and schedule
- iv. Patient's lack of knowledge of HbA1C values

To achieve our target, we have implemented the following interventions:

- i. Set up a second tier clinic, Chronic Disease Clinic (CDC), run by a Senior Doctor to review treatment for patients who had HbA1c >8% on 2 occasions and the oral hypoglycaemic agents are at maximum dose
- ii. Patients were referred to Care Manager for enhanced patient education which includes expected value of HbA1C and implication of poor control
- iii. Identified these group of patients by stamping *CDC Rm 15* on the appointment card for follow-up.

Results: The results showed that 76% of the patients with HbA1c >8% seen at the second tier clinic in Clementi Polyclinic reduced their HbA1c by 1% in 6 months, while 20% had no improvement and 4% dropped out from the programme.

Conclusion: Timely intervention, identifying patients' needs and addressing any treatment barriers can improve patients' clinical outcomes.

PC8

An Audit on the Management of Patients with Diabetes Mellitus and Microalbuminuria with Angiotensin Converting Enzyme (ACE) Inhibitors or Angiotensin II Receptor Blockers (ARB)

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Aim: Diabetic nephropathy is one of the chronic complications of diabetes mellitus and the leading cause of end stage renal disease in Singapore. The presence of microalbuminuria in patients with diabetes mellitus represents the earliest biochemically detectable stage of diabetic nephropathy. The renal disease retardation benefit of treating diabetic patients having microalbuminuria with angiotensin converting enzyme (ACE) inhibitors or angiotensin II receptor blockers (ARBs) has been shown in various studies. We sought to audit the management of diabetic microalbuminuria with ACE inhibitors or ARBs in Jurong Polyclinic and implement interventions to improve these numbers.

Methods: We identified diabetic patients with microalbuminuria via positive Urine-Albumin-Creatinine Ratio (UACR) results and studied whether they were prescribed with an ACE inhibitor or ARB on their last recorded prescription. Patients who were not prescribed the above medication were further studied to determine if there was documentation for a substantiated absence of treatment. Intervention was made in the form of a CME talk in the clinic, and reminders to doctors about management of the above disease.

Results: Over a period of 4 months, the percentage of diabetic patients with microalbuminuria who were treated with ACE inhibitors or ARBs rose marginally from 63% to 65%. The percentage of untreated diabetic microalbuminuria with documentation for a substantiated absence of treatment rose from 22% to 42%.

Conclusion: Diabetic microalbuminuria continues to be an undertreated aspect in the management of diabetes mellitus. Further effort needs to be made in changing the mindset of physicians in managing early diabetic nephropathy and paying more attention to positive UACR results.

PC9

Pilot Paperless Survey on the Use of Internet for Medical Information in Singapore.

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Aim: To conduct an internet-based paperless survey of young adults of Asian origin in Singapore to determine the current attitudes towards the use of the internet for medical and health related information.

Methods: An invitation was sent by email to 40 young professionals in Singapore to voluntarily take part in a 10-item internet-based questionnaire survey. Questions were developed using Survey Monkey.com to determine the level of use of internet for medical information by the responders and their opinions on improvements for future development. There was a combination of questions requiring multiple choice and free text responses. Demographic data of the responders were also collected. Numerical data are presented graphically and text data are summarised.

Results: There were a total of 21 complete responders with a response rate of 52.5%. There were 8 females and 13 males. The average age was 32.3 (range of 24 to 38 years old). The most popular sites for internet medical information were pubmed.org followed by medscape.com and google.com. The most common reasons for current internet medical usage were for seeking information on disease conditions (71% of responders) and on medications (42% of responders). However, 52% of responders have their doubts regarding the reliability of information obtained from the internet. 95% of responders believe a website providing information with an Asian perspective will be useful. Over 50% of responders believe that information on the latest trials and developments in medical journals should be readily available online.

Conclusion: This pilot study reflects the high usage of the internet by young professionals for medical information and also their health-seeking behaviour on the internet. Hence, there is an opportunity for the internet to have a significant impact on tomorrow's health. These results will be used as a springboard to develop more extensive surveys and for improving local medical information websites such as medihub.org.

PC10

What are the knowledge, Attitudes and Career Preference for Family Medicine between First and Third-Year Undergraduate Medical Students in Singapore?

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Aim: Studies have shown a decreasing interest among medical students for Family Medicine (FM) careers. Little is known about the knowledge, attitudes and career preferences of medical students for FM in Singapore. This study assessed the differences in these domains between first (Y1MS) and third (Y3MS) year students.

Methods: NUS Medical students were given an anonymous self-administered questionnaire assessing knowledge and attitudes using a 6-point Likert-Scale and their top 3 career choices at time of survey. Y1MS had just started school 3-months prior with minimal clinical exposure. Y3MS had just completed a 4-week community-based FM attachment.

Results: 225 Y1MS and 206 Y3MS (response rate: 87.2% and 90.0%) completed the survey. More Y1MS felt FM practice is restricted to "treating only acute problems" (35.3 vs 15.6%, $P < 0.001$) and "a given organ system" (21.3 vs 9.8%, $P = 0.01$). For both groups, only 11.7% felt that FM work is more "prestigious" and one-quarter felt that FPs were 'academically weaker' when compared with other specialists. More Y3MS disagreed that FPs lacked supporting facilities (53.0 vs 33.3%, $P < 0.001$), research opportunities (50.5 vs 28.1%, $P < 0.001$) or were academically weaker (82.4 vs 72.0%, $P < 0.005$). For career choice, only 4.0% (Y1MS) and 7.8% (Y3MS) listed FM as their 1st career choice. However, 53.4% of Y3MS and 35.6% of Y1MS listed FM as one of their top 3 career choices ($P < 0.001$).

Conclusions: Y3MS with exposure to FM appeared to have better knowledge and attitudes towards FM practice and the choice of FM as a future career.

PC11

Improving Glycaemic Control in Poorly Controlled Diabetics

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Aim: Improvement of glycaemic control in poorly controlled diabetics has been associated with a significant reduction in micro and macrovascular complications as well as mortality. However, 32.4% of diabetic patients in our practice were found to have poorly controlled diabetes (HbA1C >8%). This study was conducted to determine the causes for poor diabetic control and to implement interventions that targeted those causes.

Methods: HbA1C level readings for all diabetic patients were obtained for the period of May to December 2007. Using a patient survey and review of patients' medications, it was found that the predominant problems faced by poorly controlled diabetics were that of dietary non-compliance, inconsistent treatment offer and insufficient adjustment of medications (oral drugs or insulin). Two main interventions were implemented: a senior doctor led diabetes clinic was started to cater specifically to poorly controlled diabetics. In addition, a care manager-led insulin titration programme was initiated, incorporating home glucose monitoring and a simple protocol of insulin adjustment.

Results: After 8 months, the proportion of poorly controlled diabetics decreased from 32.4% to 18.5% ($P < 0.001$).

Conclusion: The use of specialised clinics targeting high-risk patients resulted in significant improvement in clinical outcomes. The expansion of the role of the care manager has been found to be beneficial and should be further explored, especially in the area of insulin therapy.

PC12

To Decrease the Number of Asthma Defaulters of Post-Nebulisation Follow-up in Jurong Polyclinic

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Aim: Our project's aim is to decrease the number of asthma defaulters of post-nebulisation follow-up to further reduce the frequent visits of these patients for nebulisation from 50% to 0% in 6 months.

Methods: Patients with asthma who experienced acute attacks and who received a nebulisation treatment on visit and follow-up with the Jurong Polyclinic, from January 2008 to April 2008, were included in the study. Those suffering from asthma with acute attacks were diagnosed at Jurong Polyclinic, but those who were followed-up at hospitals and private clinics and who had co-morbidities such as COPD were excluded. A 1-week appointment was given to follow-up for reassessment of condition according to the written Asthma Action Plan. Those who defaulted will be called via the telephone, and if not contacted, a memo reminder will be sent.

Results: There is an increasing trend in the number of asthma defaulters of 1-week post-nebulisation from October 2007 to December 2007 (45.7%, 50.4% and 54.7%, respectively). Hence, there is an increase in the frequency of visits of the same patients (from database of billing system) for nebulisation – a clear indication of poorly controlled asthma. The trend changed after the intervention

was made from January 2008 to April 2008 (32%, 31%, 30% and 31%, respectively). The 3 most common reasons for defaulting were (1) Patient thought to come only when sick, (2) Confused with the instruction and (3) No time.

Conclusion: We now have a better idea of why our asthma patients are defaulting; the practical difficulties of assuring ongoing follow-up and maintaining the process we've started remain challenging. It is easy to allow the follow-up visits to fall through the cracks, and stress the importance of making the follow-up appointment at the time of visit and be prudent on telephone consult and memo reminder.

PC13

To Improve Blood Pressure Control in Non-Diabetic Patients in Toa Payoh Polyclinic

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Aim: To increase the percentage of non-diabetic hypertensive patients achieving blood pressure (BP) <140/90 mmHg from 52% to 80% in Toa Payoh Polyclinic in 6 months.

Methods: Patients were surveyed to analyse their perceptions regarding BP control targets and the complications. Team discussion identified the causes of poor BP control as:

- i. Patient not aware of complications
- ii. Inconsistent education of patient by different doctors
- iii. High patient load and patient defaults due to long waiting time

The interventions put up by the team are as follows:

- i. The doctors were made aware of the BP target and what the clinic was currently achieving
- ii. A second tier Hypertension Clinic was started to manage those with poor BP control
- iii. The Care Managers helped to counsel these patients with regards to diet and lifestyle
- iv. The Family Physician Clinic was also used as a backup resource to manage poorly controlled hypertensive patients
- v. The target BP was written in the patients' personal record book and their BP readings during the consultations were also recorded

A second survey was done on the patients to see if they were now more aware about their BP targets. Patients' case notes were randomly audited to check BP readings taken during consultations.

Results: The doctors were more consistent in recording BP readings for the patients. The patients became more aware of their BP targets and control. At the end of 6 months, 69% of the non-diabetic patients achieved the target BP of <140/90 mmHg.

Conclusion: The patients need to be informed and reminded about their BP targets as well as their BP readings while the doctors need to be consistent in explaining the target BP to the patients. Both the patient and healthcare provider have to be involved to ultimately achieve better health outcomes.

PC14

To Increase the Percentage of Patient with HbA1c Control ≤7% to 40% for Choa Chu Kang Polyclinic

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Aim: The percentage of patients with HbA1c reading ≤7% at Choa Chu Kang Polyclinic (CCK) from January to July 2007 was 26% to 33% which falls below the clinic's Key Performance Indicators' (KPIs) target of 40%. This project aimed to increase the percentage of diabetic patients with good control to achieve the clinic KPI target in CCK in 6 months without hypoglycaemia.

Methods: A survey was conducted on 25 patients and the results were further analysed by the team and they identified the following as the leading causes of poor control:

- i. Suboptimal management
- ii. Lack of patient education
- iii. Review and streamline NHGP and MOH Clinical Practice Guidelines
- iv. Allowing dietician to see newly diagnosed diabetic cases
- v. Patient educational materials on simplified diet guide

There were regular staff reminders via weekly email/clinic meetings and made the treatment protocol easily accessible.

A patient survey of risk of hypoglycaemia was also conducted. The weekly results were posted at the staff notice board on a 3 monthly basis. The effects on the planned changes were measured using SPC. A post implementation survey to staff and patients were done.

Results: There was improvement from 30% in August 2007 to 42% in February 2008. Verbal feedback from patients indicated that they are happy and satisfied but our staff survey showed that care managers declined to use the simplified diet teaching material preferring their own flip chart. Doctors claimed they had no time to use the simplified teaching material to educate patients who declined to see care managers or dieticians.

Conclusion: The post implementation results have been promising, showing a gradual improvement of the HbA1c results. Further exploration of the clinical staff's reluctance to use the teaching materials is needed.

PC15

Tackling Obesity in Toa Payoh Polyclinic

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Aim: Obesity is increasing in prevalence in Singapore and is linked with 2% to 7% of total healthcare costs. To better manage obesity amongst patients attending the polyclinics, a structured weight management programme was rolled out. However, there were only 6 patients enrolled at the start of the project. This project aimed to increase the number of patients enrolled into a structured weight management program (WOW) from 6 to 100 within 6 months.

Methods: A survey was performed amongst a cohort of 50 obese patients and healthcare workers. The results of the survey showed that whilst most patients believe that they should lose weight, the cost of the programme and a lack of time were major prohibitive factors. A significant proportion of 39.3 % of patients also expressed ambivalence about the usefulness of weight management programmes. Healthcare workers are not actively referring obese patients to weight management programmes, especially patients who visit the clinic for problems other than chronic disease.

The team voted on the top causes of the low uptake of the programme to be:

- i. Lack of time on the patient's part
- ii. The healthcare worker being unfamiliar with the programme
- iii. The healthcare worker being too busy to refer

Interventions:

- i. A series of briefing sessions were held to remind the doctors and nurses about the burden of obesity, the criteria for referral and features of the weight management programme and the need to refer obese patients for weight management
- ii. A booth was set up at the patient waiting area on certain days of the week to help explain to patients about the weight management programme and to help attract them to join the programme.

Results: The number of patients who joined the programme did not increase significantly and averaged 4.5 patients per month for the 6 months of the project. However, the number of patients who were contacted by the programme nurse in-charge and who attended the introductory talks on obesity showed an increase. This was encouraging as it meant a potential increase in awareness of obesity, of the importance of tackling it and of the availability of weight management programmes in the clinic.

Conclusion: There were significant barriers to patients joining the weight management programme such as financial and time constraints on the part of the patient and the apathy of some healthcare workers in referring patients. A further project may be one that looks more closely at how to overcome these specific barriers over a longer time.

PC16

Cyclone Nargis – The experience of Team Singapore in Myanmar

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Aim: To describe the experience of a disaster relief team in cyclone-stricken Myanmar. To describe the profile of patients seen, with the aim of making a targeted medical supplies packing list for future missions.

Methods: Cyclone Nargis was a category 4 storm on the Saffir-Simpson Hurricane Scale. With peak winds of up to 190 km/hr, the storm caused catastrophic destruction in Myanmar. There were at least 100,000 estimated fatalities, and many more injured, though the actual figure was unavailable and likely to be much higher than the official figures. Singapore sent a 23-member team to Yangon in response to the disaster from May 22 to June 5 2008. Our team comprised 5 doctors, 13 nurses, 2 paramedics and 3 logisticians. The medical personnel were from the major hospitals in Singapore, and the logisticians were from the Singapore Red Cross and Mercy Relief organisations. The team was sent to Twan Te, a township an hour

away from Yangon, with a population of 250,000. The team operated in various areas of the township, including the local hospital as well as 2 villages accessible only by boat. Over a period of 9 operational days, 4490 patients were seen. The profile and diagnoses of these patients were recorded.

Results: The team saw a total of 4490 patients in Twan Te, of which two thirds were female. One third of the patients belonged to the paediatric age group. At 3 weeks post-disaster, the patient profile was different from that in the acute phase. The clinical conditions encountered were mainly infections of the skin, chest and gastrointestinal tract and post-traumatic stress disorder. Some of the areas reached by the team did not have any existing medical services, which resulted in a significant number of patients being seen for chronic conditions. Of note was the significant number of 'non-specific' diagnoses made by the team doctors, which could be partially attributed to post-traumatic stress disorder as well as the language and cultural differences between the team members and the local population.

Conclusion: For a medical relief team providing mainly primary healthcare to the disaster-stricken victims, an appropriate medical supplies packing list can be made to address the type of patients seen, by taking into consideration their demographic profile as well as the major groups of diagnoses. It would be useful to have a psychiatrist in the team in view of the large number of patients with post-traumatic stress disorder.

PC17

Potassium Levels at Primary Healthcare Centres 2008

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Aim: In our earlier studies, we recommended that blood specimens for the measurement of potassium levels should be fasting and drawn without fist clenching during phlebotomy (AAMS, 36 Suppl 11; ALH028, 2007). We evaluated the status of potassium at the National Healthcare Group (NHG) Polyclinics after recommendation to collect blood without fist clenching.

Methods: In control exercises (9 random days from 24 September 2007 to 8 October 2007), blood specimens were collected at Ang Mo Kio (AMK) and Toa Payoh (TP) polyclinics from patients who did not clench their fists. Permission was obtained from patients for the usage of K results in this study. For K >5.1 mmol/L, we investigated the medical records for explanation. Subsequently, blood specimens were by non-fist clenching technique was followed by NHG-Diagnostic laboratories in Jan 2008. The K data from the NHG database in April 2008 from 9 polyclinics were compared K data in October 2006 (before DSRB).

Results: Control studies showed mean (range, cases) of K was 4.4 mmol/L (2.3 to 5.8, n = 619) before and 4.2 mmol/L (3.2 to 5.2, n = 156) after non-fist clenching collection at AMK polyclinic; 4.2 mmol/L (2.8 to 5.8, n = 613) before and 4.3 mmol/L (2.2 to 5.6, n = 39) after at TP polyclinic. In the control case study, no repeat K test was performed. Overall, significantly different K levels (t-test; $P < 0.05$) were noted at all 9 NHG polyclinics after the implementation of the non-fist clenching technique.

Conclusion: A left-shift in percentage of lower potassium values

observed after implementation of non-fist clenching technique at phlebotomy could eliminate spurious high potassium levels in patients at primary health centres.

PC18

Streamline Work Process for DRP Referral

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Background: Streamline concept has been used to improve the work process for Diabetic Retinopathy Photo (DRP) referral and overloading leveling. Originally the patient with abnormal DRP report will be contacted for repeated consultation in order to obtain DRP referral. There is an average of 80 patients per month who are registered for DRP referral. The patients spend an average of 60 minutes waiting for consultation.

Aims: To reduce unnecessary visits to the polyclinic for patients with abnormal DRP report. The goal of this project is to improve (1) care management of patients with DRP abnormalities and (2) co-ordination of care between doctors and nurses.

Methods: Value Stream Mapping is used as a tool to reduce waste and streamline DRP workflow in Yishun Polyclinic. Nurse manning DRP detects abnormalities based on criteria for DRP referrals. The healthcare assistant (HA) sends a report to the doctor reading DRP reports. The doctor reviews and writes a specialist referral. The nurse receives the referral from the doctor. The nurse directs the patient to referral counter and, lastly, the patient obtains an eye referral appointment on the same visit.

Results: This project has resulted in an Area Scope of Future Value Stream Mapping and to facilitate DRP workflow in Polyclinics. It has showed a decline in consultation visits of 13.6%.

Conclusion: The studies we have made on the 3 months streamline work process proved to be effective. The adoption of these applications

have improved coordination of care between doctors and nurses, and reduce patient's repeated consultation visits, thus decreasing consultation cost for patients.

PC19

Improving Care for Diabetes Patients through Nurse-Directed Glycated Haemoglobin (HbA1c) and Counselling in Yishun Polyclinic

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Aims: Self-management skills are considered the cornerstone for optimum metabolic control in diabetes patients. The aim of this study is to determine the effectiveness of a structured diabetes care comprising of nurse-directed glycated haemoglobin (HbA1C) and counselling in metabolic control.

Methods: A random sample of 286 Type 2 diabetes patients with HbA1c $\geq 8\%$ was recruited between April and October 2007. These patients were assigned to the care manager prior to the doctor's consultation. The care manager performed HbA1c, measured parameters, assessed whether patients were due for their diabetic retina photography, diabetic foot screening and counselled patients. Compliance to dietary, medication and exercise were emphasised during counselling. Data were collected and compared at baseline, 3 months and 6 months.

Results: The mean age of the subjects was 58.8 years and the mean baseline HbA1c was 9.3%. The study cohort comprised of 187 females and 99 males. Out of this group, 61.2% are Chinese, 26% are Malay, 11.8% are Indian and 1% others. A total of 70.7% of patients had achieved an improvement of HbA1c at 3 months and 68.3% at 6 months of intervention. 42.3% had achieved 1% reduction in HbA1c at 3 months and 38.2% in 6 months of intervention. There was a reduction in the mean of HbA1c from baseline 9.3% to 8.2% at 3 months and 8.0% at 6 months.

Conclusion: A structured diabetes care can improve patients' clinical outcomes, standardise care and use resources effectively.

M1

Accuracy of Preoperative CT for Local Staging in Colorectal Carcinomas

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Aim: To determine the accuracy of CT in evaluation of local tumour invasion and regional lymphadenopathy in colorectal carcinomas.

Methods: Ninety-nine consecutive patients who had a contrast enhanced CT within 2 weeks of surgery with histopathological confirmation of colorectal carcinoma were selected. Intravenous contrast enhanced CT was performed with 5 to 7 mm collimation. Axial scans were retrospectively and independently reviewed by 2 radiologists (R1 and R2) blinded to surgical findings and histopathology. The readers assessed primary tumour according to conventional TNM criteria, transmural thickness and adjacent organ involvement. Radiological assessment was then compared with surgical findings and histopathology for accuracy and interobserver agreement.

Results: At histopathology, the T-stage of tumours was T2 in 5, T3 in 62 and T4 in 32 patients and the N-stage was N0 in 36, N1 in 28 and N2 in 35 patients. Adjacent organ involvement was found in 12 patients. The accuracy of CT for T-stage and N-stage for the 2 readers were 45.5% and 60.6% (interobserver agreement, $k = 0.30$), and 33.3% and 45.4% (interobserver agreement, $k = 0.23$) respectively. The accuracy for serosal involvement (tumour perforates visceral peritoneum or directly involves adjacent organs) was 63.6% and 66.7% (interobserver agreement, $k = 0.51$). The understaging and overstaging by R1 and R2 for serosal invasion was 24.1%, 12.1% and 20.1%, 12.1% respectively.

Conclusion: Our study results show that the accuracy for CT staging of colorectal carcinomas for T-stage and in particular serosal invasion is moderate, but relatively low for N-stage.

M2

Grey and White Matter Abnormalities and Neurocognitive Correlates in First Episode Schizophrenia: A Combined Structural MRI and DTI Study

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Aim: Studying structural brain abnormalities in patients with first episode schizophrenia (FES) confers a unique opportunity to elucidate changes that may occur at an earlier stage of the illness. We hypothesised that disruptions in cerebral grey and white matter integrity occur with related neurocognitive deficits in FES.

Methods: The participants included 39 patients with FES and 63 age-, sex-, and handedness-matched healthy controls. The neurocognitive domains assessed included intelligence, attention, executive functioning, verbal and spatial working memory. Structural image processing methods were based on an optimised, whole-brain voxel-based morphometry technique. ROI delineation based on abnormalities in white matter was done on individual FA maps before statistical analyses.

Results: Patients with FES scored poorer on neurocognitive tests of

executive functioning, verbal and spatial working memory. Patients with FES had bilateral volume reductions in the hippocampal regions and white matter volume reduction in the right inferior temporal-occipital region, corresponding to the inferior longitudinal fasciculus. Further analyses of the implicated white matter region did not reveal any difference in fractional anisotropy between FES and healthy controls.

Conclusion: The grey and white matter abnormalities betray possible connected regions which may underlie the neurocognitive deficits. The absence of any FA change in the implicated white matter region suggest that pathophysiological processes which underlie cerebral white matter volume reduction may not be reflected by changes in FA; and/or that FA changes are dynamic and may not be apparent in an earlier stage of the illness, needing more research to allow earlier and better detection and intervention.

M3

Impact of Ethnicity and Urgency of Therapy in ESRD Treatment in a Multi-Ethnic Asian Population

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Background: Selection of dialysis modality for end-stage renal disease (ESRD) patients has important lifestyle and occupational implications. The impact of ethnicity and other factors on ESRD treatment choice in a multi-ethnic Asian population has not been examined critically. We studied some factors affecting choices of eventual treatment modalities (ETM), 90 days after diagnosis in an academic medical centre in Singapore.

Methods: We analysed a prospectively collected database of 168 ESRD patients diagnosed in 2005 in National University Hospital, Singapore. (Mean age = 59.2 ± 13.7 , 48.2% male, 66.1% Chinese, 20.2% Malay, 5.4% Indian, 8.3% Other, 62.5% diabetic, 80.4% hypertensive, 34.2% coronary artery disease, 34.9% LVEF <50%). Statistical analysis was performed with JMP IN (Cary, NC).

Results: One hundred and nine (64.9%) patients were urgently hemodialysed. Eighty-four of the 168 (50%) had an outpatient nephrologist and dialysis plan, yet 37/84 (44%) required urgent dialysis. Urgency was not different by ethnicity nor gender ($P = NS$) but influenced ETM; with more urgent patients on hemodialysis 76.2% vs 32.2%, but not peritoneal dialysis 14.7% vs 42.4%, kidney transplantation 2.8% vs 10.2%, or conservative therapy 6.4% vs 15.3% ($P < 0.001$). More Indians (88.9%) had hemodialysis as ETM than Chinese (55.9%), or Malay (64.7%) ($P = NS$). More Chinese had dialysis plans (56.7% vs 36.8%, $P = 0.022$), or transplants (8% vs 0%, $P = 0.0055$) than non-Chinese. More Malay patients (17.7%) chose conservative therapy than Indians (11.1%), or Chinese (8.1%) but this was not significant ($P = NS$).

Conclusion: Too many ESRD patients started dialysis urgently. Identification of barriers to early therapy initiation, and transplantation in non-Chinese is needed.

M4

Predictors of Outcome in a Multi-Ethnic Southeast Asian Heart Failure Population

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Aim: This study aims to determine the predictors of outcome, and to

identify any racial differences in outcome following treatment in a multi-ethnic Southeast Asian heart failure (HF) population.

Methods: We evaluated 345 consecutive patients admitted to a university hospital in Singapore, with a primary discharge diagnosis of HF in 2004. Records for patients were reviewed with respect to patient profiles, diagnostic testing, treatment and clinical outcomes. The primary end point was a composite of HF readmissions and all-cause mortality within 6 months of discharge.

Results: The patient cohort [mean age 68.4 ± 13.2 years, 53.9% males, mean left ventricular ejection fraction (LVEF) $37.2 \pm 17.9\%$] consists of 211 Chinese (61.2%), 69 Malays (20.0%), 45 Indians (13.0%) and 20 patients of other races (5.8%). At 6 months, 31.0% of the entire cohort had an event (10.7% death, 22.4% readmission for HF). Multivariate analyses identified older age ($P=0.003$), Malay race ($P=0.007$), diabetes mellitus ($P=0.008$) and lower LVEF ($P=0.005$) to be independent predictors of events. Chinese patients had the lowest 6-month event rates (25.4%), while Malay patients had the highest (46.3%, $P=0.002$). Indian patients had an intermediate event rate of 34.1%. A higher proportion of Malay patients were younger (40.6% <65 years of age) compared to Chinese patients (28.9%).

Conclusion: Several easily identifiable factors predict HF readmission or all-cause mortality within 6 months of discharge in this racially diverse Southeast Asian HF population. Malay patients appear to have higher HF event rates compared to similarly treated Chinese patients, even though they were younger on average.

M5

Prospective Case Control Study to Validate HpOne in the Diagnosis of Helicobacter Pylori Infection

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Aim: To verify the efficacy of HpOne (rapid catalase test) in the diagnosis of H pylori infection during gastroscopy, thus determining the sensitivity and specificity of HpOne in detection of H pylori.

Background data: HpOne provides a good alternative in detection of H pylori infection. Its highest concordance with the gold standard of histology has been found to be maximum at 1 hour. Furthermore, the test kit is cheaper than that of the CLO test. However, only small series have been reported in use of HpOne in detection of H pylori infection

Methods: A total of 107 consecutive patient with various gastric symptoms who had undergone gastroscopy were recruited in this study. Antrum and body biopsies were taken for CLO test, HpOne and histology. The test results were then correlated to histological findings which acted as the standard. Sensitivity, specificity, positive and negative predictive values were calculated in comparison with histology.

Results: H pylori infection was diagnosed by histology in 42 (39.2%) patients and by CLO test in 35 (32.7%) patients and HpOne test in 34 (31.7%) patients. In comparison with histology, CLO test has sensitivity of 58.1% and specificity of 83%. For HpOne, sensitivity and specificity were 57.1% and 81.8% respectively. The positive and negative predictive values were 68.5% (CLO test) and 70.5% (HpOne test) and 78.3% in both tests. The concordance of HpOne with CLO test was 97.1%.

Conclusion: From our study we concluded that HpOne test is highly accurate for the diagnosis of H pylori infection. Compared to the CLO

test, it can give more rapid and fruitful results and also as a cheaper alternative. All the positive results occurred at 60-minute readings and therefore, it is best conducted after endoscopy.

M6

Application of Light Emitting Diode and Celecoxib (Cox-2 inhibitor) for the Management of Wounds

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Background: Wound management, especially management of chronic wounds, have always been a challenge for clinicians. Many factors come into play in order for wounds to heal properly and in a timely manner. These factors include control of infection, inflammation, stimulation of keratinocytes and fibroblast growth as well as adequacy of wound vascular bed. Of late, LEDs has been shown to upregulate keratinocyte proliferation in cell culture studies through upregulation of growth factors.

Aim: Our study aims to evaluate the efficacy of Light-Emitting Diodes (LEDs) combined with topical COX-2 inhibitor in the management of wounds, using burn wound as a model.

Methods: We used a pig model of partial thickness burn injury and studied efficacy of various treatment modalities by a) wound contraction, b) Laser Doppler imaging, c) histology, and d) immunohistochemistry for Ki-67, proliferating cell nuclear antigen, and laminin. The various treatment modalities studied include LED monotherapy, Celecoxib monotherapy, LED + Celecoxib, Silverlon burn dressing and control group.

Results: Our findings show that LED + Celecoxib combined treatment is very effective and achieved the best wound healing profile among all treatment groups. The improvement of wound healing is significantly better when compared to control as well as with the other treatment groups. Even when used by itself, LED treatment of burn wounds showed good healing when compared to control.

Conclusion: Our results suggest that treatment of burn wounds with LED in combination with topical celecoxib significantly improves wound healing. This combination showed potential to be used as a novel therapeutic intervention for the management of wounds, thus possibly opening up new avenues for the management of difficult wounds.

M7

Genetic Polymorphisms in Cytokine Molecules and the Treatment Response to BCG in Bladder Cancer Patients

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Aim: Gene polymorphisms in key immunoregulatory molecules may contribute to the heterogeneity in outcome between individuals with superficial bladder cancer receiving the immunotherapeutic treatment with BCG. This study aims to verify and identify cytokine gene polymorphisms that could influence the immune response to BCG in those patients.

Methods: We studied more than 100 patients after BCG intravesical therapy including both BCG responders and non-responders. The cytokines single nucleotide polymorphisms (SNP's) genotypes were

assessed by PCR with Sequence Specific Primers (PCR-SSP). Genotypes and allele frequencies of responders and non-responders to the treatment were compared.

Results: There is a correlation of cytokine gene polymorphisms to outcome of patients after BCG treatment

Conclusion: These results suggest that host genetics of immune regulatory molecules may play a role in predicting the treatment outcome after BCG treatment of bladder cancer. This may therefore help decision-making in the choice of treatment modalities.

M8

Scarless “On the Neck” Endoscopic Thyroidectomy (SET) – NUH Experience

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Aim: This study reviews our experience with thyroid surgery using the SET technique.

Methods: The study group comprised of all patients undergoing SET during the period of 2005 to 2008. Data was prospectively gathered, including patient demographics, indication for surgery, approach, nodule size, final pathology and complications.

Results: We performed 28 surgeries over a 3-year period comprising of 12 cases via the axillary approach, 9 cases via the anterior/breast approach and 7 cases via both the axillary and breast approach (hybrid). All were lobectomies and 1 case was an isthmusectomy. The mean age of the patients was 41.2 years, the mean gland and nodule size was 5.1 cm (range: 3.0–8.5) and 3.6 cm (range: 1.5–6.0) respectively and mean length of stay was 2.1 days (range: 1–4). The mean operative time was 155.5 minutes, whereby the first 10 cases were 164.5 minutes and the next 10 cases was shortened to 145.5 min. There were 2 conversions. The first case of conversion was our second SET where dissection was difficult due to the large size of the gland (8.5 cm) and the inability to secure the superior thyroid vessels. The reason for conversion in our fifth SET was due to the inability to confidently dissect and preserve the recurrent laryngeal nerve. We encountered 3 post-operative complications. One patient had transient hoarseness. Another patient had a delayed presentation of a suspected tracheal perforation secondary to a thermal injury, which resolved with conservative treatment. The third patient had a transient brachial neuropraxia following the positioning of the arm in a flexed and internally rotated position during the axillary approach. The final histology of 2 patients returned as papillary carcinoma and they had subsequent open completion thyroidectomies. All patients were satisfied with the aesthetic outcome of the procedure.

Conclusion: The procedure is a safe surgical technique to remove thyroid nodules. It does not leave the patient with a scar on the neck.

M10

Half Dose Ezetimibe Add-on Therapy is Safe and Effective in Improving Resistant Hyperlipidemia in Asian Patients with Ischemic Heart Disease

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Aim: Ezetimibe at standard dose of 10 mg is used for lipid lowering in patients not reaching therapeutic target with statin monotherapy. We hypothesised that half the dose of ezetimibe (5 mg) daily dosing is as effective in achieving the percentage improvement in lipid

profile in Asian patients with severe hyperlipidemia.

Methods: We conducted a prospective cohort study between September 2004 and February 2008. One hundred and five patients with hyperlipidemia not reaching target level with statin treatment alone were given add-on ezetimibe 5 mg daily treatment. Lipid profiles were compared pre- and post-ezetimibe therapy.

Results: Mean age was 56.0 ± 10.3 years. Of the patients, 79.0% were men, 62.9% had hypertension, 39% had diabetes with mean HBA1c of 7.7%, 98.1% had ischemic heart disease, 5.7% had renal impairment. Median simvastatin equivalent dose was 40 (5–80) mg. 79.1%, 4.8% and 2.9% were on simvastatin, atorvastatin and rosuvastatin respectively. Duration of ezetimibe treatment was 102 ± 60 days. We observed improvement in total cholesterol TC (5.31 ± 1.02 to 4.33 ± 1.11 mmol/L, 16.7% reduction, $P < 0.0005$); Low density lipoprotein LDL (3.43 ± 0.87 to 2.52 ± 0.95 mmol/L, 24.3% reduction, $P < 0.0005$) and TC to LDL ratio (4.92 ± 1.42 to 4.03 ± 1.16 , 15.7% reduction, $P < 0.0005$). The percentage improvement of lipid profile is comparable to the published data based on 10 mg dosing.

One patient developed myalgia symptom with peak creatinine kinase at 837 U/L. There were no significant differences in creatinine kinase, liver and renal panel pre- and post-ezetimibe therapy. No patient experienced rhabdomyolysis or liver dysfunction.

Conclusion: We concluded that 5 mg daily ezetimibe treatment is safe and effective in improving lipid profiles in Asian patients with severe hyperlipidemia not reaching target with statin monotherapy.

M12

A Phase II Study of Cetuximab in Combination with Gemcitabine and Oxaliplatin in the First Line Treatment of Patients with Advanced Pancreatic Cancer

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Background: Pancreatic cancer has a dismal prognosis. Epidermal growth factor receptor inhibitors, such as Cetuximab (C), may improve survival when added to chemotherapy.

Methods: Progression-free survival (PFS) was the primary endpoint. Patients with locally advanced (LA) or metastatic pancreatic cancer (M) were eligible. Treatment consisted of G, 1000 mg/m² over 100 minutes and C, at a loading dose of 400 mg/m² on day 1 (250 mg/m² on day 8 and subsequent cycles), and O, 100 mg/m² on day 2, every 2 weeks. This regimen was expected to extend PFS from 5.8 months to 7.54 months (30%).

Results: Forty-one evaluable patients were enrolled between June 2006 and July 2007. Median age was 62 years, (range: 44–82). There were 19 males and 22 females. Twenty patients (48.8%) had metastatic (M) disease and 8 had locally advanced disease (LA). Median PFS was 6.9 months (95% CI = 3.9–9.2). Median PFS in LA patients was 7.5 months vs 4.5 months in M patients. Confirmed RR was 24% (95% CI = 12–40%), with 1 (2.4%) CR and 9 (22%) PR. Clinical benefit rate (CR, PR and SD) was 75.6% (95% CI = 59.7–87.6%). One year survival was 53% (95% CI = 30–71%). Median OS was 6.5 months in the M group and not yet reached in the LA group. Most frequent grade 3/4 AEs included neutropenia, infection, liver enzyme elevation, fatigue, diarrhea, peripheral neuropathy, hypokalemia and thrombosis.

Conclusions: GOC is active and has a favourable toxicity profile. Updated information on the primary and secondary endpoints and correlative studies on available tumour specimens will be updated at the meeting.

Disclaimer: This study has been presented in part at the 2008 Gastrointestinal Cancer Conference (ASCO GI) in Orlando, FL, USA and at the 2008 American Society of Clinical Oncology Meeting (ASCO) in Chicago, IL, USA.

M13

Metabolic Effects of Weight Loss on a Very Low Carbohydrate Diet Compared to an Isocaloric High Carbohydrate, Low Fat Diet in Obese Subjects

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Background: Despite the popularity of very low carbohydrate diets (LC), no long-term studies have compared their effects of weight loss and metabolic change to a conventional high carbohydrate, low fat diet (HC) under isocaloric conditions.

Aim: This study compared the effects of an energy reduced, isocaloric LC and a HC on weight loss and cardiovascular disease risk outcomes after 6 months.

Methods: Eighty-eight obese adults were randomly assigned to either an energy restricted (~6-7 MJ, 30% deficit), planned isocaloric LC or HC for 24 weeks in an outpatient clinical trial. Body weight, blood pressure, glucose, lipids, insulin, apoB and C-reactive protein were measured at Week 0 and 24.

Results: Weight loss was similar in both groups (mean \pm SD: LC -11.9 \pm 6.3 kg, HC -10.1 \pm 5.7 kg; $P = 0.17$). Blood pressure, C-reactive protein, fasting glucose and insulin reduced similarly with weight loss in both diets. LC produced greater decreases in triacylglycerol (LC -0.64 \pm 0.62 mmol/L, HC -0.35 \pm 0.49 mmol/L; $P = 0.01$) and increases in HDL-C (LC 0.25 \pm 0.28 mmol/L, HC 0.08 \pm 0.17 mmol/L; $P = 0.002$). LDL-C decreased in HC but remained unchanged in LC (LC 0.03 \pm 0.79 mmol/L, HC -0.46 \pm 0.71 mmol/L; $P < 0.001$). However a high degree of individual variability for the LDL response in LC was observed, with 24% of individuals reporting an increase of at least 10%. ApoB levels were not significantly different from baseline in either diet group.

Conclusion: We conclude that under isocaloric conditions a LC and HC result in similar weight loss. Overall, although both diets had similar improvements with weight loss for a number of metabolic risk markers, HC had more favourable effects on the blood lipid profile. This suggests the potential long-term effects of LC for cardiovascular disease risk remains a concern and that blood lipid levels should be monitored.

M14

Safety of Biolimus A9-Eluting Bioabsorbable Polymer-Coated Stent in Patients with Acute Myocardial Infarction

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Aim: Our aim was to evaluate the safety of a biolimus A9-eluting bioabsorbable polymer-coated stent (BBPS) in the setting of AMI by examining clinical outcomes of AMI patients treated with BBPS.

Methods: Data were obtained from a single centre, first-in-man registry. Between 1 December 2006 and 31 December 2007, 106 patients with AMI were treated with BBPS. Those presenting with cardiogenic shock were excluded. All patients were followed up till 31 May 2008. We assessed major adverse cardiac events (MACE) defined as cardiac death, nonfatal reinfarction and target vessel revascularisation (TVR) at 30 days and up till end of follow-up. Mean follow-up period was 374 \pm 104 days.

Results: Mean age was 59 \pm 12 years with 84% males. 38% had diabetes, 55% had hypertension, 76% had hyperlipidemia, 47% smoked, and 8% had previous coronary revascularisation. The most common infarct-related artery was the left anterior descending coronary artery (63%) with 42% of patients having single, 35% double and 23% triple vessel coronary artery disease. Majority of lesions (58%) were Type B2. Mean stent diameter was 3.23 \pm 2.14 mm, and mean stent length 22 \pm 5mm. Mean left ventricular ejection fraction was 43 \pm 9%. All patients received dual antiplatelet therapy for a minimum of 6 months. At 30 days, there was no MACE. At the end of follow-up, rate of cardiac death or nonfatal reinfarction was 1.9% and TVR rate was 0.9%. There was no early or late stent thrombosis.

Conclusion: Use of BBPS in patients with AMI was safe with low rate of MACE up to a mean follow-up period of 374 \pm 104 days.

M15

Outcome of Head Injury Patients with Glasgow Coma Scale Score of 15 in the Emergency Department

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Aim: Head injury patients with Glasgow Coma Scale (GCS) Score of 15 who are clinically well are among the most challenging to manage in the Emergency Department (ED). The objective is to review the outcome of head injury in these patients.

Methods: A retrospective study was conducted at the Emergency Department of Tan Tock Seng Hospital. All patients with GCS score of 15 were managed accordingly to the guidelines of the department. The primary outcome was incident of intracranial hemorrhage (ICH).

Results: Of 445 patients studied, 208 (46.7%) were discharged, 181 (40.7%) were admitted to the ED observation medicine unit (EDOU), 46 (10.3%) were admitted to Neurosurgical ward and 10 (2.2%) were admitted to Medical ward. CT was done in 242 cases (54.4%), which showed ICH in 28 cases (6.3%). Neurosurgical intervention was needed in 2 patients (0.4%). Of the 208 patients who were discharged, 1 (0.5%) was finally diagnosed to have ICH. Patient had risk factors but was discharged on the first visit. The incidence of ICH amongst

patients admitted to EDOU, Neurosurgery and Medical ward was 6.6%, 30.4% and 10% respectively. In the multivariate analyses, age (OR 1.02, 95% CI 1.00-1.04) and complaints of vomiting (OR 3.05, 95% CI 1.12-8.33) were predicted a higher incidence of ICH.

Conclusion: The incident of ICH was the lowest in those who were discharged. The current practice is considered safe if every patient is managed accordingly to the guidelines.

M16

Serum Hydrogen Sulfide: A Novel Biological Marker that Predicts Severity of Acute Pancreatitis at its Early Stage

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Aim: Acute pancreatitis (AP) is an illness associated with significant morbidity and mortality. Currently, the severity of AP is predicted by scoring systems which are complicated and require serial testing. In mouse models, Hydrogen sulfide (H₂S) plays a pro-inflammatory role in AP. This is the first prospective study in humans, to evaluate the role of H₂S as a simple, rapid and early clinical predictor of the severity of AP.

Methods: Adult subjects with AP were recruited. Blood for serum H₂S levels was obtained at 0, 6, 12, 24, 48 and 72 hours, and analysed at intervals from onset of symptoms. They were correlated with severity of AP as determined by Atlanta criteria, Ranson's and APACHE II scores.

Results: In 25 subjects, AP was due to gallstones (44%), alcohol ingestion (20%) and endoscopic retrograde cholangiopancreatography (12%). Severe pancreatitis occurred in 48% (Ranson's score), 36% (APACHE II score) and 64% (Atlanta criteria). 4% developed organ failure. Mortality was 4%.

H₂S at 0-24 hours from the onset of symptoms correlated significantly with severity using Ranson's (mild 36.4 μM vs severe 158.3 μM, $P = 0.013$), APACHE II (mild 60.5 μM vs severe 294.1 μM, $P = 0.004$) and Atlanta criteria (mild 22.2 μM vs severe 150.9 μM, $P = 0.007$). At 24-48 hours, H₂S remained predictive of severity using Ranson's (mild 23.9 μM vs severe 183.8 μM, $P = 0.004$) and Atlanta criteria (mild 24.0 μM vs severe 98.7 μM, $P = 0.009$).

Conclusion: This study suggests that H₂S is involved in the inflammatory response of AP in humans. The correlation of H₂S with severity of AP suggests its potential role as an early predictor of AP severity, facilitating earlier intervention.

M17

The Immediate Effects of Multisensory Therapy in Reducing the Frequency of Agitated Behaviours among Geriatric Patients with Schizophrenia: A Single Blind Experimental Study

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Aim: This study examined the immediate effects of multisensory therapy in reducing the frequency of agitated behaviours among geriatric patients with schizophrenia.

Methods: An experimental pretest-posttest control group design was used. Sixty subjects with schizophrenia were recruited from 3 geriatric psychiatric long stay wards. Subjects were randomly assigned to a control and experimental group. The control group received usual care, while the experimental group participated in a 12-week multisensory therapy program (30 minutes per session, twice a week). Brief Agitation Rating Scale was used to assess its immediate effects on subjects' frequency of agitated behaviours before and after each session. The raters were blinded as to which group they were assessing.

Results: Preliminary results showed that the overall mean differences between the groups' pre- and post-intervention scores were 1.067 ± 1.172 (95% CI: 0.629-1.5) ($P < 0.005$) (Control) and 1.167 ± 1.488 (95% CI: 0.611-1.722) ($P < 0.005$) (Experimental). The frequency of agitated behaviours of male subjects in the experimental group reduced from mean score of 20.143 ± 12.823 (95% CI: 14.306-25.98) ($P = 0.012$) (pre-intervention) to 18.714 ± 12.178 (95% CI: 13.171-24.258) ($P = 0.038$) (post-intervention). The rest had minimal or no change in their scores.

Conclusion: Findings show that multisensory therapy reduces the frequency of agitated behaviours among the geriatric patients with schizophrenia, especially the males. These findings provide useful evidence-based information that will assist nurses in making informed decisions on implementing multisensory therapy for these vulnerable population.

M18

Survival from Childhood Cancer: Our Experience at National University Health System, Singapore

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Aim: Childhood cancer survival has increased dramatically over the last 30 years. This study is to evaluate the survival rate of haematological malignancies (HM, e.g. leukaemia, etc.) and solid tumours (ST, e.g. sarcomas, etc.) for patients diagnosed and treated at National University Health System, (NUHS) Singapore.

Methods: All patients who presented to the Department of Pediatrics, NUHS were included in the study. From May 1996 onwards, the Singapore Childhood Cancer Registry (SCCR) was established.

Results: There were 429 cases of HM and 342 cases of ST that have been diagnosed and treated at NUH from May 1981 to December 2007. There were 445 (57.7%) males and 326 (42.3%) females in the cohort. Of these 62.3% (n=481) were Chinese, 15.8% (n=122) were Malay, 4.2% (n=31) were Indian and 17.8% (n=137) were other ethnic groups. Median age of diagnosis for HM was 5.1 years (range, birth-20.7 years) whilst the median age for ST was 5.2 years (range, birth-20.2 years). Among the haematologic malignancies, acute lymphoblastic leukaemia (ALL) made up the majority with 275 (64.1%), and acute myeloid leukemia (AML) 56 (13.1%). Among the solid tumours, brain tumours were the most common 93 (27.3%), and sarcomas 71 (20.8%). Median follow-up for the group was 2.2 years (range, 0.003-25.7 years). At the time of last follow-up for the entire cohort, 596 (77.3%) were alive, 157 (20.4%) were deceased and 19 (2.5%) were unknown status.

Conclusion: Hematologic malignancies as expected were the more common diagnosis compared to solid tumours. Survival from childhood cancer appears to be improving.

M19

Microbial Contamination of the Peritoneum is Common Following Transgastric Endoscopic Surgery

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Aim: The 20th Century has evolved with the development of MIS, which is associated with less pain, hospital stays and complications. MIS has further improved with combined endo-laparoscopic approach and since 2005 with transluminal surgery (NOTES), which has gained popularity and great interest. The aim of this study was to investigate if the transgastric approach could affect the peritoneal cavity by transluminal contamination.

Methods: A total of 7 pigs weighing 30-40 kg, and 5-7 months of age underwent various NOTES procedures (tubal ligation, and oophorectomy) via the transgastric approach according to a standardised protocol. The stomach was lavaged with Povidone Iodine followed by sterile water until effluent was clear. Peritoneal fluid was aspirated pre-operatively, and just prior to closure of the gastrotomy using an endoscopic catheter, and sampled again on necropsy 2 weeks following the NOTES procedures. These specimens were incubated for culture using the standard technique.

Results: Five pigs were well till necropsy 2 weeks later. At necropsy, 2 out of 7 pigs had intraabdominal sepsis evidenced by abscess collections. From the pre-operative samples, 3 out of 7 animals had positive cultures. In contrast, 4 different species were isolated from the postoperative samples obtained from all the 7 animals. On necropsy, *Escherichia coli* was isolated from the abscess collections in both animals with intraabdominal sepsis.

Conclusion: The finding of *Stenotrophomonas* and *Pseudomonas* (animal pathogens not normally found in the peritoneum; 3/7 cases) and intraabdominal sepsis (2/7) suggested that significant leakage with intraabdominal sepsis is common following transgastric surgery.

M20

A Phase II Study of Bevacizumab in Combination with Nab-Paclitaxel and Gemcitabine in the Treatment of Advanced Breast Cancer

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Aim: Bevacizumab, Nab-paclitaxel and Gemcitabine improve outcomes in the treatment of breast cancer. This is the first study to assess the efficacy of triple combination therapy with these agents as first-line treatment for patients with MBC.

Methods: Patients with HER2-negative MBC received gemcitabine 1,500 mg/m², nab-paclitaxel 150 mg/m², and bevacizumab 10 mg/kg (each administered intravenously over 30 minutes) on days 1 and 15 of 28-day cycles. Cycles were repeated for the duration of therapy. Progression-free survival is the primary endpoint. A total enrollment of 30 evaluable patients and 2.5-year study duration are planned.

Results: To date, 15 patients (14 female; mean age 54 years) have been enrolled, of whom 11 were evaluated for efficacy (received ≥2 cycles), 13 for safety, 15 for estrogen receptor (ER) status, and 12 for progesterone receptor (PR) status. All patients were HER2-negative; 80% were ER+, and 58% were PR+. Ten (91%) patients achieved PR,

and 1 (9%) patient had progressive disease. All adverse events were grade 1 or 2, and the most commonly reported side effects were alopecia (62%) and fatigue (38%). Two patients were hospitalised because of port site infection and hematotoxicity.

Conclusion: This interim analysis demonstrates a 91% overall response rate to first-line combination therapy with Nab-paclitaxel, Bevacizumab, and Gemcitabine in patients with MBC. The small sample size notwithstanding, these data suggest that this regimen may represent an important new option for the first-line treatment of patients with MBC. The study is ongoing and results will be updated at the meeting.

Disclaimer: This study has been presented in part at the 2008 American Society of Clinical Oncology Meeting (ASCO) in Chicago, IL, USA.

M22

Efficacy of a Probiotic VSL#3 in the Treatment of Irritable Bowel Syndrome: A Randomised Double-Blind Placebo-Controlled Study

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Aim: There is as yet no satisfactory treatment for irritable bowel syndrome (IBS). The current study aimed to evaluate the effects of a probiotic, VSL#3, on symptoms and rectal sensitivity in patients with IBS.

Methods: Twelve IBS patients were randomly assigned to receive 4 capsules of either VSL#3 (n = 5) or matching placebos (n = 7), twice daily, for 6 weeks. Prior to and post-treatment, subjects completed bowel, and psychological questionnaires, and underwent rectal sensitivity study.

Results: Compared to placebo, VSL#3 significantly decreased the mean IBS severity scores from 286 to 190 (P < 0.03). A trend towards reduction in the mean hospital anxiety (from 9.2 to 6.2) and depression scale (from 3.8 to 2.4) was also observed after treatment with VSL#3. There was a slight increase in the mean rectal distension pressures of rectal sensation (from 12.46 mmHg to 13.99 mmHg), defecation (from 25.07 mm Hg to 26.63 mm Hg), urgency (from 30.11 mmHg to 33.26 mmHg) as well as pain threshold (22.57 mmHg to 25.96 mmHg) after VSL#3 treatment but these changes are not statistically significant.

Conclusion: Our data demonstrated that VSL#3 significantly attenuates the severity of IBS symptoms. The influence of this treatment on reducing rectal pain sensitivity and psychological profile is promising. A larger sample size is needed in order to determine the action of VSL#3 in irritable bowel syndrome. The study is ongoing.

M23

Comparing Clinical Accuracy and Efficiency of Automated Visual Acuity Assessment System with Manual Visual Acuity Assessment

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Aim: To evaluate the clinical accuracy and efficiency of Automated Visual Acuity Assessment System (AVAAS) compared against

Manual Visual Acuity (MVA) assessment. AVAAS is an innovative and newly developed system using Visual Basic which is linked to Microsoft Access database. It is based on Landolt-C optotypes (Flash MX with anti-aliasing) of 8 different orientations, and using a formulated algorithm, built in to determine the progress of the assessment.

Methods: Fifty volunteers (100 eyes) participated in this prospective study and were assessed by both MVA and AVAAS. Their best corrected visual acuity (BCVA) and the time taken to complete assessment of both eyes were recorded. A second assessment was subsequently performed based on the first recorded BCVA. Their BCVA and timing were again recorded. Fixing the level of significance at 5%, all analyses were performed with Stata 9.0.

Results: The level of agreement between AVAAS and MVA for the initial assessment was 86%. For the second assessment, it was 85%. The average time taken to complete initial MVA and AVAAS was 107.3 seconds and 115.7 seconds, respectively. The difference in timing was found to be non-significant ($P = 0.10$). However, there was significant difference between the timing for the second assessment (MVA: 64.3 sec, AVAAS: 81.9 sec; $P < 0.01$; $n = 40$).

Conclusion: The level of agreement was high. The time taken to perform AVAAS was comparable to that of MVA and the difference was clinically insignificant. The AVAAS is clinically proven to be an accurate and efficient system for visual acuity assessment.

M24

Cisplatin Induced Ototoxicity in Osteosarcoma Patients (Singapore Childhood Cancer Survivors Study [NUHS])

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Background: Improvements in treatment of cancer has led to increasing number of childhood survivors with 80% to 90% experiencing sustained survival and cure rates. Unfortunately, these long-term survivors now experience significant late effects of cancer itself or from therapy. Cisplatin, an alkylating agent used in treatment for osteosarcoma, has been associated with irreversible high-frequency sensorineural hearing loss.

Methods: Twenty-seven osteosarcoma patients treated at Department of Pediatrics, National University Hospital from 1997 to 2005 were analysed. Twelve patients were eligible for the long-term survivors study. Hearing function was tested by audiometry.

Results: Prechemotherapy audiogram was performed in 50% ($n = 6$) of patients and the audiogram results were not available in the remainder ($n = 6$, 50%) as it was either not done or records were not available. Cisplatin was administered at a dose of 100 mg/m²/course (EOI regimen) in 50% of cases, 120 mg/m²/course (T12 regimen) in 45%. Median cumulative dose of cisplatin was 550 mg/m² (cumulative dose range, 240–800 mg/m²). Out of 12 patients, 7 patients (58%) had cisplatin induced ototoxicity. According to NCI Toxicity Criteria, there was grade 1 toxicity in 2 cases (30%) and grade 2 toxicity in 5 cases (70%). One patient needed a hearing aid. Six of them had bilateral sensorineural hearing loss and renal tubulopathy (NCI Toxicity Grade 2) was noted simultaneously in 35% of cases ($n = 4$).

Conclusion: The incidence of cisplatin-induced ototoxicity is high in long-term survivors of osteosarcoma. Baseline prechemotherapy testing, close monitoring during treatment and further follow-up are essential for this subset of patients receiving high doses of cisplatin.

M25

Ethnic Differences on the Outcomes of Non ST-Elevation Myocardial Infarction in Diabetic Patients

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Aim: Diabetes mellitus (DM) is linked to adverse outcomes in patients with Acute Coronary Syndrome (ACS). We aim to examine the prevalence of diabetes and its impact in Non ST-Elevation Myocardial Infarction (NSTEMI) patients in our local population.

Methods and Results: A total of 1342 consecutive patients with NSTEMI, admitted to a local institution were retrospectively studied. The endpoints were in-hospital mortality, reinfarction and 1-year mortality. There were 37.9% female and 49.4% diabetics. The diabetics were significantly older with mean age 67.5 ± 12 vs 64.5 ± 15 years in non-diabetics ($P < 0.001$). They were predominantly hypertensive and non-smoking, 49.2% were female. Malay and Indian patients were disproportionately overrepresented in the diabetic vs non-diabetic group (Malay 23.5% vs 21.5%, Indian 18.9% vs 12.7%). Only 18.3% vs 30.3% ($P < 0.001$) of the diabetics were treated aggressively with reperfusion therapy. There was no ethnic disparity in the treatment given. However, diabetics had increased risk of in-hospital cardiovascular complications (44.1% vs 25.1%, 95% CI 1.86-2.97), and in-hospital mortality (12.5% vs 8.0%, HR 1.66 (95% CI 1.16-2.38)). After adjustment for treatment, diabetic Indians were 10 times more likely to die and twice as likely to develop complications during admission. Post-discharge, 26.4% of diabetics were readmitted for cardiovascular related complications. After adjusting for age, medical treatment only was associated with a higher reinfarction or mortality rate within a year (HR = 4.92 (95% CI 2.39-10.12)). This is independent of racial difference.

Conclusion: Diabetes with NSTEMI suffers from worse outcomes both during the admission and post-discharge. There is therefore a need for aggressive risk modification in diabetics suffering from ACS. Diabetic Indians suffer higher morbidity and mortality despite similar treatment. Further research into this may be warranted.

M26

Is Pyogenic Liver Abscess Associated with Colonic Pathology? - A Retrospective Study

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Aim: The most common known cause of pyogenic liver abscess is biliary stone disease. However, in many patients with pyogenic liver abscesses, no obvious biliary stones can be identified and these are reported as cryptogenic abscesses (range, 20-64%). We hypothesise that the source of some of these pyogenic liver abscesses may be related to undiagnosed colonic pathology.

Methods: A retrospective study of all consecutive patients admitted for pyogenic liver abscess to the National University Hospital between January 2005 and September 2007 was conducted. Patients with amebic abscesses, abscesses arising from liver tumours or infected liver cysts were excluded. Clinical parameters, symptomatology, microbiological assays and radiologic findings were abstracted, and colonoscopic findings reviewed.

Results: Ninety-six cases of pyogenic liver abscess were retrieved. The median age was 59 years (range, 22-87 years) with M:F ratio of

2:1. The most common presenting symptoms were fever (85%) and abdominal pain (45%). *Klebsiella pneumoniae* (73%) and *Escherichia coli* (13%) were the most common pathogens implicated. Median abscess size was 5.4 cm (range, 1-12.7 cm). Biliary tract pathology was identified as the source of liver abscess in 6 patients (6%). Forty-eight patients had colonoscopic evaluation, of whom 24 patients (50%) had abnormal colonoscopic findings (13 with diverticular disease, 14 with colonic polyps, 1 with sigmoid cancer and 1 with caecal colitis).

Conclusion: Abnormal colonoscopic findings were common in patients with pyogenic liver abscess. Colonoscopic evaluation is advisable in patients with pyogenic liver abscess especially if biliary tract pathology was not the source of infection.

M27

Effects of Reperfusion Therapy on the Mortality and Morbidity in the Very Elderly with Acute Myocardial Infarction

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Aim: Although the majority of the mortality related to myocardial infarction (MI) occurs in the elderly, they were underrepresented in majority of trials. Hence, there is limited data available to examine the benefits of invasive treatment in the very old. In this study, we aim to examine the impact of reperfusion therapy on the in-hospital and 1-year mortality in acute MI in the elderly.

Methods: We retrospectively analysed 622 consecutive patients aged 75 and above who were admitted for myocardial infarction to a local institution. The endpoints were mortality and 1-year reinfarction rates.

Results: Overall, there were 47% males; mean age was 82 ± 5 years. The prevalence of hypertension, and diabetes mellitus were significantly higher in women while 79.3% of the smokers were male. Only 14.0% were offered revascularisation therapy. It was noted that conservatively treated patients had a significantly higher mortality within 1 year post-MI (HZ = 1.95, 95% CI 1.16-3.29, $P = 0.012$). After adjusting for age and conventional risk factors, the composite endpoints was still higher in those treated less aggressively (HZ = 1.89, 95% CI 1.13-3.17, $P = 0.015$). In addition, in-hospital cardiovascular complications and mortality were higher in this group, $P < 0.05$ for both. Reperfusion however, did not decrease readmission for cardiovascular complications of heart failure, angina, infarction and malignant arrhythmias. Among those who were did not undergo reperfusion, in-hospital complications (cardiovascular and medical) were significantly higher in diabetics ($P < 0.05$) independent of gender. Diabetes was also the most important determinant of the 1-year re-infarction/mortality (HZ = 1.89, 95% CI 1.37-2.60, $P < 0.001$).

Conclusion: Heterogeneity of older populations may have led to a less invasive approach as a whole, elderly MI patients offered reperfusion therapy have reassuringly lower in-hospital morbidity and 1-year mortality but no change in cardiac readmission.

M28

Poor Prognostic Factors for Long Term Survival of Neuroblastoma

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Aim: To identify biological factors as well as histological and NMYC gene amplification status for subsequent long-term survival of neuroblastoma patients.

Methods: This is a retrospective cohort single-arm study of 53 neuroblastoma patients seen and treated with multimodality treatments (chemotherapy, surgery, radiation, autologous stem cell transplant and retinoic acid) at National University Hospital, Singapore from 1987 to 2007.

Results: Out of 53 patients, 5 patients defaulted. Median age of presentation was 39.77 ± 7 months (CI 95%, range 2.7-4 .0 years). Staging as per International Neuroblastoma Staging System shows Stage I, 4; IIa, 2; IIb, 3; III, 13; IV, 22; IVS, 4. Histologically, 37 well-differentiated, 2 moderately and 9 poorly differentiated. Cytogenetic testing was performed in 23 patients of whom 6 were N-MYC amplified and 17 were non N-MYC amplified. Overall survival rate for the cohort was 69% (CI 95%, 56- 82%) and mortality 31% (CI 95%, 26-37%). Survival rate for stage IV disease was 33.3% at 2 years and 20% at 3 years. Sixty per cent of the deaths were males more than 18 months of age at presentation with poorly differentiated histology, N-MYC amplification and Stage IV diseases.

Conclusion: Similar to the rest of the world, age more than 18 months at diagnosis, male sex, advanced stage (mostly IV), NMYC amplification and poorly differentiated histological types at presentation are predetermined poor prognostic factors for long-term survival despite multimodality treatments and such patients should receive intensive treatments and close follow-up for early detection of relapse.

M29

Total Transvaginal Endoscopic Ventral Hernia Repair: A Notes Survival Study

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Introduction: Natural Orifice Transluminal Endoscopic Surgery (NOTES) has gained widespread interest as a potentially less invasive alternative to laparoscopic surgery or an evolution of it. The main drawbacks of this new approach are incision-related complications, spillage of intraluminal contents with resultant intraabdominal sepsis and lack of proper instrumentation. The main objective of this study was to assess the safety of transluminal hernia repair surgery for potential human application by specifically investigating the feasibility and challenges using a transvaginal approach.

Materials and Methods: The study utilised 5 female pigs (30-40 kg) between 5-7 months of age, which underwent surgical procedures using a transvaginal approach. After excision of small parietal peritoneum area around the periumbilical area, an antiadhesive mesh

was placed to cover the defect and fixed by nonabsorbable suture and fibrin-glue or staplers. The procedures were performed using a double-channel endoscope (GIF-2T160, Olympus, Japan) under General Endotracheal Anesthesia (GETA). All the procedures were completed without technical problems. The animals lived for 2 weeks, then they were euthanised and a necropsy performed. All pigs received antibiotics therapy for 3 post-operative days and no signs of peritonitis or other post-operative complications were recorded.

Results: At the necropsy all meshes were well in place and mild adhesion were recorded in 1 animal with small abscess in the subcutaneous area.

Conclusion: The study reports the first transvaginal ventral hernia repair in the world using NOTES in a survival model. This technically seems feasible with low intraabdominal contamination and sepsis and feasible using equipments and accessories currently available for conventional laparoscopic and interventional endoscopy. New procedure-specific instruments and equipments should be developed to allow the operator safer access into the peritoneum, more degrees of instrument freedom for use in more difficult cases.

M30

Risk Predictors and Clinical Outcomes for Contrast Induced Nephropathy Post Percutaneous Coronary Intervention in Patients with Diabetes Mellitus

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Aim: Contrast induced nephropathy (CIN) is an important complication post percutaneous coronary intervention (PCI). Diabetic patients are a high-risk cohort for development of CIN. We examined the clinical predictors of CIN in diabetic patients post PCI and their clinical outcomes.

Methods: A cohort of 1211 diabetic patients undergoing PCI between May 2001 and March 2007 was recruited. Patient with baseline renal impairment (serum creatinine ≥ 1.5 mg/dl) received routine prophylactic saline hydration and oral N-acetylcysteine treatment. We examined the occurrence of CIN in this cohort and aimed to identify other clinical predictors.

Results: Incidence of CIN was lower in diabetics with mild renal impairment (glomerular filtration rate, GFR = 40-60 ml/min/1.73m²) who received prophylaxis compared with diabetics with normal renal function without prophylaxis (CIN rate 4.4% vs 8.5%, $P = 0.041$). Diabetics with moderate to severe renal impairment (GFR: 20-40 and <20) had very high risk of developing CIN despite prophylaxis (CIN rate 16.3% and 37% respectively).

Other important clinical predictors of CIN in our diabetic cohort are: female gender Odds Ratio (OR):1.50 (1.10-2.24), $P = 0.044$; Creatinine Kinase CK >350 U/L OR :2.08 (1.39-3.11), $P <0.001$; Insulin dependence OR:2.12 (1.04-4.32), $P = 0.034$; contrast volume OR:1.21 (1.01-1.58), $P = 0.045$; Anaemia OR:1.65 (1.01-2.70), $P = 0.043$; GFR:20-40 OR:2.09 (1.10-3.96), $P = 0.022$ and GFR <20 OR:6.30 (3.31-12.0), $P <0.001$.

Patients who developed CIN had higher mortality rate at 1 month

(2.0% vs 18.4%, $P <0.001$) and 6 months (3.3% vs 23.8%, $P <0.001$).

Conclusion: Despite saline and N-acetylcysteine treatment, diabetic patients with moderate to severe renal impairment, anaemia, insulin dependence, post-procedural CK rise and high contrast volume use were at high risk of developing CIN with resultant adverse outcome. Such patients might be offered additional CIN prophylactic therapy and closer monitoring.

M31

Should Elderly Patients Be Denied of Pancreaticoduodenectomy?

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Aim: Although mortality and morbidity for pancreaticoduodenectomy (PD) have improved significantly over the last 2 decades, the concern for the elderly undergoing PD remains. This study examines the outcome of the elderly patients who had pancreaticoduodenectomy in our institution.

Methods: A prospective database comprising of 69 patients who underwent pancreaticoduodenectomy between 2001 to May 2008 was analysed using SPSS (Version 15.0). Elderly patients are defined as those of age 65 and above, according to the WHO definition. Two groups of patients were compared [Group 1: Age ≤ 65 , $n = 37$ (54%) vs Group 2: Age >65 , $n = 32$ (46%)].

Results: The mean age of our cohort of patients was 62 ± 11 years. There was no statistical difference between the 2 groups in terms of gender and racial distribution. However, there were more patients in the Group 2 with >2 comorbidities ($P = 0.03$). This was correlated with greater ASA score in Group 2 ($P = 0.01$). The following parameters were comparable including clinical presentation, indication for surgery, histology, tumour size, grade and staging (T, N and AJCC).

The duration of operation was significantly longer in Group 2 (550 minutes vs 471 minutes, $P = 0.04$). Morbidity rate in Group 2 was higher (56% vs 44%, $P = 0.04$). However, this was not correlated with the grade of complications ($P = 0.37$). There was higher proportion of post-operative pancreatic fistula (POPF) in the elderly group ($P = 0.05$). Majority of them are Grade A POPF according to the ISG definition. This was not correlated to the consistency of the pancreatic parenchyma ($P = 0.58$). There was no difference in delayed gastric emptying (DGE) and post-pancreatectomy haemorrhage (PPH), wound infections and respiratory morbidities between the 2 groups.

Post-operative length-of-stay (LOS) in hospital was significantly longer in Group 2 ($P = 0.01$). Mortality rate between the 2 groups of patients was comparable.

Conclusion: Elderly patients are at increased risk of morbidity in pancreatocoduodenectomy. Therefore, careful pre-operative patient selection is important. Cardiac risk stratification should be part of the workup for them and they should not be denied the operation if indicated.

M32

A Prospective Controlled Study to Examine the Effects of Aromatherapy in Reducing PRN Night Sedation Usage for Patients with Schizophrenia in Long Term Care SettingsZY ZHOU¹, CL POH¹, SE TAY¹, KG TEY¹, J NG², H YIN¹, TC TAN¹, SY LP¹, QQ YANG¹, A GOVINDASAMY¹, L SHEN³¹Nursing Administration, Institute of Mental Health / Woodbridge Hospital, Singapore, ²Occupational Therapy, Institute of Mental Health / Woodbridge Hospital, Singapore, ³Biostatistics, National University of Singapore, Singapore**Aim:** This study aimed to examine the effects of aromatherapy in reducing PRN night sedation usage for inpatients with schizophrenia.**Methods:** Pre-test post-test single group design was used. Thirty-nine inpatients with schizophrenia, prescribed with PRN night sedation, were recruited from 10 psychiatric long stay wards. Before the intervention, subjects' PRN night sedation consumption was recorded for 3 weeks. Two drops of lavender oil were then placed on the same corner of their pillowcases between 8:30 pm to 9 pm every night for a period of 3 weeks. PRN night sedation was served only to subjects, who were still awake at 10 pm. Subjects' PRN night sedation consumption during this period was recorded. Data before and during intervention were compared. Paired Samples T-test was used to compare means.**Results:** Preliminary results indicate that 90.9% of the subjects had reduced use of PRN night sedation during the intervention phase. The rest had no change in their consumption. The average night sedation usage per subject per night reduced from 0.84 to 0.31. The overall mean difference between pre- and during intervention was 11.182 ± 5.828 (95% CI: 7.267-15.097) ($P < 0.005$).**Conclusion:** The findings of this study showed that aromatherapy is effective in reducing PRN night sedation usage for long stay inpatients with schizophrenia. These findings provide evidence-based information that will assist nurses in making informed decisions on implementing aromatherapy to reduce the number of PRN night sedation usage among patients with schizophrenia living in the long term care settings.

M33

Outcome of Pylorus-Preserving Pancreaticoduodenectomy (PPPD) in a HPB UnitAWC KOW¹, K KWAN², A EARNEST³, SE CHONG¹, KH LIM¹, CY CHAN¹, CK HO¹, LIAU KH¹¹Surgery, Digestive Disease Centre, Tan Tock Seng Hospital, Singapore,²Yong Loo Lin School of Medicine, National University of Singapore,³Principle medical statistician, Clinical Research Unit (CRU), Tan Tock Seng Hospital, Singapore**Aim:** Pylorus-Preserving Pancreaticoduodenectomy (PPPD) was advocated as it retains the physiological function of pylorus in controlled release of food content into small bowel. However, others challenged this operation as it causes higher complication of delayed gastric emptying (DGE).**Methods:** A prospective database comprising of 69 patients who underwent pancreaticoduodenectomy between 2001 and May 2008 was analysed using SPSS (Version 15.0). We compared the difference between PPPD and classical Whipple's operation.**Results:** The mean age of our patients was 62 ± 11 years. A total of 28 (41%) patients underwent PPPD compared to 41 (59%) patients in the classical Whipple's group. There was no difference between

the 2 groups (age, gender, racial distribution and comorbidities).

There was no statistical difference between the 2 groups in terms of indication for surgery, tumour histology, size, grade and staging (T, N and AJCC). There were also comparable results in terms of resection margin clearance, vascular and perineural involvement of malignant cases in the 2 groups. The proportion of patients in the PPPD group who had pre-operative stenting was comparable to the classical Whipple's group ($P = 0.53$).The mean duration of operation for the PPPD group was 555 ± 123 minutes and this was significantly longer compared to the classical Whipple's group (mean 475 ± 157) ($P = 0.03$). Total amount of intra-operative blood loss and total amount of blood transfusion were similar in both groups. Post-operative and total length-of-stay were also comparable between the 2 groups.Both groups have comparable morbidity rate and grade of complications. No statistical difference in terms of delayed gastric emptying (DGE) ($P = 0.50$), post-operative pancreatic fistula (POPF) ($P = 0.06$) or post-pancreatectomy haemorrhage (PPH) ($P = 0.85$) was demonstrated.**Conclusion:** Outcome of PPPD is comparable to classical Whipple's operation. The concern of higher DGE rate in PPPD is unfounded and the long term outcome of this operation is yet to be seen.

M34

Fulminant Community-acquired *Acinetobacter baumannii* Pneumonia in SingaporeWMC ONG¹, SWG CHUA³, KL KHOO³, SF YEOH², AC CHUA¹¹Division of Infectious Disease, Department of Medicine, ²Department of Pharmacy,³Division of Respiratory and Critical Care Medicine, Department of Medicine, National University Health System, Singapore**Aim:** *Acinetobacter baumannii* infections have attracted significant attention as they become more prevalent in hospitals. However, patients from the community are emerging with serious infections from this organism.**Methods:** We report 3 cases of severe community-acquired pneumonia from this pathogen.**Results:** All 3 patients who had *Acinetobacter baumannii* bacteremia, required intubation for respiratory failure and septic shock. Two patients succumbed.**Patient 1:** A 61-year-old male with asthma and hypertension presented with 2 days of fever, cough with purulent sputum and dyspnoea. Chest radiograph showed consolidation of the left middle to lower zone and right lower zone. He developed multi-organ failure despite empiric antibiotics (intravenous ceftazidime, amoxicillin-clavulanate and azithromycin) and succumbed the following day.**Patient 2:** A 66-year-old male with a history of supraglottic cancer, presented with hemoptysis for 2 days. Chest radiograph showed right lower lobe consolidation. He progressed to multi-organ failure and succumbed 10 hours after admission despite IV ceftazidime, amoxicillin-clavulanate and azithromycin.**Patient 3:** A 76-year-old female with hypertension, presented with 2 days of fever and cough with purulent sputum. Chest radiograph showed a right middle zone consolidation. She was started initially on intravenous ceftriaxone and oral clarithromycin. Intravenous imipenem and levofloxacin was commenced after she was transferred to ICU. She survived after a complicated ICU stay and was well on 2-month follow-up.

Conclusion: Community acquired *Acinetobacter baumannii* pneumonia can present with an acute and fulminant course. It is imperative to recognise it early so that appropriate empiric antibiotic treatment can be initiated.

M35

A Review of Post-Traumatic Endophthalmitis in an Asian Population over a Nine-Year-Period

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Aim: To describe the demographics, clinical features and outcomes of post-traumatic endophthalmitis in an Asian population

Methods: Review of all patients diagnosed with post-traumatic endophthalmitis in a tertiary ophthalmic centre between 1998 and 2006 was carried out. Endophthalmitis cases were identified via DRG codes as well as reviewing operating theatre and clinical procedure records.

Results: Five patients were identified over the 9-year period, accounting for 9.8% of all endophthalmitis patients seen within the same period. There were 1 Chinese (20%) and 4 non-Chinese (80%). The patients were young with a mean age of 31.6 years and all patients (100%) were males. Presentation of symptoms was within 1 day in 3 of 5 patients while it was within 4 days for 1 patient. Of the 5 patients, 2 had presenting visual acuity (VA) 6/12 or better but eventually all cases (100%) had final VA 6/60 or worse. There was 1 (20%) positive vitreous culture.

Conclusion: Post-traumatic endophthalmitis occurred in young males and mainly non-Chinese. Final VA is poor regardless of initial VA and time to presentation.

M36

Right Apical Pacing Versus Right Septal Pacing: Influences on Brain Natriuretic Peptide Levels

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Aim: Brain natriuretic peptide (BNP) is a useful biochemical marker to predict, prognosticate and manage heart failure. It has been shown that right ventricle apical (RVA) pacing increases BNP levels as well as causes asynchronous electrical activation of the left ventricle. Alternative site pacing, such as right ventricular septal (RVS) pacing, is thought to mimic physiological electrical activation of the ventricles. However, there has been no direct comparison in BNP levels between RVA vs RVS pacing. The aim of the study is evaluate the effects of these 2 pacing sites on BNP levels.

Methods: We conducted a prospective observational study of 43 patients (age 77 ± 9 years) without history of heart failure or structural heart disease and requiring either single or dual chamber pacemakers. BNP levels at baseline (before implant) and at 3 to 6 months follow-up and cumulative ventricular pacing (Vp %) measurements were performed. The right ventricular lead was positioned either at the RVA (superiorly directed electrical axis) or RVS (inferiorly directed electrical axis).

Results: There were 23 patients with sick sinus syndrome and 20 with atrioventricular block. Seventeen patients had dual chamber and 26 had single chamber pacemakers. Twenty patients had RV apical pacing, 23 had RV septal pacing and 20 had Vp $\geq 40\%$ of the time. In RVA pacing, BNP levels increased from a baseline mean of 245 to

327 pg/mL at follow-up. In contrast, with RVS pacing, BNP levels decreased from a mean of 439 pg/ml at baseline to 211 pg/ml at follow-up. There was a significant difference in BNP at follow-up between the RV sites ($P = 0.013$) when controlled for baseline BNP. After adjustment for Vp, BNP at follow up was still significantly different between the 2 groups ($P = 0.042$).

Conclusion: RVS pacing did not demonstrate any significant increase in BNP levels compared to RVA pacing.

M37

Polypoidal Choroidal Vasculopathy Presenting as Central Serous Chorioretinopathy in an Asian Population

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Aim: Central serous chorioretinopathy (CSCR) is a macular disorder affecting young patients, presenting with serous central retinal detachment. CSCR is associated with increased endogenous corticosteroid level, and exogenous steroid use. The pathogenesis is unknown. Choroidal hyperpermeability has recently been incriminated.

Polypoidal Choroidal Vasculopathy (PCV) is a disease of inner choroidal circulation, with dilated interconnecting inner choroidal vessels ending with aneurismal nodules detected using indocyanine green angiography (ICGA).

In the English literature, rare cases of PCV presenting as CSCR has been reported among Caucasians. We present a case series of 9 patients, highlighting that among Asian patients, PCV presenting as CSCR is not uncommon, and is an important differential diagnosis of CSCR.

Methods: Our study design was a single-centre, retrospective observational case series of 9 eyes of 9 patients with PCV masquerading as CSCR diagnosed from 2001 to 2006.

Results: All 9 patients were of Chinese descent. Six had fluorescein angiogram (FA) findings which are typical of CSCR. The remaining 3 patients' FAs showed chronic CSCR features.

However, when ICGA was performed, PCV lesions were detected. The clinical characteristics raising the suspicion of PCV will be presented. With appropriate treatment, the lesions in 7 of the 9 patients resolved. One patient had persistent polypoidal CNV, and 1 lost to follow-up.

Conclusion: PCV should be included as a differential diagnosis in patients presenting with CSCR. Patients above 45 years of age, with atypical clinical and FFA features should, in our opinion, warrant ICGA to exclude PCV.

M38

Utility of Optical Coherence Tomography for Macular Assessment following Cataract Surgery

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Aim: To evaluate the maculae after cataract surgery, by a non-invasive method-Optical Coherence Tomography (OCT) and to identify Cystoid Macular Edema (CME).

Methods: Optical Coherence Tomography was performed 3 months (for patients with Diabetes mellitus) and 4 months (for patients

without Diabetes Mellitus) following cataract surgery to assess the macula and detect cystoid macular edema. The surgeries were performed by single surgeon². All surgeries were Phacoemulsification with intra ocular lens implantation.

Pre-operatively, thorough clinical assessment of posterior segment was performed.

Results: Cystoid macular edema and macular changes are infrequent following modern cataract surgical techniques.

Conclusion: Optical coherence tomography is a sensitive tool to examine the retinal anatomy at the macula. In addition, vitreo macular changes are also very well delineated. Cystoid macular edema is explicitly demonstrated. This being a totally non-invasive procedure, is clinically extremely useful and acceptable by patients.

M39

Singapore Childhood Cancer Survivors Study (SG-CCSS): A Multi-Institutional Collaborative Study on Long-Term Survivors of Childhood Cancer

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Background: The survival rates among childhood cancer patients are increasing. Meanwhile, assessing the risk of late effects and complications are ever more important. The degree of risk of late effects may be influenced by various treatment-related factors. We set out a multi-institutional collaborative study called Singapore Childhood Cancer Survivor Study (SG-CCSS).

Methods: The retrospective cohort study consists of all children diagnosed with cancer from 1997 to 2005 during childhood or adolescence, who survived at least 2 or more years after treatment for cancer.

Results: A total of 1449 patients were registered in the Singapore Childhood Cancer Registry (SCCR). Among these, 707 (48.8%) of patients were from KK Women's and Children's Hospital (KKWCH) and 630 (43.5%) from National University Hospital (NUH). The most common childhood cancer was leukaemia, n = 620 (42.2%); second was brain tumour, n = 215 (14.8%); third was lymphoma, n = 147 (10.1%); and fourth was neuroblastoma, n = 100 (6.9%). Among leukemic patients, n = 404 (86%) were eligible for the SG-CCSS. Of these, acute lymphoblastic leukemia (ALL) had the highest percentage 88.9% (n = 355) and acute myeloid leukemia (AML) 69.8% (n = 37). The long-term survivors for germ cell tumour 57% (n = 50), hepatic tumour 52%, soft tissue sarcoma 42%, and renal tumours 44%, bone tumours 42% (n = 27), lymphoma 33% (n = 44), brain tumours 34% (n = 72), and neuroblastoma 22% (n = 23).

Conclusion: From the first monograph of the SCCR data, preliminary analysis reveals that 58% of those diagnosed with childhood cancer are long-term survivors and are eligible for the SG-CCSS study. Further detailed data collection and analysis is ongoing at this moment.

M40

Comparison of Chest Compression Only and Standard Cardio-Pulmonary Resuscitation for Out-Of-Hospital Cardiac Arrest in Singapore EMS

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Aim: To compare the outcomes of cardiac arrest patients in the Cardiac Arrest and Resuscitation Epidemiology study who had received chest compression only cardiopulmonary resuscitation (CC-CPR), standard CPR or no bystander CPR.

Methods: This prospective cohort study involved all out-of-hospital cardiac arrest (OHCA) patients attended by emergency medical services (EMS) providers in Singapore. The data analyses were conducted secondarily on these prospectively collected data. The technique of bystander CPR was reported by paramedics who arrived at the scene.

Results: From 1 October 2001 to 14 October 2004, 2428 patients were enrolled into the study. Of these, 255 were EMS witnessed arrest and were excluded. A total of 1695 cases did not receive any bystander CPR, 287 had standard CPR and 154 CC-CPR. Patient characteristics were similar in standard and CC-CPR groups except for more collapses in residences and with previous heart disease in the CC-CPR group. Patients who received standard CPR (OR 5.4, 95% CI 2.1, 14.0) or CC-CPR (OR 5.0, 95% CI 1.5-16.4) were more likely to survive to discharge than those who had no bystander CPR. There was no significant difference in survival to discharge between those who received CC-CPR and standard CPR (OR 0.9, 95% CI 0.3-3.1).

Conclusion: We found that patients were more likely to survive with any form of bystander CPR than without. This emphasises the importance of chest compressions for OHCA, whether with or without ventilation.

M41

Tumour Specific Inhibition of Na⁺/H⁺ exchanger 1 Expression by Activation of Peroxisome Proliferator-Activated Receptor Gamma (PPAR γ): A New Strategy for Anticancer Combination Therapy

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Aim: Increased expression of pH regulator, Na⁺/H⁺ exchanger 1 (NHE1) is associated with various processes of carcinogenesis, and downregulation of NHE1 sensitises tumour cells to death stimuli. Stimulated by finding a Peroxisome Proliferator Response Element

(PPRE) within the human NHE1 promoter, we hypothesised that the high level of expression of PPAR γ reported in breast cancer cells could render them susceptible to ligand-induced PPAR γ activation, which could repress NHE1 gene expression and sensitise tumour cells to anticancer treatment.

Methods: EMSA and chromatin immunoprecipitation assays were used to show PPAR γ binds to the PPRE of NHE1. Activation of PPAR γ was achieved using the natural ligand 15d-PGJ₂ or antidiabetic drugs, glitazones. Dependence of PPAR γ was demonstrated using PPAR γ -specific antagonist, GW9662 and overexpression of a DNA-binding mutant PPAR γ . Changes in NHE1 gene expression was determined using realtime PCR and Western blotting. Immunohistochemical detection was performed on formalin-fixed, paraffin-embedded normal and tumour breast tissues.

Results: Activation of PPAR γ resulted in NHE1 repression in breast cancer cells but not in noncancerous cells. In addition, PPAR γ -induced NHE1 downregulation substantially increased the sensitivity of breast cancer cells to paclitaxel-induced cell death. Histopathological analysis of breast cancer biopsies from type 2 diabetes patients treated with rosiglitazone showed significant NHE1 downregulation in the tumour itself, but not in the adjacent non-cancerous tissue. Diabetic patients not receiving rosiglitazone or those that had cancers without diabetes showed no effect on NHE1 expression.

Conclusion: Our data provide evidence for tumour-selective downregulation of NHE1 upon PPAR γ activation in vitro and in clinical breast cancer material, and its sensitising effect on drug-induced apoptosis. These findings have tremendous implications for the judicious use of PPAR γ ligands at low doses in combination chemotherapy regimens for an effective therapeutic response.

M42

Microarray Analysis of Multiple Candidate Genes and Associated Plasma Proteins for Nephropathy Secondary to Type 2 Diabetes among Chinese

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Aim: Genetic determinants are important in diabetic nephropathy (DN). We assembled a panel of 43 candidate genes and tested their association with DN in a customised 1,536 single nucleotide polymorphisms (SNPs) microarray among 1,048 Chinese.

Methods: Case (n = 545, spot urinary albumin / creatinine ratio [ACR] of >1000 mg/g)-control (n = 503, ACR <30 mg/g) study of Chinese with long standing (>10 years) type 2 Diabetes (T2DM). Genotyping was performed using Illumina GoldenGate assay.

Results: Allele and genotypes (Armitage Trend test) based analysis revealed 13 SNPs from 7 genes demonstrating potentially important association with DN at $P \leq 0.01$. Of these 13 SNPs, 4 clustered to form a 5' end NADPH oxidase homolog 4 (NOX4) haplotype block (GGCC frequency 0.776), which was associated with DN: odds ratio (OR) heterozygous 2.05 (1.04-4.06); homozygous 2.48 (1.27-4.83) ($P = 0.0055$). Homozygosity of this NOX4 haplotype was also associated with increased plasma superoxide dismutase (Cu/Zn SOD) concentration suggesting increased oxidative burden. An endothelin-1 (ET-1) SNP (rs1476046G>A) correlated with plasma C terminal proET-1 (CT-proET-1) concentrations and conferred increased susceptibility to DN: heterozygous 1.26 (0.96-1.66); homozygous 1.87 (1.13-3.12) ($P = 0.0072$). Another haplotype-block (TGTC frequency 0.38) over 5' end of Nitric oxide synthase 1

(neuronal) (NOS1) also revealed possible association with DN: heterozygous 1.26 (95% CI 0.95-1.67); homozygous 1.57 (1.04-2.35) ($P = 0.0073$).

Conclusion: Genetic variants from NOX4 and ET-1 were associated with differential plasma Cu/Zn SOD and CT-proET-1 concentrations respectively and conferred susceptibility to DN. In addition, NOS1 may be DN candidate gene among Chinese.

M43

Risk Prediction of Acute Kidney Injury Needing Dialysis in Asian Patients Undergoing Open-Heart Surgery: Evaluation of Two Scoring Methods

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Background: Acute kidney injury needing dialysis (AKI-D), post open-heart surgery (OHS) is associated with increased patient morbidity and mortality. Performance of risk prediction scoring methods in Asian countries is unknown. We evaluated 2 methods of AKI-D prediction in an academic medical centre serving a multi-ethnic Asian population.

Methods: Database of OHS patients in 2005 and 2006, was collected and retrospectively analysed. We described the patients' demographics, clinical history, laboratory results, and outcomes. We approximated variables for the methods of Thakar (JASN 2005; 16) and Mehta (Circulation 2006; 114). Calculated AKI-D risk scores were divided into quartiles, and corresponding actual AKI-D rates obtained for each.

Results: A cohort of 1128 patients was analyzed (75.8% male, mean age 59.7 ± 10.6 years, weight 65.6 ± 12.5 kg, BMI 24.6 ± 4 kg/m², 66.6% Chinese, 16.8% Malay, 10.6% Indians, 6% others, pre-operative serum creatinine 1.51 ± 1.7 mg/dL, emergency surgery 14.3%, smokers 16.3%, diabetics 47.5%, myocardial infarction 38.8%, congestive heart failure 11.3%). A total of 45 (4%) patients developed AKI-D. Thakar risk scores in quartiles were: <1, 1 to <2, 2 to <3, ≥ 3 ; and corresponding actual AKI-D rates were: 0.5%, 0.43%, 3.4%, and 8.71%. Mehta risk scores in quartiles were: <17, 17 to <20, 20 to <23, ≥ 23 ; and corresponding actual AKI-D rates: 0.31%, 0.34%, 3.49%, and 13.46%.

Conclusion: Increasing scores in both methods correlates with increasing AKI-D risk. This allows identification of at risk individuals for prevention, early intervention, and better pre-operative risk counseling. Further calibration and testing in subsequent trials is required to determine the accuracy of both methods.

M44

Establishing the Norovirus Genotype Associated with an Outbreak of Gastroenteritis in Singapore

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Aim: Norovirus is a causative agent of viral gastroenteritis that causes a high attack rate at a low infective dose. Recently, norovirus genotype II.4 (GII.4) variants were found to be associated with

gastroenteritis outbreaks circulating worldwide. In this study, we sought to establish the norovirus genotype(s) responsible for the acute gastroenteritis outbreak in October 2006 in Singapore.

Methods: Stool samples from afflicted patients (n = 47) were tested by EIA and RT-PCR, using genogroup-specific primer sets for the norovirus capsid gene (region D). Positive samples were confirmed with their respective genogroup-specific primer sets for the norovirus polymerase gene (region A) and by sequencing. Multiple sequence alignment of the protein sequences was generated using ClustalW, and a cladogram with 100 bootstraps was produced.

Results: Nineteen samples (~40%) tested negative by both EIA and RT-PCR (100% concordance), suggesting other factors being involved in the gastroenteritis outbreak. The remaining 28 samples (~60%) tested positive for norovirus by RT-PCR. However, only 23 of these 28 samples tested positive by EIA. This shows the superior sensitivity of the RT-PCR method. We found that a variant of the norovirus GII.4 strain (Nijmegen115; GenBank Accession number: EF126966) was responsible for the outbreak.

Conclusion: Our study has shown that for norovirus detection, RT-PCR is a more sensitive method compared to EIA. Our genotyping method successfully identified the norovirus strain that was causing that particular diarrhoeal outbreak in 2006. Our data also indicates that the outbreak had likely originated as a point source infection. Such a set-up will generate useful molecular epidemiological data during outbreaks and subsequent follow-up surveillance and containment measures.

M45

Day Surgery Transurethral Resection of Prostate: An Update
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Introduction: The gold standard surgical treatment for Benign Prostate Hyperplasia (BPH) is transurethral resection of prostate (TURP), using monopolar loop electrode for resection. Using the newer bipolar electrosurgical technology, we are able to selectively convert this in-patient procedure to day surgery.

Methods: This is a single institutional non-randomised study involving ASA 1 & 2 patients with significant bladder outlet obstruction requiring surgical intervention.

TURPs were done using the Gyrus Superpulse Plasmakinetic bipolar loop electrode. Post-op, patients were on continuous bladder irrigation for 4-6 hours. Stable patients with no gross haematuria were discharged and return 2 days later for removal of catheter.

Results: Seventy-four patients were recruited. Mean resection time, resected weight and duration of bladder washout were 50.09 minutes, 16.92 g and 4.56 hours respectively. Of the patients, 94.5% were discharged on the same day, 1 was re-admitted. Blood transfusion was not required. 91.8% of patients had their catheter successfully removed on 2nd POD. At 6 months, the IPSS and bothersome scores were reduced by 78.8% and 76.8% respectively. The urinary flow rates were improved by 21%. 93% of patients were happy to have their surgeries done as a day case.

We noted a high incidence of urethral strictures. Urethral dilatations prior to TURP seem to reduce this incidence.

Conclusion: Our initial experience showed that in selected patients, it is feasible to perform TURP as a day case. With the help of the reinvestment fund from MOH, we will be extending this study to most major public hospitals in Singapore.

M46

An Observational Study to Validate the ABCD² Score for Predicting Stroke Risk after Transient Ischaemic Attack in the Emergency Department

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Aim: The ABCD² score has been proposed to predict the risk of stroke after Transient Ischaemic Attack (TIA). This may be useful to clinicians at the Emergency Department (ED) deciding if patients with TIA need admission or can be safely evaluated at the outpatient clinic.

Methods: A retrospective observational study of all patients presenting to the ED for TIA, as diagnosed by the attending Emergency Physician, over a 2-year period. ABCD² scoring was based on 5 factors: Age ≥ 60 years (1 point), Blood Pressure $\geq 140/90$ (1), Clinical features: unilateral weakness (2), speech impairment alone (1), Duration ≥ 60 mins (2) or 10-59 mins (1) and Diabetes (1). Sensitivity, specificity and Negative Predictive Value (NPV) were calculated for risk of stroke at 2, 7, 30 and 90 days.

Results: From 1 January 2005 to 31 December 2006, there were 470 patients diagnosed with TIA at the ED. Mean age was 61.0 years (SD 13.2), with 63.3% males. There were 78.4% Chinese, 8.9% Malays, 7.8% Indian and 5.0% were of other races. Age ≥ 60 years, unilateral weakness and duration ≥ 60 mins were found to be significant predictors of stroke at 2 days. Based on a cut-off score of ≥ 4 , for predicting stroke at 2 days, sensitivity was 87.8%, specificity 34.8%, NPV 93.1%, c statistic 0.68. Admission rate would have been 69.1%. Similar results were obtained for up to 90 days of follow-up.

Conclusion: Consensus is needed regarding the balance between reducing admissions and the risk of a patient returning with stroke.

M47

Early Relapse Post-Cyclophosphamide Therapy is a Predictor of Poor Long-term Outcome in Steroid-Dependent and Resistant Minimal Change Nephrotic Syndrome (MCNS)

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Aim: Cyclophosphamide remains a significant option in treating children with steroid-dependent and resistant MCNS despite associated side effects. This study aimed at identifying factors associated with long-term relapsing disease post-cyclophosphamide therapy.

Methods: Clinical and histopathological data of all children with steroid-dependent or steroid-resistant minimal change nephrotic syndrome who underwent renal biopsy and received 12-weeks of cyclophosphamide as second-line treatment were reviewed. Poor long-term outcome was defined as presence of any immunosuppressive medication 2 years post-cyclophosphamide therapy. Parameters studied included gender, race, age at diagnosis, hypertension, haematuria, serum creatinine at initial presentation, global sclerosis, mesangial expansion, tubular atrophy and IGM deposits on renal biopsy, and early poor response was defined as no response or relapse

within 2 months post-cyclophosphamide therapy. Factors predictive of poor long-term outcome post-cyclophosphamide therapy were analysed by multivariate logistic regression.

Results: Forty-six children had MCNS, 21 (45.6%) were steroid-dependent and 25 (54.4%) steroid-resistant. median age at disease onset was 2.9 years (range 1-12.1 years). mean follow-up period from start of cyclophosphamide therapy was 11.53 ± 6.35 years. Twenty-nine (63%) children responded to cyclophosphamide initially, however 2 (6.9%) relapsed within 2 months post-cyclophosphamide therapy. Seven (15.2%) were hypertensive, 7 (15.2%) had haematuria and 4 (8.7%) had elevated creatinine at presentation. Thirty-one (67.4%) of biopsies were positive for mesangial IGM, 10 (21.7%) had global sclerotic lesions and 11 (23.9%) had tubular atrophy. Regression analysis showed that only early poor response to cyclophosphamide was predictive of poor long-term outcome ($P < 0.018$, $OR = 5.8$, 95% CI = 1.4-24.4). Using this model, the probability of poor long-term outcome post-cyclophosphamide therapy was expressed by the equation: $p = 1/(1 + \exp^{-r})$, where $r = 1.75$ (early poor response)-0.74. Early poor response to cyclophosphamide had a positive predictive value of 84.7% in predicting poor long-term outcome.

Conclusion: Steroid-dependent or resistant MCNS patients with early poor response to cyclophosphamide therapy were more likely to have long-term relapsing disease requiring immunosuppressive therapy.

M48

Evaluating the Use of Heart Rate Variability for the Prediction of Mortality in Critically Ill Patients Presenting to the Emergency Department

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Aim: To explore the utility of heart rate variability (HRV) as a predictor for clinical outcomes such as hospital admission, ICU admission and mortality. This may have potential as an additional 'vital sign' to identify patients at risk of poor outcomes.

Methods: ECG data was obtained from a sample of 500 critically ill patients attended at the Department of Emergency Medicine (ED), SGH who were monitored with LIFEPAK 12 defibrillator monitors. After extracting the data, filtering for noise reduction and isolating non-sinus beats, 14 HRV parameters were computed. These include time domain (RMSSD, nn50, etc.), frequency domain (VLF, LF, etc.) and geometric parameters. Patient outcome and vital signs were obtained from ED and hospital records. Principal component analysis (PCA) was performed on the outcomes.

Results: The following variables were found to be significant contributors to the outcome of death with $P < 0.01$: age, Glasgow Coma Score, respiratory rate, aRR, VLF power, LFNorm, HFnorm and LF/HF ratio. For the outcome of ICU/ICA/HD admission, pain score and STD were found to be significant predictors. Overall, frequency domain HRV parameters were found to be significant predictors of death. When combined in a PCA, these parameters predicted death with a sensitivity of 75.5% (95% CI 62.6%-85.2%), specificity of 53.0% (95% CI 51.6%-54.0%), positive predictive value (PPV) of 14.9% (95% CI 12.3%-16.8%), negative predictive value (NPV) of 95.2% (95% CI 92.7%-97.1%) and ROC area of 0.73

(95% CI 0.63-0.84) and ICU/ICA/HD admission with a sensitivity of 70.4% (95% CI 63.7%-76.4%), specificity of 43.6% (95% CI 37.8%-49.5%), PPV of 48.1% (95% CI 42.4%-53.8%), NPV of 66.5% (95% CI 59.2%-73.1%) and ROC area of 0.60 (95% CI 0.55-0.65).

Conclusion: We found HRV parameters to have an association with clinical outcomes in patients presenting to the ED. HRV shows potential as a triage tool.

M49

Alcohol Hand-rub: Fast and Good!

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Aim: Alcohol hand-rub has been recommended by World Health Organisation (WHO) and U.S. Centers for Disease Control and Prevention (CDC). Few studies have compared its efficacy with chlorhexidine hand-wash during routine patient-care; none has compared CDC's alcohol hand-rub protocol with WHO's.

Our study's aim was to evaluate the efficacy and time-spent on 3 hand-hygiene protocols during day-to-day patient-care activities.

Methods: From 8 October to 7 November 2007, we conducted a prospective randomised controlled trial in Tan Tock Seng Hospital's general wards. Sixty medical and 60 nursing staff were randomly assigned to CDC's alcohol hand-rub protocol, WHO's alcohol hand-rub protocol, or chlorhexidine hand-wash. Using the glove-juice technique, hand samples were taken pre-patient-contact, post-patient-contact, and post-hand-hygiene. Time taken for hand-hygiene was measured and bacterial counts quantified blindly. Censored regression was carried out using STATA 10.0, with statistical tests at 5% significance level.

Results: Pre-patient-contact, medical staff had significantly higher bacterial load than nursing staff (mean: 7,203 CFU/ml vs 3,542 CFU/ml, $P = 0.01$). Post-patient-contact, hand contamination increased substantially (medical 12,629 CFU/ml vs nursing 10,504 CFU/ml, $P = 0.54$). Post-hand-hygiene, bacterial load decreased significantly but remained higher in medical staff (medical 2,637 CFU/ml vs nursing 355 CFU/ml, $P < 0.01$), after adjusting for hand-hygiene time and protocol. Bacterial-reduction was similar across hand-hygiene protocols (CDC 82.5% vs WHO 75.0% vs hand-wash 75.0%, $P = 0.65$). During routine patient-care, CDC's alcohol protocol (median 22.5 seconds) required significantly less time than WHO's (38.6 seconds) ($P < 0.05$) and chlorhexidine hand-wash (80.1 seconds) ($P < 0.01$).

Conclusion: CDC's alcohol hand-rub protocol is fast and good. Healthcare workers should adopt it during routine patient-care.

M50

An Observational Study to Determine the Factors Associated with Blood Sample Haemolysis in the Emergency Department

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Aim: Haemolysis of blood samples is a common problem encountered in the Emergency Department (ED). It leads to inaccurate blood

results and has cost implications, as blood samples have to be retaken very often. The purpose of our study was to determine which factors in blood sampling were associated with higher rates of haemolysis.

Methods: An observational convenience sample of all patients presenting to the ED requiring blood Urea & Electrolytes (UE) analysis were eligible for our study. Questionnaires were distributed to the doctors and nurses conducting blood sampling to determine the method used and outcome data were collected after the samples were processed.

Results: Out of 227 UE samples analysed, 45 (19.8%) were haemolysed. Various factors, including method (IV cannulation or venepuncture), system (syringe or vacutainer), operator, rate of blood flow, difficulty of cannulation/venepuncture and source of blood (arterial or venous), were analysed, but their effects on haemolysis were not statistically significant ($P > 0.05$). However, use of the vacutainer system was associated with the highest rates of haemolysis (Adjusted OR 6.0, 95% CI 2.3, 15.1).

Conclusion: We found blood sampling with the vacutainer system to have increased rates of haemolysis. This could potentially change attitudes towards equipment used for blood sampling in the ED.

M51

Does Peripheral Neuropathy Predict the Risk of Peripheral Arterial Disease in Patients with Diabetes Mellitus?

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Background: Peripheral artery disease (PAD) is an important macrovascular complication of diabetes mellitus (DM), associated with significant morbidity and mortality. Whether patients with microvascular complications have higher risk of PAD is not known.

Aim: To determine if PAD is increased in DM patients with peripheral neuropathy (PN).

Methods: Data including demographics, cardiovascular comorbidities, and assessment for diabetic complications were prospectively collected from DM patients during their regular clinic visit in Diabetes Centre at Alexandra Hospital from September 2004 to September 2006. During this period, 400 patients were assessed. PAD was defined as present if ABI was < 0.9 . PN was defined to be present if patient was either unable to feel more than 2 out of 10 points in each foot on testing with 10 g monofilament, or if neurothesiometer threshold was > 25 volts.

Results: The mean age and standard deviation for the study group was 55 ± 13.98 years. Of the patients, 60.6% were males, and racial distribution was as follows: 74.6% Chinese, 13.2% Malays, 10.1% Indians and 2.1% others. The prevalence of PAD and neuropathy was 8.3% and 15.8% respectively. Patients with neuropathy had increased risk of PAD (Odds Ratio 3.37, 95% CI 1.06–10.7; $P < 0.05$) independent of age, smoking, hypertension, hypercholesterolaemia and duration of diabetes mellitus.

Conclusion: PAD is increased in patients with peripheral neuropathy in DM, even after correcting for duration of DM. Understanding this relationship will better guide screening protocols for PAD as well as better manage foot ulcers in patients with DM.

M52

An Interventional Before-After Study Comparing Rates of Blood Sample Haemolysis at the Emergency Department

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Aim: Sample haemolysis is a frequent problem at the Emergency Department (ED). It can affect urea and electrolyte results, and cause falsely elevated potassium (K⁺) and cardiac enzymes. The objective is to study the cause for sample haemolysis and reduce rates of sample haemolysis in the ED.

Methods: An initial survey of 227 cases revealed that the use of a vacutainer was associated with the highest rates of haemolysis. Lysis rate was 35.8% with use of the vacutainer compared to 11.0% without (Adjusted OR 6.0, 95% CI 2.3, 15.1). Univariate analysis also suggested that venepuncture was associated with lower haemolysis rates compared to drawing blood from an IV cannula (OR 4.4, 95% CI 1.5, 13.0). Literature review also identified other possible causes of sample haemolysis.

Results: An educational program for ED doctors and staff, consisting of a 15-minute presentation and discussion was conducted. Significant changes found after the educational program included: increased use of a syringe rather than vacutainer (64.3% to 98.5%, $P < 0.01$), increased use of venepuncture for blood sampling (26% to 36.8%, $P = 0.02$), reduced arterial sampling (3.1% to 0%, $P = 0.02$), increased sample volume (4.5 ml to 5.2 ml, $P < 0.01$) and reduced interval from sampling to analysis (60.8 minutes to 48.4 minutes, $P < 0.01$). We were able to attain a reduction in sample haemolysis from 19.8% to 4.9% ($P < 0.001$). This would translate to a cost savings of \$834.40 per day at the ED and \$304,556 per year.

Conclusion: Introduction of an educational program was able to significantly reduce rates of sample haemolysis. Other benefits of reduction in lysis include cost-saving for patients and the department, reduction in pain and treatment for patients.

M53

Overweight, Obesity and Risk of Colon Polyps in a Singapore Chinese Population

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Aim: The increase in colon cancer rates is believed to be contributed in part by rising obesity rates. We hypothesised that colon polyps, the possible precursors to cancer, are also more common in overweight and obese patients.

Methods: In a retrospective study on Chinese patients who underwent endoscopy at our hospital, we examined the relation between body mass index (BMI) and risk of colon polyps. Chi-square test, as well as multivariate logistic regression test, was used to control potential confounders. Patients with known adenomas or pathology predisposed to colon cancer were excluded while those with normal colonoscopies served as controls. BMI was graded as: normal weight, 18.5-22.9;

overweight, 23.0-27.4; obese, ≥ 27.5 . The odds ratio and 95% confidence interval (CI) for risk of colon polyps were computed.

Results: Seventy-three (59.8%) of those with polyps and 291 (50.4%) of those with normal colonoscopies were either overweight or obese. Being overweight or obese was significantly associated with higher risk of having non-adenomatous polyps (odds ratio, 2.907; $P=0.005$) and polyps smaller than 10 mm in size (odds ratio, 1.542; $P=0.03$). However, it was not significantly associated with higher risk of having advanced polyps or adenomatous polyps. The univariate odds for increased risk of colon polyps was marginal with borderline significance (odds ratio, 1.371; $P=0.059$). However, after controlling for confounders, being overweight or obese was an independent risk factor for colon polyps (adjusted odds ratio, 2.214; $P=0.007$).

Conclusion: Being overweight or obese (BMI ≥ 23.0) is an independent predictor for risk of colon polyps amongst Singaporean Chinese.

M54

High Incidence of Diabetes Mellitus amongst Asian Tacrolimus-Treated Renal Transplant Recipients

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Aim: Post-transplantation diabetes mellitus is a well-known complication in tacrolimus-treated renal transplants. Reported risk factors include higher tacrolimus doses and levels, steroid use, hepatitis C, age and obesity. The present study evaluated the incidence and risk factors for post-transplant diabetes amongst tacrolimus-treated renal transplants on follow-up at National University Hospital.

Methods: Patients without pre-existing diabetes undergoing renal transplantation from January 2000 to December 2007 constituted the study population. All had received tacrolimus, corticosteroids, and azathioprine or mycophenolate. Diabetes was diagnosed based on the WHO criteria. Data on demographics, time to onset of diabetes, hepatitis C, obesity, tacrolimus doses and levels, diltiazem use and steroid doses at 1, 6, 12 and 24 months post-transplantation were retrospectively obtained.

Results: Among 93 transplants, the cumulative incidence of diabetes at the end of the study was 32.3%. Mean interval to onset was 6.6 months. Cumulative incidence of diabetes was 6.5%, 20.4%, 23.7% and 26.7% at 1, 6, 12 and 24 months respectively. Risk was higher with age (47.4 vs 41.3 years, $P=0.0085$), and amongst men (OR 2.5, 95% CI = 1.01-6.19). There were no significant differences in the

prevalence of hepatitis C or obesity, tacrolimus levels, diltiazem use or corticosteroid doses between diabetics vs non-diabetics.

Conclusion: The 23.7% cumulative incidence at 12 months reported herein is significantly higher than the 9.9-15.4% incidence reported from Western series. As Tacrolimus levels and steroid doses were not risk factors for diabetes in this study, future studies should study the role of tacrolimus metabolites or genetic factors contributing to the higher incidence of diabetes amongst Asians.

M55

Comparison of Biodegradable Collagen Implant in Patients Undergoing Phaco-Trabeculectomy

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Aim: To assess the safety and efficacy of the biodegradable collagen implant in patients undergoing combined phacoemulsification, intraocular lens implantation and trabeculectomy

Methods: A retrospective study was conducted using the clinical records of patients who had undergone combined phaco-trabeculectomy using the biodegradable collagen implant. Each of these patients was then matched with a patient who had undergone combined phaco-trabeculectomy with mitomycin C (MMC). They were matched for age group, gender, ethnic group, diagnosis, pre-operative intraocular pressures (IOP), and the number of medications required to control the IOP pre-operatively.

Data collected for both groups included the IOPs at 3, 6 and 12 months post-operatively, and also the number of medications required at 3, 6 and 12 months post-operatively. The mean IOP at each time point was compared using the Mann-Whitney U test. Statistical significance was set at $P < 0.05$.

Results: At each time point, the mean IOP in the collagen implant group was statistically significantly higher than in the MMC group. At 1 year, complete success (intraocular pressure below 22 mm Hg without any medications) was achieved in all of the MMC group patients. In the biodegradable collagen implant group, 15 of 16 patients (93.75%) achieved complete success, and 1 patient (6.25%) achieved qualified success (intraocular pressure below 22 mm Hg with medications). The difference between the 2 groups was not statistically significant.

Conclusion: Use of the biodegradable collagen implant for phaco-trabeculectomy is safe and effective although the IOP lowering effect is less than for MMC-augmented phaco-trabeculectomy.

M56

Quality of Life and Health-State Utilities in Psoriasis Patients at the National Skin Centre, Singapore

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Aim: Psoriasis is a chronic skin disease affecting a significant proportion of the Singaporean population. It is thus important for dermatologists to use Quality of Life (QOL) measurements to monitor the progress of psoriasis patients.

Methods: In our study, we measured the quality of life of psoriasis patients using a general scale (SF-36), a disease-specific scale (Psoriasis Disability Index - PDI) and a visual analogue scale. Two health-state utilities, namely the time trade-off and willingness to pay indices, were assessed as well. The PASI score, an objective assessment based on clinical examination, was also obtained.

Results: From September 2007 to February 2008, we recruited 215 patients, of which 174 (80.9%) were from the Psoriasis or Phototherapy Clinic, and the rest from the General Clinic. Of the patients, 152 (70.6%) were male and 41 (29.4%) were female, comprising 71.6% Chinese, 14.4% Malays, 12.6% Indians and 1.4% Eurasians. The average age was 49.4 years. A total of 155 (72.1%) patients had a monthly income of less than \$2000. The mean duration of disease was 13.6 years, with chronic plaque psoriasis (91.6%) being the most common clinical subtype. Hypertension, hyperlipidaemia and diabetes mellitus were the most commonly found co-morbidities, occurring in 31.6%, 20.9% and 19.1% of patients respectively. Psoriatic skin lesions were present in areas unable to be concealed by clothing in almost all patients (98.1%), and arthropathy was present in almost a quarter (27.4%). Regarding treatment modalities, almost all the patients were on topical steroids, topical coal tar preparations and moisturisers. Other treatments received are as follows: methotrexate in 40.4% of patients, phototherapy in 23.3%, acitretin in 16.2%, cyclosporine in 7.0% and biologic agents in 5.1%.

The mean PASI score was 14.79 and the mean PDI 9.35. The SF-36 assessment showed the lowest scores for the energy/fatigue levels and the general health category in our group of psoriasis patients. The average time-trade off was 3.74 years of life, with 6 patients willing to give up their entire lifespan for an immediate cure. The patients were willing to give up 34% of their income/savings, on average, for an immediate cure for their condition.

Conclusion: This study illustrates that psoriasis can significantly affect patients to the extent that they are willing to trade their years of life or income in search of a cure. These data will be of use to healthcare providers and research funding agencies when assessing the impact of psoriasis on the affected population.

M57

Obesity Increases Risk of Gastroesophageal Reflux and Erosive Esophagitis

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Aim: Obesity has been shown to be a risk factor for gastroesophageal reflux disease in western populations. The latter is now the most common upper gastrointestinal condition in Singapore. This study aimed to determine whether body mass index (BMI) is associated with pathologic gastroesophageal reflux, and/or with erosive esophagitis in our population.

Methods: We prospectively studied the 24-hr esophageal pH-metry of 783 patients symptomatic for GERD and endoscopic diagnoses of 403 esophagogastroduodenoscopy patients. We categorised BMI (underweight, BMI <18.5; normal weight, BMI 18.5-22.99; overweight, BMI 23-27.49; obese, BMI ≥27.5) and applied logistic regression to examine the association of BMI with pathologic gastroesophageal reflux (defined by % time pH <4 of >4%), and with erosive esophagitis.

Results: Of 783 patients (427 men; median age, 46 years) who presented with heartburn and/or acid regurgitation, 219 had pathologic gastroesophageal reflux. Increase in BMI was significantly associated with increased risk for reflux (OR = 1.062, 95% CI = 1.022-1.104; *P* = 0.002). Patients whose BMI ≥23 were 1.4 times more likely to have reflux than those BMI <23 (*P* = 0.033). Being male (*P* <0.001), and older (*P* = 0.012) significantly increased the risk. Among 403 patients (201 men; median age, 50 years) who underwent esophagogastroduodenoscopy, 43 had erosive esophagitis. Obese patients were almost 3 times more likely to have esophagitis (OR = 2.91, 95% CI = 1.2-7.0; *P* = 0.018) than normal weight individuals. With respect to Chinese, ethnic groups other than Malay or Indian had a 2.6 fold increase in risk (OR = 2.635, 95% CI = 1.069-6.497; *P* = 0.035).

Conclusion: BMI is positively associated with both pathologic reflux and erosive esophagitis. BMI ≥23 and ≥27.5 significantly increased the risk of gastroesophageal reflux and erosive esophagitis, respectively. This finding may explain the increasing frequency of GERD in the face of the increasing trend of obesity as observed in many Asian countries.

M58

Associations of Ankle-brachial Index (PAD) with Preclinical Carotid Atherosclerosis (Intima-media Thickness) in Type 2 Diabetic Patients

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Background: Type 2 Diabetes Mellitus (DM) causes a 2-4 fold increased risk of atherosclerotic disease, the major cause of mortality among these patients. Prevalence of carotid atherosclerosis has not been well-documented among the local diabetic population.

Aim: We aimed to (1) study the prevalence of carotid atherosclerosis (CAS) by measuring carotid intima-media thickness (IMT), a known risk factor for ischaemic strokes in DM patients; (2) assess the relationship between Ankle Brachial Index (ABI) and carotid IMT.

Methods: The cohort of patients for the study was selected from patients who underwent full diabetes complication assessment done as part of their routine diabetes care in our hospital. For the next part of the study, we randomly selected patients with ABI less than 0.9 and another cohort of patients with normal ABI based on SPSS statistical software. All these patients had an ultrasound examination of the neck to assess the carotid IMT.

Results: The prevalence of CAS as defined by carotid IMT of ≥0.8mm was 37.1% (95% CI 30.1-42%). Patients with CAS were older (61.54 vs 55.57, *P* <0.05), had higher urine ACR (456 vs 53, *P* <0.001), higher systolic (137 vs 129, *P* <0.05) and diastolic blood pressure (84 vs 79, *P* <0.05), higher LDL cholesterol levels (2.63 vs 2.49, *P* <0.05), lower HDL Cholesterol levels (1.25 vs 1.40, *P* = 0.06), higher BMI (27.1 vs 25.4, *P* = 0.243), and longer duration of diabetes (9.65 vs 8.69, *P* = 0.62) compared to those patients

without CAS. Correlation analysis showed $r = 0.23$ ($P = \text{NS}$) when comparing ABI score with the mean carotid IMT, which indicated poor correlation between the 2 non-invasive markers of atherosclerosis.

Conclusion: Patients with diabetes had a high prevalence of carotid atherosclerosis and these patients had worse risk factor profile for atherosclerosis. Carotid IMT in this study was poorly correlated with ABI.

M59

Female Patients and Lack of Caregivers are Associated with Poor Diabetes Mellitus Control

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Aim: The objective was to explore the association of socio-demographic factors with poor diabetes mellitus (DM) control.

Methods: DM patients attending a single renal Specialist Outpatient Clinic were interviewed over a 1-month period. Data collected included demographics, socio-economic factors (education level, housing type and mode of outpatient payment), presence of caregivers, duration and compliance to DM medication, frequency of home glucose monitoring and glycated haemoglobin level (HbA_{1c}). Poor DM control was defined as HbA_{1c} > 7.5%. Univariate and multivariate analyses were performed using logistic regression models. Odds ratios were paired to their corresponding 95% confidence to measure effect size. Data analysis was done in Stata V.9.2 with tests conducted at the 5% level of significance.

Results: There were 48 patients, with mean age of 64.4 ± 12.1 years. The mean duration of DM was 19.3 ± 10.6 years and 18 (37.5%) patients were male. Multivariate analyses showed that females were 5.57 times (95% CI 1.22-28.35) more likely than males to have a poorer DM control ($P = 0.026$). Patients without caregivers were 6.31 times (95% CI 1.42-28.03) more likely to have a poorer DM control compared to those with a caregiver.

Conclusion: Understanding the socio-demographic factors that impact on DM control can help the clinicians to target specific groups of diabetic patients at risk of poor sugar control. We showed that female patients and patients without caregiver support are independent risk factors for elevated HbA_{1c}. The reason for gender difference in DM control needs to be explored.

M60

Good Outcomes with Mycophenolate (MMF)-Based Induction Protocol in Children with Proliferative Lupus Nephritis

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Aim: This study examined the outcomes of children with proliferative lupus nephritis using a new mycophenolate (MMF)-based protocol comprising pulse intravenous methylprednisolone, MMF +/- cyclosporine for induction.

Methods: Sixteen children with proliferative LN, WHO class III and IV (age range at start of treatment 3.7-14.8 years), treated from 1995 to 2007, were studied retrospectively. MMF dose was 1200 mg/m^2

day. Clinical and laboratory parameters pre-induction, at 6 months and at 1 year were compared. Treatment outcome was defined by Systemic Lupus Erythematosus Disease Activity Index (SLEDAI), renal function, proteinuria and serologic markers (complement C3, C4 and anti-dsDNA). Statistical analysis was performed using Wilcoxon signed-rank test.

Results: At presentation, 50% had nephrotic syndrome, 31.2% had nephritic-nephrotic syndrome, while 25% had renal failure requiring dialysis. Renal biopsy classification (WHO) was IV in 68.8% and III in 31.2%. Comparing clinical and laboratory parameters at induction, 6 months and 1 year, respectively, SLEDAI (25.38 ± 8.72 vs 1.45 ± 2.38 vs 2.43 ± 2.62), complement C3 (46.55 ± 21.05 vs 107.02 ± 27.42 vs $109.79 \pm 24.42 \text{ mg/dL}$), complement C4 (12.48 ± 13.8 vs 23.03 ± 14.33 vs $21.95 \pm 11.41 \text{ mg/dl}$) and urine protein (6.97 ± 7.09 vs 0.98 ± 1.56 vs $0.21 \pm 0.15 \text{ g/d/1.73m}^2$) improved significantly ($P < 0.03$). Anti-dsDNA positivity improved from 93.8% (15/16) to 31.2% (5/16) ($P < 0.001$). Additionally renal function normalised by 6 months in 66.7% (6/9) of patients with renal failure at onset, while 88.9% (8/9) had an improved estimated glomerular filtration rate greater than $60 \text{ ml/min/1.73m}^2$.

Conclusion: Combination MMF protocol resulted in significant clinical and serological improvement in patients with proliferative LN and can be used as an effective therapeutic alternative for induction.

M61

Neuroglycopenia and Adrenergic Responses to Hypoglycemia: Insights from the Local Epidemic of Serendipitous Massive Overdose of Glibenclamide

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Aim: Recently, an unlicensed aphrodisiac formulation originating from China known as "Power 1 Walnut" penetrated the illicit markets of South East Asia including Singapore. Subsequent toxicological analyses revealed that each 'Power 1 Walnut' pill is illegally adulterated with 2 prescription drugs - sildenafil 7mg (a PDE5 inhibitor) and glibenclamide 93.3 mg (a long-acting sulfonylurea). As the drug was sold to numerous people, a local 'hypoglycemia epidemic' ensued, of which a small cluster presented to our hospital with severe hypoglycemia. The aim is to characterise the demographics, clinical and laboratory aspects and postulate mechanisms for the relatively atypical presentation.

Methods: A retrospective study of all the patients admitted between 13 January and 15 April 2008 with hypoglycemia was done with acquisition of all relevant data after ethical approval from our DSRB.

Results: A total of 16 patients (25-73 years old) presented with severe hypoglycemia. All of them presented with neuroglycopenic symptoms (5 - confusion, 7 - drowsiness and 3 - seizures) 12-36 hours after ingestion of 'Power 1 Walnut'. Liquid chromatography-mass spectrometry (LC/MS) confirmed the presence of glibenclamide in the urine in 13/16 patients. Only 5/16 patients had symptoms of a partial autonomic response, and 3/16 patients had tachycardia and/or hypertension. None experienced a full-blown hypoglycemia-associated autonomic response.

Conclusion: The above suggests an inappropriate autonomic and catecholamine response to severe hypoglycemia in these cases of serendipitous glibenclamide overdose. Possible reasons for the blunted autonomic responses and apparent autonomic failure are reviewed.

M62**Assessing the Impact of Anthropometry Estimating Equations on Kidney Function Comparisons in Chinese Patients**E HO¹, H XU¹, T SOH¹, J LP², B SHUTER³, A KUMAR⁴, BW TEO¹¹Medicine, National University Health System, ²Statistics and Applied Probability, National University of Singapore, ³Radiology, National University Health System, ⁴Diagnostic Imaging, National University Hospital, Singapore

Aim: Body surface area (BSA) is used to normalise glomerular filtration rates (GFR) in the clinical assessment and comparison of kidney function. The commonly-used du Bois and Chinese-specific (Hu equations) formulae have not been assessed for this purpose. We compared the BSA obtained by both methods and assessed their impact on normalisation of absolute GFR in kidney function comparisons in Chinese patients.

Methods: We retrospectively analysed 41 patients who underwent a ^{99m}Tc-DTPA GFR determination by 3-sample plasma disappearance calculated using the slope-intercept method and Brochner-Mortensen correction (mean age = 53.6 ± 14.5 years, 48.8% male). BSA was calculated using du Bois and Hu formulae. Measured GFR was normalised using the different BSA. We compared the mean differences by t-tests, taking significance at the 5% level, using JMP IN (Cary, NC, USA).

Results: Mean Hu BSA was 0.065 ± 0.042 m² higher than du Bois BSA ($P < 0.001$, 95% CI 0.052-0.078); with females having a greater difference (0.102 ± 0.015 m²; $P < 0.001$, 95% CI 0.95-0.11) than males (0.026 ± 0.017 m²; $P < 0.001$, 95% CI 0.018-0.034). Mean measured GFR (61.6 ± 32 ml/min/1.73 m²) normalised to du Bois BSA was 2.14 ± 1.8 ml/min/1.73 m² higher than mean GFR normalised to Hu BSA (59.4 ± 30.7 ml/min/1.73 m²). In females, as the measured GFR increased, the measured GFR normalised to du Bois BSA becomes increasingly lower than GFR normalised to Hu BSA.

Conclusion: The BSA is different in Chinese patients when calculated using different formulae. Although the mean difference does not appear to be clinically significant, on closer examination in females, there is a trend towards much larger errors at the extremes of measured GFR, where it can be significant.

M63**Effects of Mirena (Levonorgestrel Releasing Intrauterine System) and Ortho Gynae T380 Intrauterine Copper Device on Lipid Metabolism – A Randomised Comparative Study**YW NG¹, S LIANG², K SINGH¹¹Department of Obstetrics & Gynaecology, National University Hospital, Singapore, ²Biostatistics Consultancy Unit, Yong Loo Lin School of Medicine, National University of Singapore

Aim: This study aims to assess the effects of LNG-IUS on lipid metabolism in an Asian population using Ortho Gynae T380 copper containing (non-hormonal) IUD as a control.

Methods: Ninety-two healthy women requesting IUD for contraception were randomly allocated to the 2 groups and were followed up at 6-, 12- and 18- months intervals. Serum concentrations of total cholesterol (TC), high-density lipoprotein cholesterol (HDL-C), low-density lipoprotein cholesterol (LDL-C), triglycerides (TG), apolipoprotein A-I (Apo A-I) and apolipoprotein B (Apo B) were measured pre-insertion and at each visit following insertion.

Results: There was a significant reduction in total cholesterol level in the LNG-IUS group. Triglyceride showed a delayed reduction at

the end of first year. LDL-C, HDL-C and the cholesterol ratios remained stable. Although levels of Apolipoproteins A-I and B showed a significant reduction in LNG-IUS, their ratios remained stable and insignificant.

Conclusion: In this randomised comparative study among our local Asian population, it is assuring to note that the LNG-IUS does not have any adverse effects on lipid metabolism.

M64**The Spectrum of Imaging Findings of Ingested Gastrointestinal Foreign Bodies**

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Aim: To describe the spectrum of imaging findings of ingested gastrointestinal foreign bodies.

Methods: A review of all radiologic examinations (CT, barium swallow) for cases of ingested foreign bodies from 2005 to 2007 in the Diagnostic Radiology Department was performed. The types of foreign bodies, locations of lodgment and associated complications were recorded. Interesting cases with specific teaching points were collected with subsequent detail analysis of the radiologic findings, and correlation made with the procedural reports of all patients who subsequently underwent endoscopy and surgery.

A literature review on the radiological evaluation of ingested foreign bodies was also performed.

Results: Foreign body ingestion is common in our population, with fish and other meat bones being the most commonly ingested. The oesophagus was the most common site of foreign body lodgment, followed by the stomach. Potential complications varied depending on the location, and foreign body type. A wide spectrum of imaging findings ranging from mucosal lacerations to fatal mediastinitis and peritonitis has been reported. Although plain radiographs are commonly used for initial surveys, their sensitivity and specificity were less than satisfactory, as vascular, cartilaginous and soft tissue calcifications may mimic the appearance of foreign bodies. Radiographic contrast studies were the modality of choice in the past decade. However, computed tomography has gained popularity amongst the clinicians in our institution due to its easy availability, high sensitivity and specificity, and ability to provide detailed anatomical information, as well as complications related to ingested foreign bodies.

Conclusion: Radiological studies are vital in the management of ingested gastrointestinal foreign bodies. Comprehensive reports on types and locations of foreign bodies are invaluable in the removal of foreign bodies and hence prevention of major complications.

M65**Delusion of Parasitosis – A Retrospective Study of 35 Patients seen at the National Skin Centre, Singapore**

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Background: Delusion of parasitosis (DP) is a rare disorder in which affected individuals have the mistaken and unshakable belief that they are infested by “bugs” - parasites, worms, bacteria, mites, or other living organisms. This delusion cannot be corrected by reasoning, persuasion, or logical argument. Recently, this condition has been reported with increasing frequency in Asia. However, the true

prevalence may be greatly underestimated because patients do not believe their symptoms have a psychiatric basis and are reluctant to seek psychiatric help.

Methods: We describe a retrospective analysis of a series of 35 patients seen at the Psychodermatology Clinic in the National Skin Centre, Singapore, between May 2005 to November 2007.

The patients were elderly, with ages ranging between 28 and 86 years, with a mean age of 59. There was a strong female preponderance (63.5%). The majority of the patients were Chinese (94.3%), with only 1 Indian and 1 Malay patient. Most were housewives (28.6%) and retirees (31.4%), and 62.9% were married. 8 patients (22.9%) had a positive history of psychiatric disorder – 2 had schizophrenia and 6 had depression. Only 4 patients (11.4%) admitted to self-trauma causing the cutaneous lesions.

Results and Discussion: 11 (31.4%) of the patients had been treating themselves with topical malathion for suspected scabies, and 2 patients admitted to using dettol and other strong soaps on their skin. Terms like “insects”, “worms” or “bugs” were used, and the frequent body sites affected were the trunk, limbs and scalp. Some patients even described insects crawling out through their nose or appearing in their urine.

Twenty-five patients (71.4%) were treated with the new antipsychotic risperidone, and 24 of these patients received fluoxetine in addition. The mean duration of treatment was 6.25 +/- 5.9 months. Remission of symptoms was achieved in the majority (92%) of treated patients. The patients were followed up for an average of 16.6 months. Only 1 patient relapsed while on medications. However, there was a high default rate, with 21 patients (60%) not coming for their follow-up visits. There is a high reported relapse rate in the literature for patients who discontinue medication and thus, these defaulters should be recalled for further assessment.

M66

A Review of Sexually Transmitted Infection Trends of Men who have Sex with Men (MSM) in Singapore

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Background: MSM sex is illegal in Singapore; there is minimal data and published studies on STI trends in MSM.

Aim: To review the trends of STI diagnoses of MSM patients seen at the Department of STI Control (DSC) clinic.

Methods: Case records of all MSM patients presenting to the DSC clinic from 2001 to 2007 were reviewed. The diagnoses, age, and details of most recent sexual exposure (type of sex, partner and condom use) were tabulated.

Results: The peak of STI incidence was in 2005 with 353 cases diagnosed. The peak also corresponded with the increase in the number of MSM patients seen at the clinic, 576 in 2005 vs 124 in 2001. The percentage of MSM who were seen at the clinic diagnosed with an STI a year ranged from 61.3% to 77.4%.

The most common diagnosis was genital warts with the majority perianal or anal canal warts. The most common bacterial STI diagnosed was gonorrhoea with the majority being gonorrhoea urethritis; the second was syphilis with more than half of cases being infectious

(primary/secondary) syphilis. HIV only accounted for 4.6% of all STIs diagnosed.

The majority of STI were diagnosed in MSM between the ages of 20 and 39. This is comparable to national STI statistics with the 20 to 39 age group contributing to 70% of all STIs diagnosed in males.

There is however a worrying trend of younger MSM (aged 10 to 19) presenting with STIs with 36 cases in 2006 vs 2 cases in 2001. This mirrors the national STI incidence for males in age group 10 to 19 which increased from 134 cases in 2000 to 296 cases in 2007.

Conclusion: More MSM are coming forward to be screened and tested for STIs, possibly as a result of better awareness due to ongoing education campaigns. The trend of increasing incidence of STIs being diagnosed indicates that more effort is needed to improve on current and develop new prevention and intervention strategies.

M67

Neuropsychiatric Profile and Impact on Quality Of Life and Caregiver Burden in Patients Presenting at a Memory Clinic in Singapore

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Aim: To determine the prevalence of neuropsychiatric symptoms (NS) in patients with dementia and the symptoms that most impact caregiver distress, burden and patient's quality of life (QOL).

Methods: We assessed 205 geriatric patients and their accompanying family carers who presented to a memory clinic in a tertiary hospital in Singapore. Clinicians determined the dementia type and rated the severity of dementia using the Clinical Dementia Rating (CDR) scale. The Neuropsychiatric Inventory Questionnaire (NPI-Q) was administered to assess the patient's NS and the corresponding level of distress experienced by the family carer. Patient's quality of life and carer burden were assessed by Quality of Life – Alzheimer's Disease (QOL-AD) and the Zarit Burden Inventory respectively. Analysis of variance using general linear regression model was performed to establish whether NS predicted carer distress, burden and patient QOL.

Results: NS were highly prevalent amongst our patients, with agitation (65%) and apathy (62%) most common across all stages of dementia. Motor disturbance (38%) and hallucination (25%) occurred less frequently but were more common in more severe dementia. Elation (16%) was the least common NS. NS significantly predicted caregiver's distress, feelings of burden and patients' QOL, controlling for type and severity of dementia, race, sex, marital status and age. Specifically, all NPI domains except hallucination and elation predicted caregiver burden, while agitation, apathy, night-time behaviour, depression, disinhibition, motor disturbance and hallucination were significantly and inversely related to patients' QOL.

Conclusion: This study provides evidence for the high prevalence of NS in dementia and its impact on carer distress, burden and patient QOL. The findings call for caregiver interventions that include strategies for managing patients' NS and caregivers' own stress.

M68

Risk Factors Associated with Having Psoriatic Arthritis in Patients with Cutaneous Psoriasis

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Aim: To determine if the following characteristics are associated with the presence of psoriatic arthritis in a sample of psoriasis patients: race, family history of psoriasis and psoriatic arthritis, age of onset of psoriasis, smoking, alcohol consumption, and the maximum body surface area involved.

Methods: This is a case-control study involving 400 psoriasis patients who were seen at the National Skin Centre over a 1-year period. Cases are psoriasis patients with psoriatic arthritis while the control group is psoriasis patients who do not have psoriatic arthritis. Participants completed a self-administered standardised questionnaire and were assessed by dermatologists.

Results: Psoriatic arthritis was not significantly associated with gender, age of onset of psoriasis, family history of psoriasis, smoking, alcohol consumption, and plaque versus non-plaque type of psoriasis, but was significantly associated with family history of psoriatic arthritis ($P < 0.001$) and maximum body surface area involved ($P = 0.05$). After adjusting for maximum body surface area and ethnicity, the presence of psoriatic arthritis was very significantly associated with family history of psoriatic arthritis (OR, 20.5; 95% CI: 2.49–169.10). Those with the most severe cutaneous psoriasis were significantly more likely than the least severe psoriasis patients to have psoriatic arthritis (OR, 2.52 times; 95% CI: 1.33–4.75). Indians were significantly more likely to have psoriatic arthritis compared to Chinese (OR, 2.11; 95% CI: 1.08–4.15).

Conclusion: A family history of psoriatic arthritis and a greater maximum body surface area affected are associated with having psoriatic arthritis in this study population of psoriasis patients.

M69

Comparing the Accuracy of Estimating Equations for Glomerular Filtration Rates in Asians

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Aim: Practice guidelines suggest using glomerular filtration rate (GFR-ml/min/1.73m²) from estimating equations for kidney function assessments. Estimated GFR (eGFR) are accurate but validity in ethnic groups other than Caucasians is unknown. We compared eGFR to measured GFR (mGFR) in a multi-ethnic Asian population.

Methods: We performed a retrospective analysis on 70 patients who had ^{99m}Tc-DTPA mGFR with a contemporaneous serum creatinine (± 60 days) [mean age = 51.1 \pm 14.9 years; 54.3% male; ethnic distribution: Chinese 58.6%, Indian 10%, Malay 25.7%, other 5.7; 21.4% diabetes, 30 kidney donor assessments (15 pre-nephrectomy); 11 transplants (6 kidneys, 4 livers, 1 liver-kidney)]. Body surface area (BSA) was calculated (du Bois). Estimated GFR was calculated from the Cockcroft-Gault (CG-GFR normalised to BSA) and MDRD (MDRD-GFR) formulae, and compared with mGFR using Bland-Altman analyses.

Results: Overall MDRD-GFR was 4.95 \pm 20.5 less than mGFR ($P = 0.031$, 95% CI 0.055-9.84). CG-GFR was also lower by 2.28 \pm 19.9 ($P = NS$). Comparisons by eGFR above or below 60, none of the

estimates were different ($P = NS$). CG-GFR was 2.67 \pm 9.5 higher than MDRD-GFR ($P = 0.008$; 95% CI 0.39-4.94); and this was also different for those that measured >60 (3.87 \pm 11.3, $P = 0.02$, 95% CI 0.27-7.47). Comparing patients with MDRD-GFR versus CG-GFR to within ± 5 , ± 10 , or ± 15 , there was no difference ($P = NS$).

Conclusion: Our results show that in practice the measured GFR differs significantly from estimated GFR calculated by the MDRD equation in Asian patients but not with the Cockcroft-Gault formula (normalised to BSA). Although the mean difference was small, the differences can vary as much as 20 ml/min/1.73 m², and thereby becoming clinically significant, and impacting the management of patients.

M70

Correlation between Metabolite vs Parent Ratios in Plasma and Non-responders to Gemcitabine based Therapy in NSCLC Patients

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Aim: To investigate if early cycle tumour response to gemcitabine is correlated with metabolite vs gemcitabine ratios in NSCLC patients.

Methods: From a phase II clinical trial in Singapore, plasma concentrations of gemcitabine, its inactive metabolite, 2', 2'-difluorodeoxyuridine (dFdU) were measured in 56 patients and the dFdU/gemcitabine ratios were computed for each of sampling times (10 minutes, 30 minutes, 10 minutes before the end of the infusion, and 30 minutes, 1 hour, 2 hours after the end of the infusion). Tumour response was assessed according to standard RECIST criteria after every 2 cycles. Confirmed responses required repeat CT scans at least 4 weeks later. The metabolite/parent ratios at the different sampling points were correlated with 2nd cycle tumour response.

Results: The ratios of dFdU/gemcitabine at 2 hours were significantly different between responders and non-responders ($P = 0.011$; Mann Whitney test). The average ratio of the responders was much smaller than that of the non-responders. In general, responders to gemcitabine were most likely to have low dFdU/gemcitabine ratios which represent slower deamination rates. According to frequency histogram analysis, a ratio of 500 was identified as a reasonable cutoff value to predict non-responders with a high probability (95%).

Conclusion: The ratios at 2 hours may be a good and valuable marker for oncologists to predict non-responders in early cycle tumour shrinkage through gemcitabine-based chemotherapy in NSCLC patients so as to switch their chemotherapy in early treatment stage.

M71

Quality of Life in Children with Cancer Undergoing Treatment

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Aim: With intensive chemotherapy and increased survival, quality of life in our pediatric population is of increasing concern. The aim of this study is to assess the children's quality of life during the treatment process.

Methods: Patients between 7 and 18 years old who are undergoing cancer treatment in National University Hospital were identified. The child self-reported his/her health related quality of life (HRQOL) using the PedsQL Pediatric Quality of Life Inventory and Cancer module as a validated assessment tool.

Results: Thirty-two patients were enrolled over a 3-week period in November 2007. Median age was 11 years (range 7-17 years). There was 1 non-responder (3%). Fourteen (45%) boys and 17 (55%) girls were interviewed. There were 8 (26%) patients and 23 (74%) patients with solid and liquid tumours respectively. For the Cognitive Problem Dimension score, 86% of patients with liquid tumours and 50% of those with solid tumours scored below the 75th percentile (82), OR 0.2 (0.03–1.0) $P=0.05$. For Physical Health Summary score, the patients with solid tumour scored worse, 25% below the 10th percentile, as compared to 4.3% of patients with liquid tumour. This is reflected by a worse Pain and Hurt Dimension score for patients with solid tumour. For Perceived Appearance Dimension score, patients with solid tumour (75%) scored lower than the median score (67) compared to those with liquid tumour (44%).

Conclusion: The domains of QOL are affected to different extents for the patients with solid and those with liquid tumours. This is most likely to be due to the differences in treatment strategies and clinical course. Healthcare professionals should be aware of the effects of treatment on QOL and take practical steps to address these issues.

The authors declare that there is no conflict of interest.

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M72

Deep Re-sequencing of Adrenomedullin and Drenomedullin Receptor Genes Revealed Possible Association with Plasma Mid-region Proadrenomedullin Concentrations and Diabetic Nephropathy

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Objective: Genetic determinants are important in diabetic nephropathy (DN). Adrenomedullin (ADM) - an endothelium derived vasoactive factor - and its receptor (ADM-receptor, ADMR) may be involved in the pathogenesis of DN. We previously reported that plasma ADM is elevated in DN. Therefore, we hypothesise that ADM and ADMR are candidate genes for DN.

Methods: Case (n = 545, spot urinary albumin / creatinine ratio [ACR] of >1000 mg/g)-control (n = 503, ACR <30 mg/g) study of Chinese with long standing (>10 years) type 2 Diabetes (T2DM). ADM and ADMR genes were directly re-sequenced to uncover all common SNPs with minor allele frequency (MAF) $\geq 3\%$. Genotype was determined using TaqMan Real Time-PCR assay.

Results: Cases and controls were similar in distribution of gender, age, duration of diabetes and HbA1C. Distribution of SNPs from ADM (rs4399321A >G, rs13306112A >C, rs4910118C >T, rs7944706A >G, rs4076050C >T and rs444073A >C) and ADMR (rs2279373C >T, rs12099695G >A and coding non-synonymous rs35493121T >C) did not differ significantly between cases and controls. However, an uncommon 5' haplotype of ADMR (TG - formed by rs2279373 and rs12099695, $D' = 0.90$, frequency 0.021) was associated with reduced plasma mid-region proADM (MR-proADM) concentration: carrier vs non carrier 0.60 ± 0.34 vs 0.74 ± 0.69 nM ($P = 0.017$). The haplotype (frequency among cases 0.012, controls 0.031; $P = 0.0026$) appeared to confer protection (dominant

model) against DN (odds ratio 0.38 95% CI 0.19-0.76, $P = 0.006$).

Conclusion: The 5' promoter haplotype of ADMR is associated with reduced plasma MR-proADM concentrations and decreased susceptibility to DN among Chinese.

M73

Single or Double Units Cord Blood Transplantation from Unrelated Donors Using Myeloablative or Reduced Intensity Conditioning for Adults with Haematological Malignancies: Preliminary Experience in National University Hospital

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Aim: Unrelated umbilical cord blood provides an alternative stem cell source for patients without matched related or unrelated donors. In contrast to children, the results of UCB transplant (UCBT) in adults have been less promising due to higher transplant related mortality. We report the preliminary results of 8 adult patients who received UCBT to evaluate the feasibility and effectiveness of this therapeutic approach.

Methods: Eight adults (median age 23 years, range 18–49 years) with haematological malignancies have received UCBT following myeloablative (n = 6) or nonmyeloablative (n = 2) conditioning regimen, which include Fludarabine, cyclophosphamide and total body irradiation. Cord blood units were $\geq 4/6$ matched with a median pre-freezing total nucleated cell dose and CD34 cell dose of 5.22×10^7 /kg (range 3.8-8.1) and 2.2×10^5 /kg (range 0.3-3.7), respectively. Four patients received 2 partially HLA-matched UCB units.

Results: The median time to absolute neutrophil count of $500/\mu\text{L}$ and untransfused platelet $>20,000/\mu\text{L}$ was 22 days (range 11–35) and 32 days (range 20-39), respectively. No late graft failure was seen. Three patients developed grade II acute GVHD. The median follow up for surviving patients is 10 months (range 3-15 months). The 100-day treatment-related mortality was 37.5%. Relapse-free and overall survival at 1 year were 45% and 60%, respectively.

Conclusion: These results suggest that unrelated UCBT is an acceptable alternative approach for adult patients with haematological malignancies without HLA-identical donors. Transplantation of 2 partially HLA-matched UCB units may overcome the cell dose barrier that limits the use of UCB in many adults.

M74

Efficacy and Safety of Pemetrexed in Asian Patients with Non-Small Cell Lung Cancer (NSCLC) and Mesothelioma: Experience at the Johns Hopkins Singapore International Medical Centre

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Background: The efficacy and toxicity of Pemetrexed in Asian patients is unknown.

Aim: To determine the safety and efficacy in the treatment of Asian patients with NSCLC and mesothelioma.

Methods: A retrospective review of patients treated with Pemetrexed was done. Response Evaluation Criteria in Solid Tumours were used to assess efficacy independently of the treating physician's assessment.

National Cancer Institute Common Terminology Criteria for Adverse Events version 3.0 were used for the description of adverse events.

Results: Forty-three patients received Pemetrexed: 37 had NSCLC and 6 had mesothelioma. Patients with NSCLC had a median age of 60 years (range, 45 to 89), and were predominantly male (29 men and 8 women), ethnic Chinese (32 patients) and smokers (22 patients). All had received at least 1 prior regimen (median 1, range 1-4). Twenty-nine individuals had an ECOG PS of 0 or 1. Patients received a median of 2 cycles of treatment (total 95; range 1-12). Grade 3 and 4 adverse events were as follows: anaemia, 3 patients; pneumonia, 2 patients; neutropenic fever, 1 patient; thrombocytopenia, 1 patient. Five (14%) patients had an objective response (1 CR, 4 PR) and 13 (35%) had stable disease. Median Time to Treatment Failure was 8 weeks (95% CI, 0 to 27.7). Median Overall Survival was 80 weeks (95% CI, 53.7-118.9). The median age for patients with mesothelioma was 46.5 years (range 29-73). Five men and 1 woman (4 ethnic Chinese, 1 Indian and 1 Arab) received a median of 4 cycles (total 30, range 1-15) of Pemetrexed in combination with cisplatin. Three patients had a PR, 2 had stable disease and 1 had progressed at the time of first evaluation. Grade 3 and 4 toxicity was as follows: leukocytopenia, neutropenia, and thrombocytopenia, 1 patient.

Conclusion: Pemetrexed seems to be safe and efficacious in the treatment of Asian patients with NSCLC and mesothelioma.

M75

Ultrasound Assisted Thrombolysis in Acute Basilar Artery Thrombosis

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Background: Intravenously-administered tissue plasminogen activator (IV-TPA) has been approved recently in Singapore for acute ischemic stroke. Continuous exposure of clot to 2-MHz pulsed-wave transcranial Doppler (TCD) ultrasound during IV-TPA infusion is known to augment thrombolysis. Acute Basilar artery thrombosis (BAT) is a catastrophic disease in majority and the survivors may be severely impaired.

Aim: We aimed to determine the feasibility, safety and efficacy of ultrasound-assisted thrombolysis in our patients with acute BAT.

Methods: Consecutive patients with acute BAT were treated with standard IV-tPA and continuously monitored with 2-MHz TCD through the trans-foraminal window. Arterial recanalisation was determined with Thrombolysis in Brain Ischemia (TIBI) flow-grading system. Safety and efficacy of ultrasound-assisted thrombolysis were assessed by rates of symptomatic intracranial hemorrhage (sICH) & functional recovery at 3 months, respectively.

Results: Fifteen consecutive patients (mean age 63 years, 9 men) were included. Mean-time elapsed between symptom-onset and presentation to emergency room was 82 minutes (range 50-145 minutes); mean interval between symptom-onset to IV-TPA bolus was 160 minutes (range 120-180minutes) and mean NIHSS score was 14 points (range 7-24). Partial or complete recanalisation with reduction in the stroke severity was noted in 12 out of the 15 patients during IV-TPA infusion (mean change in NIHSS = 7 points; range 3-20 points). None of our patients developed sICH while 11 patients demonstrated good functional outcome at 3 months.

Conclusion: Our preliminary study demonstrates the feasibility, safety and efficacy of ultrasound-assisted thrombolysis in acute

basilar artery thrombosis. In addition to the real-time information regarding arterial recanalisation, continuous TCD-monitoring enhances thrombolysis with good functional recovery in patients with acute basilar artery thrombosis.

M76

Non-seasonal Allergic Conjunctivitis in the Tropics: Experience in a Tertiary Care Institution

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Purpose: To understand the epidemiology, severity, types of pathology, clinical features, precipitating factors and treatment outcomes of patients with allergic conjunctivitis in a tropical climate, requiring corneal sub-specialist intervention.

Participants: Thirty-three patients with severe allergic conjunctivitis requiring corneal sub-specialist care in National University hospital, Singapore were studied.

Design: Retrospective, non comparative case series.

Main Outcome Measures: Epidemiological data, clinical features, complete ophthalmologic examination and treatment types.

Methods: Both eyes of 33 patients seen at the cornea sub specialist clinic between May 2005 and July 2006 were examined at baseline, and followed up. Clinical features, treatment and outcome variables through case sheet review were analysed.

Results: Of the patients, 75.8% were male, and 24.2% were female. Ages ranged from 3 to 25 years, mean age of presentation was 10.7 years. Seventeen (51.5%) had concomitant allergic rhinitis, 16 (48.5%) had asthma, and 17 (51.5%) had associated dermatitis. Only 9 (27.3%) had documented precipitating factors. None of the patients said that their symptoms were seasonal. Twenty-two (66.7%) said their symptoms were perennial. Twelve patients were found to have a corneal epithelial defect or shield ulcer (36.4%). Topical steroids were required in 25 patients (75.8%). Five of them were steroid responders. Eleven of the 33 patients (33.3%) required topical cyclosporine 0.5%.

Conclusion: Allergic conjunctivitis in a non-temperate non-seasonal climate has different clinical presentations, and varied precipitating factors. The disease in such conditions may respond differently to the usual anti-allergy drug options used in temperate countries.

M77

Age and Malnutrition are Independent Predictors of Mortality in a Nursing Home Population

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Aims: Knowledge about life expectancy in the heterogenous nursing home population is important for individualised care planning and resource allocation. We performed a cross-sectional study, with prospective collection of mortality data, to determine the risk factors at baseline for all-cause mortality over 2 years in a nursing home facility in Singapore.

Methods: A multi-disciplinary team evaluated the status of 154 medically stable residents at baseline. Nutrition was assessed with the Body Mass Index (BMI), and Mini Nutritional Assessment (MNA), while functional status was indicated by the modified Barthel's index. Clinical parameters measured include number of medical

diagnoses, medications, Charlson's comorbidity index, presence of dementia, depression, feeding tube, and pressure ulcers. Information for mortality was obtained from chart review.

Results: Residents had a mean age of 77 ± 12 years, with 53.2% being females. Mortality rate was 25.3% ($n = 39$) over 2 years. Baseline factors associated with mortality include increased age, low Barthel's score, BMI $< 18.5 \text{ kg/m}^2$, MNA < 17 , number of medical diagnoses > 5 and presence of dementia. (Odds ratio = 1.05, 1.01, 3.08 and 3.03, 2.58 and 5.37 respectively, all $P < 0.05$). Upon multivariate analysis, the association between age, low BMI with mortality still remained significant ($P = 0.03$ and 0.01 respectively)

Conclusion: Advanced age and malnutrition are important risk factors for short-term mortality in institutionalised older persons. The latter may be amenable to intervention with improved screening and dietary protein supplementation.

M78

The Role of Specialist Paediatric Renal Nursing Service in Optimal Care of Children on Chronic Peritoneal Dialysis

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Aim: The paediatric chronic peritoneal dialysis programme in Singapore was instituted in 1988 at the National University Hospital. However, adult renal nurses provided the dialysis services during the first 10 years. As children with end stage renal disease have special needs, in 1998, a dedicated paediatric renal nursing team was recruited. This study was conducted to determine the impact of the specialist paediatric renal nursing service on dialysis related outcomes.

Methods: Data from all children ($n = 82$) who entered the dialysis program during the two 10-year dialysis periods were analysed: Period 1 from January 1988 to December 1997 ($n = 21$), and Period 2 from January 1998 to December 2007 ($n = 61$). Rates of peritonitis, exit site infection, and modality change per patient-year of dialysis were used as indicators of nursing practice. The difference between the 2 study periods was compared using Poisson Regression.

Results: The mean ages of patients at start of dialysis in Period 1 (10.36 ± 5.12 years) and period 2 (12.70 ± 5.32 years) were similar. The peritonitis rate per patient-year was significantly higher in Period 1 (1.10) compared to Period 2 (0.30), with a relative risk of 1.68 (95% CI 1.13-2.50) ($P = 0.01$). The exit site infection rates per patient-year was also worse in Period 1 (1.21) compared to Period 2 (0.25), with a relative risk of 2.09 (95% CI 1.39-3.13) ($P < 0.001$).

Conclusion: Establishment of a specialist paediatric renal nursing team for the management of children on chronic peritoneal dialysis resulted in a significant improvement in the outcomes as measured by the decrease in technique-related complications.

M79

Clustering and Transmission of Drug-Resistance HIV-1 Variants among Recently Infected HIV-1 Drug-Naïve Seroconvertors in Singapore

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Aim: To study HIV-1 transmission dynamics and primary drug resistance of HIV-1 among recently infected, drug-naïve seroconvertors in Singapore.

Methods: Recently infected HIV-1 seroconvertors were prospectively enrolled between May 2006 and December 2007; 14 seroconvertors identified between October 2002 and April 2006 who had stored plasma samples were also included in this analysis. Plasma samples were analysed using Celeria Diagnostics ViroSeq HIV-1 Genotyping System. HIV-1 *pol* sequences were used for phylogenetic and genotypic drug resistance analysis. HIV-1 transmissions were inferred from phylogenetic clustering analysis.

Results: Of the 60 seroconvertors, 95% were men, 95% Chinese, mean age 34.9 years ± 10.5 . The risk factors for HIV-1 infection: MSM (men-who-have-sex-with-men) 73.3% (44/60), heterosexual 23.3% (14/60), intravenous drug use with sharing of needles 1.7% (1/60) and unknown 1.7% (1/60). Thirty-one (51.7%) patients were in phylogenetically-defined clusters and 90% of them reported local risk exposure compared to 59% among the non-clustered (OR 6.35; 95% CI: 1.65-23.95). MSM (OR 5.63, 95%CI: 1.17-27.15), high viral load (OR 4.28, 95%CI: 1.37-13.36), and young age (OR 0.92, 95%CI: 0.85-0.99) were independently associated with clustered individuals. Primary genotypic resistance was detected in only 1 (1.7%) patient.

Conclusion:

- Young MSMs accounted for a significant proportion of newly acquired HIV infections.
- Clustering with local transmission accounted for least half of these new infections with risk factors being MSM, young age and high HIV viral load.
- Prevention work needs to be intensified towards this risk group.
- Transmission of drug-resistant HIV-1 is rare in Singapore and recommended first-line anti-retrovirals would still be applicable for most of our patients.

M80

Troponin I – Which Cutoff to Use?

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Aim: There are a variety of different decision points used for interpretation of Troponin I (TnI) concentration. This study was designed to determine the 99th centile for TnI in a Singaporean population and assess the use of this cutoff on positivity rates.

Methods: Serum from 201 samples on individuals undergoing health screening were anonymised and analysed for serum TnI concentration (AccuTnI on Beckman Coulter DxI 800, manufacturer's 99th centile $0.04 \mu\text{g/L}$). Details of TnI requests for April and May 2008 were extracted from the laboratory information system. Outliers were identified using Dixon's criterion.

Results: The reference population comprised 118 women and 83 men, median age 43 years (21-79). Two outliers (1 male, 1 female) were excluded prior to reference interval calculation. The non-parametric 99th centile for men, women and all samples was $0.03 \mu\text{g/L}$. In 2 months, 12327 TnI measurements were performed on 5067 patients. One patient had 23, 48 patients had ≥ 10 and 451 had 5-9 TnI measurements performed. Of the samples, 25% were from ED, 75% from the wards. Using the present TnI cutoff of $0.5 \mu\text{g/L}$, the positivity rate was 13.6% (ED 4.1%, wards 16.8%). Using a cutoff of

0.04 mg/L, the positivity rates rise to 44.1% (ED 24%, wards 50.9%)

Conclusion: This study validates the manufacturer's 99th centile cutoff of 0.04 µg/L. Use of this cutoff will markedly increase the positivity rate for Tnl measurements. The clinical and health resource implications of such a change should be considered prior to implementation.

M81

Systolic Dysfunction is a Risk Factor for One-year Mortality in New End-stage Renal Disease Asian Patients

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Aim: Systolic dysfunction is a risk factor for cardiovascular mortality in patients with end-stage renal disease (ESRD) but its relative significance in Asian patients is unclear. We hypothesised that systolic dysfunction is a strong risk factor for death in a multi-ethnic Asian population of patients in the first year after diagnosis.

Methods: We analysed a prospectively collected database of 168 new ESRD patients from the National University Hospital, Singapore in 2005 (mean age = 59.2 ± 13.7; 48.2% male, 66.1% Chinese, 20.2% Malay, 5.4% Indian, 8.3% Other, 62.5% diabetic, 80.4% hypertensive, 34.2% coronary artery disease, 34.9% LVEF <50%). We used univariate analysis to identify significant factors, followed by Cox proportional hazards models. Baseline left ventricular ejection fraction (LVEF) refers to echocardiogram examination ±1 year of diagnosis.

Results: Deaths were not different by race or gender. Age ($P < 0.001$), final treatment modality ($P < 0.001$), therapy centre type ($P < 0.001$), unplanned dialysis ($P = 0.044$), a history of coronary artery disease ($P = 0.0074$), and LVEF <50% ($P < 0.001$) were associated with mortality. The Cox model examining cardiac related factors was significant ($P < 0.0019$), but only LVEF >50% was significant (HR 0.67, 95% CI 0.43-1.00, $P = 0.05$). In a final Cox model including all significant factors, LVEF >50% was a significant factor for survival (HR 0.64, 95% CI 0.42-0.97, $P = 0.036$).

Conclusion: During the first year after diagnosis of end-stage renal disease, systolic dysfunction is a strong risk factor for mortality in a multi-ethnic Asian population of patients.

M82

Doppler Blood Flow Indices of the Superior Mesentery Artery in Premature Newborns at First Oral Feed

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Introduction: The aim of this study was to test the hypothesis that increased Superior Mesenteric Artery (SMA) blood flow at first oral feed will be associated with an earlier onset of full feeds, in premature newborns.

Methods: After informed parental consent, a single investigator measured Doppler indices of SMA blood flows: Peak Systolic Velocity, End Diastolic Velocity, Time Averaged Mean Velocity

(TAMV), Resistance Index and Pulsatility Index using the Hewlett Packard Logiq 7 ultrasound machine with a 5 MHz probe applied on the epigastrium. Measurements were sampled thrice, and done immediately before, and 45 minutes after the first oral feed. Neonatologists determined progression of feeding blinded to these Doppler results. The day of life when intravenous fluids were no longer required was recorded as the time to full feed. The association between the Doppler indices and day to full feed was investigated via the Cox proportional hazards model.

Results: Twenty-two newborns with the mean gestational age 30.7 (SD 2.15) weeks were recruited. Median time to full feed was 14 (range 8–23) days. After adjusting for gestational age and pre-feed values, only post-feed TAMV was found to be a significant predictor for day to full feeds. Full feed was less likely to be achieved with increased TAMV (HR = 0.72; 95% CI 0.55-0.96; $P = 0.023$).

Conclusion: Our unexpected result of increased post-feed TAMV associated with longer time to full feeds contrasts with findings of previous investigators. Further investigations are required with a larger cohort.

M83

A Retrospective Review of Patients Diagnosed with Adult Dermatomyositis at the National Skin Centre from 1996-2006

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Introduction: Dermatomyositis is an acquired multisystem inflammatory disease with prominent, characteristic cutaneous manifestations and proximal muscle myopathy.

Aim: The aim of the study was to perform a retrospective review of adult patients diagnosed with dermatomyositis and its variants at the National Skin Centre. We sought to identify any significant epidemiological or clinical risk factors associated with malignancy.

Methods: This was a retrospective review of all patients diagnosed with adult dermatomyositis at the National Skin Centre over an 11-year period from 1996-2006.

Results: There were 51 females and 17 males giving a female to male ratio of 3:1. There were 62 Chinese, 2 Malay, 1 Indian and 3 others. The age range was 24-81 years, with a mean age of 39 years. Out of 68 patients, 25 (37%) had myositis and 43 (63%) were either hypomyopathic or amyopathic. Malignancies were detected in 17 patients (25%), the most common of which was nasopharyngeal carcinoma. Other malignancies that were detected were colorectal, breast, hepatocellular, cervix, uterine and ovarian carcinomas, and follicular/ diffuse large cell lymphoma. The period of time during which the cancers were found ranged from 10 years preceding the diagnosis to 32 months after the diagnosis of dermatomyositis. The clinical features unique to the malignancy-associated group were hyperkeratotic papules and vesiculo-bullous lesions. Although not statistically significant, the results showed a trend towards an older age group and the male gender in the malignancy associated group. We also found that symptoms are unreliable pointers towards malignancy.

Conclusion: Nasopharyngeal carcinoma is a well-documented malignancy in Asian patients with dermatomyositis. Ongoing cancer screening is prudent and essential.

M84

Long-term Outcome of Premature Infants Born Close to the Limits of Viability

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Objective: To determine the incidence of major disabilities at 2 years of age in surviving infants born at borderline viability.

Methods: This was a retrospective study of surviving infants born at 24, 25 and 26 weeks of gestation and admitted to the NICU at the National University Hospital, Singapore from July 2001 to March 2006. Data regarding major disabilities such as cerebral palsy, hearing loss, visual impairment and other morbidities such as asthma and epilepsy were collected from outpatient medical records.

Results: Twenty-seven out of 29 children were followed up at a mean corrected age of 22 months (range 14 to 28 months). Three of these 27 children were born at 24 weeks, 8 at 25 weeks and 16 at 26 weeks of gestation. Seventeen of the 27 (63%) had normal neurological examination with no major disabilities, 7 (25.9%) had cerebral palsy (4 diplegia, 2 hemiplegia, 1 quadriplegia). Four of these 7 children were ambulant without aids, 2 were potentially ambulant and 1 child with spastic quadriplegia had no ambulatory potential. Five of the 27 (18.5%) had hearing loss (4 profound, 1 severe). Twenty-six of the 27 had normal vision (4 with corrective lenses) and 1 child was diagnosed with cortical blindness. Four (14.8%) were on asthma medications and 2 had tracheostomy tubes. None had epilepsy.

Conclusion: Majority (63%) of infants born between 24-26 weeks of gestation had no major disability when assessed at 2 years of age. The results of this study will help in the counselling of parents of infants born close to the limits of viability.

M85

A Retrospective Review of Patients Diagnosed with Livedoid Vasculitis at the National Skin Centre from 1997 to 2007

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Aim: To create a database of patients diagnosed with Livedoid Vasculitis at the National Skin Centre from 1997 to 2007; to identify any significant epidemiological or clinical risk factors associated with the disease; and to analyse the treatment strategies in order to refine them.

Methods: The National Skin Centre's clinical and histology medical records databases were scanned for patients diagnosed with Vasculitis from 1997 to 2007. Patients specifically diagnosed with Livedoid Vasculitis were then shortlisted. The data were analysed to identify any significant epidemiological and clinical risk factors associated with the disease.

Results: Eighty-nine out of 1030 vasculitis patients were diagnosed with livedoid vasculitis. The mean age at diagnosis was 39 years. Sixty-nine (78%) patients were females. The racial distribution was 73% Chinese, 11% Malays, 9% Indians and 7% others. Common comorbidities include cutaneous vasculitis, hypertension and venous insufficiency. Most patients had negative autoimmune markers. A clinical diagnosis of livedoid vasculitis in some patients was not necessarily confirmed histologically.

The natural course of livedoid vasculitis is characterised by recurrent relapses and remissions with increased morbidity from pain and drug side effects. Therapy often comprises a combination of antiplatelets

e.g. aspirin, colchicine, phosphodiesterase-4 inhibitors e.g. pentoxifylline, steroids and steroid sparing agents e.g. azathioprine, cyclophosphamide.

Conclusion: This is the first database of patients diagnosed with livedoid vasculitis in Singapore. It provides useful data and trends that can be used to further refine management strategies for livedoid vasculitis, which is a disease with considerable morbidity.

M86

Use of Fibrin Glue in Pterygium Surgery: An Evidence-Based Analysis

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Objective: To perform an evidence-based analysis on the efficacy of fibrin glue for securing the conjunctival autograft in pterygium surgery.

Methods: A systematic search of the electronic database MEDLINE was performed to identify all English language articles pertaining to the use of fibrin glue in pterygium surgery. The primary outcome evaluated was evidence supporting the efficacy of the fibrin glue in pterygium surgery.

Results: Of the 10 relevant articles, 3 randomised clinical trials (RCTs) and 3 case series were identified. The 3 RCTs compared different brands of fibrin glue with different types of sutures (Beriplast P[®] vs 10-0 Nylon[®], Quixil[®] vs 8-0 Vicryl[®], and Tisseel Duo Quick[®] vs 7-0 Vicryl[®]). The total number of patients varied from 22 to 65 and the mean follow-up time ranged from 3 weeks to 6 months in the RCTs. The transplant success rate was 100% in both study groups in all 3 RCTs. All 3 RCTs showed a statistically significant reduction in the average operating time ($P < 0.05$) and improvement in the post-operative comfort ($P < 0.05$) on using fibrin glue. In the largest case series, which was non-randomised, the recurrence rate was 5.3% with fibrin glue and 13.5% with suture ($P = 0.31$). No side effects of fibrin glue were reported.

Conclusion: Current available evidence in published literature suggests that the use of fibrin glue in pterygium surgery is as efficacious as sutures in anchoring the conjunctival autograft and has the added advantage of reducing the operating time and postoperative pain compared to using sutures.

M87

An Outbreak of Influenza A in a Highly Immunised Ward Staff Population

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Aim: Between 8 and 14 May 2008, a cluster of acute respiratory illness (ARI) was reported among staff of a TTSH ward. We describe the epidemiologic and clinical features of the outbreak.

Methods: Outbreak investigations and active case finding were carried out. Nasal and throat swabs were taken for influenza and respiratory multiplex PCR tests. Interviews were conducted for travel and clinical history, and influenza immunisation records examined.

Results: Among the 53 ward staff, 15 (attack rate AR = 28.3%) reported having ARI, with 60% (9/15) tested positive for influenza A. Influenza A AR was not significantly different ($P > 0.05$) between

nurses (19.4%), assistant nurses (13.3%), and support staff (14.3%). Cough (100%), coryza (100%), and fever (88.9%) were the most common symptoms. None had travelled recently.

A total of 73.6% of staff had influenza vaccination in Sep/Oct 2007. However, influenza A AR in vaccinated staff (17.9%) was higher than unvaccinated staff (14.3%), although the difference was statistically insignificant ($P > 0.05$). Calculated vaccine efficacy was 25.1%.

Genetic sequencing revealed that the outbreak strain was antigenically related to A/Brisbane/10/2007(H3N2) contained in the 2008 southern hemisphere (SH) influenza vaccine, but had drifted from the 2007/2008 northern hemisphere (NH) vaccine strain which staff had received in late 2007.

Conclusion: Antigenic drift of the circulating influenza virus was the major factor in the apparent vaccine failure. Influenza outbreaks can occur in highly immunised healthcare staff, whenever there is a drift. In addition to the NH vaccine, staff should be immunised with the SH vaccine, whenever an antigenic drift is detected.

M88

Are Healthcare Staff Clusters of Acute Respiratory Illness (ARI) Predictive of National Influenza A Activity?

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Aim: One of the earliest alerts of the 2003 SARS outbreak in Singapore was an ARI cluster among staff from a TTSH ward. Post-SARS, a web-based medical certificate (MC) surveillance system was established. We evaluated staff MCs from January 2005 to December 2007, to determine whether staff ARI clusters was predictive of national influenza A activity, using time series models (ARIMA).

Methods: We computed permutations of the order of correlation (AR), order of moving average (MA), and chose the optimal combination of parameters using the mean absolute percentage error (MAPE). Covariates included staff ARI clusters of various definitions including cluster of ≥ 3 ARIs on the same day and cluster of ≥ 2 ARIs within an incubation period with cluster size ≥ 5 , and national activities of common respiratory viruses. We analysed lagged values for each covariate (previous week's values). The model with the lowest MAPE was selected. Data analysis was performed using STATA v9.2; tests were conducted at 5% significance level.

Results: We found the ARIMA model with AR = 1 and MA = 1 to be the optimal structural form. We studied the covariates sequentially and found the model which included staff ARI cluster size of ≥ 5 with a lag value of 1 week significant in terms of lowest MAPE reduction (-12.6%).

Conclusion: Staff ARI cluster with a cluster size of ≥ 5 was strongly predictive of national influenza A activity in the following week. Staff MC surveillance and the prompt detection of staff ARI clusters can serve as a useful tool in the early alert of a national influenza pandemic.

M89

Nosocomial Infection in the Elderly: Time for Review of Definition?

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Background: The Center for Disease Control (CDC) definition of nosocomial infection (NI) emphasises the presence of characteristic clinical features, positive supportive investigations, and positive culture results. This may pose diagnostic challenges in the elderly population.

Objective: To compare CDC and modified (based upon physician diagnosis and initiation of empirical treatment) definitions for NI with regards to incidence, clinical features and outcomes in older adults admitted to an acute geriatric ward.

Methods: We prospectively evaluated 281 newly admitted patients aged 61 to 102 years using the CDC and modified definitions. We compared NI incidence rate and classification, clinical characteristics and investigation results between the 2 groups. Length of hospital stay (LOS), Modified Barthel Index (MBI) at discharge and 6 months and 6-month mortality were analysed in relation to presence of NI before and after adjustment for age, gender, dementia, depression, severity of illness and admission MBI using regression analysis.

Results: The incidence rates of NI using CDC and modified definitions were 1.2 and 3.5 per 1000 hospital bed days respectively. The CDC definition diagnosed nosocomial pneumonia in only 12.5% of cases. Physician-diagnosed NI not fulfilling CDC definition was less likely to exhibit fever exceeding 38°C, localising symptoms, positive microscopy, positive cultures, and bacteremia. Physician-diagnosed NI was predictive of LOS and discharge MBI (both adjusted $P < 0.01$), but not 6-month mortality or MBI.

Conclusion: The stringent CDC definition tended to under-diagnose NI (especially pneumonia) in the elderly due to atypical clinical presentation and attenuated investigation results. NI predicted poorer interim outcomes in hospitalised older adults.

M90

Time Lag in the Recognition of Absence Seizures to the Diagnosis of Childhood Absence Epilepsy in Local Children

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Aim: To determine the time period from the onset of seizures to diagnosis and treatment for children with childhood absence epilepsy (CAE) in Singapore.

Methods: We reviewed the electroencephalograph (EEG) and medical records of local children managed in our institution from 1993 to 2007, who had clinical seizures and EEG findings consistent with the diagnosis of CAE.

Results: We had 34 patients, 22 girls and 12 boys, with onset of absence seizures between 4 to 11 years of age. All the patients had typical 3-Hz spike-and-wave discharges lasting at least 4 seconds in their routine EEGs, with activation seen in 31 children who could perform hyperventilation adequately. The average time period between

the onset of seizures and the diagnosis was 11 months, with 59% of the patients being diagnosed at least 6 months after the onset of absence seizure. Eight patients' seizures (24%) were noticed by school teachers and the rest by family members.

Conclusion: Our study showed a marked time lag in the recognition of absence seizures for children with CAE. As early diagnosis and appropriate treatment may be important to prevent adverse seizure, intellectual or psychosocial outcomes, a greater awareness of this condition among the medical and educational personnel in Singapore is beneficial.

M91

The Relationship between Tongue Coating and Halitosis in Patients with Untreated Periodontitis: Results from a Pilot Study

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Background and Aim: Tongue coating has been recognised as one of the presenting features of patients with halitosis and periodontal disease.

The aim of this study was to correlate tongue coating with i) halitosis as assessed by the level of volatile sulphur compounds (VSC) using a commercial equipment and ii) periodontal parameters

Methods: Forty-seven adult volunteers with untreated periodontitis were recruited for the study. Clinical examinations were carried out in the following sequence: Assessment of VSC, tongue coating examination followed by full mouth periodontal examination. The commercial equipment uses gas chromatography to assess the levels of 3 volatile sulphur products: hydrogen sulphide, dimethyl sulphide and methyl mercaptan. Tongue coating was categorised into 4 categories: 0: no coating, 1: light coating, 2: moderate coating, 3: heavy coating. Periodontal examinations included the presence of plaque, bleeding on probing, sub- and supragingival calculus, probing depths and loss of clinical attachment. SPSS 15.0 was used to evaluate the data using descriptive statistics and non-parametric statistical analyses.

Results: There was a significant difference in the levels of VSC in patients presenting with different degrees of tongue coating ($P < 0.05$). Those with minimal tongue coating (0-1) had significantly lower levels of hydrogen sulphide and methyl mercaptan ($P < 0.05$); reduced percentage of plaque and subgingival calculus ($P < 0.05$)

Conclusion: The findings reflect a positive relationship between tongue coating with volatile sulphur compounds and oral hygiene. Tongue coating could be a useful diagnostic aid in the assessment of halitosis in clinical practice.

M92

Childhood Mycosis Fungoides: A Review of 33 Patients at the National Skin Centre, Singapore

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Aim: Mycosis fungoides is a cutaneous T-cell lymphoma that is rare in young patients. This study aims to report the epidemiology, clinicopathologic characteristics and outcome of mycosis fungoides in the paediatric age group.

Methods: We performed a retrospective review of 131 new patients diagnosed with mycosis fungoides at the National Skin Centre over

a 5-year period from 2000 to 2004 and identified 33 patients aged 18 years and below as having childhood mycosis fungoides. Data were obtained from the electronic Cutaneous Lymphoma Database, in the NHG Central Clinical Research Database.

Results: Childhood mycosis fungoides represented 25.2% of cases. The most common variant was hypopigmented mycosis fungoides (78.8%). There were 21 males and 12 females with a mean age of 10.5 years (median 11 years, range 3-17 years), and no racial predilection (72.7% Chinese, 12.1% Malay, 9.1% Indian, 6.1% other races). All the patients presented with early stage disease (T1 or T2). Treatment with phototherapy (90.9%) yielded favourable clinical outcome with a complete remission rate of 75.0% at 3 years of follow-up. There were no cases of disease progression or large cell transformation.

Conclusion: In contrast to classical mycosis fungoides that mainly affects older adult patients, hypopigmented mycosis fungoides was the predominant variant seen in paediatric patients. It has a predilection for boys, and often presents at an early stage with a good prognosis. Hypopigmented mycosis fungoides remains an important differential diagnosis to be considered in any young Asian patient presenting with persistent hypopigmented patches, especially over the trunk and sun-protected areas.

M93

Primary Hypertension: Case-control Association Study of Eight Tagging Single Nucleotide Polymorphisms in the Beta 2-adrenergic Receptor Gene in 960 Chinese Singaporeans

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Aim: Genetic variation in the beta 2-adrenergic receptor gene (ADRB2) may underpin the risk of elevated blood pressure in individuals with primary hypertension. A previous study in Chinese Singaporeans found a significant difference in haplotype frequency between hypertension cases and controls. We aimed to study the possible associations of single nucleotide polymorphisms (SNPs) and haplotypes in the promoter and coding regions of ADRB2 in Chinese Singaporeans.

Methods: Using a case-control design, we genotyped 3 tagging SNPs in the promoter, and 5 tagging SNPs in the coding, regions of ADRB2, using an unlabelled probe melt-curve technique. All the 960 subjects, comprising 485 hypertensive patients with average blood pressure $\geq 140/90$ mmHg and 475 age-matched healthy controls, had neither truncal obesity nor dysglycaemia. We utilised the Chi-square test to assess both allelic and genotypic association with hypertension. We also determined the haplotypes for association analysis using the PHASE and CLUMP programs.

Results: Two coding SNPs of ADRB2, Thr164Ile and Cys659Ser, were absent in our population. A significant association was not detected between the other 6 genotyped SNPs and primary hypertension frequency in the Chinese population. We determined 8 haplotypes in the promoter region and 6 haplotypes in the coding region, and also found no haplotypic associations between the cases and controls.

Conclusion: We fulfilled our objectives. Eight tagging SNPs in the beta 2-adrenergic receptor gene did not show significant association with hypertension in Chinese Singaporeans. Since the present results do not exclude a causative role for other SNPs in hypertension, we plan further studies of the ADRB2 gene.

M94

Eruptive Syringoma and Hidradenitis Suppurativa in a Patient with Down's Syndrome

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Aim: Eruptive syringoma is an uncommon condition characterised by the sudden appearance of crops of skin-coloured or yellowish papules over the trunk and limbs. Although the association of periorbital syringoma with Down's syndrome is well-established, a similar link between the eruptive variant and this group of patients is uncertain. We describe an 18-year-old female, affected by Down's syndrome, who developed an abrupt, asymptomatic eruption of skin-coloured to reddish brown papules over her trunk and limbs.

Results: Histology of one of the papule was diagnostic for syringoma. The rash did not respond to topical tretinoin and was left alone. A few months later, she presented with painful papulonodules and abscesses with seropurulent discharge located over the axilla, perineum and buttocks. Pyogenic cultures of the purulent discharge did not grow any organism. A diagnosis of hidradenitis suppurativa was made. These nodules responded to oral cephalosporins but were recurrent and healed with scarring. The patient and her family declined a therapeutic trial of oral isotretinoin. Interestingly, no syringomatous papules were noted over the areas affected by hidradenitis suppurativa.

Conclusion: Although syringomas have traditionally been categorised as benign neoplasms of the eccrine gland ductal epithelium, the pathogenesis of eruptive syringomas is less clear. The associations of hidradenitis suppurativa, a common disorder of occlusion of apocrine-gland bearing follicular epithelium, eruptive syringoma and Down's syndrome in our patient may be fortuitous. However, the co-existence of these 2 dermatological conditions in this case may provide further clues into the understanding of the pathogenesis of eruptive syringomas.

M95

Cyclosporine, Mycophenolate Mofetil and Methotrexate as Post Grafting Immunosuppression after Nonmyeloablative Allogeneic Stem Cell Transplantations Conditioned with Fludarabine and Low-Dose Total Body Irradiation

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Introduction: Nonmyeloablative (NM) hematopoietic cell transplantation (HCT) has extended the potential curative treatment option of allografting to patients in whom it was previously contraindicated due to advanced age or comorbidity. Graft-versus-host disease (GvHD), however, remains one of the major impediments to long-term remission. We evaluated the impact of a modified post grafting immunosuppression on GvHD and outcome of patients receiving NMHCT.

Patients and Methods: Twenty-seven patients (median age, 47 years) with hematological diseases receiving NM conditioning with fludarabine 90 mg/m² and total body irradiation (TBI) 200-cGy, followed by filgrastim-mobilised peripheral blood stem cell transplant from HLA identical (n=26), or matched unrelated (n=1) donors. All patients were given cyclosporine (CSP), mycophenolate mofetil (MMF) with the addition of short course methotrexate (MTX) as post-grafting immunosuppression.

Results: The median times to neutrophil (500/mL) and platelet

recovery (.20,000/mL) were 20 and 13 days, respectively. Myelosuppression was moderate with neutrophil counts not declining below 500/mL in 5 (19%) patients, and with more than half of the patients not requiring any blood or platelet transfusion. Non-relapse mortality was low with no transplant related death occurring within the first year. Overall, 11 (20%) patients had grade 2-4 acute GvHD, with only 5 (9%) patients experiencing grade 3-4 acute GVHD. Relapse-related death occurred in 6 (11%) patients. The 4-year probability of overall and progression-free survival were 61% and 42%, respectively.

Conclusion: The addition of MTX onto the CSP and MMF as post grafting immunosuppression offers the possibility of further optimisation of GvHD control in patients receiving NMHCT.

M96

Characteristics of Newly Diagnosed HIV Patients with TB as the Presenting Illness at a National TB CentreAPG CHUA¹, SH GAN¹, KW KHINMAR¹, YS LEO², YT YANG¹, CBE CHEE¹¹TB Control Unit, Tan Tock Seng Hospital, ²Communicable Disease Centre, Tan Tock Seng Hospital, Singapore

Aim: To determine the characteristics of newly diagnosed HIV patients with TB as the presenting illness

Setting: While Singapore's TB incidence rate declined to its lowest level at 35/100,000 resident population in 2006, new HIV/AIDS infections in Singapore residents rose by a record 357 cases that year. From 2007, all TB patients with unknown HIV status were offered HIV screening at TBCU.

Methods: Data were extracted from the TBCU clinical records of patients with newly diagnosed HIV infection who presented with TB in 2007.

Results: Of the 792 Singapore residents treated at the TBCU in 2007, 33 patients were diagnosed with HIV when they presented with TB. Eight patients were identified from routine HIV screening of 708 patients at the TBCU, while 25 were diagnosed at other treatment centres prior to their referral to TBCU. The median age was 49 years (range 27-67). All were male; 17 (51%) were single or divorced. None gave a history of known TB contact. Weight loss was a presenting symptom in 25 patients (75%), cough in 23 patients (70%) and fever in 20 (60%). Seven (21%) had enlarged cervical lymph nodes at presentation. A total of 17 (51%) patients had CD4 count <50 (range 4-599, median count was 49). Seventeen (51%) had pulmonary and extrapulmonary TB, 13 (39%) had pure pulmonary TB, 3 (9%) had pure extrapulmonary TB. Sputum TB cultures were positive in 30 patients; 28 (93%) had pan-sensitive cultures; 1 patient had multidrug-resistant organisms.

Conclusion: The incidence of newly diagnosed HIV among TB patients was about 4%. The majority had advanced AIDS at diagnosis.

M97

Distal DVT whether to treat or not with Anticoagulation?A SULE¹, JC TAY², PANKAJ HANDA³¹Associate Consultant, ²Head of General Medicine II, ³Consultant; Department of General Medicine, Tan Tock Seng Hospital, Singapore

Introduction: Distal DVT involves infrapopliteal veins. In treatment of distal DVT, the need for anticoagulant treatment is debatable.

Objective: To analyse if treatment of distal DVT with enoxaparin for 2 weeks or warfarin for 3 months or no treatment made a difference

in the outcome.

Methods: Distal DVT data from our outpatient and inpatient vascular department records over the last 2 years from 1 January 2006 to 31 December 2007 was analysed.

Patients excluded were those who had distal DVT and proximal DVT or pulmonary embolism at presentation. Pearson's Chi-square test and ANOVA test were used for analysis. Primary outcome measures were resolution of thrombosis on repeat scan and secondary outcome measures were death or pulmonary embolism at last follow-up with or without treatment with anticoagulation. DSRB approval was taken.

Results: There were in total 51 patients with distal DVT. Sixteen patients were not included for primary outcome analysis as there was no follow up scan. Fifty-1 patients were included in the secondary analysis.

In 35 patients, there were 47 distal DVT; 20 soleal veins, 16 peroneal veins, 9 posterior tibial thrombosis, 2 gastronemius veins. Twenty-two distal DVT received no treatment and 25 were treated with either enoxaparin or warfarin (13 enoxaparin; 12 warfarin). There was statistically no difference in the 3 groups for baseline characteristics. There was no statistically significant difference in the 3 groups in the primary or secondary outcomes.

Conclusion: Patients with DVT can be followed up without anticoagulation.

M98

Retrospective Review of Patients treated with TNF Alpha Inhibitors at a Tertiary Dermatological Unit in Singapore

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Introduction: Tumour Necrosis Factor α (TNF α) is a pro-inflammatory cytokine that can trigger inflammatory dermatosis, such as psoriasis. These ailments are commonly treated with immunosuppressive agents. However, these treatments pose numerous challenges such as toxicities and loss of efficacy with long-term usage. Sometimes, the dermatosis may be resistant to these treatments. As our appreciation of pathogenesis of dermatosis at the molecular level increases, TNF α inhibitors may provide an alternate therapy for some of these dermatosis.

Methods: A retrospective analysis of the records of patients treated with TNF α at the National Skin Centre, a tertiary dermatological unit in Singapore, over a duration of 4 years was conducted. These agents included Etanercept, Adalimumab and Infliximab. The study explored the efficacy and side effects of these agents in the management of inflammatory dermatosis.

Results: Etanercept is relative safe and effective as monotherapy for the control of Psoriasis without loss of efficacy. Interrupted Etanercept therapy does not affect efficacy. Adalimumab has fast onset of action. (Marked effects can be seen in the first 4 weeks). It is relatively safe to use Infliximab and Adalimumab in patients with chronic Hep C. Prior exposure to other TNF α inhibitors biologics did not result in poor treatment outcome. Infliximab can be used effectively in Pustular psoriasis and subcutaneous Sweets.

Conclusion: TNF α provides an additional treatment option for the management of Psoriasis, Psoriatic arthropathy, Pustular psoriasis and subcutaneous Sweets.

M99

Extranodal NK/T Cell Lymphoma with Cutaneous Involvement: A series of Three Patients

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Aim: Extranodal NK/T Cell lymphomas are aggressive lymphomas with a high incidence of cutaneous involvement and association with EBV infection. Albeit rare, the prevalence in Asians is much higher compared to western populations. Our objective is to describe the clinical, pathological and molecular features of extranodal NK-T cell lymphoma with cutaneous presentations in 3 patients.

Methods: A retrospective review of the clinical charts, histopathological and immunophenotypic findings was performed.

Results: All 3 patients were Chinese (2 females, 1 male) with ages ranging from 59-66 years. Cutaneous involvement was the initial presentation in all 3 patients. Two patients presented with violaceous hyperpigmented plaques and the other patient with a left shoulder swelling and necrotic plaque on the thigh. Extra-cutaneous involvement of the lymph nodes, bone marrow and nasal tissues were present in 2 patients at diagnosis. The remaining patient developed nodal and splenic disease 4 years later.

Lesional skin histology of all 3 patients showed diffuse, perivascular infiltrates of atypical lymphoid cells. Immunohistochemistry demonstrated positivity for CD56+, cytoplasmic staining of CD3 and Granzyme or TIA-1. EBV virus-encoded small nuclear ribonucleic acid (EBER) was present in 2 of the patients.

Chemotherapy regimens included CHOP (Cyclophosphamide, Adriamycin, Vincristine, prednisolone), ICE (Ifosfamide, carboplatin, etoposide), SMILE (dexamethasone, methotrexate, ifosfamide, L-asparaginase and etoposide), Campath and Gemcitabine.

The clinical course was aggressive; all 3 patients developed disseminated disease. Two patients died within 8 months of systemic disease. The remaining patient continued to have progression of disease.

Conclusion: Extra-nodal NK-T cell lymphomas are rare tumours that commonly present in the skin. These lymphomas pursue an aggressive course, with rapid development of disseminated disease and resistance to chemotherapy.

M100

The Impact of Pre-hospital Delay on In-hospital Mortality in Patients with ST-segment Elevation Myocardial Infarction

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Introduction: Pre-hospital delay is a major factor that leads to delayed time to treatment in patients with ST-segment-elevation myocardial infarction (STEMI). We examine the impact of pre-hospital delay on the in-hospital mortality of patients with STEMI.

Methods: This is a prospective cohort study of 436 consecutive patients with STEMI that were admitted to our hospital between December 2006 and November 2007. The primary end point was in-hospital mortality stratified by symptom-to-door time (≤ 3 hours, >3 to ≤ 6 hours, >6 to ≤ 12 hours, >12 hours).

Results: Among the cohort of patients, the median age was 55 years (range 26-93) and males constituted 86.0%. A total of 322 (73.9%) patients received reperfusion treatment on admission (7.1% fibrinolytic

therapy, 92.9% percutaneous or surgical revascularization), and 38.4% had MI occurring in the morning between 0600 hours and 1200 hours. There were 240 (55.0%) patients who presented with symptom-to-door time of ≤ 3 hours; 70 (16.1%) in >3 to ≤ 6 hours; 55 (12.6%) in >6 to ≤ 12 hours, and 71 (16.3%) in >12 hours. Multivariate analyses identified female gender and anterior STEMI to be independent predictors of delayed presentation of >6 hours ($P = 0.033$ and $P = 0.035$ respectively). There was a significant association between in-hospital mortality and symptom-to-door time (mortality rate of 5.8%, 11.4%, 18.2%, and 8.5% for symptom-to-door time of ≤ 3 hours, >3 to ≤ 6 hours, >6 to ≤ 12 hours and >12 hours, P for interaction = 0.025). There was no significant interaction between PCI procedural success and complication rates and symptom-to-door time.

Conclusions: Delayed presentation and prolonged symptom-to-door time in patients with STEMI is associated with lower in-hospital survival rate.

M101

Quality of Life in Patients with Chronic Venous Leg Ulceration SI TEE, KS LIM, MBY TANG

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Aim: To evaluate the impact of disease on quality of life (QoL) in Asian patients suffering from chronic venous leg ulceration.

Methods: Between October 2005 and April 2006, patients seen for chronic venous leg ulceration at the National Skin Centre were invited to participate. The Cardiff Wound Impact Schedule was used to evaluate their QoL. The following aspects of QoL are assessed: 1) physical symptoms and daily living; 2) social life; and 3) well-being. Participants answered a series of questions on a scale of 1 to 5, with the latter indicating the best possible outcome (i.e. no effect on QoL). Subsequently, each item's score was summated within their categories 1-3 above and transformed into a scale ranging from 0 (all ones) to 100 (all fives).

Results: Thirty-nine patients were recruited. The mean score for physical symptoms and daily living was 67.1 (95% CI, 63.7-70.5), which suggests a reduction in QoL away from the norm (i.e. score of 100). Similarly, the mean score for social life was 68.7 (95% CI, 65.3-72.1) and the mean score for well-being was 41.9 (95% CI, 38.8-45.0). There is no association between QoL scores and number of leg ulcers, age of patients or duration of disease.

Conclusion: There is a negative disease impact on the patient's social life, physical symptoms and daily living. Also there is a significantly higher impact on patient's well-being. QoL issues are often neglected but this study affirms that a more holistic approach towards managing chronic venous leg ulceration is important.

M102

Retinal Nerve Fibre Layer Thickness Measurement after Acute Primary Angle Closure Using Optical Coherence Tomography

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Aim: To measure peripapillary retinal nerve fiber layer (RNFL) thickness after acute primary angle closure (APAC) using optical coherence tomography (OCT), and to correlate this with optic nerve head morphology and visual field changes.

Methods: This was a prospective comparative observational study of

patients who had an episode of unilateral APAC from 2000 to 2006. Peripapillary RNFL thickness was measured using OCT (Stratus OCT, Carl Zeiss Meditec Inc, Dublin CA, USA). Confocal laser scanning ophthalmoscopy or CLSO (HRT-III, Heidelberg Engineering Inc, Vista CA, USA) of the optic nerve head and automated static white-on-white perimetry (program 24-2, SITA Standard, Humphrey Instruments, Dublin CA, USA) were also performed. Results were compared with normal fellow eyes as matched controls.

Results: Fourteen patients were included in this study. Five patients were male (35.7%) and the mean age of the patients was 60.5 ± 6.6 years. Patients first presented at a mean of 1.0 ± 0.8 days (range 0.2-3.0 days) after the onset of APAC symptoms. Study assessments were performed at a mean of 32.9 ± 20.8 months after APAC. OCT showed reduced average (86.9 ± 22.2 vs $109.8 \pm 12.4 \mu\text{m}$, $P = 0.0009$), superior (111.3 ± 32.3 vs $141.1 \pm 19.9 \mu\text{m}$, $P = 0.007$) and inferior (106.8 ± 35.8 vs $141.6 \pm 23.2 \mu\text{m}$, $P = 0.0007$) peripapillary RNFL thickness in APAC eyes compared to controls. Perimetry showed reduced mean deviation in APAC eyes compared to controls (-4.57 ± 3.44 vs -2.48 ± 1.37 , $P = 0.028$). CLSO of optic nerve heads showed no difference in mean rim area (1.61 ± 0.32 vs $1.54 \pm 0.30 \text{ mm}^2$, $P = 0.405$), rim volume (0.40 ± 0.14 vs $0.49 \pm 0.19 \text{ mm}^3$, $P = 0.185$) or linear cup-disc ratio (0.40 ± 0.20 vs 0.38 ± 0.19 , $P = 0.669$) between APAC eyes and controls. Optic atrophy was found in 3 of the 4 (75%) APAC eyes with significant visual field defects (VFD).

Conclusion: In this prospective study, OCT was able to detect a reduction in RNFL thickness in APAC eyes with no loss of neuroretinal rim. RNFL changes and visual field loss after APAC may be associated with optic atrophy.

M103

Dermatological Conditions Presenting at an Emergency Department in a Singapore Hospital over a Year

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Background: In Singapore, a significant proportion of patients attain specialist dermatological services via referrals from points of primary care, such as polyclinics and emergency departments (ED). The study hospital, Tan Tock Seng Hospital, is an acute care general hospital with a large catchment area, and has the busiest ED in Singapore.

Aims: The aim of this paper is to describe the types of dermatological conditions presenting at the ED in the year 2007. This information is useful in the future education of junior doctors working in the department, as well as allocation of future resources in the treatment of the more common conditions.

Methods: The ED patient database was searched for all dermatological conditions by ICD-9 code and by keywords in the diagnosis description. The 2 lists were merged and duplications were eliminated. Consultation notes of the patients were reviewed in cases whereby the diagnosis was ambiguous. Patient demographics were then filtered and analysed.

Results: A total of 4061 patients were seen in the ED with a primary dermatological complaint, out of a total of 157,527 attendances in 2007. The most common condition seen was chickenpox and herpes zoster (20.8%). Dermatitis/eczema (11.6%) and urticaria (11.4%), nail conditions, including trauma and infections (10.2%) and drug rashes (9.7%) were also common. Venereal diseases (1%) were uncommonly seen in ED. Interestingly, men (65.3%) were seen in the

ED for dermatological conditions more than twice as often as women (34.7).

Conclusion: Recognition and management of the common conditions should be core modules in doctors' and nurses' training.

M104

Case Report: Prolonged Serotonin Toxicity in Fluoxetine Overdose J GEORGE¹, J CHAN²

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Introduction: Serotonin syndrome is a potentially fatal drug-related syndrome.

Clinical Picture: We describe an unusual case of prolonged confusional state lasting for 7 weeks in a 69-year-old man with serotonin syndrome after fluoxetine overdose.

Treatment: Lorazepam and cyproheptadine successfully suppressed symptoms of fever, myoclonus and ocular clonus and improved the patient's functional status. Rivastigmine was added when recent onset vascular dementia could not be excluded.

Outcome: The patient fully regained pre-morbid status at 10 weeks after the overdose.

Discussion: Serotonin syndrome is a drug-related syndrome characterised by mental status changes, increased neuromuscular tone and autonomic dysfunction. It occurs in antidepressant overdose or dosage change but may also occur as a result of interactions between serotonergic agents and some commonly prescribed drugs. A typical case of serotonin syndrome resolves within 24 hours of discontinuing the agent responsible. Symptoms may persist for longer periods in overdose of drugs with active metabolites and long half-lives.

Conclusion: Serotonin syndrome in fluoxetine overdose may lead to unusually prolonged mental status changes due to the long half-life of fluoxetine. While fluoxetine is seen as a safe drug in overdose, serotonin syndrome can occur even when the overdose is not a massive one. Physicians should take care to assess suicidal intent when prescribing fluoxetine with another serotonergic agent. They should maintain a high index of suspicion for serotonin toxicity in patients taking any serotonergic agents, who may present with non-specific symptoms in the absence of the full-blown syndrome.

M105

Multimodal Evaluation of Intracranial Vasodilatory Reserve in Severe Steno-Occlusive Disease of Internal Carotid or Middle Cerebral Artery

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Background: Circle of Willis provides collateral pathways to perfuse the affected vascular territories in patients with severe steno-occlusive disease of major arteries. The collateral perfusion may become insufficient in certain physiological circumstances due to failed vasodilatory reserve and intracranial steal phenomenon, the so-called 'Reversed-Robinhood syndrome'. We evaluated cerebral hemodynamics and vasodilatory reserve in our patients with symptomatic internal carotid (ICA) or middle cerebral artery (MCA) severe steno-occlusive disease.

Methods: Diagnostic transcranial Doppler (TCD) and TCD-monitoring with voluntary breath-holding according to a standard scanning protocol were performed in patients with severe ICA or MCA steno-occlusive disease. The steal phenomenon was detected as transient, spontaneous, or vasodilatory stimuli-induced velocity reductions in affected arteries at the time of velocity increase in normal vessels. Patients with exhausted vasomotor reactivity and intracranial steal phenomenon during the breath-holding were further evaluated with acetazolamide-challenged HMPAO-SPECT.

Results: Eleven patients (age: 27-74 years, 8 males) fulfilled our TCD criteria for exhausted vasomotor reactivity and intracranial steal phenomenon during the standard vasomotor testing by breath holding. Acetazolamide-challenged HMPAO-SPECT demonstrated significant hypoperfusion in 9 patients in affected arterial territories, suggestive of failed vasodilatory reserve. A breath-holding index of less than 0.3 on TCD was associated with an abnormal acetazolamide-challenged HMPAO-SPECT.

Conclusion: We describe multimodal evaluation of cerebral hemodynamics and intracranial steal phenomenon in symptomatic patients with severe steno-occlusive disease of ICA or MCA. Identification and quantification of failed vaso-dilatory reserve may identify a target group of patients for non-invasive ventilatory support in stroke prevention as well as selecting patients for possible revascularisation procedures.

M106

Clonal Characteristics and Virulence Factors of *Staphylococcus Aureus* Colonised in Patients with Atopic Dermatitis and their Close Contacts in Singapore

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Introduction: *Staphylococcus aureus* (*S.aureus*) colonisation or infection is a well-established pathogenic factor of disease flare in atopic dermatitis (AD).

Objective: To study the virulence factors and accessory gene regulator (agr) subtypes of *Staphylococcus Aureus* isolated from atopic dermatitis patients and their contacts.

Methods: Nasal swabs were obtained from the anterior nares of the subjects and close contacts. In addition, skin swabs were also taken from the worst affected areas in AD subjects. All *S.aureus* isolates were tested for the presence of 18 virulence genes by using a multiplex polymerase chain reaction platform.

Results: Patients with higher SCORAD (objective) scores were more likely to be colonized by *S. aureus* possessing enterotoxin A (sea) ($P = 0.027$). Enterotoxin B (seb) was the most common superantigen found in the *S.aureus* isolates ($n = 13$) followed by enterotoxin gene cluster (egc) ($n = 10$). No individual superantigen was associated with increased carriage among family contacts. Genotype analysis showed a high concordance of *S.aureus* strains in index patients and their close contacts.

Conclusion: Superantigen-sea was associated with more severe disease. We found a high concordance of *S.aureus* strains in both index patients and their close contacts. This suggests that *S.aureus* may be transmitted between family members and that close contacts may serve as an important reservoir of *S.aureus*.

M107

Hyperparathyroidism from Ectopic Parathyroid Tissue within an Anterior Mediastinal Tumour: A Very Rare Cause of Paraneoplastic Intact PTH-mediated HypercalcaemiaA SULE¹, MKS LEOW², HW HAN², JC TAY¹¹Department of General Medicine, ²Department of Endocrinology, Tan Tock Seng Hospital, Singapore

Introduction: Hypercalcaemia due to ectopic intact parathyroid hormone (PTH) secretion originating from an anterior mediastinal mass is very rare.

Case Report: We describe a 56-year-old lady who presented to us on 29 May 2008 with symptoms of loss of weight and appetite, with constipation over a month. She had severe hypercalcaemia at presentation with adjusted serum calcium of 3.9 mmol/L associated with hypophosphataemia of 0.4 mmol/L, intact PTH 51.5 pmol/L and an anterior mediastinal mass on chest CT imaging likely representing a thymic tumour. Her neck and abdominal CT were normal. Dual phase sesta-mibi scan of her neck and mediastinum was negative for parathyroid adenoma. CT-guided biopsy of the anterior mediastinal mass surprisingly revealed evidence of ectopic parathyroid tissue.

Treatment and Progress: She was aggressively hydrated with intravenous saline coupled with frusemide diuresis, followed by pamidronate and calcitonin. Her serum calcium on discharge 11/06/2008 was 2.78 mmol/L. She was referred to the cardiothoracic surgeons for surgical extirpation of the mass.

Discussion: Ectopic PTH secretion, unlike PTHrP-mediated hypercalcaemia, is extremely rare. This case illustrates either eutopic PTH secretion by ectopic parathyroid gland, or "ectopic" PTH from parathyroid tissue arising de novo within the thymic neoplasm by retro-differentiation. Very few case reports have been described showing functioning parathyroid tissue within anterior mediastinal masses.

Conclusion: Hyperparathyroidism due to ectopic intact PTH secretion from anterior mediastinal tumours is very rare. Definitive treatment by radical resection of the mass is potentially curative.

M108

The Epidemiology of Severe Aortic Stenosis — New Insights to an Old Disease

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Aim: There have been recent advances in percutaneous intervention of severe aortic stenosis (AS). Previously, this disease could only be treated surgically. We aim to describe the etiology, anatomy, clinical presentation and attitudes of patients towards this condition. This would impact on the feasibility of developing percutaneous programmes for such patients.

Methods: Two hundred and forty-nine consecutive patients who underwent transthoracic echocardiography (April 1999 to April 2008) and had been diagnosed with severe AS were assessed retrospectively. Demographic and clinical data were collected. Specific outcomes of death, surgery and hospitalisation for heart failure were assessed. Patients' decision on surgery was also analysed.

Results: Mean age was 73 ± 10 years (50.2% males). The patients had a mean follow-up of 23 months and the majority were asymptomatic. The most common presenting symptom was dyspnoea. A total of 40 patients (17%) had co-existent atrial fibrillation. Two hundred and sixteen (87%), 11 (4.4%) and 19 (7.6%) were of degenerative,

rheumatic and bicuspid etiologies respectively. The mean annulus diameters also differed based on etiologies, and were 19.9 ± 3.3, 17.4 ± 8.0 and 21.3 ± 2.7 cm respectively. The mean euroscore was 10.8 ± 12.4. 51% of patients who were offered surgery had refused it. There were 69 (27%) deaths, 68 (27%) underwent surgery and 86 (35%) patients presented with heart failure during follow-up.

Conclusion: Degenerative AS was common in this contemporary cohort of patients. The mean annulus diameter was smaller than Caucasian cohorts and may impact on sizing the percutaneous valve. Such patients had a high euroscore and a high refusal rate for surgery. They may therefore be considered for percutaneous treatment in the near future.

M109

Prevalence of APOE-ε4 Genotype amongst Dementia Patients Attending a Memory Clinic and Comparison with Community Based Non-Demented ControlsCCD SEOW¹, HL CHIONH², SA KHOO³, TP NG⁴, LKP YAP⁵^{1,5}Geriatric Medicine, Alexandra Hospital, Singapore, ²Nursing, Alexandra Hospital, Singapore, ³Psychology, Alexandra Hospital, Singapore, ⁴Psychological Medicine, National University Hospital, Singapore

Aim: This is a prospective study which aims to examine the APOE-ε4 profile and its influence on geriatric patients with dementia at a Memory Clinic in Singapore.

Methods: Two hundred and thirty-seven patients were screened and diagnosed with dementia, of these 218 have had their APOE status evaluated. Clinical diagnosis of Alzheimer's disease (AD) and Vascular Dementia (VAD) were based on the Diagnostic and Statistical Manual of Mental Disorders, 4th Edition (DSM-IV). APOE genotyping from blood samples was done using the deoxyribonucleic acid (DNA) polymerase chain reaction (PCR) amplification and single nucleotide extension technique.

Results: Two hundred and eleven patients were classified as AD, mixed dementia and VAD; 7 were of other dementia types, these were not considered in the current analysis. Patients with either one or both ε4 alleles were considered ε4 positive.

There were 76 patients (36%) aged ≤74 years and 135 (64%) ≥75 years old. Seventy-five (35.5%) were males and 136 (64.5%) females. One hundred and fifteen (54.5%) were diagnosed with AD, 23 (10.9%) VaD and 73 (34.6%) mixed dementia.

Overall prevalence of APOE-ε4 was 30.8%.

Comparison with a group of 2399 community based non-demented older adults from the Longitudinal Aging Study of the Elderly in Singapore was made. The prevalence of APOE-ε4 in this group was 17.3%. The difference in prevalence was statistically significant.

Conclusion: This study provides useful local epidemiological data on the APOE-ε4 and dementia. Its prevalence among dementia (AD, VAD, mixed dementia) patients is 1.8 times higher when compared to community based non-demented adults.

M110

Treatment Outcomes for Patients with Primary Insomnia

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Introduction: Untreated insomnia has a chronic course. Mellinger et al, found that 47% of adults with Primary Insomnia (PI) over a year

developed high levels of psychic distress, depression and anxiety disorders.

Methods: This retrospective review of patients seen in a 3-year period (2002 to 2005) in an Insomnia Clinic had ethics approval. Analyses were performed using SPSS v 13.0.

Results: Of 141 patients, 67 (47.5%) were diagnosed with PI. A total of 7.1% had Parasomnias and the rest, psychiatric disorders.

There were significantly more males with PI ($P = 0.039$, OR = 2.0, 95% CI 1.03-4.0). There were no differences in terms of race, marital status, age education or occupation compared to those with other diagnoses. The main reasons for referral in the PI group was that the 'referrer insisted' (52.5%, $P = 0.013$). These were also the patients with sleep problems for the longest period before referral; 21 patients (31.3%) had had sleep problems for more than a year. The majority of those with PI had received treatment (86.6%) mostly from family physicians (74.6%). This was mainly pharmacotherapy (85.1%) with only 13.4% receiving advice on sleep hygiene measures. 32 (47.8%) had a comorbid Axis I Diagnosis and 52 had a Cluster C Personality Disorder.

After a year of treatment, those without PI were more likely to be still on follow-up ($P = 0.006$; OR = 3.3, 95% CI 1.4-8.1). Those with PI were more likely to have improved and ended treatment ($P = 0.017$, OR = 2.4, 95% CI 1.2-5.0). Only 8 patients (11.9%) with PI were still on follow-up after a year.

Conclusion: Patients with Primary Insomnia responded well to both pharmacotherapy and non-pharmacological treatment measures provided in the clinic.

M111

Adiponectin is Correlated with Activity of Disease in Psoriasis

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Aim: Adiponectin is an adipocyte-derived cytokine with insulin-sensitising and anti-inflammatory properties. Circulating adiponectin levels are decreased in diabetes and obesity. Paradoxically, adiponectin is increased in chronic inflammatory disorders such as systemic lupus erythematosus, rheumatoid arthritis and inflammatory bowel disease. However, the relationship between adiponectin and psoriasis is not well-studied. Epidemiologic data suggests that psoriasis is associated with diabetes and obesity. We sought to determine the relationship between psoriasis severity and adiponectin.

Methods: Psoriasis patients were recruited from the National Skin Centre psoriasis clinic from October 2007 to March 2008. Serum adiponectin, PASI, BMI and fasting glucose were measured. Non-diabetic patients and diabetics on diet therapy were subjected to a 2-hour oral glucose challenge.

Results: One hundred and ten patients were studied. This comprised 74 Chinese, 14 Malays and 22 Indians. Mean adiponectin was 2.80 ± 1.31 ng/ml. Adiponectin levels were correlated with severity of psoriasis, measured by PASI ($r = 0.222$, $P = 0.02$) and negatively correlated with BMI ($r = -0.335$, $P < 0.001$).

Conclusion: Our findings indicate that disease activity of psoriasis is associated with raised adiponectin levels. This is consistent with the observation that adiponectin is elevated in various chronic inflammatory conditions and adds to our current knowledge on the role of the adipocytokines in psoriasis.

M112

A Rare Variant of a Common Infection: Herpes Folliculitis

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Aim: Herpes folliculitis is an infection of the follicular epithelium by varicella zoster or herpes simplex virus. Clinical diagnosis is often problematic because typical features of herpetic infection are often lacking. Histological diagnosis is also challenging as the diagnostic changes may be very focal, requiring multiple step sections and are easily missed if herpes infection is not clinically suspected.

Methods: We report a case of a 60-year-old female who presented with an acute erythematous papulonodular eruption on her scalp and right eye.

Results: Histology revealed viral cytopathic changes confined to the follicular epithelium, featuring epidermal cells with homogenous ground glass cytoplasm, ballooning degeneration and multinucleated cells. Notably absent were reticular degeneration of epidermal cells and vesicle formation. Varicella zoster virus DNA polymerase chain reaction was positive. Her lesions responded to oral acyclovir.

Conclusion: Close histopathological correlation, a high index of suspicion and adjunctive PCR studies are required to clinch a diagnosis of herpes folliculitis. We review the literature on this rare clinical and histological manifestation of an otherwise common infection.

M113

Two Tuberculids: Erythema Induratum with Concurrent Papulonecrotic Tuberculid

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Aim: Tuberculids are the result of immunologic reactions to hematogenously spread antigenic components of *Mycobacterium tuberculosis* and have been reported rarely in the literature to co-exist.

Methods: We report a case of a 31-year-old female who presented with biopsy-proven classical lesions of nodular vasculitis and more superficial papulovesicles, pustules and centrally ulcerating papules on the thighs and forearm.

Results: Histology of a pustule showed a subcorneal collection of neutrophils. There were features of leukocytoclastic vasculitis, namely intramural fibrin deposition of the upper dermal vessels, neutrophils, leukocytoclasia and red blood cell extravasation. A perivascular lymphocytic infiltration was present around lower dermal vessels, but granulomas and acid-fast bacilli were absent. The patient's Mantoux reading was strongly positive at 20 mm and the T-SPOT.TB test was reactive.

Conclusion: While a classical caseating granulomatous pathology was not seen in the papulonecrotic lesion, the clinicopathological correlation of centrally necrotic papules with leukocytoclastic vasculitis in the setting of erythema induratum renders the notion of 2 simultaneous tuberculids attractive. We review the histology and clinical findings of erythema induratum and papulonecrotic tuberculid, their twin occurrence and suggest that in parallel to the histological spectrum of erythema induratum which may feature nodular vasculitis, a leukocytoclastic vasculitis may be an expression of papulonecrotic tuberculid. The co-existence of both erythema induratum and papulonecrotic tuberculid in our patient further confirms the clinical

and histological continuum of tubercloid reactions as a disease entity.

M114

Sleep Behaviour in a Sample of Preschool Children in Singapore

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Aim: Sleep problems are common in all ages, but may be particularly acute in Singapore where anecdotally, children often sleep later because of various cultural and social factors. The objective of this study was to describe the sleep behaviour of preschool-aged children and to identify any sleep problems in this population.

Methods: This was a cross-sectional questionnaire survey of 358 children attending local childcare centres. The questionnaire was based on the Children's Sleep Habits Questionnaire (CSHQ), a validated parent-report sleep screening questionnaire that contains 54 items identifying sleep behaviours in children.

Results: A total of 358 children participated in the survey. The mean age was 4.6 years with a range of 2–6 years. Average sleep duration at night was 8.53 hours, and average nap duration was 2.67 hours, with average total sleep duration of 10.53 hours. This was lower than the recommended sleep duration of 11–13 hours/night for the preschool age group and was approximately 1 standard deviation below the mean for the age group. Total sleep duration also decreased by 14 minutes for every year of the child's age. Co-sleeping was also common in the local population, with 80.9% of children sharing the same room with a parent or sibling, and 42.2% sharing the same bed with a parent or sibling. A total of 84.1% of parents perceived that their child's sleep duration was adequate.

Conclusion: The duration of sleep in the preschool population sampled here is lower than previously described Caucasian populations. Parental perception of adequacy of sleep deviates from current recommendations. In view of clear relation of sleep duration with cognitive functioning, learning, attention as well as physical growth and behaviour, preschool children should be screened for sleep adequacy in well-child follow-ups.

M115

Headaches in Singapore School Children—An Epidemiological Study

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Aim: This study aimed to determine the headache and migraine prevalence among children in Singapore. Chronic daily headaches, allodynia, psychosocial co-morbidities and headache disability in headache sufferers were also evaluated.

Methods: A questionnaire study was conducted in randomly sampled primary and secondary school children. Headache classification was according to the International Headache Society-II (IHS-II). The Paediatric Symptom Checklist (PSC) and Paediatric Migraine Disability Assessment (PedMIDAS) were used to evaluate psychosocial co-morbidities and headache disability respectively. Descriptive cephalic and extra-cephalic symptoms of allodynia were sought.

Results: There were 2873 responders. Headache prevalence was high at 80.2%. Girls were more predisposed to headaches at primary and secondary levels. Migraine with and without aura occurred in 8.6% of the school population. Chronic daily headaches were more prevalent in adolescents, and more were self-medicating than seeking treatment. PedMIDAS averaged 3.17 ± 8.35 days, and children with migraine with aura reported most disability in the moderate and severe range. Children with headaches were more likely to have psychosocial co-morbidities than children without headaches, and a higher proportion of them reported positively to stress in schools and sleep deprivation. Allodynia symptoms were more common in Indian and Malay primary school girls, and were not specific to migraineurs.

Conclusion: The burden of headache in Singapore school children is high and comparable to developed countries. Our study did not support lower headache or migraine prevalence in Asian children. Migraineurs were more likely to have severe disability and psychosocial co-morbidities. Physicians, teachers and parents should be aware of the headache-sleep-affective symptom constellation in children presenting with headaches.

M116

Renal Histopathological study of Consecutive Patients Biopsied in Alexandra Hospital

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Aim: The aim of this study is to analyse the renal histopathological diagnosis of patients presented with microscopic hematuria, proteinuria and or renal impairment in a single centre.

Methods: A total of 22 consecutive patients underwent real-time ultrasound guided percutaneous renal biopsy of native kidney from May 2007 to April 2008. All the specimens were sent for light microscopy and immunofluorescence study routinely. Electron microscopy examination was done in selected cases.

Results: Mean age was 50.4 ± 19.8 years old, with 50% male and 81.9% Chinese. The co-morbidities were hypertension (63.6%), diabetes mellitus (18.2%), dyslipidemia (50%), ischemic heart disease (4.5%), stroke (4.5%), systemic lupus erythematosus (13.6%) and malignancy (9%).

There were 54.5% patients with significant proteinuria (urine total protein >0.3 g/d), and 63.6% had microscopic hematuria (urine RBC >2 phf). Baseline characteristics were 24 hours urine creatinine clearance (CCT) 73.2 ± 42.8 ml/min, systolic blood pressure 133.5 ± 17.7 mmHg, diastolic blood pressure 75.9 ± 11.6 mmHg, serum albumin 37.4 ± 6.9 g/l and total cholesterol 5.7 ± 1.8 mmol/L. Nine patients had CCT below 60 ml/min. Post renal biopsy hematuria occurred in 1 patient. The sampling adequacy was 77%.

The renal histology findings are IgA nephropathy (6), minimal change glomerulopathy (3), lupus nephritis (3), membranous nephropathy (2), focal segmental glomerulosclerosis (2), nephrosclerosis (2), diffuse proliferative glomerulonephritis (1), diabetic nephropathy (1), acute interstitial nephritis (1), thrombotic microangiopathy and rapid progressive glomerulonephritis (1).

Conclusion: There is a variety of glomerulonephritis in our cohort and Ig A nephropathy appeared to be the most common (27%).

M117

PLack of Awareness Amongst Community Patients with Diabetes and Diabetic Retinopathy: The Singapore Malay Eye Study

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Aim: We assessed awareness of diabetes and diabetic retinopathy in an Asian Malay population. We hypothesise that poor awareness is associated with poorer control of diabetic retinopathy risk factors (glycaemic and blood pressure levels) and suboptimal treatment with laser therapy.

Methods: A population-based survey of 3,280 (78.7% response rate) persons among Singaporean Malays aged 40-80 years was conducted. Diabetes was defined in persons with random glucose ≥ 11.1 mmol/L, use of diabetic medication, or a previous physician diagnosis of diabetes. Diabetic retinopathy was graded from retinal photographs following the modified Airlie House classification system. Patient awareness was assessed via structured interviews. Glycosylated haemoglobin was measured from venous blood.

Results: Of the 3280 participants in the study, 768 persons with diabetes who had gradable retinal photographs were included. Of these, 13.2% (n=101) had diabetes but were unaware of it. Participants unaware of diabetes had significantly higher mean glycosylated haemoglobin (9.7% vs 8.2%, $P < 0.001$), systolic blood pressure (160.0 mmHg vs 153.7 mmHg, $P = 0.01$) and diastolic blood pressure (83.5 mmHg vs 78.5 mmHg, $P < 0.001$), compared to participants who were aware of their diabetes status. Of the 272 (35.4%) participants detected to have diabetic retinopathy, 84.4% (n=227) were unaware of having retinopathy. Of the 77 with vision-threatening retinopathy, laser treatment had been performed in only 55.6% of those unaware of having retinopathy.

Conclusion: In a sample of Asians with diabetes in the community, high proportions were unaware of their disease. Unawareness was associated with poorer control of risk factors. Only half of persons who were unaware that they had vision-threatening diabetic retinopathy had received laser treatment. These data highlight room for improvement in diabetes and diabetic retinopathy prevention through better patient education and screening.

M118

Intracranial Atherosclerotic Large Artery Disease in Acute Ischemic Stroke and its Correlation with Vascular Risk Factors: An Ultrasonographic Study

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Background: Intracranial large artery vaso-occlusive disease is an important cause of ischemic stroke, with higher incidence in non-Caucasian populations. We studied the distribution of large artery disease and its correlation with stroke subtypes and risk factors in our multi-ethnic population in Singapore.

Methods: Three hundred and forty-one consecutive acute ischemic stroke patients admitted to our tertiary care hospital were recruited. All underwent duplex sonography and transcranial Doppler (TCD) studies of the cervical and intracranial arteries. Clinical data were extracted from hospital database, and strokes were subtyped according to Oxfordshire Community Stroke Project Classification. Large artery intracranial disease was defined as $\geq 50\%$ stenosis or occlusion, based on previously published TCD peak systolic velocity criteria. We evaluated the possible associations of symptomatic intracranial vaso-occlusive disease with demographic data and common vascular risk factors, before and after exclusion of patients with atrial fibrillation. Statistical analysis with Chi-square test and multiple logistic regression analysis were performed using SPSS v. 11.5.

Results: Male gender and Chinese ethnicity were significantly associated with symptomatic intracranial vaso-occlusive disease, whereas atrial fibrillation (AF) had a negative association. After exclusion of patients with AF, smoking and hypercholesterolaemia were additional risk factors with borderline significance. Only male gender and Chinese ethnicity remained significantly associated with symptomatic intracranial disease after multiple logistic regression analysis, with or without inclusion of AF patients.

Conclusion: Intracranial vaso-occlusive large artery disease characterised by multivessel involvement is a common etiology of ischemic stroke in Singapore. Male gender and Chinese ethnicity are significant risk factors for symptomatic intracranial vaso-occlusive disease.

M119

Reversed Flow in the Basilar Artery in Acute Vertebrobasilar Ischaemia is Associated with Favourable Prognosis

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Background: Acute vertebrobasilar ischaemia is a potentially sinister pathology with high mortality and poor functional outcome in survivors. Reversal of blood flow in basilar artery (BA) in patients with acute vertebrobasilar ischaemia has been reported with better clinical outcomes. We evaluated the incidence of flow reversal in BA and its association with functional outcomes in our patients with acute vertebrobasilar ischaemia.

Methods: Consecutive patients with acute vertebrobasilar ischaemia admitted to our tertiary care stroke centre underwent transcranial Doppler (TCD) evaluation. Reversed BA flow was identified as low-resistance signal toward the probe between the depths of 80-100 mm from suboccipital or transforaminal window. Location of occlusion was determined as proximal, mid, and distal. Functional outcomes were assessed by modified Rankin scale at 3 months. Patients without reversed BA flow served as controls.

Results: Nine out of the 51 patients (32 men, mean age 56 years) with acute vertebrobasilar ischaemia revealed reversed blood flow in the basilar artery with variable mean flow velocities (mean MFV 32 cm/s). Six patients showed proximal BA occlusion while mid-BA occlusions were noted in the rest. Patients with reversed BA flow had lower NIHSS score (mean 6 compared to 9 in control group). All but 1 patient (89%) with reversed BA flow achieved functional independence (mRS 0-2) at 3 months compared to 51% in the control group. All 3 deaths occurred in the control group.

Conclusion: Reversed flow in the distal BA observed in patients with acute vertebrobasilar ischaemia is associated with lower stroke severity and better functional outcome.

M120

A Randomised Double-Blind Controlled Trial to Compare a Triclosan-Incorporated Emollient with Vehicle for the Treatment of Atopic Dermatitis

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Background: The use of topical antiseptics in the treatment of AD had previously been explored. However, no triclosan incorporated stay-on emollient has been evaluated previously.

Aims: The aims of this study were to assess the safety and efficacy of a novel triclosan-incorporated emollient cream compared to its vehicle for the treatment of AD.

Methods: Eligible patients with mild to moderate AD were randomised to receive either study cream or vehicle. All patients also received a low potency corticosteroid cream during the treatment phase of the study. They were assessed for severity according to the SCORAD index, amount of corticosteroid used and patient's impression of cream and adverse events.

Results: Thirty patients each received study cream or vehicle and an intention-to-treat analysis was performed. At D14, there was a significant decrease in SCORAD from baseline for study cream compared to vehicle ($P = 0.035$). At D27, although there was an improved mean reduction from baseline, this was no longer statistically significant ($P = 0.399$). A total of 87% of the patients had a "good" or "excellent" impression of the cream and only 4 patients had mild treatment related adverse events. The amount of topical steroids applied by the study cream arm of patients was significantly lower than the vehicle arm ($P = 0.021$).

Conclusion: Triclosan-incorporated stay-on emollient was safe and highly acceptable to patients. It had an overall greater benefit to AD patients, albeit not statistically significant. The amount of topical steroids applied by the study cream arm of patients was significantly less compared to the vehicle arm and further studies would be needed to confirm its steroid-sparing effect.

M121

'Tissue Paper Sign': A Highly Specific Marker of Gonococcal Urethritis Males

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Background: Gonorrhoea is an significant sexually transmitted infection in the local population. We have noticed a unique behavioural pattern in some male patients with gonococcal urethritis (GU), with tissue paper lining the insides of their underwear. We have coined this the 'tissue paper sign'.

Aim: The aims of the study were to seek a correlation between the 'tissue paper sign' and GU, and determine its sensitivity, specificity and predictive values.

Methods: A prospective study was conducted at DSC over a 7-month period, and data of male patients with the 'tissue paper sign', as well as the total number of patients with GU and non-gonococcal urethritis were collated and analysed.

Results: Forty-six of the 49 patients with 'tissue paper sign' had GU. The specificity was 99.6% and the positive predictive value was 94%.

Conclusion: This newly described sign could be very useful in increasing diagnostic confidence, especially in places where symptoms

of genital discharge is managed by primary care and emergency physicians without access to laboratory facilities for urethral smears and cultures.

M122

Permcath Insertion by Nephrologist: A Single Centre Experience

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Introduction: Conventionally, intervention radiologists insert tunneled dialysis catheter (permcath) at local setting. We (nephrologists) started permcath insertion for newly diagnosed end stage renal disease (ESRD) patients without mature access since July 2007.

Methods: This is a retrospective study, using historical cohort for comparison. Eighteen patients with complete data were studied, 11 patients (group 1) had permcath inserted at our institution and 7 patients (group 2) were sent to other institutions before this facility was available. All the patients had ultrasound and fluoroscopy guided permcath insertion and under strict aseptic technique. Demographic data, complication rates and catheter survival were analysed.

Results: There was a total of 18 (55.6% male, 66.7% Chinese) patients who had their first permcath inserted. There was no significant difference comparing group 1 and 2 for mean age (53.9 ± 8.9 years vs 62.3 ± 12.6 years) and proportion of diabetic status (90.9% vs 71.4%). Mean catheter survival was 110.9 ± 91.7 days and 190.9 ± 222.2 days respectively ($P = ns$). Four patients in each group had catheter removal due to access maturity or started peritoneal dialysis. There were no significant differences for immediate post-catheter insertion complications (1 patient from group 1 had bleeding; in group 2, 1 patient had bleeding and 1 patient had internal jugular vein thrombosis). One patient from each group required catheter removal due to catheter-related bacteremia.

Conclusion: There were no significant differences in the catheter survival and complications rate. Permcath can be inserted safely by nephrologists under fluoroscopy guidance.

M123

Profile of Elderly Patients Presenting With Abdominal Pain at the Emergency Department.

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Aim: This is a study of the profile of the elderly with abdominal pain in the Emergency Department (ED). We are looking into the demographics of the patients, the discharge diagnosis, the reattendance rate of patients to the ED and any other significant diagnosis upon follow-up.

Methods: The study data is comprised of patients aged 65 years and older who presented to Tan Tock Seng Hospital ED over a 4-week period. Those who complained of abdominal pain during triage or consultation were included. Those who presented with urinary retention were excluded. Patient's demographics, discharge diagnosis, reattendance rate and final diagnosis at 6 months were captured through EMR (Electronic Medical Records).

Results: A total number of 210 patients were analysed. There were 55.7% females and 44.3% males. Their median age was 76. Of the

patients, 83.3% were Chinese, 7.6% were Indian, 6.2% were Malay and others constituted 2.9%. The majority of the patients were PAC 2 (75.2%). Of the patients, 70.5% were admitted, 12.4% of these patients were discharged with an outpatient specialist appointment, and 14.8% were discharged without any follow-up or given a follow-up with their general practitioner. During this period, 6 patients (2.86%) were re-attended. The re-attendance rate for patients over the next 6 months was 23.8%. The rate was higher in the discharged group (33.9%) compared to those who were admitted (19.6%). Constipation and gastroenteritis were the most common diagnosis. Some of these patients were eventually diagnosed with colorectal carcinoma.

Conclusion: We should be aware of the pitfalls of abdominal pain in the elderly as they may have atypical presentations. All patients should be given a follow-up appointment upon discharge.

M124

Hyperimmunoglobulin E Syndrome with Cutis Vertices Gyrata RYL TEO¹, M CHIO², A TAN²

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Case Report: The hyper-IgE (HIE) syndrome is a rare multisystem disorder first described in 1966 by Davis et al when 2 patients were reported with eczematous dermatitis, recurrent staphylococcal abscesses, hyperextensible joints and coarse facies. It is now recognised as a primary immunodeficiency disease with additional features of recurrent pneumonia with pneumatocele formation and elevated serum IgE levels. Recently mutations in the signal transducer and activator of transcription 3 gene (STAT3) have been demonstrated in autosomal dominantly inherited and sporadic cases of HIE syndrome. We report a case of sporadic HIE syndrome in a 50-year-old Malay man who had chronic eczematous dermatitis, recurrent skin, soft tissue and eye infections, characteristic coarse facies, dental abnormalities and consistently elevated IgE levels with eosinophilia. He did not have recurrent pneumonia or pneumatocele formation, and may represent a milder variant of this syndrome. He had associated cutis vertices gyrata, which may be a secondary phenomenon from underlying chronic dermatitis, and this association has not yet been reported in the literature.

M125

Mental health of Singaporean Children: Risk and Resilience Factors

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Aim: To examine the risk and resilience factors associated with mental health problems in Singaporean children aged 6 to 12.

Methods: The Child Behaviour Checklist (CBCL) and a nonverbal test of intellectual ability were administered to a representative population sample of 2141 primary school children. Demographic information about the child and family was collected. Structural equation modelling was done to examine the impact of assets and risks on children's mental health, adaptive functioning and academic performance.

Results: Assets and resources (innate intelligence, father's educational

level and father's occupation) influenced both emotional and behavioural outcomes ($T = -2.56$) as well as academic outcomes ($T = -7.91$), while risks and adversity (negative spousal conflict resolution, negative methods of discipline, chronic health problems, negative life events and developmental delay) influenced only emotional and behavioural outcomes ($T = 8.12$).

Conclusion: Our findings reinforce the importance of both positive resilience building focusing on assets and resources, as well as alleviating risks and adversities.

M126

The Impact of Endothelial Progenitor Cell Capture Stent Implantation in Patients with Acute Myocardial Infarction: Intermediate to Long-term Clinical Follow-Up

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Background: The endothelial progenitor cell (EPC) capture stent is a bioengineered R stent coated with immobilised antibodies on its stent struts which allows for capture of circulating EPCs to promote rapid endothelialisation. We assessed the impact of the EPC capture stent in the primary percutaneous coronary intervention (PCI) of patients with acute ST-elevation myocardial infarction (STEMI) and examine its early to long-term clinical outcomes.

Methods: All patients with acute STEMI without cardiogenic shock and underwent primary PCI between January 2005 and April 2007 were enrolled in the study. Dual anti-platelet therapy was given for a month and statin therapy started immediately after the procedure. The study endpoints were major adverse cardiac events (MACE) defined as death, MI and target lesion revascularisation at 30 days, 6 months and 1 year.

Results: A total of 321 enrolled patients received 357 EPC capture stents during the study period. The cohort comprises 81.0% males with mean age of 54.6 ± 11.6 years. Diabetes mellitus was present in 97 patients (30.2%) and 22.4% of patients had multi-vessel coronary disease. Procedural success was achieved in 99.4%. Platelet glycoprotein IIb/IIIa inhibitor was used in 13.1%. The mean stent length used was 20.98 ± 5.50 mm and mean stent size was 2.99 ± 0.32 mm. A total of 94% of patients achieved Thrombolysis in Myocardial Infarction (TIMI) 3 flow post-procedurally.

The cumulative MACE rate was 8.1% at 30 days, 10.6% at 6 months and 13.1% at 1 year. There was no late thrombosis and no late cardiac mortality observed in our cohort. The need for TVR was low at 5% at 1 year.

Conclusion: The use of EPC capture stent in patients who underwent primary PCI for STEMI is safe and showed good clinical outcomes, with low rate of TVR and no late stent thrombosis.

M127

Superior Survival in Paediatric Patients Receiving Allogeneic Hematopoietic Cell Transplantation from Alternative Donors versus HLA-Matched Related Donors: Preliminary Experience in the National University Hospital, Singapore

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Aim: We compared the transplantation outcomes in children with acute leukaemia receiving allogeneic hematopoietic cell transplantation (HCT) from HLA-matched related donor (MRD) vs

alternative donor (AD).

Methods: Between 1983 and 2007, 33 of 91 paediatric HCTs were performed for acute leukaemia (ALL, n = 19; AML, n = 13; acute b-lineage leukaemia, n = 1). Patients with ALL received TBI-based conditioning regimens while patients with AML received busulfan-based regimens. Depending on the donor graft, graft-versus-host disease (GVHD) prophylaxis was with cyclosporine and methotrexate or methylprednisolone ± anti-thymocyte globulin. In year 2000, a paediatric cancer ward was established. To reduce time bias, we compared HCT results in the era before and after year 2000. Eighty four per cent of patients were in complete remission and equal numbers were transplanted in relapse in both MRD (n = 2) and AD (n = 2) groups. Besides matched unrelated donors, AD also included mismatched unrelated cord blood and one-antigen mismatched family donors. ten HCTs (7 MRD, 3 AD) and 22 HCTs (5 MRD, 17 AD) were performed before and after 2000 respectively.

Results: For HCT done before 2000: 100-day transplant-related mortality (TRM) was lower (14% vs 33%) but relapse rates (RR, 71% vs 33%; $P = 0.03$) higher in MRD versus AD group. For HCT done after 2000: MRD group had lower 100-day TRM (0% vs. 6%) compared to AD group. Acute GVHD was lower in MRD (20%) compared to AD group (41%). No MRD patients compared to 35% of AD patients developed chronic GVHD. However RR were higher in MRD versus AD group (60% vs 12%; $P = 0.01$). Overall, the higher RR in MRD group resulted in statistically inferior overall survival (OS 14% vs 33% and 40% vs 82%) compared to AD group in both time periods ($P = 0.016$).

Conclusion: In this small series of patients, recipients of AD HCT had superior survival compared to MRD HCT. The initial higher complications associated with AD HCT were overcome by much significantly reduced relapse and hence provided an improved overall survival advantage. This may have arisen from increased 'graft-versus-leukaemia' (GVL) effects. With improvements in HLA-typing, advances in supportive care and post-transplant therapy, AD HCT is superior to conventional MRD HCT in children with acute leukaemia in our setting. The role of HCT in managing very high risk leukaemia in children may further be enhanced by strategies that harness 'GVL' effects in both MRD and AD HCT.

M128

The Relative Head Injury Severity Scale Versus the Glasgow Coma Score for Predicting Disability Outcome in Non-fatal Paediatric Traumatic Brain Injury

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Background: Traumatic brain injury (TBI) is a leading cause of morbidity and mortality in children. The Glasgow Coma Score (GCS) at admission is the most commonly used predictor of outcome. The recently described Relative Head Injury Severity Scale (RHISS) has been found to be a useful predictor of mortality in children with TBI.

Aim: To investigate the usefulness of the RHISS score in predicting disability outcome following TBI.

Methods: A retrospective review was conducted of all non-fatal TBI admissions to the Paediatric Intensive Care Unit from 2000 to 2004. RHISS, GCS and the Coma Outcome Score according to Jennet were calculated for all patients. Linear regression was performed using SPSS version 15.0.

Results: Of the 41 patients, 68% were male; 51% were Chinese. The mean age was 8.9 years \pm 7.1. The RHISS and GCS were correlated with each other - low GCS scores were associated with the severe RHISS category and vice versa. The RHISS and GCS scores were also correlated with COS. The r value achieved for the RHISS was 0.576 with an r-square of 0.331 whereas GCS achieved an r value 0.703 with an r-square value of 0.495.

Conclusion: In this series, the RHISS score did correlate with disability outcomes, but less robustly compared with GCS scores. RHISS scores may therefore be more useful in prediction of mortality rather than disability, not unexpectedly as GCS scores measure an element of physiological dysfunction. While RHISS is easier to administer, GCS remains the more useful assessor of brain injury in children.

M129

A Phase I Study of the Oral Fluoropyrimidine, Capecitabine, in Patients with Solid Tumours

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Aim: Regional differences exist in the tolerability profiles of capecitabine at the approved dose (1250 mg/m² bid 14 days q3weeks) with more treatment-related toxicity reported in the US compared with Europe and Asia. This may be due to differences in the distribution of *TYMS* variants (2R, 3R). We hypothesise patients with *TYMS* 3R/3R (group A) are more tolerant to standard doses of capecitabine and require higher doses to achieve similar clinical outcomes to 2R/2R or 2R/3R (group B).

Methods: Escalating doses of capecitabine were administered to patients with advanced and/or metastatic cancer for 14 days q3weeks. Dose level 1 was 1250/m² bid. Dose escalations followed a standard phase I dose escalation design with subsequent levels at increments of 125 mg/m² bid. Pharmacokinetics (PK) of capecitabine and its metabolites and genotyping of genes relevant to capecitabine metabolism were also performed.

Results: Eight and 3 patients have been recruited into group A and B respectively. The current dose levels reached in groups A and B are level 3 (1500 mg/m² bid) and level 1 (1250 mg/m² bid) respectively. Dose limiting toxicity (febrile neutropenia) was seen in 1 patient at dose level 3. A partial response was seen in 1 of the 6 evaluable patients in group A.

Conclusion: Patients in group A tolerated doses of capecitabine beyond the standard recommended dose, thus supporting our hypothesis. These results suggest patients with *TYMS* 3R/3R genotype are more tolerant to higher doses of capecitabine compared with 2R/2R or 2R/3R genotype. Enrolment is ongoing to determine the maximal tolerated dose.

M130

Evaluation of Two Rapid Tests for Detection of *Clostridium Difficile* Toxins A and B in Stool Specimens

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Aim: The laboratory at Alexandra Hospital receives approximately 1000 stool samples per year for analysis of *C. difficile* toxin in stool. This study was performed to compare the method the laboratory uses

with a recently introduced alternative method.

Methods: Stool specimens were included from patients with diarrhoea when *C. difficile* toxin test had been requested. Forty-seven stool specimens and a positive and negative control sample were included. The majority of the stool specimens were liquid or semi-solid. Recommendation from the manufacturer of ImmunoCard Toxins A & B (Meridian, Cincinnati, OH, USA) and TOX A/B QUICK CHEK (Techlab, Blacksburg, VA, USA) respectively were followed

Results: The ImmunoCard Toxins A & B test and the TOX A/B QUICK CHEK test took about 25 and 30 minutes to perform respectively. The TOX A/B QUICK CHEK test cards were perceived to be easier to read. The longer incubation time was also perceived to be an advantage since staff could walk away during this time. For 48 of the 49 specimens there was agreement between the methods (7 positive, and 41 negative). For one specimen the ImmunoCard Toxins A & B gave a weak positive result, whereas the TOX A/B QUICK CHEK was negative.

Conclusion: The 2 tests appear to perform essentially equally well, however the TOX A/B QUICK CHEK test, with the present sample volume in our laboratory, will cost approximately \$11600 less than ImmunoCard Toxins A & B test per year. This was also perceived to be easier to work with.

M131

The Incidence of Venous Thromboembolism After Total Knee Replacement Surgery in an Asian Population

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Aim: The incidence of post-surgical venous thromboembolism (deep vein thrombosis [DVT] and pulmonary embolism [PE]) among Asians is uncertain. Our study aims to determine the incidence of venous thromboembolism after total knee replacement (TKR) in Asians.

Methods: Between January 2004 and December 2006, all patients undergoing TKR in our institution were prospectively studied. Patients did not routinely receive pharmacologic thromboprophylaxis. Only those deemed at high risk were given prophylaxis. Patients underwent lower limb venous Doppler ultrasound (DUS) on the fifth to seventh post-operative day. Those with signs and symptoms of PE underwent CT pulmonary angiography. Patients were followed up for 14 days post-discharge for any readmission.

Results: A total of 538 patients underwent surgery (71% Chinese, 13% Malays, 16% Indians). Of these, 76% had DUS performed. The incidence of DVT among the whole cohort was 6.5% (n=35). Among patients who had DUS, the incidence of DVT was 8.5%. The incidence of DVT was similar among the 3 ethnic groups ($P = 0.2$). Proximal DVT accounted for 37%, while calf vein thrombosis accounted for 63%. One readmission occurred for calf vein thrombosis. One case of PE occurred (0.18%), leading to a fatal outcome. When both these patients were considered, the overall incidence of venous thromboembolism was 6.9%.

Conclusion: The incidence of venous thromboembolism after TKR appears to be low in our population. The practice of screening low risk patients for DVT, thus avoiding the bleeding risks and costs of routine thromboprophylaxis appears to keep the rate of venous thromboembolism to an acceptable level.

M132

Usefulness of BP180 Antibody Levels in Monitoring Disease Activity and Outcome in Patients with Bullous Pemphigoid

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Background: Bullous pemphigoid is characterised by circulating IgG autoantibodies targeting BP180 and BP230 hemidesmosomal proteins. Anti-BP180 IgG antibodies have been shown to be directly pathogenic in the formation of blisters.

Aim: To determine if BP180 ELISA values correlate with disease severity, clinical course and outcome of bullous pemphigoid in our local population.

Methods: Thirty-nine consecutive new patients with typical clinical, histologic and immunofluorescence findings of bullous pemphigoid were recruited from our outpatient clinics during a 3-year period, from March 2005 to March 2008. Patients were seen at enrolment, monthly for the first 3 months and during disease flares, till clinical remission. Disease activity was scored and serums were tested for BP180 antibodies levels at every visit.

Results: Mean age of recruited patients was 71.1 (± 14.4) years. Male to female ratio was 2:1. Majority (79.5%) had generalised form of bullous pemphigoid. A total of 36 patients (92.3%) completed 12 weeks of follow-up, while 16 (41%) were followed-up till remission. Five patients never had positive BP180 ELISA value at all visits and were excluded from analysis of correlation. Disease activity correlated with serum levels of BP180 antibodies at enrolment ($P = 0.004$), week 8 ($P = 0.013$) and at flares ($P = 0.002$). Correlation is not seen between BP180 antibody level and time to remission. A high BP180 antibody level seems to predict flare after remission.

Conclusion: BP180 antibody level can be used to monitor disease activity of most patients with bullous pemphigoid. Close follow-up and gradual tailing of corticosteroids is recommended for patients who have high levels of antibodies at remission.

M133

A Case of Eruptive Pruritic Papular Porokeratosis

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Introduction: A 63-year-old Chinese male presented with a chronic rash over his buttocks, groin and forearms for the past 13 years. The rash is usually asymptomatic; however, he had at least 3 episodes of intensely pruritic exacerbations in which new itchy lesions appear. The itch disappears with treatment, leaving behind hyperpigmented lesions.

Physical examination of the buttocks reveals multiple erythematous scaly annular plaques with a colerette of scales against a background of post-inflammatory hyperpigmentation.

A skin biopsy revealed irregular epidermal hyperplasia with acanthosis, elongation of the rete ridges and at least 2 parakeratotic tiera (cornoid lamellae) arising from within keratin-filled furrows. The upper dermis shows mild chronic inflammation.

The clinical picture together with the biopsy is consistent with porokeratosis. Given the history, the diagnosis is eruptive pruritic papular porokeratosis (EPPP).

Discussion: Porokeratosis is a keratinisation disorder thought to arise from mutant clones of keratinocytes, of which disseminated

superficial porokeratosis (DSP) is one variant. While DSP is usually asymptomatic, cases of an eruptive pruritic papular variant have been reported since 1992. These patients typically have a long-standing history of DSP with a sudden onset of intensely pruritic papular porokeratosis, which subside spontaneously after several months leaving behind brown, annular lesions.

Although the lesions tend to resolve over a period of months, topical and/or systemic treatment may be indicated for severe pruritus. In our patient, only topical steroids and oral antihistamines were prescribed. However in general, response to therapy is variable.

M134

Baboon Syndrome Secondary to Isoniazid

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Introduction: A Chinese male with no past medical history presented to the National Skin Centre with a 2-week history of rashes. One week prior to onset, he was diagnosed with pulmonary tuberculosis and started on isoniazid, rifampicin and pyrazinamide.

On physical examination, erythematous, well-demarcated slightly scaly patches were seen over the intertriginous areas (neck, axillae, wrists, groin, back of knees) and also symmetrically over the buttocks, thighs and shins.

The patient was told to stop his antituberculous antibiotics, resulting in complete clearance of the lesions within a week. A skin biopsy of the rash revealed interface dermatitis with eosinophilia with is consistent with a drug reaction.

A follow-up drug challenge led to recurrence of the same rash after administration of isoniazid, which again resolved spontaneously upon discontinuing the drug. The diagnosis is therefore Baboon Syndrome secondary to isoniazid.

Discussion: Baboon Syndrome is a form of systemic contact dermatitis in which patients develop an exanthem involving the buttocks and flexures, resembling the red gluteal area of baboons, after systemic exposure to contact allergens. Some researchers have also used the acronym SDRIFE (Symmetrical Drug-Related Intertriginous and Flexural Exanthema) to refer specifically to the group of patients with this distinct reaction pattern. The pathomechanism of SDRIFE is likely a cell-mediated type IV allergy. A large number of allergens have been implicated, especially mercury and beta-lactam antibiotics. However to our knowledge, this is the first case of Baboon syndrome secondary to isoniazid reported in the literature.

M135

Aortic Root Dimensions in Children with End-stage Renal Failure

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Aim: End-stage renal failure (ESRF) is associated with changes in the cardiovascular parameters. The aim of this study is to determine if ESRF and peritoneal dialysis (PD) affect the aortic root dimensions in children.

Methods: Patients who were commenced on PD between January

2001 and December 2007 were identified. Patients who developed ESRF before the age of 21 years and had a complete set of echocardiography data were included in this study. Patients with concomitant congenital heart disease were excluded. Aortic root dimensions were obtained at end-diastole in the parasternal long axis view in the standard manner. Aortic root dilatation (ARD) was defined as that greater than the 97th centile for the patient's body surface area based on reference values for children. Serial measurements were obtained just before the commencement of PD and subsequently at 6 to 12 monthly intervals.

Results: Thirty-four patients (15 male) were included in the analysis. The mean age at commencing PD was 13.5 years. ARD was seen in 59% of patients. No adverse cardiovascular outcomes were seen with ARD. Coronary artery dilatation was also seen in 74% of patients with ARD. In 68%, ARD occurred after PD was commenced. Only 2 patients showed resolution of ARD; both patients did not have ARD prior to PD.

Conclusion: ARD is seen in a significant proportion of children with ESRF on PD. This generally does not resolve with time. No adverse cardiovascular outcomes have been associated with ARD in our cohort of patients.

M136

Coronary Artery Dimensions in Children with End-stage Renal Failure

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Aim: End-stage renal failure (ESRF) is known to cause ventricular systolic and diastolic dysfunction. This may have an impact on the size of coronary arteries. The objective of this study is to evaluate the dimension of coronary arteries in children with ESRF on peritoneal dialysis (PD).

Methods: Patients who were diagnosed with ESRF (before the age of 21 years) between January 2001 and December 2007 were identified and included in this study. The proximal left and right coronary artery (LCA and RCA) dimensions were measured before and after the start of PD. RCA and LCA dilatation were defined as that greater than the 97th centile for the patient's body surface area based on reference values for children.

Results: Thirty-four patients (15 male) were included in the analysis. Coronary artery dilatation was seen in 21 patients (62%), with LCA and RCA being affected in approximately equal frequency. The mean haemoglobin concentration in patients with coronary artery dilatation prior to PD was 9.46 g/dl compared with 10.42 g/dl in those without coronary artery dilatation. The mean haemoglobin concentration after the commencement of PD in those with dilated coronary arteries was 9.78 g/dl. A few patients showed resolution of coronary artery dilatation; this was associated with an improvement in the haemoglobin concentration.

Conclusion: Coronary artery dilatation is seen in a large proportion of children with ESRF on PD and is associated with a lower haemoglobin concentration. Resolution of coronary artery dilatation is seen with improvement in the haemoglobin concentration.

M137

A Qualitative Study of Psychosocial Concerns of Sichuan 12 May 2008 Earthquake Survivors

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Aim: To explore psychosocial concerns of survivors of the 12 May 2008 Sichuan earthquake.

Methods: Sichuan, China, was hit by an earthquake of magnitude 8.0 on the Richter scale on 12 May 2008 which killed 70,000 and left 1.5 million homeless. Survivors from mountainous villages were housed in fewer than 20 temporary settlement areas of which Xiaoba was one. In-depth interviews with 20 survivors in Xiaoba community during third week after earthquake were transcribed and analysed using qualitative methods. Field observations of daily life within Xiaoba community were also made by the authors and linked to interviews.

Results: Though their houses and farms in the village were destroyed, elderly and adult women survivors would like to return to their pre-earthquake way of life and did not look forward to living in a community of pre-fabricated houses. Knowledge-based workers e.g. teachers, nurses worried about timely arrival of resources to resume their career and rebuild their communities. Teenagers felt lost, did not look forward to studying because many witnessed deaths of classmates and had difficulty expressing their psychosocial concerns. Though psychosocial issues and resources to help survivors were discussed extensively on mass media, the survivors did not tune in to mass media and were unaware of such discussions. Based on symptoms elicited during interviews, at least 6 interviewees would benefit from psychological intervention.

Conclusion: Teenagers would benefit from counselling and programmes to address their concerns and facilitate return to school. Elderly and adult women survivors would need help to accept and integrate into community living in pre-fabricated houses.

M138

A Survey of the Perceptions, Knowledge and Attitudes towards Nasogastric Tube Insertion and Nasogastric Tube Feeding among Patients and their Care-givers in a Geriatric Clinic

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Aim: To survey the perceptions, knowledge and attitude towards nasogastric (NG) tube insertion and feeding among patients and care-givers attending a geriatric clinic.

Methods: Patients and their care-givers were surveyed from 3 June to 10 June 2005. Cancer patients and their care-givers and patients with dementia were excluded from this study.

Results: Thirty-six patients and 83 care-givers were surveyed. Mean age was 81.4 years with 31 male and 61 female patients. Seventeen patients were aware of tube feeding. Twenty-four patients wanted artificial feeding for a short period in the event of mentally and physical incapacitation (up to 3 months) but only 9 were keen on permanent NG feeding.

Seventy-seven care-givers wanted their relative to have a short period of artificial feeding and 52 care-givers wanted their relatives to have permanent NG tube feeding if required. Only 25 care-givers would want permanent NG tube feeding for themselves if required.

More care-givers opted for NG tube for their relatives but were not keen to have it for themselves ($P = 0.001$).

Twelve patients did not want permanent NG tube feeding for themselves in event of irreversible incapacitation although their care-giver preferred otherwise (not statistically significant).

Conclusion: This survey highlights the discrepancy in perception, knowledge and attitude towards NG tube insertion and feeding amongst older patients and care-givers. The decision to utilise the NG tube has to be made after careful discussion and consideration of the patient's and/or care-giver's needs, understanding and expectations.

N1

The Use of Text Messaging to Improve Asthma Control: A Study of Short Message Service (SMS)

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Background: Singapore has good access to modern technological devices such as mobile phones. The National Healthcare Group suggested development and implementation of SMS as a means of supporting asthmatic patients in asthma control, and taking proactive and preventive approach to reduce healthcare utilisation.

Aim: The primary objective of the study was to evaluate the feasibility of using SMS for symptoms-monitoring through mobile phones by patients admitted for asthma.

The secondary objective, which is still in process, was to evaluate patient compliance with SMS monitoring measured by response rates over time. The study also aimed to compare healthcare utilisation within the control and intervention groups. This study also looks at patients' satisfaction and their opinion of this service.

Methods: Recruitment started in August 2007. All consecutive patients admitted with the diagnosis of asthma were screened using inclusion and exclusion criteria. Patients were randomised into 60 in the control and 60 in the intervention group. Patients in the intervention group were supported by SMS system following a structured workflow, whereas patients in the control group had no SMS support.

Results: Out of 780 patients admitted for asthma, contact analyses revealed that gender, ethnic and age differences in patients are characteristics that are deemed to be pertinent for the successful implementation of the SMS service.

Conclusion: We found reliable differences in patient characteristics to suggest that the SMS service may not be suitable for certain types of patients. Implementation efforts should be aware that other methods of outreach may be necessary for these patient subgroups.

N2

Impact of Patients' Self Perception and Emotional Well-Being on Knowledge Retention and Self-Care Management

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Introduction: Burn-out syndrome may contribute to health-compromising behaviour, particularly with long-standing diabetes. We conducted a group diabetes self-management Skills for Life (SFL) program in our diabetes centre. We devised a diabetes-related self-perception questionnaire, together with a validated diabetes knowledge questionnaire (DKT) to assess our patients' knowledge retention, self-care belief and related self-management activity.

Methods: A 1-year prospective study was done on 92 participants attending the SFL program in 2006. Information on diabetes self-perception was collected prior to commencement of SFL. DKT was administered immediately before and upon completion of SFL.

Results: A total of 82.6% of participants agreed they could improve the quality of their life if their condition improved; 84.8% said they would like to delay diabetes complications by learning self-care skills; and most (88%) believed they could play a role in improving their diabetes care.

A total of 44.6% of participants did not express good emotional well-being; 21.7% felt overwhelmed, 12% were unsure and 10.9% did not commit their feelings. Of those who felt overwhelmed, literacy levels were as follows: tertiary education 25%; secondary 40%, and primary or less 35%. A smaller number of participants performed self glucose monitoring (66%) compared to the non-overwhelmed group (81.3%). There was a lower mean DKT test-score difference of 0.35 ($P=0.56$) for participants feeling overwhelmed compared to 1.66 ($P=0.00$) for the non-overwhelmed group.

Conclusion: Psycho-emotional health could affect learning ability and impact diabetes control regardless of educational background. Psychosocial well-being has an important impact on chronic disease and public health.

N3

Preventing Patients from Dislodging Nasogastric Tube

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Background: A 1-month data from ward 3 between 5 December 2006 and 5 December 2007 showed that 21 patients were in nasogastric tube and 8 (38%) patients pulled out the tubes. These findings may be a common occurrence but studies have shown that that they have serious implications on the patient's safety. Not only does reinsertion of nasogastric tube causes discomfort and trauma to the patient, a dislodged tube is also associated with the risk of tracheobronchial aspiration of gastric contents. Gonzalez CL, et al (1975) stated that aspiration pneumonia is associated with a mortality rate of 45% among hospitalised elderly patients.

Aim: To have 0 incidence of inpatients removing nasogastric tube in ward 3 (Geriatric Medicine) in Alexandra Hospital within 3 months.

Methods: Using the 80-20 rule, the key root causes were identified (the cause and effect diagram) and the following were implemented Physical restrainers were used before implementation. The hand mitten was created and redesigned. It was washable, comfortable to use and did not restrict the patient's movements. To promote the patient's comfort, anchoring of nasogastric tube was introduced using the bolster method.

Results: A post-implementation survey showed that patients on the mittens did not remove the feeding tubes and so did not require reinsertion.

Conclusion: The design was put on trial at the ward. Positive feedback was received from caregivers that the mittens not only prevented the patients from removing tubes and lines, but allowed free movement of upper limbs, preventing self-injury and scratching. This enhanced patient safety and care in our organisation.

N4

Therapeutic Nurse Patient Relationship in Psychiatry: An Evidence-Based Review

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Aim: Therapeutic nurse-patient relationship has been a concept of great importance in the field of psychiatry. Patients with mental illnesses often have difficulty establishing and maintaining interpersonal relationships. However, they long for deeper connection with the nurses. Likewise, nurses wish to feel connected with them.

Therefore, it is important to examine this delicate relationship that exists between nurses and patients. This paper critically evaluates existing evidences supporting the importance of therapeutic nurse-patient relationship and factors impeding its development.

Methods: Computerised searches for published peer-reviewed literature were conducted using OVID, EBSCOHost, MEDLINE, PsycINFO and CINAHL databases. Search terms such as 'nurse-patient relationship', 'therapeutic relationship' and 'therapeutic alliance' were used. Searches were limited to the English language. No pre-determined year of publication was set. Papers selected were reviewed independently by at least 2 authors.

Results: Results affirmed that therapeutic nurse-patient relationship had been pivotal to the effective management of patients with mental illnesses. Numerous studies had reported that such relationship improved patients' compliance with medication regime; had positive impact on patients' satisfaction levels and optimised patients' outcomes. However, most studies focused on the qualitative description of the relationship and lacked quantitative scientific values.

Conclusion: This paper provides evidence-based information and insight to therapeutic nurse-patient relationship. The reported benefits for nurses, to establish therapeutic relationship with their patients who have mental illnesses, are encouraging. Further research in the form of clinical trials may be required to further substantiate its therapeutic claims.

N5

Severe Neonatal Jaundice is not associated with an Immediate Abnormal Automated Auditory Brainstem Response (AABR) Post Phototherapy

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Aim: Previous studies postulate that severe hyperbilirubinemia is associated with an increased risk of hearing impairment and repeat screenings are recommended. Yet, conflicting studies suggest that hyperbilirubinemia may not be associated with this risk. Recently a regional study on infants revealed a refer rate of 37.2% and a hearing impairment rate of 8.8% in each ear screened. We aimed to determine if screening treated severely jaundiced neonates with AABR after phototherapy will identify those at increased risk of hearing impairment.

Methods: Term severely jaundiced neonates admitted from 2005 to 2008 were screened prior to discharge. Baseline biodata were collected, as well as the etiologies that resulted in the severe jaundice. AABR results were compared with the routine hearing screening results done soon after birth. The differences in screening results were evaluated using chi-square analysis.

Results: One hundred and twenty-six jaundiced infants were screened with a mean gestational age and weight of 38 weeks and 3076 g respectively. Their mean peak bilirubin was 365 umol/L. A third had risk factors for hemolysis. Only 2 babies (1.6%) screened positive. The second screening outcome was not different from their immediate newborn screening result. The screening positive rate was also not significantly higher than the screening positive rate in the non-jaundiced newborn population (2.2%).

Conclusion: The repeat early screening with AABR in this suspected high risk group did not identify additional babies at risk for hearing

impairment. We conclude that a repeat screening in the first week is not beneficial. However, the optimum age for screening for such infants is yet to be determined.

N6

Effectiveness of Education by the Paediatric Epilepsy Nurse on Caregiver Use of Rectal Diazepam for Children with Seizure Recurrences

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Aim: Children with febrile seizures or epilepsy can have seizure recurrences that last several minutes or more. For the caregivers, rectal diazepam can help to abort the seizures whilst transporting the child to a medical care. This is a study to assess the effectiveness of caregiver education on the use of rectal diazepam in an attempt to abort the seizures in the child.

Methods: This prospective study included 219 children aged less than 12 years who had seizures in the 2-year period from March 2006 to Febury 2008. Caregivers were taught how to identify seizures and administer diazepam rectally if the seizures lasted longer than 5 minutes. They were also taught to monitor respiration and on-going seizure activity. Children who had seizure recurrence and were reviewed at the Children's Emergency (CE) at our hospital were recruited.

Results: Thirty-eight patients were reviewed at the CE for seizure recurrence. Thirty-two of them had seizures that lasted longer than 5 minutes, out of whom 31 (97%) had rectal diazepam administered at home. The seizures stopped after administrating rectal diazepam in 25 of children (81%); 6 of the patients (19%) required further intravenous treatment in the CE or after admission to the hospital. There was no significant respiratory depression in any of these children.

Conclusion: Rectal diazepam is an effective measure to abort acute seizures. It can safely be administered by caregivers who have been carefully instructed by the paediatric epilepsy nurse. It is a "reassuring safety net" for patients who are prone to prolonged seizures or status epilepticus.

N7

Was it Easy to Use Asthma Control Test™ (ACT) in Different Clinical Practice Settings?

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Background: The Asthma Control Test™ (ACT) is a 5-item self-administered tool designed to assess asthma control. It is said to be simple, easy and be can be administered quickly by patients in clinical practice setting. The stated benefit in our clinical practice setting has yet to be demonstrated.

Aim: To identify factors associated with difficulty in administration of ACT in clinical practice setting.

Methods: This is a prospective study performed from May to June 2008. All patients diagnosed with asthma and referred to the asthma nurse from inpatient and outpatient clinical practice setting in Tan Tock Seng Hospital were enrolled in this study.

Results: Four hundred and forty-seven patients were asked to complete the ACT tool. Eighty-nine per cent were able to complete the survey and 74% were able to self-administer the tool. In the multivariate analysis, we found that co-morbidities and clinical practice setting were independently significantly associated with completion of ACT. The odds ratio of completion among those with 2 and above 3 co-morbidities were 0.37 (95% CI: 0.16-0.87) and 0.30 (95% CI: 0.15-0.63) respectively. Those on outpatient follow up were 3.87 times (95% CI: 1.82-8.22) more likely than inpatients to complete the test ($P < 0.0001$).

Conclusion: The results show that ACT was simple and easy to be administered by patients with asthma as their only co-morbid condition and in patients who are already on follow-up at outpatient setting.

N8

Falls in the Elderly Presenting to the Emergency Department: Who Are They, and Who Should We Target?

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Aim: A fall in an elderly is a sentinel event that may lead to further falls and functional decline. Due to time constraints and limited resources in the emergency department (ED), there is a tendency towards managing the injury without addressing underlying risk factors for future falls. Before embarking on a falls management programme in the ED, we sought to define the extent of the problem and attempted to profile the 'Elderly Faller'.

Methods: A retrospective chart review of ED patients over 4 weeks (4 June 2006 to 1 July 2006) was performed. Elderly patients (age 65 and above) presenting with 'fall' as a symptom were sub-analysed based on demographics, mode of arrival, patient acuity (PAC) score, ED diagnosis, and disposition. Where relevant, a comparison with a younger control population (aged 45-64) was made.

Results: Of the 11533 ED patients, 24.7% were elderly. 13.9% of the elderly presented with a fall, compared to 9.0% in the control group. 61.5% were female and 84.4% Chinese. 44.6% were transported by ambulance, and 77.6% were non-ambulant. 72.8% were triaged at PAC2, compared to only 26.2% at PAC3. Head injuries (26.5%), hip fractures (12.1%) and back injuries (8.1%) were common injuries sustained. 61.7% were admitted, compared to 35.9% in the younger population.

Conclusion: Elderly fallers present to the ED with higher acuity, non-ambulant and admission rates than their younger counterparts. Those discharged from the ED represent an at-risk yet manageable-sized group and serve as the target population for an upcoming Falls Evaluation Programme in our ED.

N9

Geriatric Emergency Review Clinic – A New Service for At-Risk Elderly Discharged from the Emergency Department

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Aim: To describe the role of the Geriatric Emergency Review Clinic (GERC), a new service in the emergency department (ED).

Methods: Elderly patients discharged from an ED 24-hour observation unit received geriatric assessment and intervention. Many had outstanding issues that required an additional review. The weekly

GERC was set up to provide continuity of care for these at-risk elders. It was run by an emergency physician trained in geriatric care.

Patient profiles and the nature and outcome of reviews were analysed.

Results: A total of 15 patients were listed over 10 GERC sessions between January and April 2008. Thirteen (86.7%) were female, and the median age was 73. The mean interval between ED visit and GERC appointment was 9.3 days.

Nine (60.0%) patients were reviewed for postural hypotension, 7 (46.7%) for medications, 5 (33.3%) for diabetic control, 4 (26.7%) for borderline hypotension, 2 (13.3%) for gait, and 2 (13.3%) for cellulitis. Majority (73.3%) had more than one reason for review.

The compliance attendance rate was 73.3%. Half (54.6%) of reviewed patients were discharged as their outstanding issues had resolved. The other half had unresolved issues: 2 had newly-diagnosed depression, one had anaemia, 1 was admitted for persistent cellulitis, and 1 had recurrent postural hypotension.

Two patients reattended ED for symptoms related to their original problems: recurrent hypoglycemia and near fall.

Conclusion: The elderly have multiple issues that may not be completely addressed during a single ED visit. The GERC provides an opportunity for the ED to provide continuity of care, and address the outstanding needs of the at-risk elderly.

N10

Evidence-based Best Practices for Medication Administration in Acute Adult Inpatient Psychiatric Settings

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Aim: Medication errors can prolong patients' hospitalisation and increase treatment costs. Errors are common in the process of medication administration. In psychiatric settings, patients are less vocal and have reduced capacity to judge if the medications given to them are correct. This makes nurses administering the medication, the last line of defence to detect errors before patients receive the drugs. It is therefore, important to explore strategies to reduce such errors. This study aimed to critically evaluate the best available evidences associated with the administration of medicine to adults in the acute inpatient psychiatric settings.

Methods: OVID databases which include MEDLINE, PsycINFO, and CINAHL were searched for published papers. Search terms such as 'medicine safety' and 'medication errors' were used. Existing guidelines from both local and overseas institutions were also reviewed. Searches were limited to the English language. Evidence from the literature was then extracted and graded using the Scottish Intercollegiate Guidelines Network (SIGN).

Results: Results indicate that strategies to reduce medication errors need to target each phase of the medication administration process. The use of 2 identifiers to establish patient identity during medication administration and accurate documentation of information regarding the medication administered at the post-administration phase were some of the evidences gathered.

Conclusion: The findings recommend various best practices that reduce medication errors to be implemented at different phases of the medication administration process. Such pertinent practices will assist nurses in reducing medication administration errors and advancing their daily practices based on best available evidences.

N11

Developing an Ontology for Representing Knowledge in Evidence-Based medicine

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Aim: The practice of Evidence-Based Medicine (EBM) has been strongly advocated in today's field of medicine. It marks a new paradigm shift for medical practice, by directing clinical decision-making towards examination of evidence from clinical research and drives patient safety and quality care. The practice of EBM has however been limited by 2 factors: lack of physicians' knowledge on EBM principles and difficulty in retrieving quality research information. The lack of an existing knowledge representation for EBM further accentuates these limiting factors. Thus the objective of this study is to develop an EBM-Practice ontology for:

1. Encoding the knowledge required for practising the process of EBM
2. Encoding elements of clinical evidence that should be extracted for the necessary evaluation and application for clinical practice.

Methods: The EBM-Practice ontology is developed from an analysis of requirements gathered from sources of EBM information and subsequently built on the disease-treatment ontology developed by Khoo et al (2007). The disease-treatment ontology is developed bottom-up to broaden its scope to represent knowledge for EBM practice and encoding beyond treatment type of evidence to include other areas such as harm, aetiology, diagnosis, and prognosis.

Results: EBM-Practice ontology has top-level classes *EBMProcess* and *ClinicalEvidence*. *EBMProcess* represents knowledge associated with the process of practising EBM while *ClinicalEvidence* specifies the elements in research literature to be reported for evaluation and application of research in practice. *EBMProcess* has the following properties: *identifyClinicalQuestion*, *identifyTypeOfStudy*, and *appraiseEvidence*; and the corresponding subclasses *ClinicalQuestion*, *TypeOfStudy* and *Evidence* were also conceptualized as subclasses of top-class *ClinicalEvidence*. The 4 top-classes of the disease-treatment ontology, including *Treatment*, *Condition*, *Disease*, *Effect*, were conceptualised as subclasses of the top-class *ClinicalEvidence* while the top-class *Evidence* of the disease-treatment ontology has added subclasses including *Studies*, *SystematicReview* and properties *hasStatisticalAnalysis* and *evaluateResults* in EBM-Practice ontology.

Conclusion: The ontology is then evaluated with extraction from 2 published peer-reviewed research articles and is found to be sufficiently comprehensive in encoding most of the extracted information. Elements to be considered for inclusion in the ontology for encoding *Studies* include concepts relating to conduct of research and research ethics, analysis of factors through non-statistical methods and representation for subgroup analyses. From *SystematicReview* research perspective, the ontology also needs to be further developed to expand the scope for *LiteratureReview*, *SelectionOfStudies*, and *Appraisal* subclasses.

N12

Reducing Catheter-Associated Urinary Tract Infection

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Aim: Catheter-associated urinary tract infections (CAUTI) is the

most common nosocomial infections in our neuroscience intensive care units. In August 2007, the urinary tract infection (UTI) rate peaked at 15.2 per 1000 catheter-days. These observations led us to develop a urinary catheter care bundle to reduce CAUTI. We hypothesised that this bundle will reduce the rate of CAUTI.

Methods: A multidisciplinary nursing team developed a UTI bundle based on best practice guidelines. The project involved an 18-bed neuroscience ICU. The project comprised of a 3-month intervention phase from October to December 2007. The population consisted of all consecutive patients with an indwelling urinary catheter in the unit.

The indications for urinary catheterisation and infection control practices were the same for the 2 time periods. We performed septic workout whenever patients developed systemic or local signs of infection.

We classified CAUTI rate as the number of patients with CAUTI divided by the number of indwelling urinary catheter-days multiplied by 1000. We used Poisson Regression model to compare the rates of the pre-implementation period from January 2005 to September 2007 with the post-implementation period from January 2008 to March 2008.

Results: The incidence rate ratio of UTI was 0.49 (95% Confidence Interval 0.12 to 2.01; $P = 0.32$).

Conclusion: To date, the implementation of a set of urinary catheter care bundle appears to reduce the rate of CAUTI, although the data did not achieve statistical significance. The assessments are ongoing. If successful, we will spread the bundle to the other ICUs in the hospital.

N13

Predictors of Catheter-Associated Nosocomial Urinary Tract Infection

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Aim: Catheter-associated urinary tract infection (UTI) is the most common nosocomial infection. This preliminary study aims to identify clinical and demographic factors that predict symptomatic catheter-associated nosocomial urinary tract infection.

Methods: We performed a retrospective cohort record review. We included all urine cultures of patients admitted to an 18-bed ICU, and suspected to have symptomatic catheter-associated nosocomial UTI between 1 July to 31 September 2007. We defined UTI according to the definition provided by the Centers for Disease Control and Prevention.

We conducted univariate and multivariate analyses. Factors evaluated included age, sex, who inserted the catheter, catheter-day, duration in ICU, debilitating conditions and antibiotic usage. We included significant factors identified in the univariate analysis sequentially in the multivariate logistic regression model, starting with the most significant factor. Data analysis was done using Stata V9.2 with level of significance at 5%.

Results: We analysed 152 urine cultures. The prevalence of a positive culture was 15.79% (95% CI, 10.4-22.6%). The sample consisted of 63% male, mean age 57.81(SD 15.87) and median catheter-day 3 (range 1-18). Multivariate analysis showed that age and catheter days were significant independent predictors of UTI. For every year increase in age, the odds of UTI increased by 1.05 (95%

CI, 1.01-1.09, $P = 0.01$). For every increase in catheter-day, the odds of UTI increased by 1.17 (95% CI, 1.05-1.30, $P = 0.005$).

Conclusion: This study suggests that age and catheter-day are predictive of those at risk of developing UTI. The findings could aid in screening strategies. This preliminary study is limited by sampling urine cultures instead of patients. The main study will address this.

N14

A Case of Syntometrine-Induced Anaphylaxis with Positive Skin Test to Oxytocin

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Introduction: Syntometrine (oxytocin 5 IU/ergometrine 500 mcg per ml) is used in the third stage of labor. There are very few reports of possible oxytocin-induced anaphylaxis and anaphylactoid reactions. Ergometrine has been reported to cause bronchospasm.

Case history: JS, a 34-year-old lady underwent an elective caesarean section for a breech pregnancy on 8 August 2007 under general anaesthesia. After delivery of the baby and placenta, I.V. syntometrine was administered. Within 5 minutes, her blood pressure started to fall from 137 down to 50 mmHg systolic with concurrent tachycardia up to 150/minute. She was seen developing marked angioedema involving trunk, extremities and vulva with erythema of overlying skin. There was no bronchospasm. She was given I.V. fluids, dopamine and hydrocortisone. Blood pressure returned to normal in about 30 minutes and tachycardia subsided. General anaesthesia was reversed and angioedema resolved after more than a day. The patient had received I.M. syntometrine without adverse reaction in 2003 for a missed abortion. The patient was referred to our Allergy service on discharge.

Skin tests and results: She underwent skin prick followed by intradermal (ID) testing to syntometrine in January 2008. On ID testing, she had a weak positive result at 1:10 dilution and the reaction was greater with the undiluted drug (wheal 7 x 8 mm, erythema 10 x 12 mm). Patient then underwent skin testing to oxytocin (10 IU/mL) and ergometrine maleate (500 mcg/mL). She had positive ID test to oxytocin 1:10 (wheal 8 x 6 mm, erythema 19 x 32 mm) and was negative to ergometrine. A healthy normal control who had received syntometrine more than once in the past was tested negative to both syntometrine and oxytocin.

Conclusion: We describe a case of anaphylaxis to syntometrine due to allergy to the oxytocin component with positive skin tests.

N15

Knowledge and Behavioural Change of Patients with Diabetes after Foot Screening In Primary Care Setting

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Introduction: The prevalence of Diabetes Mellitus (DM) in 2004, among Singaporeans aged 18 to 69 years is 8.2%. There are about 900 amputations per year seen among the diabetics. It is important to educate patients on foot care and prevent diabetic foot complication.

Aim: To evaluate knowledge and behavioural change of DM patients after foot screening in primary care setting.

Methods: Two hundred patients were randomly recruited for foot screening from December 2007 to April 2008. Interviews were conducted prior to foot screening using a semi-structured questionnaire to assess patients' knowledge and behaviour on foot care. Follow-up interviews via telephone were conducted to these patients after 3 months. Outcome measures such as patients' knowledge on blood glucose control and smoking can contribute to the development of foot complications and the importance of foot care. Data were entered and analysed using SPSS.

Results: Preliminary results showed that 60.5% were males and 39.5% were females. The mean age is 56. A total of 98% of the subjects knew the importance of controlling blood sugar level and 89.5% knew that smoking can predispose to foot complication. All patients knew that they had to see their doctor if their leg ulcer had not healed in 2 days. A total of 98% knew the importance of checking their feet regularly for cuts, abrasions and blisters. All patients knew the importance of not filing their calluses or using corn remover plaster.

Conclusion: The study showed that education and awareness can increase patients' knowledge on the importance of foot care.

QHSR1

Audit of Process Measures in Patients with Rheumatoid Arthritis in an Outpatient Rheumatology Service

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Background: In a busy rheumatology service, objective documentation of process measures is difficult. However, with quantitative measurement treatment is more likely to be intensified to achieve “tight control”.

Methods: We reviewed records of consecutive outpatients with rheumatoid arthritis seen at the National University Hospital over one month in May 2007. Records were audited for documentation of measures of disease severity, disease activity and safety monitoring.

Results: Of 83 patients reviewed, 86% were female. The median age was 57 (range 23 to 81) years. A total of 72% of the patients had comorbid conditions. Seropositivity was recorded in 92% and presence of erosions in 47% of patients. Duration of morning stiffness was documented in 37%, swollen and tender joints in 88% and measurement of acute phase reactants in 89%. Blood monitoring for adverse effects of therapy was done in 95% and a baseline chest X-ray in 77%. Bone mineral density was tested in 63% of the 71 patients on glucocorticoids and annual eye screen was done for 65% of the 23 patients on hydroxychloroquine. Blood pressure was measured at 67% of visits, and 34% of patients had annual lipid and blood glucose screening. Baseline radiographs were done in 92% of patients for assessment of damage; however, only 63% had appropriate follow-up X-rays to assess progression.

Conclusion: Objective documentation of process measures is suboptimal, possibly due to physician time, shortage of ancillary staff and cost. A standardised form has been developed to ensure easy and objective data capture. Cases will be re-audited to assess its impact.

QHSR2

Outcome of Emergency Patients with a Disposition Diagnosis of Gastroenteritis

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Background: Though gastroenteritis (GE) remained a common disease seen at the emergency department (ED) in the industrialised world, there is little data regarding the presentation of GE in the adult population.

Aims: The primary outcome measures were the prevalence of disease symptoms, adverse events and the misdiagnosis of patients with GE.

Methods: This is a prospective observational study. Patients diagnosed with GE at the ED from 1 March 2008 to 30 April 2008 were recruited. Data were collected from their first visit and from a telephonic follow-up 7 days later.

Results: During the study period, there were 914 patients diagnosed with GE. The majority was discharged (n = 680). A total of 626 among the discharged and 207 among the admitted patients were contacted for follow-up. Most did not require further medical attention whether they had been discharged (533/626) or admitted (185/207). A minority re-visited the ED after their initial ED discharge (n = 43/626). Clinical investigations suggested that seven cases might have been misdiagnosed at initial presentation. Among those initially admitted, clinical investigations suggested 30 cases of probable

misdiagnosis. Preliminary data analyses suggest that cases misdiagnosed with GE may differ from those who were correctly diagnosed on some symptoms and signs at initial presentation at the ED. The former group may also incur a longer length of inpatient stay.

Conclusion: Despite being a very common problem presenting to the ED, there is scant literature on outcome of patients diagnosed with GE. The present study is an early attempt to explore ways in which the diagnosis of GE can be made more accurately.

QHSR3

An Exploration of Rehabilitation Outcomes in Stroke Patients Undergoing Early Supported Discharge (ESD) Programme in National University Hospital (NUH)

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Aim: Stroke often results in physical, psychological and functional limitations in a person after acute hospitalisation. Currently, acute stroke patients admitted to National University Hospital are given an option of enrolling into home-based occupational therapy and physiotherapy programme upon discharge. This on-going pilot study aims to investigate the functional outcomes of the stroke patients who were enrolled in home-based therapy termed as the Early Supported Discharge (ESD) programme.

Methods: All 44 patients, with mean age of 67 years, were enrolled into the ESD programme from July 2007 to April 2008. The primary functional outcomes collected at the first and last ESD session, which included Functional Independence Measure (FIM), Frenchay Activity Index (FAI), Motricity Index and Modified Rankin Scale were analysed using paired sample *t*-test.

Results: In all the functional outcomes, change in scores for FIM, FAI, modified Rankin scale and Motricity Index were found to be statistically significant. There was a mean improvement of 17 points ($P < 0.05$) on the FIM scores and 11 points ($P < 0.05$) on the FAI scores indicating that patients were better able to carry out their basic and instrumental activities of daily living. At the impairment level, patients also showed improvements in their Motricity Index of the upper and lower limbs of the hemiplegic side while globally improved from being moderately disabled to slight disability (mean difference of 1.3, $P < 0.05$) when rated on the Modified Rankin Scale.

Conclusion: Early supported discharge programme results in good functional outcomes for patients with acute stroke. Ongoing evaluation may further substantiate the benefits of continuing the ESD programme.

QHSR4

“A Stitch in Time Saves Nine...!” The Dilemma of Reducing Hospital Stay for Orthopaedic Trauma Patients in a Safe and Efficient Manner

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Aim: Orthopaedic trauma cases account for a majority of patients,

both in terms of volume and workload, admitted to the Orthopaedic Department in the National University Hospital. Analysis of the 'turn-around-time' (TAT = time from admission to time of operation) and overall length of stay showed that these were longer than international norms.

We hypothesised that it is possible to reduce both the TAT and length of stay for orthopaedic trauma patients by improving efficiency and cutting down waste in the care pathway of orthopaedic trauma patients, whilst maintaining safe working practices.

Methods: The carepath for an orthopaedic trauma patient was analysed in detail by a multidisciplinary group to determine the reasons for increased length of stay, where the delays in a patient journey occur and the root causes for prolonged in-patient stay. Two different populations were identified; one was young, fit and healthy with single limb soft tissue injury or closed fracture and the second population was elderly, with medical co-morbidities, or patients with open fractures. New systems of management were proposed for both groups.

Results: We report on a Rapid Improvement Experiment (RIE) which introduced new systems of managing the hospital stay for young, fit, healthy patients so that they are admitted and have their operation within 24 hours and are discharged within 48 hours. This resulted in a reduction in average length of stay of one day per patient and greatly reduced turn-around-time.

Conclusion: Reduction in patient length of stay is possible, without compromising patient safety.

QHRS5

Use of Molecular Pathology in the Diagnosis of Translocation-Related Sarcoma

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Aim: Reverse transcription polymerase chain reaction (RT-PCR) and fluorescence *in situ* hybridisation (FISH) analysis for the detection of sarcoma translocations are regularly used in the molecular diagnostic setting. The aim of this study is to report their applications in a solid tumour-focused molecular diagnosis laboratory, highlighting the advantages, problems and overall accuracy of these approaches.

Methods: Thirty-two sarcomas were analysed from August 2007 to May 2008, with a) the following commercially available FISH break-apart probes: *EWS* (22q12), *CHOP* (12q13) and *SYT* (18q11.2); and b) targeted RT-PCR tests for the three translocations involved in Ewing's sarcoma, primitive neuroectodermal tumour (PNET), desmoplastic small round cell tumour (DSRCT), synovial sarcoma and myxoid liposarcoma.

Results: For the cases analysed, 13/14 are positive for *EWS* FISH, 1/1 is positive for *EWS* RT-PCR, 4/5 are positive for *SYT* FISH, 4/7 are positive for *SYT* RT-PCR, 2/2 are positive for *CHOP* FISH and 3/3 are positive for *CHOP* RT-PCR. Five cases were examined for both FISH and RT-PCR, with a concordance of 100%. Taking into account the preferred clinico-pathological impression, the concordance with the molecular testing is 100%. An interesting

finding which may affect the FISH interpretation includes a solitary fibrous tumour with amplified gene copy number.

Conclusion: Overall, these findings confirm the pivotal role of molecular techniques in the diagnosis of sarcoma, and the complementary roles of RT-PCR and FISH for this purpose.

QHRS6

Prevention of Surgical Site Infection

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Aim: Surgical site infection (SSI) is a preventable problem. The aim of our project is to reduce surgical site infection for gastrointestinal and hernia operations in Department of Surgery by 50% over two years.

Methods: The study was conducted in TTSH Department of Surgery from January 2006 to December 2007. A total of 2408 patients who underwent elective clean or clean-contaminated gastrointestinal and hernia operations were recruited. Prospective and historical data were collected for comparison. Using CPIP methodology, four new interventions were implemented, namely surgical site hair removal using clippers instead of shavers; standardisation of prophylactic antibiotics regimen and administration of antibiotics within 30 minutes prior to surgical incision; standardisation of glucose monitoring and control for diabetics; and maintenance of postoperative normothermia.

Results: TTSH SSI rates in 2005 for clean and clean-contaminated operations were at 1.6% and 4% respectively. With these bundle of interventions, our SSI rate was reduced from 3.1% to 0.5% ($P < 0.001$) giving an overall reduction of SSI by 84% within two years. The SSI rate of clean operations was 0% and clean-contaminated operations was 0.8%. Our overall intervention compliances were 91%, 87%, 89%, 76% and 44% respectively. Given the good results, we have spread this good practice to other surgical subspecialties and orthopaedic surgery.

Conclusion: With the bundle of SSI interventions, SSI rate could be effectively reduced. Given the good results, we have embedded the protocol to all elective patients in Department of Surgery. Further improvement is needed to maintain postoperative normothermia.

QHRS7

Validation of *c-kit* Exon 11 Mutation Analysis in Gastrointestinal Stromal Tumour Cytology Samples

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Aims: To validate *c-kit* exon 11 mutation analysis on cell block material obtained from fine needle aspiration cytology (FNAC) of gastrointestinal stromal tumours (GISTs) by comparison with formalin fixed, paraffin embedded full sections of the corresponding resection specimens.

Objectives: To show that molecular cytopathology can overcome the

limitations of FNAC for the diagnosis and prognostication of GISTs.

Methods: *c-kit* mutation analysis was done on cell block material obtained from 9 cases encountered in our department from 1999 to 2008 on which FNAC was attempted pre-operatively, and compared with analysis on full paraffin section of the corresponding resected tumours in seven cases where patients opted for resection. Only *c-kit* exon 11 was examined via bi-directional nucleic acid sequencing.

Results: Our results showed 100% concordance for the presence and type of exon 11 mutation in the resected and aspirated tumours in all seven cases. These mutations had diagnostic value when compared with other neoplasms which are part of the differential diagnosis, such as leiomyosarcomas or gastric adenocarcinomas.

Conclusion: Molecular cytopathology is a powerful tool that can complement morphology and immunohistochemical assessment of cytologic material in routine practice for the diagnosis and prognostication of GISTs.

QHRS8

A Carepath Value Analysis for Orthopaedic Trauma Patients; To Improve Patient Care in the Department of Orthopaedic Surgery, National University Hospital

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Aim: Most patients, following an orthopaedic injury, wish to be diagnosed, admitted, have their operation and discharged safe and well, in a timely manner. Analysis of turn-around-time and overall length of stay for orthopaedic trauma patients in our hospital showed that patients waited longer for operation and stayed longer than international norms.

A value stream analysis of the carepath for an orthopaedic trauma patient was performed to identify which parts of the pathway provided value to the patient, where wasteful practices occurred and to detect where delays in treatment occurred. Elimination of wasteful practices allowed efficient and safe reduction in the turn-around-time and length of stay.

Methods: A multidisciplinary group analysed an orthopaedic trauma patient carepath, in details, to determine the root causes for delays in discharging patients. Every part of the pathway, involving an interaction with an orthopaedic patient was visited, with staff being interviewed and observed to determine root causes for delays; identifying wasteful practices. We then proposed methods of reducing current patient turn-around-time by 50% and length of stay by two days within one year.

Results: We report on how the problems identified in the pathway have been tackled and how patient perceptions are changing. We also report on the Rapid Improvement Experiments (RIE) which allows us to determine whether the proposed changes provide the expected benefits for the patient and hospital.

Conclusion: The carepath value analysis is a useful tool in identifying wasteful practices and improving the patient pathway and reducing overall length of stay.

QHRS9

Antibiotic Usage and Resistance Pattern in Bile Infection

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Aim: To investigate the relationship between antibiotic usage and antibiotic resistance pattern in bactibilia at a tertiary hospital.

Methods: The resistance pattern of *Escherichia coli*, *Enterobacter*, *Klebsiella*, ESBLs (Extended Spectrum Beta-Lactamase in *Escherichia coli* and *Klebsiella* species) to three groups of antibiotics were analysed based on 2007 antibiogram data from our microbiology lab. Antibiotic resistance is defined as the sum of intermediate and resistant strains. Antibiotics in Group 1 are amoxicillin, Amoxicillin/Clavulanic acid and piperacillin-tazobactam; Group 2 ciprofloxacin, cefazolin, ceftriaxone, ceftazidime and cefuroxime; Group 3 imipenam, meropenam and ertapenam. The usage data of these groups of antibiotics by Department of Surgery in 2007 was collected from our pharmacy and usage in each group was studied. The correlation analysis between antibiotic usage and resistance pattern was done using Spearman's statistical method.

Results: Mean percentage resistance of bactibilia to each group of antibiotics were 44%, 53% and 1% respectively. The percentage usage of antibiotic Groups 1, 2 and 3 were 43%, 45% and 12% respectively. Analysed data showed the significant correlations between the use of each group of antibiotics and mean resistance of bactibilia to these groups ($P < 0.01$). In the subgroup analysis, the usage of antibiotic is strongly correlated to proportion of resistance organisms in each group ($P < 0.001$) except *Enterobacter* species ($P = 0.67$). This could be due to antibiotics we analysed are predominantly for Gram-negative organisms.

Conclusion: Indiscriminate use of antibiotics results in the emergence of resistance strains of bacteria in bile infection. Therefore, discriminatory use of Group 3 antibiotics in bile infection is strongly encouraged.

QHRS10

Case Management and Clinical Pathways: The Effectiveness of Disease Management Tools in Acute Psychiatric Care

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Designation?

Introduction: Two disease management tools, case management (CM) and clinical pathways (CP) were introduced to the Institute of Mental Health (IMH), in 2000 and 2002 respectively. This paper describes the effectiveness of these tools in patient care in IMH.

Methods: A retrospective analyses (2003-2007) was undertaken using SPSS version 13.0.

Results: The 5-year period involved manpower increases, from three case managers to nine. Service outcomes involved increases in (i) service referrals 1021 (2004) to 3454 (2007), (ii) referrals to internal and external services 227 (2004) to 2844 (2007), (iii) psychoeducation sessions, 819 (2004) to 2193 (2007), (iv) telephonic case management, 1291 (2004) to 1554 (2007), (v) home visits, 21 (2004) to 113 (2007), (vi) crisis management 9 (2004) to 19 (2007) and significant clinical outcomes such as reduction in (i) patients' suicide, suicide attempts and forensic complications, (ii) patients' readmission rates, hospitalisation days and treatment defaults.

Eleven Clinical Pathways were developed leading to increases in (i) utilisation: 1185 (2004) to 3038 (2007), (ii) percentage placement of patients admitted with CP criteria eligibility: 49% in 2004 to 68% in 2007.

Clinical outcomes included reduction and stabilisation of average length of stay for patients on CP: Dementia (28.3 days in 2005, 22.7 days in 2007), First Episode Schizophrenia (17.9 days in 2004, 15.3 days in 2007), Alcohol Dependence (20.4 days in 2004, 12.7 days in 2007), Relapsed Schizophrenia (21.1 days in 2004, 21.3 days in 2007).

Conclusion: The significant clinical outcomes and resource utilisation highlights the relevance and importance of these management tools in acute psychiatric care.

QHSR11

Effects of Survey Mode on Results of a Patient Satisfaction Survey at an Acute Care Hospital in Singapore

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Aim: Healthcare professionals and managers are recognising the value of surveys as tools for describing disease, assessing patient outcomes and measuring patient satisfaction with the provision of care. This study aims to determine if there is a difference in responses obtained when a patient satisfaction survey is administered through face-to-face interview, phone interview and self-administered questionnaire.

Methods: All patients admitted at an observation unit of a tertiary level acute care facility from May 2006 to October 2007 were invited to participate in a patient satisfaction survey using an internationally validated tool. The study was divided into three phases during which different survey modes were applied. Phone interviews post-discharge were conducted during the initial phase followed by self-administered questionnaires, and finally by face-to-face interviews.

Results: There were 832 patients included in the survey. Univariate analysis revealed that responses to 11 out of 18 quality of care questions were associated with survey mode. Face-to-face interviews yielded socially desirable responses from 72.7% of the questions, while phone interviews yielded socially undesirable responses from 63.3% of the questions. Logistic regression results showed that responses to nine out of the 18 questions (50.0%) were associated with survey mode. Out of the nine questions where a difference in response was detected, 76% were due to differences in responses obtained from face-to-face and phone interview.

Conclusion: Researchers must be aware that the choice of survey method has serious implications on the quality of results of patient satisfaction surveys.

QHSR12

Comparison between Depressed and Non-Depressed Elderly in an Emergency Department Observation Unit

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Aim: To examine the profile of depressed elderly in an emergency department (ED) observation unit, and compare them with their non-depressed counterparts.

Methods: Patients aged 65 and above in an ED's 24-hour observation

unit were screened for various geriatric issues prior to discharge. This was performed by a team of emergency nurses trained in geriatric care. Active intervention and/or onward referrals were offered for positive findings. Patients found to have a mood disorder were subanalysed.

Results: A total of 315 patients received geriatric screening. Sixty-two (19.7%) were found to have mood disorder. There were no significant differences in age and gender between depressed and non-depressed groups. There was a greater preponderance of Malays (14.5% vs 8.3%) in the depressed group, although this was not significant.

The depressed group showed significantly lower basic activities of daily living (17.76 out of 20 vs 18.94, $P = 0.03$) and abbreviated mental state (7.29 vs 8.02, $P = 0.034$) scores.

The depressed patients were also found to have a higher incidence of other geriatric syndromes, such as social issues (30.65% vs 10.28%, $P = 0.000$), fall risk (58.06% vs 39.53%, $P = 0.01$), incontinence (61.29% vs 32.81%, $P = 0.000$), cognitive impairment (37.10% vs 21.74%, $P = 0.021$), behavioural difficulties (19.35% vs 8.3%, $P = 0.019$), and sleep disturbance (51.61% vs 19.76%, $P = 0.000$).

Conclusion: Elderly depression is a diagnosis rarely made in the ED. Here, through geriatric screening, we found almost one-fifth of the elderly had significant mood issues. Furthermore, these patients had lower functional and cognition pre-morbid, and were associated with significantly higher incidences of other geriatric syndromes. Active identification and intervention of elderly with depression may reduce future functional and cognitive decline.

QHSR14

Knowledge, Attitudes, Beliefs and Referral Patterns of Western Medicine Trained Healthcare Professionals Towards Complementary and Alternative Medicine in Singapore

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Aim: To study the knowledge of, attitudes towards, belief of and referral experiences with Complementary and Alternative Medicine (CAM) among western medicine trained healthcare professionals.

Methods: An anonymous, self-administered survey was conducted in April 2008. Hardcopy questionnaires were sent out to all doctors, registered nurses, physiotherapists (PT) and occupational therapists (OT) in Tan Tock Seng Hospital (TTS). Data were analysed using SPSS v15.

Results: The overall response rate was 60.5%, namely 27.8% (182/654) for doctors, 81.8% (712/870) for nurses, 91.9% (57/62) for PT and 81.4% (35/43) for OT. Findings suggested that most respondents perceived that they had limited knowledge regarding CAM; had limited personal experiences with CAM; and referred only a small percentage of patients for CAM therapies. Nonetheless, 62.8% of them believed that CAM is safe when practised by trained professionals; only 6.6% believed that physicians should warn patients against CAM. Respondents did not refer it due to a lack of personal knowledge on the subject (45.1%); not knowing a suitable CAM practitioner (24.4%); and not thinking it was necessary (12.4%). The key reasons for referring were patients' preferences (45.7%); efficacy of CAM for specific conditions (31.0%); and other treatment modalities being unsuccessful (17.6%). Most of them (82.7%) had a favourable attitude and expressed interest in attending CAM seminars.

Conclusion: The majority of healthcare professionals perceived their knowledge of CAM to be low. Limited personal knowledge and experiences were also associated with lower referrals for CAM therapies. Nonetheless, they have a favourable attitude towards CAM and see a greater need for more CAM educational programmes.

QHSR15

Referrals from Primary Healthcare Centres to the Emergency Department: Impact and Appropriateness

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Introduction: Attendances to a busy Emergency Department (ED) are contributed by various sources including referrals from primary healthcare centres (PHC). Objective criteria to define appropriate referrals are needed to optimise resource distribution in the public healthcare system to cope with increasing patient expectations.

Aims: (i) To evaluate the impact of public PHC referrals on total attendances to the ED, (ii) To evaluate appropriateness of PHC referrals

Methods: A retrospective review was conducted from 24 April to 30 April 2008. Two emergency physicians reviewed all referral letters and ED consultation notes independently.

Appropriate referrals were defined in this study as patients who required: (a) resuscitation, (b) hospitalisation, (c) observation, (d) procedures not performed at PHC, (e) same day specialist consult, (f) laboratory investigations or imaging not available at PHC.

At least 1 criterion had to be met for a referral to be considered appropriate. The above criteria was modeled after Cohen's criteria for appropriateness of soldiers' referrals to an Israeli ED (Mil. Med Aug 2003).

Results: Two hundred and thirty-four referrals were reviewed and these constituted 10% of ED attendances during the study period. A total of 73% of referrals were appropriate. Interdisciplinary variations were observed. A total of 98% of ENT, Ophthalmology, Cardiology and Neurosurgical cases were appropriate. General Surgery and General Medicine cases were 70% and 72% respectively. Referrals for Orthopaedic conditions were the least appropriate at 52%.

Conclusion: Although it may be inferred that ED services have been utilised as surrogate specialist clinics, laboratory and X-ray centres; collaboration with PHC is needed to confirm whether the choice of criteria used for referral is adequate and correct to make such an inference. This study demonstrated that PHC referrals did not significantly impact ED workload.

QHSR16

A Pilot Study on the Effects of a Music Therapy cum Activity-Based Programme on Behavioral and Depressive Symptoms in Dementia

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Aim: To evaluate the effects of a music therapy cum activity-based programme on behavioural and depressive symptoms in patients with dementia.

Methods: Patients with dementia attended a weekly interactive group music therapy and activity based-programme conducted by a qualified music therapist and an occupational therapist for eight weeks. Two validated scales, the Cornell Scale for Depression in Dementia (CSDD) and the Revised Memory and Behavioural Problems Checklist (RMBPC), were used to measure the change in outcomes of mood and behaviour respectively. Patients were assessed through caregiver reporting at baseline and re-evaluated upon completion of the programme.

Results: Preliminary analysis of the first 10 patients showed overall reductions in all scores (including subscales) for both scales. Significantly, mean CSDD scores decreased from 9.67 to 5.89 ($P=0.004$) and mean RMBPC scores decreased from 67.20 to 36.00 ($P=0.006$). Significant reductions in the Caregiver Reaction ($P=0.003$) as well as the Memory-Related ($P<0.001$) subscale scores of the RMBPC were also observed.

Conclusion: These preliminary results suggest that a music therapy cum activity-based programme can ameliorate behavioural problems and depressive symptoms in patients with dementia, which in turn helps to improve quality of life for patients and their caregivers. Further data and results will be obtained from this ongoing study.

QHSR17

Stroke Patients are not Presenting to a Hospital Early Enough!

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Introduction: Stroke is the fourth most common cause of death and the biggest cause of long-term disability in Singapore. Despite this, it has been shown that many patients are unaware of the importance of seeking help immediately upon the onset of their symptoms as there is now evidence that time-dependent thrombolytic therapy for acute stroke can improve patient outcomes.

Aims: 1) To evaluate the timing of arrival of stroke patients to the Emergency Department (ED) following the onset of symptoms

2) To evaluate the epidemiology of stroke presentation at the Emergency department (ED)

Methods: A retrospective review of all patients presenting with stroke symptoms to the ED from 1 January to 31 January 2008 was done.

Results: One hundred and eight patients were included in the study. Majority of patients (69.5%) arrived at the ED more than three hours after the onset of symptoms. Fourteen (13.0%) were unsure of the time of onset of their symptoms. Only 19 (17.6%) patients arrived within three hours.

Most of the patients were aged more than 60 years (75.0%). Of the patients, 57 were men (52.8%). The most common presenting stroke symptom was unilateral limb weakness, experienced by 48 (44.4%) patients. Other common presenting complaints were altered mental state (19.5%) and slurring of speech (10.2%).

Only one patient (0.9%) received thrombolytic treatment.

Conclusion: This study showed that local stroke patients presented to the hospital too late. In fact, the reason for the very low number of patients receiving thrombolysis was mainly because of their late presentation. A national information campaign may be useful in teaching people to seek help early.

QHSR18**Departmental Patient Satisfaction Survey - Our Initial Experience**LA GOH¹, HS LIM¹, C CHONG², V CHONG¹¹Department of Diagnostic Imaging, National University Health System (NUHS), Singapore, ²Quality Improvement Unit, National University Hospital, Singapore**Aim:** To perform a pilot patient satisfaction survey in the Diagnostic Imaging Department, as a prelude to regular surveys.**Methods:** The survey was carried out over a 10-day period. Survey forms were distributed to every 5th registered patient per hour interval in the Main Building, Functional Imaging Center and private wing. Patients were asked to grade their level of satisfaction from poor to excellent, with regards to the courtesy, attentiveness, clarity of explanations and skills/professionalism they had received from our staff.**Results:** One hundred and nineteen out of 250 surveys forms were returned. Response rate was 24%, 36% and 78% at the Main Building, Functional Imaging Center and private wing respectively. Overall experience was rated excellent (38%), very good (35%) or good (20%) by all the patients surveyed with the exception of one poor rating (1%). Seven forms did not indicate overall satisfaction. Private wing patients generally did not express greater satisfaction, despite more personalised service. The most frequent source of dissatisfaction was delay (43% of patients did not have their examinations done at the appointed time). Only 19% of patients received an explanation when there was a delay.**Conclusion:** The pilot survey suggests that regular surveys with a larger sample size would provide valuable feedback and are feasible. The priorities and expectations of the private and non-private patients need to be explored further in future surveys, as well as the causes of delay.**QHSR19****Cost of Care for Low-Income Patients with Diabetes Mellitus in Tertiary Hospitals**B LIM^{1,2}, M JONG², AWL TAN³, PC SOON²¹Department of Ambulatory Operations, Tan Tock Seng Hospital, Singapore, ²Department of Endocrinology, Tan Tock Seng Hospital, Singapore, ³Department of Clinical Research Unit, Tan Tock Seng Hospital, Singapore**Aim:** To determine the amount payable by the low-income patients with diabetes (DM) and subsidy needed to standardise costs of care provided in association with the disease categories and encounters/visits at the tertiary hospital (TH).**Methods:** We extracted retrospective data for analysis of low-income patients with DM through the Chronic Disease Management computer system. Patients were enrolled in the DM Care Endowment Programme from 1 January 2005 to December 2006 were included in this study. Patients' conditions were classified into four disease categories (CAT 1 - on diet control, CAT 2 - on DM medication, CAT 3 - hypertension and dyslipidemia and CAT 4 - DM with related complications). Variables for analysis included age, gender, race, patient class, disease category, amount payable, standard cost, difference in standard amount payable, number of visits/encounters of inpatients (IP), outpatients (OP), emergency department (ED) and day surgery (DS), and were analysed using STAT.**Results:** One hundred and eighty three patients were included in this analysis and with a total number of 4270 hospital encounters/visits. The total mean cost in Singapore dollars payable by patients per encounter was: IP \$1166.51 ± \$1260.32, OP: \$59.30 ± \$125, ED: \$68.85 ± \$8.95, and DS: \$404.11 ± \$261.11. The total mean subsidy cost by the government per encounter was: IP: \$4885.77 ± \$14,716.58, OP \$418.21 ± \$3611.45, ED \$125.39 ± \$123.47, and DS \$343.99 ± \$544.92. Patients with cardiovascular complications with DM accounted for the highest encounters/visits and payable costs. Patients with two diabetes complications, renal and cardiovascular, received the highest subsidy in the TH.**Conclusion:** High numbers of hospital encounters, amounts payable and subsidies were associated with low-income patients with DM related to the complications treated in TH. Strategies would need to be employed to make a difference to the health status of low-income patients with DM.**QHSR20****Psycho-Education for Patients and Their Families in a Psychiatric Outpatient Clinic**BL LIM¹, KC WEP², C LEE³¹Department of General and Forensic Psychiatry, Institute of Mental Health, Singapore, ²Department of General Psychiatry, Institute of Mental Health, Singapore, ³Department of Community Psychiatry, Institute of Mental Health, Singapore**Aim:** The primary aim is to set up a psycho-education programme for patients with chronic mental illness and their family members in a psychiatric outpatient clinic. The secondary aim is to improve their knowledge on these psychiatric illnesses and their treatment.**Methods:** This is a naturalistic and descriptive study. Patients and families who came to the satellite outpatient clinic were recruited. Patients (n = 60) who agreed to participate underwent an individual psycho-education session about their medication and this was reinforced by the pharmacist or in group sessions. Family members (n = 30) who agreed to participate underwent individual psycho-education sessions about the illnesses, medications, crisis management and relapse prevention, and this was followed up with telephonic, group or further individual sessions. Medication Knowledge Assessment Tool and a face-validated questionnaire were used to track the progress of patients and family members respectively.**Results:** A total of 67% of patients who underwent one individual session followed by a reinforcement session demonstrated "good" knowledge about their medications vs 37% of patients who underwent only one single session and 20% at baseline. A total of 58% of family members who underwent one individual session demonstrated "good" knowledge about the patients' illness vs 27% at baseline. Attendances were poor for both patient and family group sessions**Conclusion:** Local patients and families preferred individual to group sessions. For patients, additional reinforcement sessions aided in their knowledge but it was difficult to engage family members beyond one individual session.

S1

Unique Protein/Peptide Signatures in Maternal Blood as a Non-Invasive Tool to Detect Fetal Trisomy Conditions

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Aims: The objective of this study is to develop a non-invasive technique for the diagnosis for fetal aneuploidy using maternal serum proteins. We hypothesised that mothers carrying trisomy (T) fetuses have unique protein fingerprints in their blood and produce new proteins in response to the abnormal fetus.

Methods: Maternal serum samples (total: 108); normal (85); Trisomy13 (6), Trisomy18 (8) and Trisomy21 (9), with positive triple test were used for this study. Protein fingerprints were generated using Surface Enhanced Laser Desorption and Ionization/Time-of-Flight Mass Spectrometry technique. Using in-house algorithm, peak features were identified. Maternal serum proteins unique to fetal trisomies were identified using gel electrophoresis and Tandem MALDI-TOF-MS/MS approach and validated using immunoblotting studies.

Results: Protein/peptide spectral features unique to each trisomy conditions, T13 (5), T18 (12) and T21 (8) were identified, which could discriminate normal samples from the 3 trisomy conditions with near 100% sensitivity and specificity. Unique proteins in blood from patients carrying fetuses with trisomies were identified. Proteins identified belong to specific groups associated with (a) amyloidosis, (b) immune tolerance, (c) cell division, (d) proteinase inhibitors, (e) proteases, (f) amniotic fluid proteins, (g) acute-phase reactant proteins and (h) proteins for neuromuscular development. The above proteins, when used as a panel of markers, could distinguish normal ones from trisomy cases without misdiagnosis.

Conclusion: Using proteomics-based approach we have shown successful detection of protein fingerprints in maternal blood for 3 trisomy conditions. This technique has the potential to be successfully used for non-invasive detection of fetal trisomies.

S2

Closure of Gastrotomy in NOTES: A Randomised Study Using an Ex-Vivo Model Comparing Endoloop with Endoclip

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Background: Closure of access site is one of the key issues that will determine the development of NOTES.

Aim: Our study was designed to compare the effectiveness of 2 most common gastrotomy closure techniques i.e. endoloop vs endoclip.

Design: Ex-vivo study experimental study.

Interventions: Twenty-four ex-vivo porcine stomachs were gastrotomised and the gastrotomies were closed with either hand-sewn, endoloop or endoclip by randomisation. A 2-cm gastrotomy was created with a needle knife and sphincterotome, and the defects closed thereafter.

Main outcome measurements: Time to closure of gastrotomy and pressure at which the closure leaked.

Results: Three endoloops were required for all the closures in the endoloop group and in endoclip group, the mean (range) number of

endoclips used was 10 (8-13). There was no difference in the closure times between endoloop 28 (16-58 minutes) and endoclip 30 (21-40 minutes) methods. All stomachs were successfully distended at the end of the procedure and none experienced fluid leak. The endoclip closure sustained a higher mean pressure 64 mmHg before leaking compared to an endoloop of 26 mmHg, this difference was significant ($P < 0.001$). Majority of air leaks were from the wound site. In the endoclip group, 2 had leaks from the clip bite sites.

Conclusion: Among the currently available closure methods of endoclips and endoloops, endoclips seem to be better for gastrotomy closure by their potential value to endure higher pressure without any prolongation of application time.

S3

Bioreactor Enhanced Human Fetal Mesenchymal Stem Cell Mediated Cellular Scaffolds as an Effective Tissue Engineered Graft for Critical Size Defect Healing in an Orthotopic Rat Femoral Defect Model

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Aim: The generation of large voluminous tissue engineered grafts which can be modelled into different shapes and sizes is useful for healing of critical-sized bone defects. However, the lack of osteogenicity and difficulties in maintaining mass transfer of nutrients results in high cellular death in the necrotic interior, and hence graft failure. We have recently reported that the use of highly osteogenic human fetal bone marrow derived MSC (hfMSC) seeded onto high porosity scaffolds and matured in a novel biaxial rotating bioreactor demonstrated enhanced osteogenic differentiation and cellular viability over a standard static culture system. We now test this bioreactor-enhanced hfMSC-scaffold's ability to heal a critical sized bony defect in an orthotopic rat femoral defect.

Methods: hfMSC were seeded to polycaprolactone-tricalcium phosphate (PCL-TCP) high-porosity bioactive scaffolds, and cultured in our bi-axial bioreactor, and predifferentiated for 2 weeks before transplantation into a 7-mm rat femoral segmental defect. Vascularisation was studied through microfil vascular contrast on microCT, and bone healing monitored through serial microCT, histological analysis and mechanical testing.

Results: Compared with empty defect, bioreactor-enhanced hfMSC/PCL-TCP scaffolds can induce the larger vasculature network forming in the defect area after 1 month's implantation and regenerate greater new bone in the defect area after 3 months demonstrated by microCT analysis and histological study, resulting in repair femur with significantly higher mechanical strength.

Conclusion: This proof-of-principle experiment demonstrates the superior bone forming capacity of a bioreactor-enhanced cellular-scaffold, with improved vascularisation and osteogenic capacity of value to all large voluminous defects.

S4

Anterior Segment Optical Coherence Tomography Agrees Well with Clinician Assessment of Angle Configuration: Optimizing Clinician-Independent Screening of Patients for Predisposition to Angle Closure GlaucomaEW CHAN¹, C ZHENG², PT CHEW^{2,3}, MD AQUINO³, JL SEE³¹National Healthcare Group, Singapore, ²Department of Ophthalmology, Yong Loo Lin School of Medicine, National University of Singapore, Singapore, ³Department of Ophthalmology, National University Hospital, Singapore

Aim: Screening methods for patients predisposed to angle closure glaucoma require ophthalmologist evaluation. We aimed to assess the adequacy of biometric parameters measured on anterior segment optical coherence tomography (AS-OCT) by correlating them with ophthalmologists' assessment of angle configuration in the images.

Methods: This was a cross-sectional study involving 178 eyes from 178 patients. Parameters evaluated were anterior chamber depth (ACD), scleral spur-scleral spur distance (SSD), lens vault (LV), angle recess area at 500 μ m (ARA500) and 750 μ m (ARA750) and angle opening distance at 500 μ m (AOD500) and 750 μ m (AOD750). A panel of 3 glaucoma ophthalmologists graded angle configuration based on iris-trabecular meshwork contact and urgency for laser peripheral iridotomy into closed, very narrow, narrow and open angle categories. Parameters were correlated with angle configuration. The receiver operating characteristic (ROC) of parameters were compared to identify cut-off values for angle closure.

Results: ACD, LV, ARA500, AOD500, ARA750, AOD750 showed significant agreement ($P < 0.001$) with clinician-assessed angle configuration, while SSD did not ($P = 0.651$). The order of agreement of the parameters were, from most to least optimal, AOD750 (AUC 0.978), ARA750 (0.964), AOD500 (0.959), ARA500 (0.909), ACD (0.834) and LV (0.810). In AOD750, the best combination of sensitivity of 96.7% and specificity of 94.6% was determined at a cutoff value of ≤ 0.278 mm.

Conclusion: Parameters on AS-OCT correlated well with clinician assessment of angle configuration, with AOD750 having the highest sensitivity and specificity. AS-OCT has the potential to be employed as a clinician-independent screening modality for angle closure.

S5

Pain Experienced during Ophthalmic Laser Procedures

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Aims: To investigate the severity of pain experienced by patients during argon laser photocoagulation and to determine the relationship between severity of pain and the laser parameters.

Methods: Sixty-two patients undergoing argon laser photocoagulation (panretinal photocoagulation (PRP), focal lasers) were interviewed within 1 hour of their laser procedure using a standardised questionnaire. The pain experienced during the laser procedure was scored on a visual analogue scale of 0 to 10, where 0 represents no pain and 10 represents the most severe pain. No pain relieving medication was provided during the procedure.

Results: The mean age of the 62 patients was 57.9 years (range, 34–81, SD \pm 9.0). Of the 30 patients undergoing panretinal photocoagulation (PRP), 27 (90%) experienced pain. The mean pain scores were 3.0 (sharp), 1.40 (dull), 0.37 (throbbing) and 0.17

(constant). There was no significant difference between the pain scores of those who received more than 1000 laser burns compared to those with less. The power of the laser beam correlated with the pain score for throbbing pain ($P = 0.04$). Of the 32 patients undergoing focal or grid photocoagulation, 13 (40.6%) experienced pain. The mean pain scores were 0.31 (sharp), 0.88 (dull), 0.19 (throbbing) and 0.13 (constant). Sharp pain correlated with the power of the laser ($P = 0.003$) while throbbing pain correlated with the number of shots ($P < 0.001$).

Conclusion: A higher proportion of patients undergoing PRP experienced pain compared to those undergoing focal photocoagulation. Pain score correlated with the power and number of laser burns.

S6

Short-term Outcomes of the Ligation of Inter-Sphincteric Fistula Tract (LIFT) procedure for Treatment of Fistula-in-Ano: A Single Institution Experience in SingaporeAW KOW¹, AC ROSLAN², K CHITTAWATANARAT³, CB TSANG³, DC KOH²¹Department of General Surgery, Tan Tock Seng Hospital, Singapore, ²Division of Colorectal Surgery, Department of Surgery, National University Hospital Singapore

Introduction: The ideal treatment for fistula-in-ano (FIA) should result in high healing rates, low recurrence rates, preservation of sphincter function and minimising patient discomfort. The current surgical options available such as fistulotomy, seton insertion and endorectal advancement flaps (ERAF) seem suitable for simple FIA but not for complex fistulae like the intersphincteric FIA. We present our experience with a promising new technique, the ligation of the inter-sphincteric fistula tract (LIFT) procedure.

Methods: Our study period was between April 2006 and January 2007. We enrolled patients who required surgical intervention for fistula-in-ano prospectively into the study. Extra-sphincteric fistulae were excluded. During the pre-operative assessment, all patients underwent anal manometry and endoanal ultrasonography to delineate anal sphincter function and anal canal and fistula anatomy. Intraoperatively, under general anaesthesia, the LIFT procedure was performed. A partial core-out fistulectomy was also performed as part of this procedure.

Patients were followed up every 1 to 2 weeks until healing occurred. Anal manometry and endoanal ultrasonography were repeated at least 6 weeks post-operatively, and when there were clinical indications.

Our primary outcome of interest included operative time, healing rate, healing time, pain scores and complications.

Results: Seventeen patients were enrolled. The majority (11/17) had high fistulas as defined by ultrasonography. Mean operative time was 42.6 minutes (range: 15–95 minutes). Pain scores and complication rates were low. The healing rate was 76.5% and mean healing time was 6 weeks. There were 4 treatment failures, 3 of which were high fistulas. There was 1 late recurrence. The longest follow up was 13 months. Post-operative anal manometry did not show significant changes from baseline.

Conclusion: The LIFT procedure is a promising technique for treatment of fistula-in-ano, even in high inter-sphincteric fistula.

S7

Expanding the Use Of Ophthalmic Quality-of-Life Assessments by Employing Hypothetical Scenarios

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Aim: To assess the impact of using modified quality of life (QOL) assessments in myopia. Questions were asked in the context of a hypothetical scenario where curative treatment (glasses and contact lenses) was unavailable.

Methods: Sixty myopic university students were administered standard and modified Visual Function (VF)-14 and utility values questionnaires (time trade-off [TTO] and standards gambles for death and blindness [SGD & SGB]). The modified questionnaires required participants to imagine life without corrective lenses and answer accordingly.

Results: Compared to the standard questionnaires, severe (spherical equivalent [SE] \leq -6D) and moderate (SE -3.00D to -5.99D) myopes reported lower QOL in the modified VF-14, TTO, SGD and SGB questionnaires (VF-14 - severe: 27.5 vs 99.5, $P < 0.001$; moderate: 61.6 vs 98.9, $P < 0.001$. TTO - severe: 0.75 vs 0.95, $P < 0.001$; moderate: 0.83 vs 0.96, $P < 0.001$. SGD - severe: 0.92 vs 1.00, $P = 0.01$; moderate: 0.96 vs 0.98, $P = 0.006$. SGB - severe: 0.89 vs 0.99, $P = 0.009$; moderate: 0.95 vs 0.98, $P < 0.001$). Severe myopes scored lower than moderate and mild myopes only in the modified VF-14 (severe vs mild: 27.5 vs 77.6, $P < 0.001$; severe vs moderate: 27.5 vs 61.6, $P < 0.001$).

Conclusion: Severe and moderate myopes understood the hypothetical situation and reported lower QOL on the modified VF-14, TTO, SGD and SGB assessments compared to the standard questionnaire. The subjects scored lower with increasing severity of myopia only in the modified VF-14 but not the other standard or modified QOL assessments. Hypothetical scenarios in QOL assessments, especially VF-14, are a promising way of studying QOL.

S8

Laparoscopic Common Bile Duct Exploration (LCBDE) as a Salvage Procedure for Failed Endoscopic Treatment of Common Bile Duct Stones (CBDS)

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Aim: To propose LCBDE as salvage procedure for failed endoscopic treatment for CBDS.

Methods: Retrospective case note review of patients managed with LCBDE after attempted endoscopic treatment for CBDS with particular interest to review the case notes of 15 patients who underwent LCBDE after failed endoscopic stone extraction.

Results: Forty-three patients underwent LCBDE at TTSH since 2006. Twenty-one out of 43 patients had an attempt for endoscopic treatment. Six out of 21 patients had successful endoscopic stone extraction. In the remaining 15 patients the stone was not successfully extracted either due to technical difficulty or critical illness of the patient. The mean age of these 15 patients was 64.4 years. Mean interval from endobiliary intervention to LCBDE was 32.6 days in. LCBDE was successful in removing the stones in all the patients with one open conversion. Mean operating time was 253 minutes. Transcystic approach was used in 7, and in 8 patients laparoscopic

choledochotomy was performed. Three patients had T-tube placed and 2 patients had internal C stent placed. Abdominal drains were used in 12 patients and average time to removal was 2.9 days with a mean hospital stay of 2.6 days. There was 1 bile leak, which resolved spontaneously. Fourteen patients were treated as ambulatory care surgery and 1 patient as same day admission.

Conclusion: LCBDE can be safely and effectively proposed as a salvage treatment for failed endoscopic stone extraction. Training of surgeons in LCBDE should be encouraged.

S9

Laparoscopic Ileorectal Anastomosis: Discussion of Technique and Review of Literature

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Aim: Reversal of Hartmann's procedure or restoration of ileorectal continuity is a major undertaking by open method. Thus the rate of reversal is low. Our aim was to review the current literature and discuss the technique along with a word of caution.

Methods: We report our case of a morbidly obese man who underwent a laparoscopic ileorectal anastomosis following an open subtotal colectomy done for massive bleeding diverticular disease. We also report a unique complication in this case unrelated to ileorectal anastomosis. The technique will be discussed in detail along with a video presentation.

Results: The restoration of intestinal continuity was successfully done laparoscopically. The operative time was 3 hours and 20 minutes and blood loss was 200 ml. Patient was started on oral feeding on third postoperative day when he had an unusual complication not related to ileorectal anastomosis.

Conclusion: With increasing experience in laparoscopic colorectal surgery and with innovations in select cases, laparoscopic reversal of Hartmann's procedure is a technically feasible and safe alternative for the restoration of intestinal continuity and is supported by the current literature. The procedure results in minimal morbidity and short hospital stays. Conversion to open surgery is uncommon despite prior and often extensive abdominal surgery.

S10

The Impact of Age and Riding Position on Mortality of Inpatient Adult Motorcycle Casualties: A Major Trauma Centre's Experience

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Introduction: In Singapore, road traffic accidents (RTAs) are the second most common cause of deaths in trauma. Motorcycle casualties account for 54% of all fatalities. Studies have shown that the mean age of motorcycle casualties are significantly younger than other RTA victims.

Methods: We reviewed the mortality of all motorcycle casualties ≥ 16 years, admitted to an acute hospital as an emergency from January 2004 to December 2006. In order to determine the impact of age on mortality, we divided our patients into 2 groups, 1 group consisting of patients ≤ 21 years (younger), and the other group consisting of those > 21 years (older). A subset analysis based on riding position (motorcyclist vs pillion rider) was performed to determine the impact

of mortality in these 2 groups.

Results: There were 96 (14%) patients in the younger group and 586 (86%) patients in the older group. The mortality for younger motorcycle casualties was significantly higher (14.6% vs 8%). ($P = 0.04$) There were significantly more pillion riders in the younger group (25% vs 8.4%). ($P = 0.0001$) The mortality rate of the young pillion riders was significantly higher than the young motorcyclists (29.2% vs 9.7%). ($P = 0.019$) The mortality rate of the young pillion riders was significantly higher than the older pillion riders. (29.2% vs 10.2%) ($P = 0.04$).

Conclusion: Young motorcycle casualties have a significantly higher mortality rate than older motorcycle casualties. Young pillion riders have the highest mortality rate and contribute significantly to the mortality of the young motorcycle casualties.

S11

Outcome of Operative Management of Patients with Splenic Injury in a Trauma Center: Splenectomy vs Splenorrhaphy

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Aim: Splenic injury is one of the most common solid organ injuries in abdominal trauma. While splenectomy is performed commonly in severe splenic injury beyond salvage, splenorrhaphy is an alternative surgical option in an attempt to conserve the spleen. This study examines the outcome difference between splenectomy and splenorrhaphy in patients undergoing operative management for splenic injuries.

Methods: A retrospective database comprising of 15 patients with splenic injuries requiring either splenectomy or splenorrhaphy between December 2001 and September 2007 was analysed. We defined splenorrhaphy as surgery involving the use of a vicryl mesh to envelope the spleen and vicryl sutures to secure adequate pressure with the mesh.

Results: The mean age was 35 ± 18 years. All the patients in the splenectomy group were male compared to the splenorrhaphy group ($P = 0.02$). There was no statistical difference between the 2 groups in terms of racial distribution.

Preoperative investigative modalities like Focused Abdominal Sonography in Trauma (FAST), Computer Tomography (CT) abdominal scan or diagnostic peritoneal lavage/aspirate (DPL/A) did not predict the type of surgery required ($P = 0.91$, $P = 0.26$, $P = 0.22$). The presence of hypotension prior to surgery also did not influence the type of surgery performed on the spleen ($P > 0.05$).

Postoperative complications were not significantly higher in either group of patients. There was no statistical difference between the 2 groups in terms of total blood loss intra-operatively, total blood products required intra- and post-operatively, as well as post-operative length of stay.

Conclusion: Outcomes between patients with splenic injury requiring either splenectomy or splenorrhaphy are comparable. Therefore, splenorrhaphy is an available option in surgical management of splenic injury.

S12

Change in Quality of Life Following Cataract Extraction

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Aim: To evaluate the visual quality of life (QOL) of patients with cataracts before and after cataract surgery and to assess factors affecting the change in QOL.

Methods: A longitudinal, questionnaire-based study of 20 consecutive patients with cataracts was carried out. Patients' QOL was assessed before and after phacoemulsification cataract surgery using time trade-off (TTO), standard gamble for death (SGD), standard gamble for blindness (SGB) utilities and visual function-14 (VF-14) questionnaires.

Results: The mean age of the patients was 66.2 years (range, 48-80, $SD \pm 8.9$). All the visual quality indicators improved after cataract surgery (VF-14: 74.5-96.3, $P = 0.001$; TTO 0.86-0.89, $P = 0.75$; SGD 0.88-0.98, $P = 0.06$; and SGB 0.84-0.98, $P = 0.029$). Preoperatively, the mean VF-14 score was lower for subjects with advanced cataracts (advanced: 67.3, early: 82.7). There was a greater improvement in VF-14 score after cataract surgery for patients with advanced cataracts (39.4) compared to those with early cataracts (12.3) ($P = 0.013$). The mean VF-14 score improved from 72.8 to 93.4 in patients with VA $> 20/40$ compared to 78.8 to 98.3 for those with VA $\leq 20/40$ initially. SGD and SGB correlated with each other both pre- and post-operatively ($P < 0.001$). There were no correlations between VF-14 and utility values.

Conclusion: There are improvements in quality of life indicators after cataract surgery using both VF-14 and utility values. Patients' visual function improved following cataract extraction, with the improvement greater for those with more advanced cataract disease and poorer VA initially. Standard gambles for death and blindness correlated well.

S13

Variability in the Assessment of Anterior Chamber Depth Using the Modified Van Herick Method – Factors Affecting Errors

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Aim: To evaluate the variability in peripheral anterior chamber depth (ACD) assessment using the modified Van Herick method.

Methods: In a prospective clinical study, 76 subjects (151 eyes) were examined separately by 4 trained examiners using a Haag-Streit slit lamp under standardised lighting. The subjects' peripheral ACD was assessed using a seven-grade modified Van Herick method (ACD 0%, 5%, 15%, 25%, 40%, 75% or 100% of peripheral corneal thickness). Variability between the observers was calculated and Kappa statistics (K) were used to ascertain the level of agreement.

Results: The mean age was 48.6 years ($SD \pm 22.74$, range 20- 86). There were 47 males (62%) and 29 females (38%). For all subjects, agreement among the raters is fair (Kappa OD: 0.35; OS: 0.33). Between 2 observers, variations in ACD grading were more common in older subjects (60% vs 22%, $P < 0.01$) and shallow anterior chambers (55% vs 39%).

Conclusion: The modified Van Herick method of assessing ACD is fairly reliable. Larger variations occur when assessing older subjects and shallow anterior chambers.

S14

A Comparison of Hand-Assisted Laparoscopic (HAL) and Standard Laparoscopic-Assisted Proctectomy (SLS) as Treatment for Rectal Cancer in Singapore: A Single Institution Experience

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Introduction: The role of laparoscopic proctectomy for rectal cancer remains controversial due to the paucity of randomised studies. However, the techniques of this approach are well-described. The aim of this study was to compare the short-term outcomes of Hand-assisted Laparoscopic proctectomy (HAL) with Standard Laparoscopic-assisted proctectomy (SLS) in the treatment of patients with rectal cancer.

Methods: We performed a retrospective review of all patients who were treated with laparoscopic-assisted proctectomy for rectal cancer (either HAL or SLS) between July 2004 and May 2007. The inpatient medical records were reviewed and the data collected and analysed using the SPSS software. The independent *t*-test and Mann-Whitney test were used to compare parametric and non-parametric variables respectively. Statistical significance was set at 95% confidence interval and the *P* value at <0.05.

Results: Sixty-one patients (30 HALS, 31 SLS) were analysed. Both groups were similar in demographic distribution and ASA status. The mean distance of the tumour from the anal verge was 12.5 ± 5 cm and 10 ± 4 cm for HAL and SLS groups respectively (*P* = 0.063). Mean duration of surgery was 189 ± 77 min for HAL and 205 ± 54 min for SLS (*P* = 0.363). The mean lymph node harvest was 15.7 ± 8 for HAL and 14.9 ± 7 for SLS. Half the patients (50%) in the HAL group had stage Duke's B tumors, while Duke's B and C comprised 39% and 45% respectively in the SLS group.

The overall length of stay (LOS) was comparable for both HAL and SLS group, with a mean of 6.7 ± 3.8 days and 6.5 ± 4.9 days respectively (*P* = 0.912). Morbidity rate was 18% (HAL) and 25.8% (SLS), including 2 anastomotic leaks in each group and 2 rectovaginal fistulae in the SLS group. Post-operative ileus was twice more often in the SLS group (23%) compared to the HAL group (11%). Other minor morbidity included wound infection (1 in HAL and 2 in SLS). There was no mortality or readmission within 2 weeks post-surgery.

Conclusion: Both HAL and SLS proctectomy are equally effective in treating rectal cancers with both groups yielding comparable short-term outcomes and oncologic clearance.

S15

Prevalence of Poor Visual Outcome after Laser Photocoagulation for Diabetic Retinopathy at One Year and Two Years

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Aim: To determine the prevalence and risk factors for poor visual outcome after laser photocoagulation for diabetic retinopathy (DR) at 1 and 2 year intervals.

Methods: A review of 504 eyes undergoing focal, grid or pan-retinal photocoagulation for DR was done, identifying risk factors for poor visual outcome (visual acuity [VA] 6/60 or worse) after 1 and 2 years.

Results: The mean age of the 504 cases was 58.1 years (range 31-85). Overall, poor outcome occurred in 7.1% and 4.3% of cases at 1 and

2 years respectively. The rates were highest for the subgroup with both clinically significant macular edema (CSME) and non-proliferative diabetic retinopathy (NPDR) (14.2% & 9.2% at 1 and 2 years). Loss of e³ lines of Snellen VA occurred in 8.2% and 8.9% of cases at 1 and 2 years respectively. Vision remained relatively stable over 2 years, with most patients staying within the same VA range during that period. Overall, more than 80% of cases remained stable within the good VA range of 20/20 to 20/40. Patients presenting with severe NPDR or proliferative diabetic retinopathy and poor initial VA experienced the greatest improvement in VA at 1 and 2 years, with 83.3% improving to 20/150 or better at 1 year and 75% of these improving to 20/40 or better at 2 years.

Conclusion: The prevalence of poor outcome following laser photocoagulation for diabetic retinopathy was 7.1% and decreased to 4.3% at 2 years. Most patients remain stable within the same VA range as the initial VA.

S16

Early Experience in Laparoscopic Liver Resection for Colorectal Liver Metastasis

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Aims: Laparoscopic liver is a new technique in liver surgery. A previous colorectal surgery may pose further challenges for this approach. We aim to study the feasibility of laparoscopic liver resection for colorectal metastases following previous colorectal resection.

Methods: From May 2007 to April 2008, 4 laparoscopic liver resections for colorectal liver metastasis were performed. Four matched controls were found from our open liver resection database based on type of resection, presence of cirrhosis, age, presence of steatosis, and gender. Peri-operative data were studied.

Results: Comparing the 4 laparoscopic liver resections for colorectal liver metastasis to the 4 open liver resections, the former has lesser intra-operative blood loss (mean 225 ml vs 750 ml); shorter operation duration (mean 283 minutes vs 312.5 minutes); shorter length of hospital stay (mean 6.75 days vs 7.5 days); lesser amount of post-operative analgesia consumption (mean 15.8 mg vs 41.06 mg); and lower average daily pain score (mean 0.98 vs 3.07 at rest, mean 2.67 vs 4.55 on movement).

Conclusion: Laparoscopic liver resection is feasible following previous colorectal resection and offers superior peri-operative outcomes.

S17

To Avoid Unnecessary Skull X-ray

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Aim: To decrease unnecessary use of skull X-ray in paediatric age group with stable head injury by 90% in 6 months at children's emergency.

Methods: The total number of head injuries in 6 months (January 2007 to June 2007) was 40. The number of children who underwent skull X-ray were 17 (42%). None reported a fractured skull.

Criteria were set –normal mental status GCS 15/15, no abnormal or focal findings on neurological examination, no physical evidence of skull#. Exclusion criteria –multiple trauma, un-observed loss of consciousness, bleeding diathesis, AV malformation or shunts, suspected child abuse, suspected cervical spine injury.

Regular briefing of MO's, modification of head injury advice, international standards for the references, CE and ward nurses are also involved in explaining to the parents.

Results: The use of unnecessary skull X-ray was decreased by 100% in 3 months.

S18

Is Alphafetoprotein a Good Screening Tool for Hepatocellular Carcinoma and its Recurrence?

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Aim: While Alphafetoprotein (AFP) is useful in diagnosing hepatocellular carcinoma (HCC), its efficacy in screening for resectable disease and for recurrences is unknown. We aim to elucidate this by studying the serial AFP trends in patients with curatively resected HCC and at recurrence.

Methods: Patients who had curative resection for HCC at the National University Hospital Singapore from 2001 to 2006 were analysed.

Results: Seventy-two patients were studied. The mean preoperative AFP was 3081.31 ug/L. However, 50% of these patients had AFP <20ug/L and 75% had <200 ug/L at time of resection. Mean AFP at time of recurrence was 9638.34 ug/L and that at last follow-up for non-recurrences was 21.13 ug/L. A total of 56% of the subjects who had recurrences, had AFP values on upward trend after normalisation following surgery. AFP at laboratory 'normal level' of 15.00 ug/L has the highest sensitivity (63%) and negative predictive value (78.7%) but lowest specificity (90.2%), while cut-off at 400.00 ug/L has the highest specificity (100%) and positive predictive value (100%). Patients with preoperative AFP ≥400 ug/L have a higher probability ($P=0.000$) of having AFP ≥400 ug/L at recurrence, while those with preoperative AFP <400 ug/L have higher probability ($P=0.000$) of having AFP <400 ug/L at recurrence. Patients with preoperative AFP <200 ug/L have a higher probability ($P=0.000$) of having AFP <200 ug/L at recurrence.

Conclusion: Single AFP value is not a good indicator of early resectable HCC. A recurrent tumour has similar AFP secreting characteristics as the primary and as such AFP surveillance is useful only when initial AFP is high.

S19

Genetic Polymorphisms in Cytokine Genes and Response to Bacillus Calmette-Guerin Immunotherapy for Superficial Bladder Cancer

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Aim: As a 'gold-standard' treatment for high risk superficial bladder cancers, Bacillus Calmette-Guerin (BCG) immunotherapy still has a 20-40% tumour recurrence rate along with frequent, potentially

serious side effects. A number of cytokine gene polymorphisms have been linked to the response to BCG therapy. IL-10 is of particular interest as polymorphisms in the promoter region have been linked with decreased IL-10 production.

Methods: Peripheral blood DNA was prospectively obtained from 99 high-risk superficial bladder cancer patients, who underwent post-resection intravesical regimes of BCG (81 mg, n = 50 or 27 mg, n = 19) or BCG (27 mg) with interferon alpha (IFNa) (n = 30), and followed-up for a mean of 4.5 years. A single nucleotide polymorphism in the IL-10 promoter region (-1087) was tested with restriction fragment length polymorphisms following PCR amplification. Healthy controls were also recruited and genetic polymorphisms of 13 have been analysed. Data was analysed using chi-square analysis.

Results: Of the 82 with AA genotype, these were the results: tumour free n = 56 (68.3%), recurrence n = 17 (20.7%), progression n = 9 (11.0%). Of the 17 with AG genotype, these were the results: tumour free n = 11 (64.7%), recurrence n = 4 (23.5%), progression n = 2 (11.8%). Recurrence, progression time, cancer-specific death were analysed as parameters using chi-square analysis and found to be not significant. Controls had similar proportions of polymorphisms as patients.

Conclusion: Our findings suggest that the genetic polymorphism in the (-1087) promoter region of the IL-10 gene alone, does not correlate with response to BCG treatment. Other cytokines should be studied as well and evaluated together along with this result for a more conclusive correlation of cytokine polymorphisms and response to BCG treatment.

S21

A Study of Endogenous Endophthalmitis in an Asian Population

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Aim: To describe the demographics, microbiology and outcomes of endogenous endophthalmitis in a tertiary ophthalmic centre.

Methods: Review of all patients diagnosed with endogenous endophthalmitis in the Department of Ophthalmology, Tan Tock Seng Hospital between 1998 and 2006 was carried out. Endophthalmitis cases were identified via DRG codes as well as reviewing operating theatre and clinical procedure records.

Results: Of a total of 50 endophthalmitis cases identified, there were 16 cases of endogenous endophthalmitis (32%). The mean age of these patients was 65 years (range 48-87), with an equal proportion of males and females. There was a higher proportion of Chinese affected (68.8%) compared to non-Chinese (31.2%), with a higher occurrence in patients with diabetes mellitus (56.3%) compared to non-diabetics (45.7%). Of the vitreous samples cultured, 62.5% yielded positive results. The most common organism cultured was coagulase negative staphylococcus (18.8%) followed by Klebsiella, Pseudomonas and fungi (each 6.3% respectively). Outcome measures, in terms of final visual acuity, were worse than 6/12 in 93.8% of patients.

Conclusion: Endogenous endophthalmitis occurred more commonly in diabetic patients. The most common organism cultured was coagulase negative staphylococcus, and visual prognosis was generally poor.

S22

The Artificial Bowel Sphincter for Fecal Incontinence: The NUH Experience

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Aim: This study was undertaken to evaluate our experience with the AMA® artificial bowel sphincter (ABS) implantation for the treatment of intractable fecal incontinence in an Asian population.

Methods: At the National University Hospital Singapore, 6 Asian patients underwent ABS implantation between March 2004 and December 2007 for fecal incontinence. These patients were reviewed retrospectively to determine operative and functional outcomes.

Results: The ABS was implanted successfully in 6 patients [mean age: 50 (20-73) years; 4 males]. The 2 most common causes of incontinence were congenital anomaly of the anus (imperforate anus after a pullthrough procedure: 2 patients) and status-post ultralow anterior resection (2 patients). Two patients required device explantation due to post-operative infection, one of whom eventually required a stoma. No other patient required a revision or replacement. After a mean follow-up of 22 (4-36) months, 4 patients continued to have a functional artificial bowel sphincter. Fecal incontinence severity scores improved from a mean of 13 (12-14) preimplant to 6 (0-9) post activation. Anal manometry showed an increase in mean resting pressures. [Pre-implant 19.2 ± 7.5 vs Post-implant (cuff inflated) 45.0 ± 12.0 mmHg]. The comparative pre-operative and post-activation fecal incontinence quality of life (FIQL) scores showed improvement [(FIQL1, lifestyle: 0.82 ± 0.26 vs 0.85 ± 0.25 ; FIQL2 coping/behaviour: 0.59 ± 0.30 vs 0.79 ± 0.19 ; FIQL 3 depression/self perception: 0.64 ± 0.30 vs 0.84 ± 0.28 ; FIQL4, embarrassment: 0.34 ± 0.13 vs 0.79 ± 0.28 ; Global of FIQL: 0.60 ± 0.25 vs 0.81 ± 0.24 in pre- vs post-implantation respectively]

Conclusion: The AMA® ABS is a suitable option for the treatment of intractable fecal incontinence. Infection remains the major impediment to good outcomes.

S23

Immune Reactivation Uveitis – A Case Out of the Box

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Aim: To report a patient with an atypical presentation of immune reactivation uveitis (IRU) in Singapore.

Methods: A 60-year-old Eurasian male, newly diagnosed with AIDS (acquired immunodeficiency syndrome) with a baseline CD4 cell count of <20 and treated with 2 weeks of highly active antiretroviral therapy (HAART), presented to our clinic with complaints of blurring of vision, floaters, redness and pain in his right eye for 1 week.

Result: Slit lamp examination revealed a severe right anterior uveitis with keratic precipitates, hypopyon, active vitritis and retinitis with haemorrhages and perivascular sheathing. Retinal appearance was suggestive of cytomegalovirus (CMV) retinitis and clinically unlike that of acute retinal necrosis/progressive outer retinal necrosis. Steroid eye drops were started and the hypopyon progressed to a hemorrhagic component with clinical improvement seen within 3 days. His left eye remained quiescent.

Conclusion: Very few IRU cases with anterior segment inflammation have been reported to present as a hemorrhagic hypopyon. IRU is also seldom seen as early as 2 weeks post HAART initiation. Systemic immune reconstitution has been described in patients as early as within a few days of starting HAART but intraocular inflammatory responses have typically been described after 1 to 6 months. Hence, this case highlights the need to consider IRU as the cause of intraocular inflammatory disease seen in patients even within a few days of commencing HAART. Changes in the degree of immunosuppression, especially from a low baseline, can affect the intensity of inflammation associated with CMV retinitis and change the course of its presentation.

S24

Spanning Reconstruction Plate – A Novel Technique in Fibular Free Flap Mandibular Reconstruction

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Introduction: The fibula free flap is widely used in mandibular reconstruction. The current emphasis is on the preservation of form and function by maintaining the spatial relationship of the bone and soft tissue. Accurate 3-dimensional contouring of the fibula to create the neomandible and precise restoration to preoperative alignment after resection is critical in reestablishing native occlusion and facial symmetry. This remains a challenge for surgeons.

Aim: The remnant mandibular fragments tend to become freely mobile following segmental mandibulectomy. Various methods have been described to maintain and stabilise their position. Temporary external fixation, intermaxillary fixation using arch bars and preplating with reconstruction plate have been attempted to achieve this purpose. We describe a modification to the pre-plating technique commonly used to maintain mandibular position intraoperatively.

Methods: Our patient has a defect that spans the angle on the left to mid parasymphysis on the right after wide resection of left buccal squamous cell carcinoma. A spanning unilock plate was placed on the vestibular aspect of the superior border of the bilateral mandibular remnants prior to resection. Segmental mandibulectomy is then performed with the plate removed. Reattachment of the spanning plate establishes the original alignment of the mandibular remnants and provide rigid fixation. The fibular bone is contoured using a single osteotomy using the resected mandible or the contralateral normal mandible as a template.

Results: The superiorly positioned spanning reconstruction plate maintains rigid fixation of the mandible with the advantage of leaving the defect completely free and unhampered by hardware, allowing for planning of the fibula osteotomy and easier fixation of the neomandible to reconstitute the mandible. The size and location of the diseased mandible does not affect the placement of the spanning plate as it is only fixed to the normal mandibular remnants.

Conclusion: Using this modified technique, we are able to recreate an almost similar mandibular profile with ease and achieve good functional and aesthetic result.

S25

Surgical Treatment of Fistula-in-Ano in Singapore – A Retrospective Study of 457 Patients

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*Division of Colorectal Surgery, Department of Surgery, National University Hospital of Singapore***Aim:** To evaluate the outcomes of patients who underwent surgical treatment for fistula-in-ano (FIA) from 2002 to 2006.**Methods:** All patients who underwent various types of surgery for FIA were studied retrospectively. All fistulae were classified using Parks' classification and type of surgery performed was recorded. Specific end points studied included patient demographics, type of surgical procedure correlated with type of fistula, healing and recurrence rates.**Results:** Four hundred and fifty-seven patients with a mean age of 41.2 years were assessed. Male to female ratio was 4:1. Ethnic distribution was as follows: Chinese 66.3%; Indian 16.2%; Malay 13.1% and others 4.4%. 8.5% of the patients had co-morbidities (7.2% diabetes mellitus; 0.7% inflammatory bowel disease; 0.4% rectal cancer and 0.2% HIV positive). 45.5% of them were evaluated preoperatively with endoanal ultrasonography. The distribution based on classification was as follows: inter-sphincteric 209 (47.3%), trans-sphincteric 220 (49.8%), supra-sphincteric 2 (0.5%), extra-sphincteric 4 (0.9%) and horseshoe 7 (1.6%). 26 patients (5.7%) had secondary extension of fistulous track. Ten patients (2.2%) had fistula operation performed prior to their presentation to our hospital. Fistulotomy was predominantly performed for low inter-sphincteric (85%) and low trans-sphincteric fistulae (71%). For higher complex fistulae, seton insertion followed later by definitive surgery was performed for high inter-sphincteric (69%) and high trans-sphincteric (68%), supra-sphincteric (50%), extra-sphincteric (100%) and horseshoe fistulae (100%). The mean time before definitive surgery after seton insertion was 8.9 weeks. The mean time to complete wound healing following surgery was 15 weeks. Fistulae persistence occurred in 29 patients (6.3%) whilst complete healing was achieved in 428 patients (93.7%). The number of operations required for complete healing of the fistulae were distributed as follows: 1 operation: 333 (72.9%), 2 operations: 76 (16.6%), 3 operations: 15 (3.3%) and 4 operations: 4 (0.9%). After a mean follow up of 25 weeks, recurrence was noted in 12 patients (2.6%).**Conclusion:** Our prevalence and distribution of FIA were similar to other studies. The outcomes following surgery guided by Park's classification were satisfactory.

S26

Unilateral Mydriasis During Orbital Fracture fixation: A Case ReportMSW YEO¹, R AL-MOUSA², G SUNDAR², TC LIM¹¹Division of Plastic, Reconstructive and Aesthetic Surgery, Department of Surgery, National University Hospital, Singapore, ²Division of Oculoplastic Surgery, Department of Ophthalmology, National University Hospital, Singapore

Pupillary mydriasis during repair of an orbital fracture can be a distressing event. In a previous study published by Lim et al, eight out of 387 patients undergoing orbital floor fracture fixation through a subconjunctival approach were found to have intraoperative mydriasis (2.1%). In the authors' institution, care of patients with orbital floor fractures is shared between the craniomaxillofacial

trauma and oculoplasty services. In our experience, careful preoperative evaluation and planning can be immensely valuable in allaying anxiety when mydriasis is encountered during fracture fixation. Although disconcerting, mydriasis does not signify visual loss in most clinical situations. The authors briefly outline the neuroanatomy of the pupillary reflex, discuss the common causes of mydriasis and the approach to its diagnostic evaluation. Furthermore, the authors describe a case of mydriasis detected during operative reconstruction of an orbital floor fracture, and its successful treatment.

S27

Circum-Articular Migrations of Broken Cerclage Wire after Patellar Fracture Fixation

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*Department of Orthopaedic Surgery, National University Hospital, Singapore***Aim:** We report on 2 cases of an unusual pattern of circum-articular migration of broken cerclage wires after fixation of patellar fracture, and highlight the clinical implications. This pattern has not previously been reported.**Methods:** Tension band and cerclage wiring techniques have been widely used in the fixation of patellar fractures. Kirschner wires have been reported to migrate to important structures such as heart, thorax, mediastinum, abdominal cavity and major blood vessels. However, there are not many reports of migration of broken cerclage wires, which are commonly used in the fixation of patellar or olecranon fractures. We described 2 cases of circum-articular migration of broken cerclage wires after fixation of patellar fracture.**Results:** We evaluated 2 patients with migration of broken cerclage wire post patellar fracture fixation. The initial and follow-up X-rays of the 2 patients showed similar migration routes of the wire fragment around the knee, towards the popliteal fossa. In 1 patient the wire fragment impinged on the popliteal vessels with incipient vascular injury. Both patients underwent removal of the migrating fragments, and the potential tissue planes that could be the migration path of such broken wires, were explored.**Conclusion:** A better understanding of the potential migration route of such fragments, and the possibility of injury by the broken wire fragments to vital structures, can serve as a guide for the surgeon in deciding the mode of management in such cases, and help in determining the urgency of treatment. With proper treatment, the outcome is favourable.

S28

Laparoscopic Adjustable Gastric Band for Morbid Obesity: Results at Four to Five Years Duration

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*Department of Surgery, Alexandra Hospital Singapore***Aim:** To present the results of laparoscopic adjustable gastric banding surgery for morbid obesity in a cohort of Singapore patients who have been followed up for between 4 and 5 years. The results include amount of weight reduction and late weight regain, co-morbidity resolution or otherwise and recorded complications.**Methods:** Since 2001 AH has accumulated a sizable collection of morbidly obese patients who have undergone laparoscopic adjustable gastric banding for morbid obesity. Some of our early results have been presented previously.

Details of all our patients were recorded prospectively into a database.

Through this database, we are able to retrieve the details of all those patients who have completed 4 to 5 years since their surgery. This timeframe is chosen because other studies have found out that more accurate reflections of weight loss or regain, co-morbidities resolution and operative complications appear 4 to 5 years after the insertion of the gastric band.

Patients who elected to be followed up by our pioneer surgeon, who is now in private practice, were contacted by telephone and electronic means. With this effort we were about to provide follow-up data for the majority of our patients. Their weight reduction after surgery, co-morbidity resolution or otherwise, reported complications, re-operation rate, and weight regain if any, are hereby reported.

Results: There are about 100 patients who have had the gastric band for 4 to 5 years. Among these patients, about 50 have had their gastric bands for 5 years or more. On average weight reduction of over 20% of the excessive weight is achieved in the majority of our patients. There are a significant number of late weight regains. A number of complications, at surgery, early post-operative period, or later, were recorded. Some of these required reoperations, sometimes more than once. Details of these events are presented. There were 2 mortalities.

Conclusion: LAGB is a reasonable surgical procedure for the morbidly obese who fulfill criteria for surgery. It is a relatively safe operation with a predictable outcome in terms of weight reduction and co-morbidity resolution. However, surgical complications do occur and there is a small associated mortality. Careful lifelong follow-up post surgery is essential.

S29

Sensate Propeller Flap for Soft Tissue Coverage of Megaknee Prosthesis

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Aim: The knee region has always been known as a poor source of available flaps. The propeller flap, which is widely used in limb reconstruction, is a useful option in this area. It can be raised easily and allows the coverage of wide defects successfully with good cosmetic and functional results.

Methods: We describe a case for which the propeller flap is used as soft tissue coverage of a knee defect. The defect occurred following wound dehiscence after resection of proximal tibia osteosarcoma in a young patient, causing exposure of Megaknee prosthesis. An island flap was raised in the lateral aspect of leg with careful dissection of the perforators and from the peroneal vessels. Nerves accompanying the vessels were carefully preserved. It was then rotated through 110 degrees to fit into the defect. The donor site was closed with skin grafting.

Results: The patient recovered with no complications, and good aesthetic and functional results. Sensation remains intact over the flap.

Conclusion: The sensate propeller flap is a useful option in the reconstruction of knee defect. It is easy to harvest and manipulate and achieves good functional and aesthetic results with minimal donor site morbidity.

S30

Tolterodine Improves the Compliance and Cystometric Capacity of Adult Neurogenic Bladders Secondary to Spinal Cord Injury

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Aims: Spinal Cord injury patients often develop complications secondary to upper urinary tract deterioration. There have not been any significant studies reviewing the efficacy of tolterodine in the management of patients with adult neurogenic bladders secondary to spinal cord injury. We decided to review our urodynamic data of adult patients with neurogenic bladders with spinal cord injuries who were treated with tolterodine and oxybutynin.

Methods: From our urodynamic database, 136 patients were found to have neuropathic bladders secondary to spinal cord injury. We specifically studied reviewed pre- and post-tolterodine urodynamic studies of these patients and compared them with a similar group of patients who were treated with oxybutynin.

Results: Complete data sets of urodynamics, before and while on medication, were available for 18 and 10 patients treated with tolterodine and oxybutynin respectively. Mean age was 44 years, mean follow-up period was 3 years and male to female ratio was 14:1. The levels of spinal cord injuries were as follows: 16 cervical cord, 9 thoracic cord and 3 lumber spine injuries. For the tolterodine group average increase in compliance was 47 ml/cmH₂O and average change of cystometric capacity was +44.5 ml. For the oxybutynin group, average increase in compliance was 4.2 ml/cmH₂O and average change in cystometric capacity was -80 ml.

Conclusion: Although tolterodine is widely used in the management of neurogenic bladder secondary to spinal cord injuries, there is a paucity of evidence supporting its use especially in delaying worsening compliance and subsequent upper tract complications. Our study indicates that tolterodine seems to improve compliance and cystometric capacity of patients with adult neurogenic bladder secondary to spinal cord injuries.

S31

Glaucoma Drainage Implant Retraction - The Case of the Appearing and Disappearing Tube

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Aim: To report a case of a Glaucoma Drainage Implant complicated by tube retraction which resolved spontaneously.

Methods: In the recent years, insertion of glaucoma drainage devices has become an important approach to reducing intraocular pressure in glaucoma that is refractory to conventional methods by shunting aqueous from the anterior chamber to the sub-tenon space. Tube retraction is a known but uncommon complication. We report on a patient who had an Ahmed Glaucoma Valve implant inserted for primary angle closure glaucoma complicated by episodes of tube migration. The tube initially "disappeared" as it retracted into the sub-tenon space and then spontaneously "re-appeared" in the anterior chamber as it found the track formed and re-entered the eye. This resulted in periods of raised IOP which corresponded to tube retraction and episodes of normalised IOP when the tube re-entered the anterior chamber. The patient eventually had a repeat surgery with reinsertion of the Ahmed Glaucoma Valve implant in another quadrant.

Conclusion: Tube retraction is a significant post-operative complication that may result in eventual failure of the glaucoma drainage device. We postulate possible causes of tube retraction in this case and discuss the peri-operative measures to decrease this risk.

S32

Early Results of Lymphaticovenular Anastomosis

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Introduction: Chronic lymphedema is a debilitating disease that can occur primarily or secondary as a result of previous surgery, infection or radiotherapy. It is usually treated conservatively with limb elevation, compression stockings and physiotherapy. Lymphaticovenular anastomosis (LVA) has recently emerged as an effective method of treating chronic lymphedema. The advent of supermicrosurgical technique allows for the anastomosis of subdermal lymphatic channel with venules 0.5-0.8 mm in diameter. The low pressure venule system enables reestablishment of lymphatic drainage, improving lymphedema.

Aim: The aim of the study is to examine the early results of LVA in our local population

Methods: The authors present a preliminary result of a series of 23 patients who underwent LVA – 10 upper limbs and 13 lower limbs cases. These patients are prospectively followed up after LVA. Circumferential limb measurements are taken pre-operatively and post-operatively at 3 months. The normal limb serves as a control.

Results: Limb girth reduction was present at 3 months post-operatively. No mortality is present. Minor morbidity like cellulitis was resolved with antibiotic treatment.

Conclusion: Based on these early results, we believed that LVA is a safe and effective treatment for chronic lymphedema.

S33

The Prevalence of CAM Usage in Allergic Rhinitis Patients

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Aims: Studies have shown that Complementary and Alternative Medicine (CAM) usage continues to be common in Singapore and other Asian countries. This is seen more in chronic illnesses that push patients to try alternatives that might offer help. While CAM usage has been studied in many clinical settings and diseases, its prevalence in Allergic Rhinitis (AR) in Singapore has not been determined. Because information is limited, it is difficult to gauge the potential magnitude of their health impact. This study aims to determine the prevalence, demographic and disease factors associated with its usage in AR.

Methods: This is a prospective study, surveying all patients seeking treatment for AR in National University Hospital Otolaryngology-Head & Neck Surgery clinic via an investigator-administered questionnaire over a 2-month period. Although figures obtained might not be a true reflection of CAM usage in AR in the entire population, it will represent the group of patients who are having significant symptoms from AR.

Results: One hundred and twenty-eight patients diagnosed with AR were interviewed; the prevalence of usage was 39.8%. The most common form of alternative treatment was Traditional Chinese

Medicine (43.1%) in the form of herbal teas and pills. Other common forms of alternative treatment included acupuncture and aromatherapy with eucalyptus and peppermint. There was no significant relation between CAM usage and demographic factors or disease factors (chronicity and severity).

Conclusion: The use of CAMs in this study is reported to be relatively high. The acceptance level appears to be similar in all socioeconomic status. Thus it is of importance for local doctors to address these forms of treatment in their consult.

S34

Defining the Position of the Deep Inguinal Ring Using Findings at Laparoscopic Inguinal Hernia Repair

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Aim: To establish the surface location of the deep inguinal ring under direct vision during laparoscopic hernia repair, and compare this with currently-practised versions of its surface markings.

Methods: Just prior to surgery, all patients undergoing laparoscopic hernia repair are assessed clinically by the study team who will mark 2 traditional surface reference points of the deep ring, namely the mid-inguinal point (MIP) and midpoint of inguinal ligament (MPIL). The location of the deep ring is ascertained at the time of surgery and its relation and distance, if any, from the surface-marked point is then recorded.

Results: The deep ring was found to correspond to the MPIL in most patients, but in a significant number of patients also found to correspond quite well to the MIP. Obesity is a significant predictive factor for a surface location of the deep ring that lies outside of traditional surface markings.

Conclusions: There is good correlation between the true position of the deep ring and the approximation given by existing guidelines to its surface markings. Comparing the 2 commonly used surface landmarks, the exact position of the MPIL is less well agreed upon and more cumbersome to employ. We propose that the surface marking of the deep ring to be taken at a point just lateral to the MIP, which is a line drawn joining the ASIS and pubic symphysis. This should give a rather convenient yet accurate representation of the location of the deep ring.

S35

Triple Negative Breast Cancers: Clinicopathological Differences in an Asian Population

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Background: Triple negative breast cancers (TNBC) account for 15% of all types of breast cancers and more frequently affect premenopausal African and Afro-American women. There is a paucity of data from Asian countries. We aim to review our data to compare clinicopathological characteristics in our local population.

Methods: Three hundred and twenty-six consecutive patients who sought treatment for breast cancer from May 2006 to December 2007 were analysed. Data on clinical and histopathologic characteristics were retrieved from a prospectively collected database. TNBC patients were defined by negativity of estrogen, progesterone and HER2neu receptors. Chi square analysis was used to evaluate independent prognostic factors.

Results: In the study cohort, the median age was 56 years (range 27-90). Of the patients, 284 (88%) were invasive ductal carcinoma, 18 (6%) were invasive lobular carcinoma, 14 (4%) were mucinous and 8 (3%) were categorised under 'others' (cribriform, tubular etc). Of the cohort, 236 (73%) were estrogen receptor positive, 144 (45%) were progesterone receptor positive and 52 (16%) were Her2neu positive.

The incidence of TNBC is 13%. The majority were between the age groups 51 to 60 years (35%) while 37% were more than 60 years old. Of the patients, 69.8% (n = 30) were Chinese and 30% (n = 13) of the patients were premenopausal. Tumour size was ≤ 1 cm in 3% (n = 1), 1.1-2 cm in 33% (n = 13), 2-5 cm in 49% (n = 19) and >5 cm in 15% (n = 6). Lymphovascular invasion was seen in 10 (29%) patients. A total of 30% (n = 13) presented with AJCC stage 1 disease, 35% (n = 15) with stage 2 disease; 26% (n = 11) with stage 3 disease and 9% (n = 4) with stage 4 disease. The majority were grade 3 tumours (79%).

The non-TNBC group comprised 283 patients (86%). The majority were between 41-50 years old (29%) and 51-60 years old (31%). Of the cohort, 77% (n = 217) were Chinese and 38% (n = 106) were premenopausal. 5% (n = 13) had tumours ≤ 1 cm, 34% (n = 83) were 1.1-2 cm, 46% (n = 114) were 2-5 cm and 15% (n = 38) were >5 cm. Lymphovascular invasion was seen in 33% (n = 75). 31% (n = 88) presented with stage 1 disease, 35% (n = 107) were stage 2, 19% (n = 55) were stage 3 and 12% (n = 33) were stage 4. The majority were grade 1 or 2 tumours (69%). Lymph nodes were positive in 128 (47%).

Prognostic variables evaluated suggest that TNBC tend to occur more commonly in postmenopausal women ($P=0.05$) and have high grade tumours ($P < 0.005$). There were no differences for age, ethnicity, tumour size, lymphovascular invasion, staging and nodal involvement.

Conclusion: The incidence of TNBC in our Asian population is similar to Western literature. TNBC are also more likely to be high grade tumours. However unlike other studies, TNBC seem to be more common in post-menopausal women in our country.

S36

An Evaluation of Risk Factors in Determining the Outcome of Perforated Peptic Ulcers and Determining the Best Surgical Option for High Risk Patients

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Aim: Mortality of surgery for perforated peptic ulcer has been correlated with risk factors as stated from Boey's Score being presence of co-morbidities, perforation more than 24 hours and pre-operative hypotension. However, other factors influencing outcome such as size of perforation, age and type of operation has not been well studied. We aimed to identify the risk factors that predispose to failure of surgical repair and mortality in Alexandra Hospital.

Methods: The retrospective study was based on 76 patients who were operated for perforated peptic ulcers in Alexandra Hospital from 2003 to 2007. Risk factors analysed were Boey's Score, age, size of perforation and type of operation.

Results: There were 67 males and 10 females. Overall mortality rate was 10.5% (8/76). Mortality for Boey's Score 0, 1, 2 and 3, were 0%, 8%, 25% and 50% respectively. Mortality for large ulcers (>1.5 cm)

was 50% (4/8) compared to small ulcers (≤ 1.5 cm), which was 6.3% (4/63). Mean age for patients who died was 71.625 and those who survived was 52.523. Failure rate of surgical repair was 4% (3/76) involving large ulcers. Of the 3 patients who failed surgical repair, 2 were simple omental patch repairs and 1 was pyloroplasty with simple closure. Two subsequently died.

Conclusion: Mortality rate for each category in Boey's Score has been reduced compared to earlier studies. In addition, large ulcer, advanced age and high Boey's Score are risk factors for mortality and failure of repair. Operations other than a simple patch repair may give better outcome in these patients.

S37

Review of the Surgical Conditions of Institutionalised Patients with Mental Disorders

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Aim: Our hospital receives a fair proportion of institutionalised patients with a good proportion from Institute of Mental Health (IMH). No previous study regarding the surgical conditions of IMH patients has been conducted. This study aims to evaluate the surgical conditions, presentation and outcome of this group of patients.

Methods: A retrospective review of patients admitted from IMH to Department of Surgery from the period of January 2007 to February 2008 was conducted.

Results: A total of 88 patients were included in our study. The mean age was 53 years old (range: 17-90 years). A total of 59.1% of the patients were independent in activity of daily living, 56.8% were able to ambulate, 25% were wheelchair-bound and 18.2% were totally bed-bound.

Head injury was the commonest cause for admission to our department, making up 27.3% of the admissions. This was followed by upper and lower bleeding gastrointestinal tract, each with 11.4% of admissions. The proportion of admissions for abdominal pain was 12.5%: sepsis 10.2%, foreign body ingestion 9.1%, constipation 6.8%, acute urinary retention 3.4%, feeding tube related problems 2.3%.

Bivariate analysis of the predictors of readmissions to hospital showed that patients with more than one co-morbidity and those admitted for feeding tube related problems were significant with P values of 0.001 and $P = 0.016$ respectively.

Patients admitted for sepsis were at a much higher risk for developing further complications with odd ration 12.67 (CI 2.09-76.88). Other risk factors for complications included ADL dependence and malnourishment with odd ration of 8.23 (CI 0.92-73.72) and 20 (CI 2.21-180.04) respectively.

Bivariate analysis of the predictors for mortality showed that patients admitted for sepsis, malnourishment and those on NG tube feeding were significant.

Conclusion: This study concluded that patients who were ADL dependent, with more than one comorbidity, malnourished and those admitted for sepsis had a poorer outcome. Hence, special attention should to given to patients with such risk factors identified. In addition, dietary requirements of this group of patients should be looked into.

S38

Outcomes of Laser Treatment in Diabetic RetinopathyJSH LEE¹, CSH TAN²¹*Yong Loo Lin School of Medicine, National University of Singapore, Singapore,* ²*National Healthcare Group Eye Institute, Tan Tock Seng Hospital, Singapore***Aim:** To study outcomes of laser photocoagulation for diabetic retinopathy and clinically significant macular oedema (CSME).**Methods:** A review of 200 patients with diabetic retinopathy who underwent laser photocoagulation between 2004 and 2005 was done. The indications, duration of treatment, final visual acuity and complications were analysed for different subgroups.**Results:** The mean age of the 200 patients was 59.4 years (range 31-84, SD ± 9.32), with 110 males and 90 females. At the end of the review period, 172 cases (86%) were stable, with 23 (11.5%) defaulting treatment and 5 (2.5%) still on active treatment. The mean duration of treatment was 12.3 months (range 1-41, SD ± 7.94) with 54% of cases completing treatment within a year and 93% within 2 years. Visual acuity remained stable, with 70% of cases (111 of 158 cases) having a final visual acuity within one line of the initial visual acuity. The most frequent complication was vitreous haemorrhage, which occurred in 9.3% of cases (16 of 172 cases). Vitreous haemorrhage occurred most frequently in patients with proliferative diabetic retinopathy (30%), followed by 6.5% for severe non-proliferative diabetic retinopathy (SNPDR) and 0% for CSME. Patients with proliferative diabetic retinopathy had poorer final visual acuity ($>6/12$) (42.1% compared to 23.7% for SNPDR and 27.5% for CSME).**Conclusion:** Most patients treated for diabetic retinopathy are stable within 12 months. The final visual acuity is within one line of the initial visual acuity in 70% of cases. Patients with proliferative diabetic retinopathy had poorer outcomes, with 30% experiencing vitreous haemorrhage.

S39

A Prospective Trial Comparing Incision and Drainage versus Saucerisation of Subcutaneous Abscesses

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*Department of General Surgery, Alexandra Hospital, Singapore***Aim:** To determine whether incision and drainage ('I&D') is superior to saucerisation for the treatment of subcutaneous abscesses, in terms of faster wound healing, lower complication rates and higher patient satisfaction.**Methods:** One hundred consecutive patients admitted with subcutaneous abscesses were randomised to receive either incision and drainage, or saucerisation. They were then followed up at weekly intervals. At the end of the follow-up period, wound healing time, with adjustment for wound size was assessed. The type and development of any complication was also noted during the follow-up period. Patients also undertook a questionnaire on satisfaction with regards to the procedure prior to their discharge from follow-up.**Results:** Patients in the 'I&D' group had shorter wound healing times, though this was not statistically significant. Neither group had any significant complication like bleeding or infection. Patients generally reported greater satisfaction with I&D rather than saucerisation.**Conclusion:** This study has increasing clinical relevance as patients become more educated. Although treatment of abscesses should still

be individualised to each case, I&D has significantly shown equally good results with a more expedient recovery process, and may be offered to patients whenever feasible.

S40

Natural History of Small 'Indeterminate' Hepatic lesions in Patients with Colorectal Cancer

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*Division of Colorectal Surgery, Department of Surgery, National University Hospital, Singapore***Aims:** To determine the prevalence and significance of small 'indeterminate' liver lesions (<1 cm on CT scan) in patients diagnosed with colorectal cancer and also to determine if further surveillance imaging of these findings is required.**Methods:** Data were collected retrospectively from 1 January 2002 to 31 December 2005. All patients who were surgically treated for their colorectal cancer and noted to have small 'indeterminate' liver lesions on their initial staging CT were analysed. These lesions were reported as being too small to be characterised. Subcentimetre hepatic lesions, which were characterised definitively by the radiologists as a cyst or metastases were excluded. All subsequent imaging of the liver was reviewed to assess the natural history of these small 'indeterminate' liver lesions.**Results:** Four hundred and nineteen patients underwent surgery for their colorectal cancer and had a staging CT done. Seventy patients (16.7%) had small 'indeterminate' liver lesions on their initial staging CT which could not be definitely characterised. Forty six patients (65.7%) had subsequent follow-up imaging for their liver lesions. Forty one (89.1%) of these showed stable lesions which were likely to be benign in nature. Only 5 patients (10.9%) showed evidence of progression, suggestive of early metastases, on subsequent liver imaging done with a mean follow-up of 8.8 months after the initial staging CT. These patients either died from advanced malignancy or received palliative treatment.**Conclusion:** Small 'indeterminate' liver lesions may occur in up to 16.7% of colorectal cancer patients. Although most of these lesions remain quiescent, surveillance imaging may be recommended as a small but not insignificant number of patients with such lesions actually harbour early metastases.

S41

Profiling Endocrine Disruptors in Benign and Malignant Ovarian Tissues and Cyst Fluid SamplesN KOTHANDARAMAN¹, B CHANBASHA², K SHIVARAJAN², M YIN², L LIN¹, S KOH¹, HK LEE², M CHOOLANI¹¹*Department of Obstetrics and Gynaecology, Yong Loo Lin School of Medicine, National University Health System, Singapore,* ²*Department of Chemistry, National University of Singapore, Singapore***Aims:** The objective of this study is to determine profile and quantify various estrogen metabolites and toxic compounds which mimic estrogens [endocrine disruptors (EDs)] from ovarian tumour tissue and cyst fluid samples.**Methods:** We developed a novel method to determine the accumulation pattern of persistent organic pollutants (POPs) in ovarian tumour tissue and cyst fluid samples, which involves the use of simultaneous microwave-assisted digestion (MAD) and micro-solid-phase extraction (μ -SPE), in which the sorbent is held within a propylene membrane envelope, with gas chromatographic-mass

spectrometric (GC-MS) analysis.

Results: A total of 11 Organo Chlorine Pesticides (OCPs) and 5 Poly Chlorinated Biphenyls (PCBs) were detected in ovarian tumour tissue samples. Two compounds, p,p'-DDD ($P = 0.009$) and p,p'-DDT ($P = 0.045$), showed statistically significant differences in the accumulation patterns in benign cases compared to cancer cases. Estrogen compounds were found to vary in their accumulation pattern in malignant and benign samples as observed for 17 α -ethynylestradiol ($P=0.12$) and 17 β -estradiol ($P=0.035$) respectively. Except for diethylstilbestrol (2x) all the other estrogen metabolites were present in higher concentration in benign samples (estrone (1.05x), 17 β -estradiol (1.85x) and 17 α -ethynylestradiol (1.64x)).

Conclusion: Our results have showed for the first time consistent toxic compound accumulation pattern in all ovarian tumour samples tested. The identified compounds might play significant role associated with malignancy in ovarian cancer along with other compounding factors.

S42

A Novel Strategy for Management of Anterior Table Frontal Sinus Fractures Involving the Frontal Sinus Outflow Tract

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Aim: To describe our experience with a novel single-stage strategy using open and transnasal endoscopic techniques for anterior table frontal sinus fractures with frontal sinus outflow obstruction.

Method: Three patients with depressed anterior table frontal sinus fractures involving the outflow tract, as documented on computed tomography (CT) scan, were managed by open reduction and internal fixation (ORIF) via a bi-coronal incision. Endoscopic fronto-ethmoidectomy and insertion of stents into the fronto-ethmoidal recess were performed at the same time. Nasal packs were removed at 1 week postoperatively and frontal stents removed at 1 month. Patients were followed up by regular endoscopic surveillance and check CT scans at 1 year.

Results: There were 5 depressed anterior table frontal sinus fractures with outflow tract involvement (bilateral in 2 patients, unilateral in 1). Posterior table was intact in 2 patients and minimally displaced in 1. Associated facial fractures included naso-ethmoidal fractures ($n = 5$), orbital blowout fractures ($n = 3$), zygomatico-maxillary fractures ($n=3$) and nasal septal fracture ($n=1$). Patients remained asymptomatic with patent frontal sinus outflow tracts and transilluminable frontal sinuses up to 4 years post-operatively. There were no major post-operative complications.

Conclusion: ORIF with transnasal endoscopic fronto-ethmoidectomy appears to be a successful management strategy in patients with depressed anterior table frontal sinus fractures with outflow tract involvement, obviating the need for secondary-staged procedures. Postoperative endoscopic surveillance is simple without the need for frequent imaging studies, and morbidity from aggressive traditional operations such as obliteration and cranialisation is avoided.

S43

EBV-associated Smooth Muscle Tumour Presenting as a Parapharyngeal Mass – A Rare Presentation

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Aim: To present an interesting patient with Epstein-Barr virus-associated smooth muscle tumour (EBV-SMT) that masqueraded as nasopharyngeal carcinoma (NPC).

Methods: The casenotes, histopathological and radiological investigations of this patient were reviewed. Medline search was performed for all published literature on EBV-SMT.

Results: A 35-year-old Chinese male with known HIV infection and acquired immunodeficiency syndrome (AIDS) was referred with reduced hearing on the left. Examination showed left middle ear effusion and fiberoptic nasendoscopy revealed a submucosal mass on the left with smooth overlying nasopharyngeal mucosa. EBV serology was abnormal (1:640 titre for EBV-viral capsid antigen [VCA] IgA). A provisional diagnosis of NPC was made. MRI scan showed a large soft tissue mass measuring 3.5 cm arising from the left parapharyngeal space. Endoscopic transnasal biopsy of the mass was performed. Histologically, the lesion was cellular with proliferation of polygonal to spindle cells which stained positive for SMA (smooth muscle actin) and EBER-ISH (EBV early RNA in-situ hybridisation), confirming the diagnosis of EBV-SMT.

Conclusion: EBV-SMT is a rare entity that has only recently been recognised. To the best of our knowledge, this is the first reported case of EBV-SMT presenting as a parapharyngeal mass with unilateral conductive hearing loss from serous otitis media. Given the patient's medical history and demographic details, the clinical findings are easily mistaken for that of submucosal NPC. The sporadic occurrence, non-specific presenting features and frequently unusual sites of occurrence are typical of EBV-SMT which therefore often presents a diagnostic challenge for the clinician. Literature review of this condition and its management are discussed.

S44

Temporal Bone Resection for Primary Tumours of the External Auditory Canal – The Singapore Experience

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Aim: To analyse the clinical data and outcome of patients treated by temporal bone resection for primary tumours of the external auditory canal (EAC).

Methods: A retrospective study of all patients with primary tumours of the EAC treated in our department by radical surgery was done. Patient demographics and symptoms were recorded. Tumour location, surgical technique, post-operative radio-therapeutic treatment, histopathological diagnosis and patient outcomes were analysed.

Results: From 1995 to 2007, 13 patients with primary tumours of the EAC underwent temporal bone resection (10 lateral, 3 subtotal). Of

these, 10 had squamous cell carcinoma, 1 had adenoid cystic carcinoma, 1 had recurrent papillary-squamous cell carcinoma and 1 had ceruminous adenocarcinoma. Mean age was 56 years. Nine (69%) were male and 4 (31%) were female. Ten (77%) were Chinese and 3 (23%) were Malay. All but 1 underwent postoperative adjuvant radiotherapy. Survival data for patients with T1 disease at last follow-up ranges from 8 to 58 months. Patients with T2 disease were alive at 18 months, 63 months and 11 years. Patient with T3 disease was alive at 22 months and those with T4 disease were alive at 39, 41 and 58 months. One patient with T4 disease died at 9 months from metastatic disease. Another with T4 disease had tumour recurrence extending to the clivus at 1 year and was alive at 23 months. Post-operative morbidity occurred in 9 (69%) patients.

Conclusion: Primary tumours of the EAC are rare. Our data demonstrate that there is a strong predilection for Chinese male patients. Survival data for patients treated by aggressive radical surgery and adjuvant radiotherapy in our institution appear favourable even in patients with T4 disease.

S45

Multinodular Goitre – Malignancy Risk in Non-Dominant Nodule?

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Aim: The old adage that multinodular goitres have a lower risk of developing carcinoma has been challenged in recent studies. In addition, though the investigation focus has traditionally been on the dominant nodule, we have noticed cancers arising from non-dominant nodules instead.

Therefore the aim of our study is to determine: 1) the incidence of carcinoma in multinodular goitres in our local population, and 2) the incidence of carcinoma arising from non-dominant nodules (versus dominant nodules).

Methods: A retrospective review was conducted on all patients with multinodular goitres, who underwent thyroidectomies from January 2000 to February 2008, by the Department of Otolaryngology - Head and Neck Surgery, National University Hospital. A total of 156 patients fulfilled our criteria, and their histopathology reports were examined, noting: (i) presence of carcinoma, (ii) whether the carcinoma was isolated/uni-focal versus multi-focal, and (iii) whether it arose from the non-dominant or dominant nodule.

Results: The incidence of malignancy in multinodular goitres was 14.7% (23 of 156 patients). Of those with malignancy, 52.2% (12 patients) were isolated/uni-focal and 47.8% (11 patients) were multi-focal. In the isolated/uni-focal group, 5 (41.7%) arose from non-dominant nodules and 5 (41.7%) from dominant nodules. The remaining 2 were indeterminate.

Conclusions: Our study corroborates with recent literature that the risk of malignancy associated with multinodular goitres is comparable to that of single thyroid nodules. Traditionally surgeons have focused their assessment for malignancy (e.g. FNAC) on the dominant nodule. However, based on our study that the risk of cancer in the non-dominant nodule is equally significant, we recommend that the physician be equally vigilant when monitoring non-dominant nodules.

S46

Transscleral Fixation of Posterior Chamber Intraocular Lenses – Our Experience

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Introduction: Scleral fixation of intraocular lenses has been practised since the 1980s and is indicated in patients with minimal capsular support. Previous studies have shown good visual outcomes. We aim to describe our experience in Tan Tock Seng Hospital and compare the results between the anterior approach and posterior approach.

Methods: A retrospective, descriptive, nonrandomised study was carried out on 23 eyes that underwent trans-scleral suture fixation at Tan Tock Seng Hospital, Singapore.

Post-operative visual acuity, determined as good (visual acuity 6/6-6/12), and poor (visual acuity 6/15 or worse), and complication rates in both groups were measured.

Results: The significant determinants of good visual outcome were that of male gender and an uncomplicated procedure. The male sex was noted to achieve a better visual outcome (odds ratio 0.17, 95% confidence interval 0.03-0.90, $P=0.04$). An uncomplicated procedure was also associated with a good visual outcome. (odds ratio 0.10, 95% confidence interval 0.01-0.85, $P=0.04$).

The posterior vitrectomy approach was 1.98 (95% confidence interval: 0.40-9.69, $P=0.29$) times more likely to achieve a good visual outcome as compared to anterior vitrectomy, although this result was not statistically significant.

The significant determinant of occurrence of ocular complications with surgery is that of gender. Females are noted to be more likely to experience a complicated procedure (0.12, 95% confidence interval 0.02-0.92, $P=0.04$). The posterior vitrectomy group was 2.70 times more likely to run into complications compared to the anterior vitrectomy group (confidence interval 0.43-16.95, $P=0.29$) although this was not statistically significant.

Conclusion: Trans-scleral fixation of lenses appears to be a viable option in selected patients. Although not statistically significant, it appears that the posterior approach achieves a better visual outcome compared to the anterior approach and encounters less sight-threatening complications. A larger study may be conducted to validate this data.

S47

Measurement of Anterior Chamber Angle Morphology after Small Spot Size Argon Laser Peripheral Iridoplasty Using Anterior Segment Optical Coherence Tomography

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Aim: To measure the change in anterior chamber (AC) angle morphology after argon laser peripheral iridoplasty (ALPI) using anterior segment optical coherence tomography (ASOCT).

Methods: This was a retrospective study of patients with chronic angle closure who underwent ALPI in the year 2006. All patients had dark irides. The laser spot diameter used was either 50 mm or 100 mm. The power and duration of laser shots were modulated in each case to achieve AC deepening, small gas bubble formation, and localised iris tissue contraction. Imaging of nasal and temporal AC

angles was performed with the ASOCT prototype (Carl Zeiss Meditec, Dublin CA, USA) before and no later than 4 weeks after ALPI. The angle opening distance at 500 mm (AOD500) and 750 mm (AOD750), AC depth, pupil diameter in the dark and corneal thickness were quantified from the ASOCT images. Eyes were assessed clinically for best corrected visual acuity (BCVA), intraocular pressure (IOP) and complications after ALPI.

Results: Ten patients were included with a mean age of 62.4 ± 7.0 years. All (100%) were Asian and 4 were male (40%). In the dark, there was an increase in the mean temporal AOD500 (0.013 ± 0.042 vs $0.078 \pm 0.060 \mu\text{m}$, $P = 0.007$), no increase in the mean nasal AOD500 (0.036 ± 0.060 vs $0.059 \pm 0.063 \mu\text{m}$, $P = 0.092$), an increase in the mean nasal AOD750 (0.073 ± 0.084 vs $0.151 \pm 0.072 \mu\text{m}$, $P = 0.010$) and an increase in the mean temporal AOD750 (0.074 ± 0.072 vs $0.155 \pm 0.083 \mu\text{m}$, $P = 0.012$) after ALPI. In the light, there was an increase in the mean nasal AOD 750 (0.111 ± 0.090 vs $0.183 \pm 0.081 \mu\text{m}$, $P = 0.002$), but no increase in the mean nasal AOD500, (0.065 ± 0.073 vs $0.084 \pm 0.055 \mu\text{m}$, $P = 0.226$), the mean temporal AOD500 (0.049 ± 0.066 vs $0.096 \pm 0.069 \mu\text{m}$, $P = 0.116$) or the mean temporal AOD750 (0.140 ± 0.076 vs $0.191 \pm 0.081 \mu\text{m}$, $P = 0.087$). There was an increase in the mean AC depth after ALPI (2.031 ± 0.254 vs $2.065 \pm 0.283 \mu\text{m}$, $P = 0.048$). There was no change in the mean IOP (14.90 ± 4.38 vs 15.40 ± 3.17 mmHg, $P = 0.663$) or the mean number of ocular hypotensive medications (1.00 ± 0.82 to 0.50 ± 0.53 , $P = 0.052$) after ALPI. There was no change in BCVA (0.15 ± 0.12 vs 0.17 ± 0.13 logMAR units, $P = 0.370$), the mean pupil diameter in the dark (4.337 ± 0.521 vs 4.240 ± 0.417 mm, $P = 0.335$) or the mean corneal thickness (0.579 ± 0.026 vs 0.579 ± 0.035 mm, $P = 1.000$) after ALPI. One eye (10%) developed pigment dispersion after ALPI without raised IOP.

Conclusion: In this study, a change in AC angle morphology after small spot size ALPI was demonstrated using ASOCT. A larger prospective series is indicated to investigate the effect of ALPI on long term outcomes.

S48

Ovapro: A Database Using Text-Mining Approach for Biomarkers Implicated in Epithelial Ovarian Cancer

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Aims: Epithelial ovarian cancer (EOC) is the fourth leading cause of cancer-related deaths among women. Current oncology databases for these biomarkers are too complex and heterogeneous to provide concise information about the cancer. We propose a database using a text mining approach that provides efficient and ready access to information about the EOC such as proteins, gene ontology, body fluid distribution, mode of detection, and the most frequently cited proteins, in the form of a freely accessible web resource.

Methods: Proteins and genes associated with EOC were collected using search queries. Biomarkers for EOC were downloaded from abstracts using Perl programme and verified against NCBI database. A web portal was developed to display the end results.

Results: The text mining method identified 3,303 proteins amongst 18,890 collected abstracts, from the year 1972 till early 2006. Protein

CA125 was found to be the most common protein studied ($f = 54.06$). Proteins associated with binding function were the most common reported, plasma membrane as the most common cellular component and metabolic process as the most common biological process studied with 373,130 and 477 entries respectively. We also identified that Tyr Protein Kinase was the most frequently studied family ($f = 14.04$) and Cancer Research was the most common journal cited in these abstracts ($f = 5.16$).

Conclusion: The text mining tool enabled the identification of EOC related targets. This database can be a valuable tool for researchers to identify specific proteins expressed in EOC and can be translated for other disease conditions.

S49

Hand Infections in End-Stage Renal Failure

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Introduction: Little has been described about patients with end-stage renal failure (ESRF) who develop hand infections. The objective of the study was to delineate and update the bacteriological spectrum, characterise the patterns and sites of injury, and possible complications in such patients.

Methods: All hand infections operated on in Singapore General Hospital Hand Surgery Department from 1 January 2001 to 31 June 2007 were reviewed retrospectively. We examined all laboratory reports and recorded the etiological organisms. We retrieved creatinine and creatinine clearance levels to determine their renal failure status. Creatinine clearance (CCr) was used as an estimate for GFR. Inclusive criteria included patients with end stage renal failure (ESRF) (glomerular filtration rate (GFR) of less than 15 ml/min per 1.73m² or CCr <15 ml/min). We collected demographic data, types of hand infections, length of stay and treatment.

Results: Forty-seven ESRF patients with upper limb infections requiring surgical treatment were found. Of these, 57.4% were males. Average age was 58.77 years (range 36–85 years). A total of 57.45% were on hemodialysis. The commonest co-morbidity was diabetes mellitus (89.37%). Average time to presentation was 6.64 days (range 1–60), and 53.2% had no fever on presentation. Infection affected the right in 46.8% and left side in 48.9%; in 4.26% this was bilateral. Commonest conditions include abscesses (34%), gangrene (25.53%) and osteomyelitis (10.64%). Average white blood count was 12.70 (4.18–28.23), C-reactive protein was 135.51 mg/L (3.2–408 mg/L) and erythrocyte sedimentation rate was 86.75 mm/hr (1–140 mm/hr). All patients in this series underwent surgical debridement. Median number of operations was 2 (range 1–4). The majority of patients (65.96%) underwent delayed wound closure. 55.32% underwent secondary suture (average number of days from first operation was 14.15 days (range 2 to 121 days)). 10.64% underwent skin grafting. 57.78% of wound cultures grew a single organism. The commonest single occurring organism was methicillin resistant *Staphylococcus aureus* (17.78%). Mixed growth was seen in 28.9%. These most commonly grew MRSA (38.5%). Adverse events occurring during hospital stay include myocardial infarction (14.9%), septic shock (10.6%) and disseminated intra-vascular coagulopathy (6.4%).

Conclusion: ESRF patients tend to present with severe infections which are difficult to treat and often need repeat surgery.

S50

A Review of Post-Traumatic Endophthalmitis in an Asian Population Over a Nine-year Period

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Aim: To describe the demographics, clinical features and outcomes of post-traumatic endophthalmitis in an Asian population.

Methods: All patients diagnosed with post-traumatic endophthalmitis in a tertiary ophthalmic centre between 1998 to 2006 were reviewed. Endophthalmitis cases were identified via DRG codes as well as reviewing operating theatre and clinical procedure records.

Results: Five patients were identified over the 9-year period, accounting for 9.8% of all endophthalmitis patients seen within the same period. There were 1 Chinese (20%) and 4 non-Chinese (80%). The patients were young with a mean age of 31.6 years and all (100%) were male. Presentation of symptoms was within 1 day in 3 of 5 patients while it was within 4 days for 1 patient. Of the 5 patients, 2 had presenting visual acuity (VA) 6/12 or better, but eventually all 5 cases (100%) had final VA 6/60 or worse. There was 1 (20%) positive vitreous culture.

Conclusion: Post-traumatic endophthalmitis occurred in young males and mainly in the non-Chinese. Final VA was poor regardless of initial VA and time to presentation.

S51

Laparoscopic Adrenalectomy - A Singaporean Single Centre experience in 79 patients

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Aim: Laparoscopic adrenalectomy was first described in 1992 and has since emerged as the gold standard for the treatment of benign adrenal neoplasms. We report our experience in laparoscopic adrenalectomies at National University Hospital (NUH), Singapore.

Methods: Records of all patients having adrenalectomies from August 1996 to January 2008 were prospectively collected. One hundred and twenty-five patients were treated, with 128 adrenalectomies performed. Seventy-nine patients were treated laparoscopically and 49 with open surgery. This paper presents the laparoscopic experience in our centre. Patients' demographics and variables such as pathology, operative and tumour details, hospitalisation stay and complications were collected.

Results: The mean patient age was 48.9 years (22-71 years). There were 48 left adrenals and 30 right adrenals removed and 1 patient with bilateral adrenalectomy. The indications were as follows: Conn's syndrome n = 54, Cushing's n = 9, non-functioning tumors n = 9, pheochromocytoma n = 6, carcinoma n = 1. The mean tumour size removed was 2.3 cm (0.4-7 cm), the mean operative time was 110 minutes (60-210 minutes). The average hospital stay was 2.7 days (1-15 days). There were 3 laparoscopic adrenalectomies converted to open, all due to bleeding. There was no peri-operative mortality. One patient with cortical carcinoma died within 3 months due to metastatic disease. Morbidities included 2 post-operative lung atelectasis.

Conclusion: The results of laparoscopic adrenalectomies in NUH for adrenal lesions are comparable with that of other centres, with low conversion and morbidity rates, and no post-operative mortality.

S52

Silent Sinus Syndrome: A Case Presentation

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Clinical Picture: A patient presented with painless drooping of her left upper eyelid with progressive enophthalmos. There were no associated eye or neurological symptoms. CT scan evaluation of the orbits and paranasal sinuses showed an ipsilateral ethmoid mucocoele obstructing the infundibulum of the osteomeatal unit. The ipsilateral maxillary antrum was contracted due to a low lying (prolapsed) orbital floor.

Treatment: Patient underwent functional endoscopic sinus surgery to resect the ethmoidal pyo-mucocoele, relieve the obstruction at the osteomeatal unit and drain the maxillary sinus. Intraorbital fat implantation is being considered to correct enophthalmos at a later date.

Outcome: The chronic left ethmoid and maxillary rhinosinusitis arising from the ethmoidal pyo-mucocoele and osteomeatal complex obstruction has resolved with objective endoscopic surveillance and post-operative medical therapy.

Discussion: The silent sinus syndrome is a spontaneous unilateral atelectasis of the maxillary sinus. Negative intrasinus pressure accounts for contracture of the sinus causing expansion of the orbital volume. Improving sinus aeration by surgical means halts the progress of contraction.

Conclusion: Silent Sinus syndrome is a known but rare entity. An awareness of this condition and presentation can lead to early and accurate diagnosis by ophthalmic examination, nasal endoscopy and CT scan evaluation of the orbit and paranasal sinuses. Functional endoscopic sinus surgery is a safe and effective treatment for the cause.

S53

Immune Reactivation Uveitis in HIV Patients on Highly Active Anti-Retroviral Therapy with Cytomegalovirus Retinitis: An Analysis of the Characteristics, Presentation and Long Term Outcomes in the Singapore Population

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Aim: To give a retrospective review of the presenting characteristics and long-term outcomes of immune reactivation uveitis (IRU) in patients diagnosed with HIV (human immunodeficiency virus) infection, and treated with highly active anti-retroviral therapy (HAART) in Singapore.

Methods: Patients were selected from the database of the general ophthalmology clinics at Tan Tock Seng Hospital from 2007 to 2008. Inclusion criteria were patients placed on HAART, with diagnosed CMV retinitis and who developed intra-ocular inflammation post initiation of HAART.

Results: Thirty-three patients (46 eyes) fulfilled the inclusion criteria with an average age of 43.7 years (range 11-70 years) Thirty patients (90.9%) were male with IRU affecting both eyes in 13 (39.4%) with mean CD4 counts of 75.2 before initiation of HAART. Most presented with IRU at a mean of 12.2 months post HAART with a case seen as early as 2 weeks and 1 manifesting 3 years later. Mean CD4 counts at diagnosis of IRU were 202.2 with a mean increase of 127 (169%)

from pre-HAART levels. Twenty-five patients (75.8%) manifested as an anterior uveitis and 21.2% as a pan-uveitis. Three patients developed uveitic glaucoma as a complication.

Conclusion: IRU manifestations in the Asian population are comparable to that in the West. However, majority of our patients developed anterior segment inflammation versus the more commonly described posterior segment inflammation. Most cases were transient and responsive to topical steroids. Future studies can be done to characterise the predisposing factors for IRU and further delineate any differences between Asian and Western eyes.

S54

Composite Hemangioendothelioma of the Back: A Case Report and Review of the Literature

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Hemangioendotheliomas (HE) are a heterogeneous group of uncommon cutaneous tumors, with varied biological behaviour ranging from benign to malignant. Composite hemangioendothelioma is one of the subtypes and was first described in 2000. Only 17 cases of composite HE have been reported in the literature, with regional metastases only developing in 2 cases. The authors describe a case of clinically aggressive composite hemangioendothelioma occurring in a 19-year-old Chinese male who initially presented with a palpable, bleeding nodule over his back, and developed satellite lesions while awaiting definitive surgery. An initial incision biopsy showed a vasogenic tumour composed of retiform, epithelioid and papillary intralymphatic angioendothelioma (PILA) components, the last of which is a novel finding in composite HEs. In addition, small focal areas resembling low-grade angiosarcoma were noted. Wide excision with split-thickness skin grafting was performed. Four months later, he presented with massive hemoperitoneum secondary to rupture of splenic lesions and underwent emergency splenectomy. Histopathology of the spleen showed the lesions to comprise of similar composite HE foci. Despite chemotherapy with Sunatinib, he developed widespread peritoneal and hepatic metastases and succumbed 6 months after the initial excision. The authors are the first to describe distant metastases, and resulting mortality in an unusually aggressive case of composite HE.

S55

Interim Results of Laparoscopic Radical Gastrectomies for Early Gastric Cancer at the National University Hospital

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Background: In Singapore, gastric cancer ranks as the 4th most common cancer in males and 6th most common amongst females. Increasing use of screening modalities allows for detection of early gastric cancer. Laparoscopic surgery for early gastric cancer is associated with better short-term outcomes and is oncologically safe when compared to open surgery. The study aims to report our local experience on laparoscopic radical gastrectomies for early gastric cancer.

Methods: Sixteen patients who underwent laparoscopic radical gastrectomy for early gastric cancer from May 2004 to June 2008 were included in the study. Operative statistics, post-operative outcomes, recurrence and survival data were extracted and analysed from a prospective database.

Results: Laparoscopic radical subtotal gastrectomy was performed in 13 (81.3%) patients and 3 (18.7%) patients had total gastrectomies. The median operative time was 5 hours (4-8 hours). On an average, patients used 21.3 mg (12-38 mg) of morphine post-operatively for analgesia. Median time to return of bowel sounds was 2 days and that for return to soft diet was 6 days. Median length of hospitalisation was 6 days (5-10 days). No patient required conversion to open surgery. There were no post-operative complications. After a median follow-up of 9 months (3-25 months), no recurrence was detected.

Conclusion: Interim analysis of our small case series shows laparoscopic radical gastrectomy to be safe with good operative, short-term outcomes.

S56

Isolated Retropharyngeal Edema From Nephrotic Syndrome

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Introduction: Widening of the pre-vertebral space on a lateral neck radiograph is a sign of retropharyngeal effusion which is often suppurative in nature. Non infective isolated collection in the retropharyngeal space is uncommon. We present a case of nephrotic syndrome manifesting initially with isolated retropharyngeal effusion.

Clinical Picture: A 32-year-old healthy male presented with dysphagia. Clinical examination showed a bulging posterior pharyngeal wall resulting in partial occlusion of his laryngeal inlet. The patient was febrile. Of note were the lack of pedal edema and other signs of water retention. Significant widening of the prevertebral space on lateral neck radiograph was noted. CT scan showed non-enhancing fluid in the retropharyngeal space extending to the parapharyngeal neck spaces bilaterally. Serum biochemistry showed marked hypoalbuminaemia. Subsequent investigations showed extensive urinary protein loss and renal biopsy confirmed Minimal Change Nephropathy.

Treatment: Although the patient's hypoalbuminaemia was noted, concern for airway obstruction and possible retropharyngeal abscess as suggested by the patient's fever and a lack of signs of water retention elsewhere led to surgical neck exploration. There was no evidence of suppuration or inflammation of the retropharyngeal space intra-operatively. Secondary suture of the neck wound was performed after further investigations confirmed nephrotic syndrome.

Conclusion: This case report is to highlight an uncommon non-infective differential diagnosis of isolated retropharyngeal effusion for which drainage of the retropharyngeal region might not have been necessary. As the patient subsequently developed intracranial venous sinus thrombosis due to hypercoagulopathy associated with nephrotic syndrome, it is postulated that his initial presentation of isolated retropharyngeal edema may have arisen from thrombosis of the pharyngeal venous plexus. His initial presenting signs and possible airway compromise influenced our decision to err on the side of caution opting for surgical drainage.

S57

Eccrine Carcinoma of the Axilla in a HIV Positive Patient Treated with Excision and Rhomboid flap: A Case Report**JM SHRESTHA, MSW YEO, M WONG, ECH HING, JS AMMAR, J LIM***Div. of Plastic, Reconstructive and Aesthetic Surgery, Department of Surgery, National University Hospital, Singapore*

Eccrine carcinomas arise from the eccrine sweat glands and represent a rare group of tumors with potential for local destruction and metastasis to regional lymph nodes and distant sites. These tumors show high recurrence rate with a fatal outcome. The authors report a 76-year-old male patient with 3 years of HIV (human immunodeficiency virus) infection and on antiretroviral therapy, who developed a rapidly-growing lesion in the left axilla of 3 months' duration. Initial incision biopsy was performed and histopathological examination showed an invasive tumour of the dermis extending to the subcutaneous fat consisting of nests of cells with small nucleoli and pale eosinophilic cytoplasm. Focal ductal structures resembling the acrosyringium were noted within the tumour with connections with the overlying epidermis, highly suggestive of an eccrine carcinoma. The lesion was treated with wide excision of tumour and level 3 axillary clearance, and the resulting 25 x 25 cm defect was covered with a rhomboid perforator-sparing transposition flap. Histology revealed involvement of 4 of 8 axillary lymph nodes. A rhomboid flap was chosen over other reconstructive options as it would permit good healing in an elderly, immunocompromised patient and permit early adjuvant radiotherapy. The axilla was treated with 5000Gy of radiotherapy. He has been followed up for 12 months with no clinical evidence of recurrence. To the authors' knowledge, this is the first reported case of eccrine carcinoma associated with HIV infection.

S58

Endovascular Stenting of Salmonella Mycotic Aneurysm in a Patient with Systemic Lupus Erythematosus**CW HUEY, AWC KOW, KH CHIA***Department of General Surgery, Tan Tock Seng Hospital, Singapore*

Introduction: Salmonella mycotic aneurysm is rare and the usual mode of management includes surgical resection, debridement and bypass. Patients with systemic lupus erythematosus (SLE) are at increased risk of infection, notably salmonellosis. We present a patient with SLE and Salmonella mycotic aneurysm treated successfully via emergency endovascular stenting with a favourable outcome to date.

Clinical Picture: Our patient, a 49-year-old Chinese lady, presented with lower abdominal pain and fever with elevated C-reactive protein and erythrocyte sedimentation rate (ESR). A computed tomography (CT) scan done to look for possible lupus enteritis or other causes of intra-abdominal sepsis revealed a leaking mycotic infra-renal abdominal aortic aneurysm. Blood cultures yielded Salmonella.

Treatment: The initial plan was for elective endovascular stenting after adequate treatment of her bacteraemia as she was haemodynamically stable. However, she became hypotensive 3 days later and an emergency endovascular stenting was undertaken under antibiotics cover. The stent graft (Medtronic) was deployed via the right common femoral artery with successful exclusion of the aneurysmal sac. She was maintained on corticosteroids throughout to prevent a lupus flare.

Outcome: Our patient had good post-operative recovery with early

return to daily activities and diet. She was converted to oral ciprofloxacin according to blood culture reports. CRP and ESR trended downwards. She was discharged with long-term oral ciprofloxacin. A follow-up CT scan at 4 months showed resolution of the pseudoaneurysm and the retroperitoneal haemorrhage.

Conclusion: Endovascular stenting in mycotic aneurysms, although a fairly new procedure, can be an invaluable management approach with good outcome.

S59

Migration of the Abdominal Catheter of a Ventriculoperitoneal Shunt into the Mouth; A Rare Presentation — Case Report**SW LOW, L SEIN, N CHOU, TT YEO***Division of Neurosurgery, National University Hospital*

Abstract: A 1-year-old boy presented with protrusion of the distal ventriculoperitoneal (VP) shunt tip from the mouth due to perforation through the gastrointestinal tract after bouts of vomiting. The child had a history of peritonitis post exomphalos repair, which may have predisposed him to this rare shunt complication. Probable causes of the perforation will be discussed in more detail in the poster. This is the fifth such case reported in the literature and probably the first local case. The case report will present the history, management plans as well as the outcome of this rare complication of ventriculoperitoneal shunt.

Conclusion: The appearance to the tube in the mouth represented the bowel penetration. Spontaneous bowel penetration or perforation is a rare complication of VP shunt surgery, occurring in only 0.01% to 0.07% of patients. A high index of suspicion is essential in paediatric patients for diagnosis of perforation or penetration as the abdominal symptoms and signs may be vague. The abdominal radiology, including plain X-rays and contrast CT may be required in some cases. CSF culture is also mandatory for diagnosis of retrograde CSF infection. Early removal of the suspected shunt and conversion to external ventricular drain are important measures for control of CNS infection. The selection of the clean site for CSF diversion is imperative for successful management of complicated paediatric cases.

S60

Comparison of Geriatric vs Non-Geriatric Trauma in our Centre**R GANESH, A VIJAYAN***Trauma and General Surgery, Tan Tock Seng Hospital*

Aim: To study the impact of trauma on geriatric and non-geriatric patients in our centre, Tan Tock Seng Hospital, using mortality the outcome.

Methods: We looked at all trauma patients in the 5-year period (2003 to 2007), taking into consideration age group, mechanism of injury, injury data and outcome of trauma in terms of mortality. The age 65 was used as a cut-off to differentiate the geriatric age group.

A literature review was conducted using PubMed, with analysis of papers on the impact of trauma in the geriatric patients and comparisons of trauma outcomes of the geriatric vs non-geriatric age groups.

Results: Falls and Road Traffic Accidents (RTA) were the commonest mechanisms of injury in adult trauma. There were twice as many falls in the geriatric compared to the non-geriatric age group. But there were twice as many RTAs in non-geriatric trauma. We found that mortality overall was twice more in the geriatric age group for a higher injury severity score. There is also a direct correlation between

the number of comorbidities and trauma outcome

Conclusion: Due to decreased physiologic reserves, presence of more comorbidities and poor response to stress, geriatric trauma patients had a higher mortality rate when the severity score was higher. Clinically this data would allow us to identify subgroups of geriatric patients who would be at higher risk in trauma and who would benefit from earlier intervention during resuscitation.

S61

Rare Extra-adrenal, Infraaortic Paraganglioma in a Young Lady – Case Report

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Aim: Most extraadrenal, inferior aortic paragangliomas are solitary. They present at middle age (30 to 50 years) and have equal sex distribution. Incidence worldwide is unknown (1:100,000, 1:1,000,000?). Of the 10% of extra adrenal paragangliomas, less than 30% are infraaortic.

Methods: A 20-year-old female presented with an abdominal mass when being investigated for diarrhoea. She had an ultrasound of the pelvis and had an initial diagnosis of a large ovarian tumour. Intra-operatively noted to have 20 x 20 cm vascular tumour located within mesentery of sigmoid colon and attached to the sacrum. A literature review was conducted using PubMed, with analysis of papers and books written on paragangliomas. Most articles were small case series or case reports.

Results: Histology of the tumour shows the classic zellballen pattern of an endocrine neoplasm, well differentiated. Between the zellballen, there are abundant vascular channels. Nuclei show salt and pepper chromatin and the cytoplasm is eosinophilic and granular, characteristic of an endocrine neoplasm. The features are of an extra-adrenal, inferior paraaortic paraganglioma. Even though there are no established histologic criteria to predict outcome, an extra-adrenal location is associated with an increased risk of malignancy. The definitive criteria of malignancy of extra-adrenal paragangliomas is the presence of lymph node or distant metastasis. No lymph nodes were harvested during the resection. Postoperatively, our patient recovered without complications. A CT scan of the neck, thorax, abdomen and pelvis did not reveal other masses. Catecholamine and their precursor levels were normal.

With no known advantage of either adjuvant radiotherapy or chemotherapy, she was managed with close surveillance using CT scans.

Conclusion: Extra-adrenal paragangliomas are rare and very poorly understood. Likewise in our literature search, there are no concrete recommendations on post-operative adjuvant therapy, duration of follow-up and the investigation of choice in follow-up. Much research is needed to understand the behaviour of this disease.

S62

Diagnosis and Laparoscopic Management of a Case of Adult Intussusception

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Aim: We highlight a case of adult intussusception with classic imaging features, which was subsequently treated successfully with laparoscopic resection; emphasising the need to maintain a high

index of suspicion in order to reach a timely diagnosis despite its rarity in the adult age group.

Methods: We discuss the case details of a 28-year-old female who presented with a short history of right-sided abdominal pain with nausea and vomiting. An ultrasound examination ordered on the presumptive diagnosis of biliary colic showed the typical ultrasound picture of an ileo-colonic intussusception. A CT scan showed typical ileocolic intussusception.

Results: Laparoscopy confirmed an irreducible ileocolic intussusception. An en bloc resection was carried out laparoscopically. Resection and anastomosis was completed without difficulty. The patient made an uneventful recovery. The resected specimen showed a moderately differentiated adenocarcinoma of the caecum which formed the apex of the intussusception.

Conclusion: The diagnosis of intussusception may be clinched with CT imaging in up to 95% of cases. A timely diagnosis of intussusception has made this case amenable to laparoscopic surgery with consequent speedy postoperative recovery and excellent cosmesis. Rapid ultrasound or CT diagnosis followed by laparoscopic surgery should become the standard of care for cases of intussusception.

S63

Minimally Invasive Retroperitoneal Pancreatic Necrosectomy (MIRP) in the Management of Infected Necrotising Pancreatitis

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Introduction: The mainstay of management of infected pancreatic necrosis is surgical debridement. However, the disease itself and the surgery have been associated with significant morbidity and mortality. Surgeons have attempted to minimise the surgical insult with the advent of minimally invasive techniques. We aim to review our recent experience with this fairly new technique of MIRP.

Methods: The medical records of consecutive patients between who underwent MIRP October 2007 and April 2008 were reviewed. All the patients had a pre-operative CT guided aspiration and positive bacteriological culture of the peri-pancreatic collection

Results: Five patients underwent MIRP. A total of 14 MIRP procedures were done, with a mean of 3 (range 1-5) procedures per patient. Only 1 patient required post-operative intensive care monitoring, the rest were managed in the general ward. One patient had a left renal contusion and another had a pancreatic fistula post-operatively. There were no mortalities.

Conclusion: MIRP is a good alternative technique in the management of selective patients with infected peri-pancreatic necrosis.

S64

Laparoscopic Intraoperative Cholangioscopic Laser Lithotripsy for Difficult Bile Duct Stones

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Aim: When giant, impacted or hard stones in the hepatic or common bile ducts are encountered, traditional methods of stone extraction such as Foley catheter balloon dredging, Dormia basketry, use of mechanical lithotripters, or electro-hydraulic lithotripsy may not be able to extract such stones effectively or adequately without undue collateral damage to the bile ducts. The use of contact laser in this situation may be an effective option under these circumstances.

Methods: We describe the use of intraoperative cholangioscopic laser lithotripsy in 3 patients to manage difficult bile duct stones encountered during laparoscopic common bile duct exploration.

Results: Two of the 3 patients had prior ERCP and sphincterotomy. However, bile duct stones were unable to be extracted. In all 3 cases, trans-cystic intraoperative cholangiogram was performed to determine the size and position of remnant stones, dredging and Dormia basketry was attempted but was unable to dislodge the impacted stones. The use of a 20 watt Holmium: YAG solid state laser (Dornier Medtack, Kennesaw GA) to target and fragment stones in combination with continuous saline flushing resulted in rapid and effective removal of stones. Small remnant stone fragments were able to pass easily through the ampulla of Vater from previous ERCP established sphincterotomies or from dredging.

Conclusion: The advantages of using intraoperative cholangioscopic laser lithotripsy include the accurate targeting of the contact laser fibre, whether the stones are in the hepatic or common bile ducts; effective stone fragmentation and efficient removal of the resulting stone fragments. With the reduction in size, dredging becomes less traumatic. Stone fragments can also be made to go through the ampulla, thus negating the necessity of repeated intubation of the choledochotomy site or the cystic duct. Cost and the necessity of personnel properly credentialed to operate the laser generator can be listed as disadvantages.

S65

Validating Medical Students Surgical Skills Using Virtual Surgical Simulators

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Aim: Surgery is a competitive discipline and choosing from traineeships applicants is difficult. Surgical simulators are widely used in evaluating performances of trainee and expert surgeons. We aim to evaluate surgical skills of medical students using surgical simulators and identify predisposing factors, if any, that might aid in selecting surgical trainees.

Methods: Fifty Yr-3 YLLSOM students randomly selected after completing Medicine and Surgery clerkships were evaluated using a virtual surgical simulator (LapMentor, Simbionix, USA) on 3 tasks (Eye-Hand Coordination; Clip Applying; Two-Handed Manoeuvres). Data regarding lifestyles, hobbies, and habits were used as primary outcomes. Results were statistically analysed by independent samples t-test and ANOVA.

Results: Scores for Eye-Hand Coordination were significantly better in students drinking <1 cup coffee/day (0.006) and driving manual cars (0.002). For Clip Applying, performance was significantly better in students not needing spectacles (0.041), and expressing interest in surgery (0.010). Score differences were insignificant between groups in Two-Handed Manoeuvres. Further analysis showed that the economy-of-movement of non-dominant hand was better in male students (0.012); those playing PC games over handheld/console (0.041) and not playing sports regularly (0.002). No significant differences were found for military service status, race, sleeping time, musical instrument played, and driving.

Conclusion: Our study showed certain factors affecting student performances on the surgical simulator, possibly indicating better aptitude and performance in surgical training. They include interest in surgery, reduced coffee intake, driving manual cars, history of

playing computer games regularly, gender, computer game platform, and not playing sports regularly. Further studies can be done to utilise these factors in selecting candidates for surgical traineeships.

S66

Incidence of Inadvertent Parathyroidectomy in Thyroid Surgery and Factors Associated With It

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Aim: Thyroidectomy is a frequently performed surgery in Singapore. However, even with meticulous dissection, surgeons would occasionally be surprised by a pathology report stating the incidental finding of a parathyroid gland/tissue in the resected thyroid gland specimen. This study aims to assess the incidence of inadvertent parathyroid removal during thyroidectomy and to identify factors that might predict patients at increased risk.

Methods: A retrospective study was done on thyroidectomies (272 cases) performed for thyroid pathologies in the Department of Otolaryngology at the National University Hospital, Singapore from January 2005 to December 2007. Patient demographics, indications for surgery, operative and pathology parameters were analysed.

Results: There were 23.5% male and 76.5% female patients. The incidence of all inadvertent parathyroidectomy (IP) was 7.7% (21 out of 272), of which 14.3% (3 out of 21) were intrathyroidal. Thus, the incidence of true inadvertent thyroidectomy was at most 6.6% (18 out of 272). In each case of IP in our study, only 1 foci of parathyroid tissue or 1 gland was found. The incidence of all IP was significantly higher in those who underwent total thyroidectomy (38.1% vs 13.5%, $P = 0.002$). Other factors such as age, gender, indication for surgery, identification of the recurrent laryngeal nerve during surgery, the final thyroid pathology, were not found to be associated with inadvertent parathyroidectomy in our study. Among those who experienced IP, at least 23.8% had transient hypocalcemia.

Conclusion: The incidence of inadvertent parathyroidectomy in thyroid surgery is 7.7%. Total thyroidectomy is a factor associated with inadvertent parathyroidectomy.

S67

Laparoscopic Resection of Gastric Gastrointestinal Stromal Tumours

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Aims: Although significant advances in new chemotherapeutic regimens have been made for Gastric gastrointestinal stromal tumours (GISTs), only surgery offers the chance of long-term survival. We present our local experience on surgical resection of GIST tumours and compare outcomes between our open and laparoscopic resection groups.

Methods: Between January 2001 and January 2008, 41 consecutive patients undergoing laparoscopic or open resection of gastric GISTs were identified from a prospectively collected database. Outcome data collated include patient demographics, size and site of tumour, operative time, resection margin status, pain scores, and post-operative morbidities and follow-up details. Primary end points were days to solid diet and length of hospital stay.

Results: There were 28 patients who underwent open wedge resections

compared to 13 who underwent laparoscopic wedge resections. The mean age was 62 years in the open group vs 61 years in the laparoscopic group. The mean operating time was 140 minutes in the open group and 152 minutes in the laparoscopic group. There was 1 positive resection margin in the laparoscopic resection group.

Patients who had a laparoscopic resection stayed 2 days shorter ($P = 0.013$) in hospital and returned to soft diet 2.6 days earlier ($P = 0.013$) when compared to the open group. No local or port site recurrences were detected at median follow-up of 32 months.

Conclusion: Laparoscopic wedge resection of gastric GIST is oncologically safe and technically viable. Our series demonstrates that laparoscopic GIST resection offers shorter operative time, quicker return to solid diet and earlier discharge.

S68

Hand-Assisted Laparoscopic Restorative Proctocolectomy for Familial Adenomatous Polyposis

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Introduction: Restorative proctocolectomy (RPC) with ileal pouch anal anastomosis (IPAA) is the procedure of choice for patients with familial adenomatous polyposis (FAP). With rapid advances in instrumentation and techniques, it is now possible to perform RPC with a hand-assisted laparoscopic approach.

Methods: We present a case of hand-assisted laparoscopic RPC with IPAA in a patient diagnosed with FAP.

Results: Operative time was 345 minutes. A small lower vertical midline incision of 6 cm was made for retrieval of resected colon. There were no intra-operative or post-operative complications. Patient was started on clear feeds on POD 2 with progression to soft diet on POD 4 and was discharged on POD 6.

Conclusion: Hand-assisted laparoscopic RPC with IPAA for FAP is safe and feasible, has low morbidity, and provides a superior cosmetic result.

S69

To Evaluate the Midterm Efficacy of Alpha-Adrenergic Antagonists in the Treatment of Men with Primary Bladder Neck Dysfunction

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Aim: To evaluate the midterm efficacy of alpha-adrenergic antagonists in men with primary bladder neck dysfunction (PBNB).

Methods: From our urodynamic database of 328 patients from the year 2002 to 2006, 19 were found to have PBNB diagnosed using video-UDS. All were treated with alpha-adrenergic antagonists. Follow-up was in the form of non-invasive uroflowmetry. Pre- and post-treatment urodynamic parameters were compared. Men above 50 years of age, with neurological diseases, urethral strictures, and urological malignancies were excluded.

Mean age was 40 (23-50) years. All patients were started on alpha-adrenergic antagonists (Terazosin / Alfuzosin) after the diagnosis of PBNB were made.

Pre- and post-treatment maximal flow rates (Qmax) and post-void residual urine volume (RU) were compared. Clinical outcomes and urodynamic results were analysed with Wilcoxon signed rank test with $P < 0.05$ considered statistically significant.

Results: The average duration was 22 months. There was an improvement of mean Qmax from 6.3 +/- 3.0 (1.5-13.4) ml/s to 12.7 +/- 5.1 (4.7-23.1) ml/s ($P = 0.022$) and reduction of mean PVRU from 114.9 +/- 104.1 (0-320) ml to 62.9 +/- 72.7 (0-295) ml ($P = 0.226$) with treatment. Only 1 patient with anxiety disorder reported postural dizziness with Alfuzosin and the medication was stopped.

Conclusion: Patients with PBNB benefit from a course of alpha-adrenergic antagonist in the medium-term, with significant improvement of Qmax. There was no improvement in PVRU.

S70

Intractable Pelvic & Rectal Endometriosis: Current Management and Review of Literature

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Aim: Colonic involvement occurs in 5% of patients with Endometriosis and 76% of these cases involve the rectum or rectosigmoid area. We describe our technique of laparoscopic Low Anterior Resection along with excision of left endometriotic ovarian cyst in the management of deep pelvic endometriosis with rectal involvement. Technical details of the procedure and current literature will be discussed.

Methods: A 28-year-old woman presented with a history of long-standing, severe pelvic and bowel endometriosis. Pronounced cul-de-sac tenderness and nodularity were noted on pelvic examination. She also had increased frequency of defecation during menses as well as tenesmus and proctalgia. Endorectal ultrasound revealed an endometriotic nodule involving muscular propia at 6 cm from anal verge. The symptoms had worsened even on being regular NSAID's and hormonal treatment since the age of 14 years.

Results: The patient underwent a laparoscopic low anterior resection along with excision of left endometriotic ovarian cyst. On Laparoscopy the Pouch of Douglas was obliterated with rectum densely stuck to it and left ovary was found to have a 3-cm endometriotic cyst. Also an Endometriotic nodule was found to be adherent to anterior rectal wall at 6 cm from anal verge. The operative time was 5 hours and estimated blood loss was 200 mL. She had near or total resolution of preoperative symptoms on follow-up. Histology of rectum and left ovarian cyst revealed endometriosis.

Conclusion: Extensive pelvic endometriosis generally requires rectal excision or bowel resection. Laparoscopy in experienced hands is a safe alternative with less morbidity.

S71

Characterising the Distribution and Types of Ear, Nose and Throat Disorders in Children with Down's Syndrome in Singapore

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Aim: The aim is to characterise the distribution of ENT problems in children with DS in Singapore.

Methods: A questionnaire on possible ENT and other systemic problems in children with DS was administered to caregivers of the children who were attending a medical seminar organised by the Down Syndrome Association on 24 May 2008.

Results: Amongst 23 caregivers, 90% reported delayed or unclear

speech, 50% snoring (only 1 child had a sleep study), and 44% ear problems (canal stenosis, otitis media with effusion and hearing loss). 37% reported recurrent nasal infections and 22% allergic rhinitis. None reported recurrent tonsillitis, gastroesophageal reflux disease (GERD) and adenotonsillar hypertrophy. Amongst non-ENT problems, 50%, 25% and 13% were eye, heart and thyroid related respectively.

Conclusion: ENT problems are very common in children with DS, with speech, snoring and ear problems being the leading ENT disorders. Routine sleep study may be needed so that obstructive sleep apnea is not missed. Recurrent colds and allergic rhinitis must be optimally managed to reduce the further compromise to the airway. The nil report of adenotonsillar hypertrophy will need further study to evaluate if this is so in DS or if diagnosis is missed. GERD likely has been under-diagnosed. This study can help raise the awareness of common ENT problems in DS amongst physicians and caregivers in Singapore.

S72

Angle Evaluation with Visante AS-OCT versus Cirrus SD-OCT J TATSIOS, PTK CHEW, JLS SEE

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Aim: Qualitative comparison of anterior segment scans obtained with high-definition spectral domain optical coherence tomography (Cirrus SD-OCT) and anterior segment optical coherence tomography (Visante AS-OCT).

Methods: Prospective observational study of 41 consecutive subjects recruited at the National University Hospital, Singapore was carried out. The Cirrus SD-OCT was fitted with a special lens to allow imaging of the anterior segment. All subjects underwent imaging with the modified Cirrus SD-OCT and Visante AS-OCT (Carl Zeiss Meditec, Dublin/USA) under standardised dark room conditions. Nasal angle quadrants of right eye images taken with Cirrus SD-OCT were compared with corresponding quadrants on Visante AS-OCT scans of the same subjects by 2 independent masked operators and graded as open or closed. Kappa score was calculated for agreement.

Results: Mean age of the subjects was 60.9 years, 80.48% were Chinese and 70.73% female. Angle closure was observed in 18 eyes with Cirrus SD-OCT compared to 22 eyes with Visante AS-OCT. Kappa score for agreement between the 2 devices was 0.65. Seven eyes were excluded from analysis due to poor visibility of the angle in the images.

Conclusion: Cirrus SD-OCT and Visante AS-OCT demonstrate good agreement (82.35%) for angle measurements, especially where angles were clearly open or closed. Agreement was poorer for very narrow angles. The posterior trabecular meshwork and peripheral iris were not clearly visualised in 17.07% of Cirrus scans due to limited scleral penetration by the lower wavelength used in the device. Cirrus SD-OCT offers higher resolution and better visualisation of the trabecular meshwork compared to Visante AS-OCT and shows potential for anterior segment imaging. However, further refinement is required.

S73

Survey of Traditional Medicine Usage in Breast Cancer Patients KY WONG, PMY CHAN, EKW LIM

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Aim: To determine the prevalence, demographic characteristic of traditional Chinese medicine (TCM) usage among breast cancer

patients, and benefits, if any as perceived by patients.

Methods: A questionnaire on traditional medicine usage was given to breast cancer patients attending outpatient follow-up at Tan Tock Seng Hospital. Ninety-three patients were interviewed over a 2-month period.

Results: The prevalence of TCM usage among breast cancer patients at Tan Tock Seng Hospital was 43.0% (40 out of 93 patients). Younger patients and individuals with higher education level were strongly associated with TCM use. More than half of the patient population (57.5%) studied commenced usage of TCM within 6 months after surgery. 37.5% of the patients used TCM with an intention to treat breast cancer whereas only 10% used it to alleviate symptoms from adjuvant therapy. Majority of the patients (62.5%) were not able to tell the types of TCM they were using. On average, each patient spends an estimated \$158.32 (\$8-\$680) per month on TCM expenditure. Improvements were reported in 75.5% of patients. Only 5% experienced adverse reaction from the TCM they used. 70% of patients did not reveal their TCM usage to their doctors.

Conclusion: The use of TCM is very prevalent among breast cancer patients. Given the lack of information given to patients and hesitant disclosure to doctors, doctors will have to assume a more active role in identifying these patients. Education among patients is greatly needed to ensure safe administering of TCM and its use along mainstream medical treatment.

S74

Complete Ophthalmoplegia following Herpes Zoster Ophthalmicus: A Case Report and Review of the Literature

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Aim: To present a case of unilateral complete ophthalmoplegia secondary to HZO and review the literature for its clinical features, treatment options and pathophysiological basis.

Methods: One case of HZO was retrospectively reviewed. A literature search was conducted on Pubmed to identify reports published in English-language journals from 1978 to 2008 using the key words 'herpes zoster', 'complete ophthalmoplegia' and 'myositis'.

Results: A 76-year-old Indian male developed unilateral total ophthalmoplegia with complete ptosis 8 days after onset of HZO. Magnetic resonance imaging (MRI) of brain and orbits was normal. He completed 2 weeks of acyclovir with near-resolution of ophthalmoplegia and ptosis, but subsequently developed secondary glaucoma from persistent uveitis. Review yielded 13 cases of HZO with complete ophthalmoplegia. All patients were over 40 years of age, and immunocompetent except for 1 on systemic steroids and another with Hodgkin's Disease. Presentation varied from painful ophthalmoplegia alone to that accompanied by ptosis, pupil involvement, posterior segment inflammation, proptosis, corneal hypoesthesia or meningoencephalitis. MRI for 2 patients demonstrated myositis. Ophthalmoplegia and ptosis resolved between 2 weeks and 18 months in all patients, except in the patient with Hodgkin's disease who lost the eye to bacterial endophthalmitis. Treatment initiated included systemic anti-virals and/or systemic steroids.

Conclusion: Complete ophthalmoplegia is a rare complication of HZO, and appears to be transient with good prognosis. The effect of anti-viral or steroid treatment on outcome has not been formally studied. Pathophysiology is likely multi-factorial and case-specific.

O-MSP1

Knowledge and Practice of Household Mosquito Breeding Control Measures between a Dengue Hotspot and Non-Hotspot in Singapore

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Aim: To compare the knowledge and practices of household mosquito-breeding control measures between a dengue hotspot (HS) and a non-hotspot (NHS).

Methods: Eight hundred households were randomly sampled from HS and NHS areas, and an NEA questionnaire was administered to heads of the household. Interviewers were blinded to dengue status of households. We included subjects aged above 16 years, who were communicative and currently living in household. Chi-square test was used to compare proportions and multiple logistic regression to adjust for socio-demographic differences between both areas.

Results: The overall response rate was 59.0% (n = 472). There were significant differences in gender, educational level, employment status and housing type between HS and NHS (all $P < 0.05$). NHS residents were less knowledgeable in six anti-mosquito breeding actions: changing water in vase/bowls [AOR (adjusted OR) = 0.20 (0.08–0.47), $P < 0.01$], adding sand granular insecticide to water [AOR = 0.49 (0.31–0.71), $P < 0.01$], turning over pails when not in use [AOR = 0.39 (0.17–0.89), $P = 0.02$], removing flower pot/plates [AOR = 0.35 (0.18–0.67), $P < 0.01$], removing water in flower pot/plates [AOR = 0.36 (0.17–0.75), $P < 0.01$] and putting insecticide in roof gutters [AOR = 0.36 (0.13–0.98), $P = 0.04$]. HS residents reported better practice of only two mosquito-breeding control measures: changing water in vases or bowls on alternate days [AOR = 2.74 (1.51–4.96), $P < 0.01$] and removing water from flower pot plates on alternate days [AOR = 1.95 (1.01–3.77), $P = 0.05$].

Conclusion: More HS residents were knowledgeable and reported practicing mosquito-breeding control measures than NHS residents. However, a knowledge-practice gap still existed.

O-MSP2

Ethnic Difference in Cardiovascular Disease Burden by Framingham Risk Score – in Young Healthy Asymptomatic Singaporean Civil Servants

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Aim: We wish to investigate the prevalence of cardiovascular (CVD) risk factors in a cohort of healthy asymptomatic Singaporeans using the Framingham Risk Score (FRS) and a novel race adjusted Singapore Risk Score (SRS).

Methods: We analysed 1605 healthy asymptomatic civil servants who underwent occupational health screening in our institution. Those with a BMI > 27.5 kg/m² or suffering from diabetes were labelled as high risk regardless of the calculated FRS or SRS.

Results: Across the cohort, 91.0% were male; 57.3% were Chinese, 35.8% Malay, and 6.9% Indian. Mean age was 37.2 ± 8.2 year old; High CVD risk was identified in 411 (25.6%) of the total cohort. Prevalence of diabetics and Impaired Glucose Tolerance (IGT) were 1.7% and 2.3% respectively. 2.1% had newly diagnosed diabetes mellitus and 24.7% of their BMIs were > 27.5 kg/m². With the FRS, 86.1%, 12.0% and 1.9% were at very low ($< 10\%$), intermediate (10–20%) and high ($> 20\%$) risk, respectively. With our novel SRS, the corresponding values were 92.0%, 6.0% and 2.1%. 0.8% Chinese, 3% Malays and 8.2% Indians were classified as high risk. High CVD risk was 2.9% and 3.2% in the FRS and SRS respectively, an increase. Among the high CVD risk subjects, only 8.1% Chinese, 16.0% Malays and 12.2% Indians were reclassified as having intermediate CVD risk using the recalibrated model.

Conclusions: High prevalence of obesity and diabetes which are modifiable CV risk factors in young Singaporeans results in an underestimation of CVD risk if FRS or SRS is used alone. A significant ethnic disparity in CV risk exists. Global risk estimation and ethnic-targeted intervention and prevention may be indicated.

O-MSP3

Genetic Polymorphisms in Cytokine Genes and Response to Bacillus Calmette-Guerin Immunotherapy for Superficial Bladder Cancer

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Aim: As a 'gold-standard' treatment for high risk superficial bladder cancers, Bacillus Calmette-Guerin (BCG) immunotherapy still has a 20–40% tumour recurrence rate along with frequent, potentially serious side effects. A number of cytokine gene polymorphisms have been linked to the response to BCG therapy. IL-10 is of particular interest as polymorphisms in the promoter region have been linked with decreased IL-10 production.

Methods: Peripheral blood DNA was prospectively obtained from 99 high risk superficial bladder cancer patients, who underwent post-resection intravesical regimes of BCG (81 mg, n = 50 or 27mg, n = 19) or BCG (27mg) with interferon alpha (IFNa) (n = 30), and followed-up for a mean of 4.5 years. A single nucleotide polymorphism in the IL-10 promoter region (-1087) was tested with restriction fragment length polymorphisms following PCR amplification. Healthy controls were also recruited and genetic polymorphisms of 13 have been analysed. Data was analysed using Chi-square analysis.

Results: Of the 82 with AA genotype, Tumour free n = 56 (68.3%), Recurrence n = 17 (20.7%), Progression n = 9 (11.0%). Of the 17 with AG genotype, Tumour free n = 11 (64.7%), recurrence n = 4 (23.5%), progression n = 2 (11.8%). Recurrence, progression time, cancer-specific death were analysed as parameters using chi-square analysis and found to be not significant. Controls had similar proportions of polymorphisms as patients.

Conclusion: Our findings suggest that the genetic polymorphism in the (-1087) promoter region of the IL-10 gene alone, does not correlate with response to BCG treatment. Other cytokines should be studied as well and evaluated together along with this result for a more conclusive correlation of cytokine polymorphisms and response to BCG treatment.

O-MSP4**Functional Analysis of CHSY1, a Novel Biomarker and Therapeutic Target for Breast Cancer****JP THIA¹, Y YU¹, SM LEOW¹, PH TAN², GW YIP¹**¹Anatomy, National University of Singapore, Singapore, ²Pathology, Singapore General Hospital, Singapore

Aim: Chondroitin sulphate is highly expressed in breast carcinoma, the commonest cancer among Singaporean women. *CHSY1*, encoding chondroitin synthase-1, has recently been shown to regulate mitosis. In this study, we aimed to analyse its expression in breast cancer and determine its functional roles.

Methods: *CHSY1* expression in breast carcinoma was measured using real-time PCR. Functional analysis was performed using *CHSY1* siRNA to measure the effects on cancer cell behaviour after silencing the gene. Expression of potential downstream targets of *CHSY1* was measured by PCR and Western blotting.

Results: *CHSY1* transcripts were found to be up-regulated in a panel of breast cancer cell lines and clinical cancer specimens by quantitative PCR. To determine its functional roles, *CHSY1* expression was down-regulated using siRNA in MDA-MB-231 human breast cancer cells. Silencing of *CHSY1* resulted in decreased proliferation, migration and invasion of the carcinoma cells. TIMP3, AAT and CD44 are known regulators of cancer cellular behaviour. Quantitative PCR and Western blotting showed significant reduction in expression of these molecules at both mRNA and protein levels after silencing *CHSY1*, suggesting that these molecules may be downstream targets.

Conclusion: Our data demonstrated that *CHSY1* plays important roles in regulating breast carcinoma cellular behaviour, acting via TIMP3, AAT and CD44. *CHSY1* is thus potentially a novel biomarker and therapeutic target for breast cancer. Further studies are currently being carried out to determine if correlations exist between its expression and clinicopathological parameters, and to evaluate its use in predicting clinical outcome.

O-MSP5**Risk of Hepatitis Reactivation and Role of Antiviral Prophylaxis in Lymphoma Patients with Past Hepatitis B Infection Receiving Chemo-immunotherapy****YX KOO^{1,2}, DSW TAN¹, IB TAN¹, M TAO¹, R QUEK¹, ST LIM¹**¹Department of Medical Oncology, National Cancer Centre, Singapore, ²Yong Loo Lin School of Medicine, National University of Singapore, Singapore

Aim: The incidence and epidemiology of Hepatitis B virus (HBV) reactivation in lymphoma patients with past HBV infection [defined as Hepatitis B surface antigen (HBsAg) negative, anti-Hepatitis B core antibody (anti-HBc) positive] have not been previously studied.

Methods: We accrued 430 consecutive patients from May 2006 to May 2008. All were tested for HBsAg. Anti-HBc test was not performed routinely for all patients until after May 2007. Stored sera from consented patients were genotyped for HBV DNA.

Results: The prevalence of HBV infection is 7.2% (31/430). 233 patients had both tests performed; 80 (34%) were anti-HBc positive only. Among the 80 patients, 58 had a HBV DNA test, which was

positive in three (5.2%). 67 patients with past HBV infection received systemic treatment, including rituximab in 46. Among them, one patient who received rituximab reactivated (1/46; 4.3%); he did not receive anti-viral prophylaxis and had undetectable HBV DNA. Of the 26 patients with HBV infection receiving systemic treatment, 11 (42.3%) reactivated ($P < 0.001$). 90% of patients with HBV infection received antiviral prophylaxis compared to 10% with past HBV infection. All 4 patients with mutant HBV genotypes reactivated.

Conclusion: The incidence of past HBV infection (34%) is unexpectedly high and a proportion (5.2%) had occult infection (detectable HBV DNA). Majority of patients with past infection did not reactivate even with rituximab, although the risk (4%) is not negligible. Undetectable HBV DNA does not preclude reactivation. Anti-HBc should be routinely tested and those with past infection monitored for reactivation. Optimal use of anti-viral prophylaxis, particularly if immunotherapy is given, should be further evaluated.

O-MSP6**Overexpression of Hes1 in Primary Human Colorectal Cancer: Biological and Therapeutic Implications****YH OU YANG¹, S BIN ABDUL RASHID², LG KIM^{1,2}, CW ONG^{1,2}, TK KO², M SALTO-TELLEZ^{1,2}**¹Department of Pathology, National University Health System, Singapore, ²Oncology Research Institute, National University of Singapore, Singapore

Aim: Hes1 is the terminal gene target of the canonical Notch signalling pathway which is an important mediator of growth and survival in several cancer types. We analysed the protein expression patterns of Hes1 in primary Human colorectal adenocarcinomas (CRC).

Methods: Hes1 immunohistochemistry was conducted on 4 tissue microarrays representative of CRC (n = 106) and paired normal samples. These cases represented both the chromosomal instability pathway and the microsatellite instability pathway (previous analyses). The results were compared against normal controls as well as previously generated data in our lab on the expression patterns of other tumour-related proteins and other clinicopathological data derived from the same microarrays.

Results: Hes1 is over-expressed in colorectal cancer, regardless of tumour subtype ($P < 0.01$) Clinicopathological parameters: Nuclear Hes1 is increased with MSI-H/MSI-L status ($P < 0.01$) Cytoplasmic Hes1 is associated with Signet cell histology ($P < 0.01$). Nuclear Hes1 is associated with left sided CRC ($P < 0.01$). Cytoplasmic status of Hes1 negatively was associated with Ki67 ($P < 0.05$). Other parameters which lack significant correlation: size, sex, race, differentiation, invasion depth, lymph nodes positive, Duke's stage, TGF- β , Tunnel stain (apoptosis), B-Catenin, Sir-T1, NF-K β and Runx3

Conclusions: This preliminary study indicates that Hes-1 expression is a disease marker in a significant percentage of CRC. The associations highlighted above show that different patterns of Hes-1 expression may be related to distinct molecular pathways, this association may have both biological and clinical implications. Furthermore, Hes1 as terminal gene target of Notch may function as a therapeutic monitor for inhibition of Notch signaling, an exploratory new anti-cancer target.

P-MSP7

Outcome of Pylorus-Preserving Pancreaticoduodenectomy (PPPD) in a Hepatopancreaticobiliary (HPB) Unit.

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Background: Pylorus-Preserving Pancreaticoduodenectomy (PPPD) was advocated as it retains the physiological function of pylorus in controlled release of food content into small bowel. However, others challenged this operation as it causes higher complication of delayed gastric emptying (DGE).

Methods: A prospective database comprising of 69 patients who underwent pancreaticoduodenectomy between 2001 to May 2008 was analysed using SPSS (Version 15.0). We compared the difference between PPPD and classical Whipple's operation.

Results: The mean age of our patients was 62 ± 11 years. 28 (41%) patients underwent PPPD compared to 41 (59%) patients in the classical Whipple's group. There was no difference between the two groups (age, gender, racial distribution and comorbidities).

There was no statistical difference between the two groups in terms of indication for surgery, tumour histology, size, grade and staging (T, N and AJCC). There were also comparable results in terms of resection margin clearance, vascular and perineural involvement of malignant cases in the two groups. The proportion of patients in the PPPD group who had pre-operative stenting was comparable to the classical Whipple's group ($P = 0.53$).

The mean duration of operation for the PPPD group was 555 ± 123 min and this was significantly longer compared to the classical Whipple's group (mean 475 ± 157) ($P = 0.03$). Total amount of intra-operative blood loss and total amount of blood transfusion were similar in both groups. Postoperative and total length-of-stay were also comparable between the 2 groups.

Both groups have comparable morbidity rate and grade of complications. No statistical difference in terms of delayed gastric emptying (DGE) ($P = 0.50$), postoperative pancreatic fistula (POPF) ($P = 0.06$) or post-pancreatectomy haemorrhage (PPH) ($P = 0.85$) was demonstrated.

Conclusion: Outcome of PPPD is comparable to classical Whipple's operation. The concern of higher DGE rate in PPPD is unfounded and the long-term outcome of this operation is yet to be seen.

P-MSP8

Late-Onset Neutropenia in Patients with Diffuse Large B-Cell Lymphoma Following RCHOP Therapy

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Aim: Rituximab has been associated with the development of late-onset neutropenia (LON). As only heterogeneous studies have been conducted, its incidence and clinical course remain unclear. We aim to:

- 1) Study the incidence and clinical relevance of WHO grade 3/4 LON in a uniform group of patients with diffuse large B-cell

lymphoma (DLBCL) in complete remission following curative rituximab, cyclophosphamide, doxorubicin, vincristine and prednisolone (RCHOP) chemotherapy.

- 2) Ascertain predictive factors for LON.

Methods: The 121 eligible patients identified from our prospectively maintained database were followed up for occurrence of WHO grade 3/4 LON. The clinical course of LON was documented, and its relationship with patient- and tumor-related factors was analyzed.

Results: With a median follow-up of 883 days (range, 265 to 1762), 13.2% had developed LON of grade 3/4. The median time to neutrophil nadir was 129 days (range, 39 to 277). The median time to recovery was 69 days (range, 3 to 349) and occurred in all except two patients. Only one episode of non-life threatening bacterial culture-positive urinary tract infection and pulmonary tuberculosis, both occurring in the same patient was documented. Results of Fisher's exact test revealed that age, stage, LDH level, ECOG, marrow involvement and hematologic parameters did not predict for LON development.

Conclusion: WHO grade 3/4 LON is not infrequent in DLBCL patients receiving RCHOP. Even so, it is reassuring that LON is self-limiting and unassociated with life-threatening infection. A watchful waiting approach is appropriate in majority of patients who develop LON following RCHOP.

P-MSP9

Expression Analysis of Syndecans in Breast Papillary Tumours

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Aim: Syndecans are transmembrane heparan sulphate proteoglycans. Comprising four family members, syndecans are known to be expressed in several cancers. This study aimed to analyse the expression patterns of syndecans-1 to 4 in benign and malignant papillary breast tumours.

Methods: Expression patterns of syndecans-1 to 4 were examined in 36 cases of benign papillomas and 39 patients with malignant papillary ductal carcinoma *in situ* (DCIS) by immunohistochemistry using specific antibodies. Staining intensities and percentages of cells stained were determined by light microscopy. The immunoreactivity score (IRS) was calculated by multiplying staining intensity by percentage of cells stained.

Results: Syndecans-1 and 3 showed moderate to strong immunohistochemical staining in papillomas, which was significantly decreased in papillary DCIS. Significant down-regulation of syndecan-4 expression was observed in epithelial cells of DCIS compared against papillomas. Interestingly, expression of syndecan-4 in papillomas was localised to epithelial cells, with minimal expression in myoepithelial and stromal cells, a phenomenon not observed in DCIS. There were no differences in staining between the two lesions for syndecan-2. The expression of syndecans-1 and 4 in epithelial cells of DCIS of low nuclear grade were found to be significantly greater than that in DCIS of intermediate grade.

Conclusion: Our data shows that syndecans-1, 3 and 4 are differentially expressed in benign papillomas and malignant papillary DCIS. These molecules may be involved in tumorigenesis, and potentially may be useful clinically as biomarkers or therapeutic targets. Further studies will be performed to evaluate their expression in a larger sample series, and to determine their biological functions.

P-MSP10**Knowledge and Misconceptions of Cancer Among Community-living Adults in HDB Estate****J LEE¹, CS ONG¹, G OOI¹, XQ TAN¹, HM VERKOOIJEN², G KOH²**¹*Yong Loo Lin School of Medicine, National University of Singapore, Singapore,* ²*Community, Occupational and Family Medicine Department, Yong Loo Lin School of Medicine, National University of Singapore, Singapore*

Aim: Many studies have shown that greater cancer knowledge is associated with greater adherence to cancer screening. Few studies have been conducted locally to ascertain common misconceptions and adequacy of knowledge towards cancer.

Methods: We studied the relationships between socio-demographics and screening, cancer knowledge, misconceptions of cancer and screening attitudes. Method used: A questionnaire survey of 480 eligible Singaporeans/permanent residents. Quantitative and qualitative data were analyzed separately with statistical and thematic analysis respectively.

Results: Up to 50% of the study population was unaware that breast and colon cancer can be hereditary, less than 45% knew that modifiable lifestyle factors such as obesity, lack of exercise and lack of fruits and vegetables in the diet were risk factors for cancer and more than 50% of our respondents could not identify common modifiable lifestyle factors. Twenty-nine per cent felt that cancer screening was only for symptomatic individuals. Determinants of high level of cancer knowledge included higher socio-economic status, having friends or relatives who have had cancer and knowing someone working in the healthcare service.

Conclusion: In Singapore, there is a high prevalence of lack of knowledge and misconception about cancer, cancer risk factors and warning signs. In order to tackle the increasing burden of cancer in Singapore, this lack of knowledge and misconceptions about cancer and cancer screening need to be addressed.

P-MSP11**Effects of Reperfusion Therapy on the Mortality and Morbidity in the Very Elderly with Acute Myocardial Infarction****WBA TAN¹, LC LEE², KK POH², HY ONG³, HC TAN²**¹*Medical Faculty, National University of Singapore, Singapore,* ²*Cardiac Department, National University Hospital, Singapore,* ³*Cardiac Department, Alexandra Hospital, Singapore*

Aim: Although the majority of the mortality related to myocardial infarction (MI) occurs in the elderly, they were underrepresented in majority of trials. Hence, there is limited data available to examine the benefits of invasive treatment in the very old. In this study, we aim to examine the impact of reperfusion therapy on the in-hospital and 1-year mortality in acute MI in the elderly.

Methods: We retrospectively analysed 622 consecutive patients aged 75 and above who were admitted for myocardial infarction to a local institution. The endpoints were mortality and 1 year reinfarction rates.

Results: Overall, there were 47% males; mean age was 82 ± 5 years. The prevalence of hypertension, and diabetes mellitus were

significantly higher in women while 79.3% of the smokers were male. Only 14.0% were offered revascularization therapy. It was noted that conservatively treated patients had a significantly higher mortality within 1-year post-MI (HZ = 1.95, 95%CI 1.16-3.29, $P = 0.012$). After adjusting for age and conventional risk factors, the composite endpoints was still higher in those treated less aggressively (HZ = 1.89, 95% CI 1.13-3.17, $P = 0.015$). In addition, in hospital cardiovascular complications and mortality were higher in this group, $P < 0.05$ for both. Reperfusion however, did not decrease readmission for cardiovascular complications of heart failure, angina, infarction and malignant arrhythmias. Among those who were did not undergo reperfusion, in hospital complications (cardiovascular and medical) were significantly higher in diabetics ($P < 0.05$) independent of gender. Diabetes was also the most important determinants of the 1-year re-infarction/mortality (HZ = 1.89, 95%CI 1.37-2.60, $P < 0.001$).

Conclusion: Heterogeneity of older populations may have led to a less invasive approach as a whole, elderly MI patients offered reperfusion therapy have reassuringly lower in-hospital morbidity and 1-year mortality but no change in cardiac readmission.

P-MSP12**Change in Quality of Life Following Cataract Extraction****WK NGO¹, CSH TAN²**¹*Yong Loo Lin School of Medicine, National University of Singapore, Singapore,* ²*National Healthcare Group Eye Institute, Tan Tock Seng Hospital, Singapore*

Aim: To evaluate the visual quality of life (QOL) of patients with cataracts before and after cataract surgery and to assess factors affecting the change in QOL.

Methods: A longitudinal, questionnaire-based study of 20 consecutive patients with cataracts. Patients' QOL was assessed before and after phacoemulsification cataract surgery using time trade-off (TTO), standard gamble for death (SGD), standard gamble for blindness (SGB) utilities and visual function-14 (VF-14) questionnaires.

Results: The mean age of the patients was 66.2 years (range, 48 to 80, $SD \pm 8.9$). All the visual quality indicators improved after cataract surgery (VF-14: 74.5 to 96.3, $P = 0.001$; TTO 0.86 to 0.89, $P = 0.75$; SGD 0.88 to 0.98, $P = 0.06$; and SGB 0.84 to 0.98, $P = 0.029$). Preoperatively, the mean VF-14 score was lower for subjects with advanced cataracts (advanced: 67.3, early: 82.7). There was a greater improvement in VF-14 score after cataract surgery for patients with advanced cataracts (39.4) compared to those with early cataracts (12.3) ($P = 0.013$). The mean VF-14 score improved from 72.8 to 93.4 in patients with VA $> 20/40$ compared to 78.8 to 98.3 for those with VA $\leq 20/40$ initially. SGD and SGB correlated with each other both pre- and post-operatively ($P < 0.001$). There were no correlations between VF-14 and utility values.

Conclusion: There are improvements in quality of life indicators after cataract surgery using both VF-14 and utility values. Patients' visual function improved following cataract extraction, with the improvement greater for those with more advanced cataract disease and poorer VA initially. Standard gambles for death and blindness correlated well.

MSP13

Quality of Life in Children With Cancer Undergoing Treatment

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Aim: With intensive chemotherapy and increased survival, quality of life in our pediatric population is of increasing concern. The aim of this study is to assess the children's quality of life during the treatment process.

Methods: Patients between 7 to 18 years old who are undergoing cancer treatment in National University Hospital were identified. The child self-reported his/her health-related quality of life (HRQOL) using the PedsQL Pediatric Quality of Life Inventory and Cancer module as a validated assessment tool.

Results: Thirty-two patients were enrolled over a 3-week period in November 2007. Median age was 11 years (range, 7 to 17 years). There was one non-responder (3%). Fourteen (45%) boys and 17 (55%) girls were interviewed. There were 8 (26%) patients and 23 (74%) patients with solid and liquid tumours respectively. For the Cognitive Problem Dimension score, 86% of patients with liquid tumours and 50% of those with solid tumours scored below the 75th percentile (82); OR 0.2 (0.03 – 1.0) $P = 0.05$. For Physical Health Summary score, the patients with solid tumour scored worse, 25% below the 10th percentile, as compared to 4.3% of patients with liquid tumour. This is reflected by a worse Pain and Hurt Dimension score for patients with solid tumour. For Perceived Appearance Dimension score, patients with solid tumour (75%) scored lower than the median score (67) compared to those with liquid tumour (44%).

Conclusion: The domains of QOL are affected to different extents for the patients with solid and those with liquid tumours. This is most likely to be due to the differences in treatment strategies and clinical course. Healthcare professionals should be aware of the effects of treatment on QOL and take practical steps to address these issues.

The authors declare that there is no conflict of interest.

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MSP14

Validating Medical Students Surgical Skills Using Virtual Surgical Simulators

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Aim: Surgery is a competitive discipline and choosing from traineeship applicants is difficult. Surgical simulators are widely used in evaluating performances of trainee and expert surgeons. We aim to evaluate surgical skills of medical students using surgical simulators and identify predisposing factors, if any, that might aid in selecting surgical trainees.

Methods: Fifty year-3 YLLSOM students randomly selected after completing medicine and surgery clerkships were evaluated using a virtual surgical simulator (LapMentor, Symbionix, USA) on three tasks (Eye-Hand Coordination; Clip Applying; Two-Handed Manoeuvres). Data regarding lifestyles, hobbies, and habits were used as primary outcomes. Results were statistically analyzed by independent samples t-test and ANOVA.

Results: Scores for Eye-Hand Coordination were significantly better in students: drinking <1 cup coffee/day (0.012); driving manual cars (0.001); not playing sports regularly (0.49). For Clip Applying, students expressing interest in surgery performed significantly better (0.012). Score differences were insignificant between groups in Two-Handed Manoeuvres. Further analysis showed economy-of-movement of non-dominant hand was better in: male students (0.032); those playing PC games over handheld/console (0.007) and not playing sports regularly (0.005). No significant differences were found for military service status, race, sleeping time, musical instrument play and driving.

Conclusion: Our study showed certain factors affecting students' performances on the surgical simulator, possibly indicating better aptitude and performance in surgical training. They include interest in surgery, reduced coffee intake, driving manual cars, history of playing computer games regularly, gender, computer game platform, and not playing sports regularly. Further studies can be done to utilise these factors in selecting candidates for surgical traineeships.

MSP15

Ethnic Differences on the Outcomes of Non ST-Elevation Myocardial Infarction in Diabetic Patients

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Aim: Diabetes mellitus (DM) is linked to adverse outcomes in patients with Acute Coronary Syndrome (ACS). We aim to examine the prevalence of diabetes and its impact in Non ST-Elevation Myocardial Infarction (NSTEMI) patients in our local population.

Methods and Results: A total of 1342 consecutive patients with NSTEMI, admitted to a local institution, were retrospectively studied. The endpoints were in-hospital mortality, reinfarction and 1-year mortality. There were 37.9% female and 49.4% diabetics. The diabetics were significantly older with mean age 67.5 ± 12 vs 64.5 ± 15 year old in non-diabetics ($P < 0.001$). They were predominantly hypertensive and non-smoking, 49.2% were female. Malay and Indian patients were disproportionately overrepresented in the diabetic versus non-diabetic group (Malay 23.5% vs 21.5%, Indian 18.9% vs 12.7%). Only 18.3% (vs 30.3% ($P < 0.001$)) of the diabetics were treated aggressively with reperfusion therapy. There was no ethnic disparity in the treatment given. However, diabetics had increased risk of in-hospital cardiovascular complications (44.1% versus 25.1%, 95% CI 1.86-2.97), and in-hospital mortality (12.5% versus 8.0%, HR 1.66 (95% CI 1.16-2.38)). After adjustment for treatment, diabetic Indians were 10 times more likely to die and twice as likely to developed complications during admission. Post discharge, 26.4% of diabetics was readmitted for cardiovascular related complications. After adjusting for age, medical treatment only was associated with a higher reinfarction or mortality rate within a year (HR = 4.92 (95% CI 2.39-10.12), this is independent of racial difference).

Conclusions: Diabetes with NSTEMI suffers from worse outcomes both during the admission and post-discharge. There is therefore a need for aggressive risk modification in diabetics suffering from ACS. Diabetic Indians suffer higher morbidity and mortality despite similar treatment, further research into this may be warranted.

MSP16**A Cross-sectional Study on Unwarranted Visits to the Accident and Emergency Department Among Adult P3 patients – Do We Know Why Patients Come?****QY HO¹, VS TAN¹, CC HONG¹, WS LIM¹, J LEE², TY WONG², LS QUEK³**¹Yong Loo Lin School of Medicine, National University of Singapore, Singapore ²Community, Occupational and Family Medicine, Yong Loo Lin School of Medicine, National University of Singapore, Singapore, ³Dept of Emergency Medicine, National University Hospital, Singapore**Aim:** To determine the prevalence of unwarranted visits among non-emergency (P3) adult patients to the Accident and Emergency Department (ED) and the factors for such visits.**Methods:** A cross-sectional survey was administered to patients above 21 years old, who were triaged as P3 by the triage nurse in a tertiary hospital ED for 1 week. Information on demographics, use of ED services, primary care physicians (PCP) and other treatment modalities, self-reported urgency and reasons for visiting the ED were collected. The opinions of 2 independent physicians (an ED consultant and a PCP) were used to determine if the visit was unwarranted or warranted. We analysed the association of specific factors between both groups.**Results:** Of 593 eligible subjects, 316 had sufficient data for analysis. Almost 16% of all P3 patients attending the ED are likely to be unwarranted. This was associated with younger age ($P = 0.004$), higher education status ($P = 0.001$), being single ($P = 0.004$), foreign nationality ($P = 0.028$), SAF personnel ($P = 0.000$) absence of referral by PCPs ($P = 0.018$), use of non-western medicine ($P = 0.041$) company policies on private PCPs' medical certificate ($P = 0.002$) and ability to receive free or subsidised treatment ($P = 0.032$). The 3 most important reasons cited by unwarranted visitors were: proximity of residence to ED (15.2%), belief that ED had better facilities (13.0%) and that one is able to obtain earlier specialist appointment (8.7%).**Conclusion:** Unwarranted visits could be an important contribution to overcrowding at the ED. We found that factors related to PCPs appear to affect the decision of such patients. Younger, more highly educated patients were also more likely to have unwarranted visits.**MSP17****Characterising the Distribution and Types of Ear, Nose and Throat Disorders in Children with Down Syndrome in Singapore****S WIRYASAPUTRA¹, LHY LIM²**¹4th Year Medical Student, National University Singapore, Singapore, ²Consultant, Otolaryngology-Head and Neck Surgery Department, National University Hospital, Singapore**Aim:** Down syndrome (DS) is the most common congenital chromosomal anomaly at 1 in 700 live births. Children with DS are predisposed to ear, nose and throat (ENT) problems. The aim is to characterise the distribution of ENT problems in children with DS in Singapore.**Methods:** A questionnaire on possible ENT and other systemic problems in children with DS was administered to caregivers of the children who were attending a medical seminar organised by the Down Syndrome Association on 24 May 2008.**Results:** Amongst 23 caregivers, 90% reported delayed or unclear speech, 50% snoring (only 1 child had a sleep study), and 44% ear problems (canal stenosis, otitis media with effusion and hearing loss). Thirty-seven per cent reported recurrent nasal infections and 22% allergic rhinitis. None reported recurrent tonsillitis, gastroesophageal reflux disease (GERD) and adenotonsillar hypertrophy. Amongst non-ENT problems, 50%, 25% and 13% were eye, heart and thyroid related respectively.**Conclusion:** ENT problems are very common in children with DS, with speech, snoring and ear problems the leading ENT disorders. Routine sleep study may be needed so that obstructive sleep apnea is not missed. Recurrent colds and allergic rhinitis must be optimally managed to reduce the further compromise to the airway. The nil report of adenotonsillar hypertrophy will need further study to evaluate if this is so in DS or if diagnosis is missed. GERD likely has been under-diagnosed. This study can help raise the awareness of common ENT problems in DS amongst physicians and caregivers in Singapore.**MSP18****Pain Experienced During Ophthalmic Laser Procedures****LWY FOO¹, CSH TAN², KG AU EONG²**¹Yong Loo Lin School of Medicine, National University of Singapore, Singapore, ²National Healthcare Group Eye Institute, Tan Tock Seng Hospital, Singapore**Aim:** To investigate the severity of pain experienced by patients during argon laser photocoagulation and to determine the relationship between severity of pain and the laser parameters.**Methods:** Sixty-two patients undergoing argon laser photocoagulation (panretinal photocoagulation (PRP), focal lasers) were interviewed within one hour of their laser procedure using a standardized questionnaire. The pain experienced during the laser procedure was scored on a visual analogue scale of 0 to 10, where 0 represents no pain and 10 represents the most severe pain. No pain relieving medication was provided during the procedure.**Results:** The mean age of the 62 patients was 57.9 years (range, 34 to 81, SD \pm 9.0). Of the 30 patients undergoing panretinal photocoagulation (PRP), 27 (90%) experienced pain. The mean pain scores were 3.0 (sharp), 1.40 (dull), 0.37 (throbbing) and 0.17 (constant). There was no significant difference between the pain scores of those who received more than 1000 laser burns compared to those with less. The power of the laser beam correlated with the pain score for throbbing pain ($P = 0.04$). Of the 32 patients undergoing focal or grid photocoagulation, 13 (40.6%) experienced pain. The mean pain scores were 0.31 (sharp), 0.88 (dull), 0.19 (throbbing) and 0.13 (constant). Sharp pain correlated with the power of the laser ($P = 0.003$) while throbbing pain correlated with the number of shots ($P < 0.001$).**Conclusions:** A higher proportion of patients undergoing PRP experienced pain compared to those undergoing focal photocoagulation. Pain score correlated with the power and number of laser burns.

MSP19

Female Patients and Lack of Caregivers are Associated with Poor Diabetes Mellitus Control

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Aim: The objective was to explore the association of socio-demographic factors with poor diabetes mellitus (DM) control.

Methods: DM patients attending a single renal Specialist Outpatient Clinic were interviewed over a one month period. Data collected included demographics, socio-economic factors (education level, housing type and mode of outpatient payment), presence of caregivers, duration and compliance to DM medication, frequency of home glucose monitoring and glycosylated haemoglobin level (HbA1c). Poor DM control was defined as HbA1c >7.5%. Univariate and multivariate analyses were performed using logistic regression models. Odds ratios were paired to their corresponding 95% confidence to measure effect size. Data analysis was done in Stata V.9.2 with tests conducted at the 5% level of significance.

Results: There were 48 patients; mean age of 64.4 ± 12.1 years; mean duration of DM was 19.3 ± 10.6 years and 18 (37.5%) patients were male. Multivariate analyses showed that females were 5.57 times (95% CI, 1.22-28.35) more likely than males to have a poorer DM control ($P = 0.026$). Patients without caregivers were 6.31 times (95% CI, 1.42-28.03) more likely to have a poorer DM control compared to those with a caregiver.

Conclusion: Understanding the socio-demographic factors that impact on DM control can help the clinicians to target specific groups of diabetic patients at risk of poor sugar control. We showed that female patients and patients without caregiver support are independent risk factors for elevated HbA1c. The reason for gender difference in DM control needs to be explored.

MSP20

Knowledge, Attitudes and Views of Hospital Nurses Towards the Advance Medical Directive in Singapore

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Aim: As of 2006, only about 4000 Singaporeans have signed up for the Advance Medical Directive (AMD) - a completion rate of about 0.1% for Singapore's population. As front-line healthcare workers, nurses can be valuable patient educators to support patient autonomy and informed decision-making with regard to the AMD.

1. To explore the knowledge, attitudes and views of nurses working in an acute hospital setting towards the AMD
2. To find out the factors affecting the nurses' knowledge and attitudes towards the AMD

Methods: This cross-sectional study was conducted in 2 wards in Alexandra Hospital. A total of 89 nurses composed the available sample. A 14-item questionnaire was distributed to and self-administered by the nursing staff.

Results: The response rate was 66%. The nurses had poor knowledge of the AMD with a mean knowledge score of 61.6%. Medical ward

nurses had a higher AMD knowledge score of 66.8% compared to 54.5% for surgical ward nurses.

Forty-six per cent of the nurses expressed acceptance of the AMD, with an equal percentage (46%) holding a neutral view. Fifty-one per cent of the nurses could not decide if they would be comfortable discussing the AMD with patients. Acceptance of the AMD was found to be a positive predictor for being more comfortable discussing the AMD with patients.

Twenty-nine per cent of medical ward nurses had received formal instruction related to the AMD, compared to 8% of surgical ward nurses. A large majority (86%) of the nurses felt that more education related to the AMD is needed.

Conclusions: More education pertaining to the AMD and palliative care is required to equip nurses with the knowledge, confidence and skills to discuss the AMD effectively and comfortably with patients. This is particularly important as our population is ageing and, with better education, more individuals can be expected to approach healthcare professionals to find out more about the AMD.

MSP21

The Relationship Between Severity of Somatic Symptoms and Treatment Preference of Adults with Depression in Singapore

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Aim: To characterise the relationship between somatic symptoms and treatment preference in patients diagnosed with depression.

Methods: We performed a cross-sectional study of 36 adult patients who fulfilled DSM IV-TR criteria for Major Depressive Disorder and were treated in National University Hospital. Patients were categorised using 28-item Somatic Symptoms Inventory (SSI) into 'minimal' (total SSI score ≤56) and 'moderate to high' (>56) groups according to degree of somatic symptom discomfort. Severity of depression was assessed by 17-item Hamilton Depression Rating Scale (HAMD-17) and quality of life using 12-item Short Form Health Survey (SF-12). They were also asked to rate their treatment preference.

Results: The mean HAMD-17 score was 16.81 (± 6.94). Somatic symptoms increased as a function of overall depression severity ($r = 0.56$), with 'feeling fatigued, weak or tired all over' ($r = 0.68$), 'hot or cold spells' ($r = 0.56$) and 'headaches' ($r = 0.47$) showing the strongest correlation with total HAMD-17 scores. Medication was generally preferred over psychotherapy with higher percentage in the 'moderate to high discomfort' group. Greater severity of somatic symptoms was associated with reduced quality of life. The 'moderate to high discomfort' group had lower physical [$P = 0.002$] and mental component summary scale scores of 33.76 (± 8.14) and 33.27 (± 7.14) respectively as compared to the 'minimal discomfort' group with scores of 42.85 (± 7.96) and 37.78 (± 12.78).

Conclusion: Greater severity of somatic symptoms was associated with increased depression severity, preference for medication and reduced quality of life. Assessment of somatic symptoms could thus be useful in evaluation of the disorder and treatment strategies.

MSP22

Subglottic Stenosis in Infants and Children

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Aim: To study the epidemiology and outcome of subglottic stenosis in infants and children and to evaluate current techniques in the diagnosis and management of subglottic stenosis at KK Women's and Children's Hospital.

Methods: Retrospective review and long-term follow-up of all infants and children diagnosed with subglottic stenosis over an eleven-and-a-half-year period between January 1997 and June 2008.

Results: Eighteen patients (nine males; nine females) with a median age of 7.5 months at the time of diagnosis of subglottic stenosis were identified. Two patients were diagnosed with definite congenital stenosis; 16 with acquired stenosis. The majority had a grade I stenosis (55.6%), followed by grade II (27.8%), grade III (16.7%), and grade IV (0%). Seventeen patients were intubated; seven underwent tracheostomy. The most common surgical intervention performed was microlaryngoscopy and bronchoscopy, with or without dilation, laser and mitomycin application. The other surgical interventions included cricoid split, laryngotracheal reconstruction and cricotracheal resection. As of June 2008, the median duration of treatment lasted four years with an overall recovery rate of 61.1%. There was a successful decannulation rate of 57.1%. There have been two mortalities due to reasons unrelated to subglottic stenosis. Three are still undergoing treatment and two were lost to follow-up.

Conclusion: Conservative management may be all that is required in the majority of grade I stenosis. We found the mean number of reconstructive procedures performed per patient increased with increasing severity of stenosis. Each laryngeal framework procedure has to be customized to suit the individual.

MSP23

Sleep Behaviour in a Sample of Preschool Children in Singapore

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Aim: Sleep problems are common in all ages, but may be particularly acute in Singapore where anecdotally, children often sleep later because of various cultural and social factors. The objective of this study was to describe the sleep behaviour of preschool-aged children and to identify any sleep problems in this population.

Methods: This was a cross-sectional questionnaire survey of 358 children attending local childcare centers. The questionnaire was based on the Children's Sleep Habits Questionnaire (CSHQ), a validated parent-report sleep screening questionnaire that contains 54 items identifying sleep behaviours in children.

Results: A total of 358 children participated in the survey. The mean age was 4.6 years with a range of 2 to 6 years. Average sleep duration at night was 8.53 hours, and average nap duration was 2.67 hours, with average total sleep duration of 10.53 hours. This was lower than

the recommended sleep duration of 11 to 13 hours/night for the preschool age group and was approximately 1 standard deviation below the mean for the age group. Total sleep duration also decreased by 14 minutes for every year of the child's age. Co-sleeping was also common in the local population, with 80.9% of children sharing the same room with a parent or sibling, and 42.2% sharing the same bed with a parent or sibling. 84.1% of parents perceived that their child's sleep duration was adequate.

Conclusion: The duration of sleep in the preschool population sampled here is lower than previously described Caucasian populations. Parental perception of adequacy of sleep deviates from current recommendations. In view of clear relation of sleep duration with cognitive functioning, learning, attention as well as physical growth and behaviour, preschool children should be screened for sleep adequacy in well-child follow-ups.

MSP24

Seroepidemiology of Varicella and the Reliability of a Self-reported History of Varicella Infection in Singapore Military Recruits

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Aim: Varicella is an acute disease with significant morbidity. However, there is little knowledge on the seroepidemiology of the disease in Singapore. The objective of this study was to assess the seroprevalence of varicella zoster virus (VZV) antibodies in military recruits in Singapore and to ascertain the predictive value of a self-reported history of varicella. The latter is a possible proxy for seroprevalence, and may be used to provide efficient identification of candidates for vaccination.

Methods: From September 2000 to October 2005, 2189 servicemen were selected during their pre-enlistment medical check-up. Blood samples were obtained to determine the varicella IgG levels via enzyme-linked immunosorbent assay (ELISA).

Information about the participant's race, history of varicella and vaccination, and other clinical variables were obtained through a questionnaire.

Results: The overall prevalence of VZV sero-positivity in military recruits was 76.0% (75.8% in the 16 years to 20 years age group). For the reported history, 73.7% of Chinese participants, 73.0% of Malays, and 63.6% of Indians reported having had varicella infection and/or vaccination. Overall, the sensitivity, specificity, positive and negative predictive values of a self-reported history of varicella for serologically confirmed immunity were 87.2%, 83.2%, 94.3% and 67.1% respectively.

Conclusions: The prevalence of VZV antibodies in pre-enlistees to the Singapore Armed Forces (SAF) is high. Incidence of varicella in the SAF is on the wane, indicating an increase in herd immunity against VZV. A recalled history of varicella infection was also a good predictor of serological immunity and may be used for selection for vaccination.

Full article may be accessed at: www.annals.edu.sg/pdf/36VolNo8Aug2007/V36N8p636.pdf

MSP25

Whipple's Procedure and the Elderly – Is there a Significant Risk?

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Aim: Whipple's procedure or pancreaticoduodenectomy (PD) has had a high rate of mortality and morbidity since its inception. Although there have been significant improvements over the last two decades, the concern for elderly undergoing PD remains. This study examines the outcome of the elderly patients who had pancreaticoduodenectomy in our institution.

Methods: A prospective database comprising of 69 patients who underwent pancreaticoduodenectomy between 2001 to May 2008 was analysed using SPSS 15.0. Elderly patient is defined as age 65 and above, according to the World Health Organization (WHO) definition. Two groups of patients were compared [Group 1: Age ≤ 65 , N = 37 (54%) vs Group 2: Age > 65 , N = 32 (46%)].

Results: The mean age of our cohort of patients was 62 ± 11 years. There was no statistical difference between the 2 groups in terms of gender and racial distribution. However, there were more patients in the Group 2 with 2 or more comorbidities ($P = 0.03$). This was correlated with greater American Society of Anesthesiology (ASA) score in Group 2 ($P = 0.01$). The following parameters were comparable including clinical presentation, indication for surgery, histology, tumour size, grade and staging (T, N and AJCC).

The duration of operation was longer in Group 2 (550 vs 471 min, $P = 0.04$). Morbidity rate in Group 2 was higher (56% vs 44%, $P = 0.04$). There was no difference in delayed gastric emptying (DGE) and post-pancreatectomy haemorrhage (PPH), wound infections and respiratory morbidities between the 2 groups.

Postoperative length-of-stay (LOS) in hospital was significantly longer in Group 2 ($P = 0.01$). Mortality rate between the 2 groups of patients was comparable.

Conclusion: Elderly patients are at increased risk of morbidity in pancreatoco-duodenectomy. Therefore, careful preoperative patient selection is important but they should still be offered the procedure if indicated.

MSP26

Validation of a Laparoscopic Surgery Course Using Virtual Surgical Simulators

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Aim: Didactic teaching and operating theatre mentoring are tools in surgical training programmes today. Surgery is evolving and surgical residency training is now different. Short-term courses and workshops have become an integral part of surgical education. Following the benefits in aviation, the advancement in technology has led to the use of surgical simulators in skills training and education curriculum without exposing patients to potential complications. The aim of our study is to validate a surgical training course with the use of a virtual surgical simulator.

Methods: Eighteen participants of a Basic Laparoscopic Surgery Course underwent a pre and post-workshop assessment by performing 3 pre-selected exercises using the Lap Mentor II™ Virtual Simulator (Symbionix, USA). The course included 3 hours of lectures, 4 hours of inanimate tissue exercises, and 4 hours of animal tissue exercises. The results of the assessments were then compared.

Results: The mean age of the participants was 41 years (15M; 3F). Sixteen were specialist trainees (12 GS and 4 Obs/Gyn) and 2 were basic trainees. Two of the participants had more experience in laparoscopic surgery than the others (< 100 cases) while 16 had basic (< 20 cases) or no experience at all. The participants needed 27.75%, 24.25%, and 15.5% shorter ($P < 0.001$) to complete the pre-selected exercise 1, 2, and 3, respectively after completing the workshop.

Conclusion: Our study has shown that short-term laparoscopic workshops are useful, effective, and indispensable tools for continued surgical education. Likewise, the virtual reality surgical simulator is a useful and objective means for evaluating and differentiating the skill levels of trainees.

MSP27

The Effect of Using Modified Ophthalmic Quality-of-Life Assessments in Myopia

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Aim: To assess quality of life (QOL) in myopes using modified QOL assessments where questions were asked in the context of a hypothetical scenario where glasses and contact lenses were unavailable.

Methods: Standard and modified Visual Function-14 (VF-14) and utility values questionnaires (time trade-off [TTO] and standard gambles for death and blindness [SGD and SGB]) were administered to 176 myopic medical students. The modified questionnaires required participants to imagine life without corrective lenses.

Results: Compared to the standard questionnaires, scores for the modified VF-14, TTO, SGB and SGD were significantly lower (VF-14: 48.7 vs. 99.0, TTO: 0.80 vs. 0.95, SGB: 0.93 vs. 0.99, SGD: 0.95 vs. 0.99, all $P \leq 0.002$). In standard questionnaires, there was no significant difference in QOL scores between severe (spherical equivalent (SE) $\leq -6.00D$), moderate [SE $-3.00D$ to $-5.99D$] and mild [SE -0.50 to $-2.99D$] myopes. However, QOL scores were progressively lower with increasing severity of myopia in the modified VF-14 and the difference between all groups was significant (mild: 75.2, moderate: 53.6, severe: 24.9, $P < 0.001$). The same was seen in the modified TTO (mild: 0.89, moderate: 0.80, severe: 0.73, $P < 0.05$).

Conclusion: Myopic medical students respond differently to modified QOL assessments compared to standard questionnaires, and reported significantly lower QOL on the modified questionnaires. The scores decreased progressively with severity of myopia and were significant for the modified VF-14 and TTO questionnaires.

MSP28

Outcomes of Laser Treatment in Diabetic Retinopathy

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Aim: To study outcomes of laser photocoagulation for diabetic retinopathy and clinically significant macular oedema (CSME).

Methods: A review of 200 patients with diabetic retinopathy who underwent laser photocoagulation between 2004 and 2005. The indications, duration of treatment, final visual acuity and complications were analysed for different subgroups.

Results: The mean age of the 200 patients was 59.4 years (range 31 to 84, SD \pm 9.32), with 110 males and 90 females. At the end of the review period, 172 cases (86%) were stable, with 23 (11.5%) defaulting treatment and 5 (2.5%) still on active treatment. The mean duration of treatment was 12.3 months (range 1 to 41, SD \pm 7.94) with 54% of cases completing treatment within a year and 93% within two years. Visual acuity remained stable, with 70% of cases (111 of 158 cases) having a final visual acuity within one line of the initial visual acuity. The most frequent complication was vitreous haemorrhage, which occurred in 9.3% of cases (16 of 172 cases). Vitreous haemorrhage occurred most frequently in patients with proliferative diabetic retinopathy (30%), followed by 6.5% for severe non-proliferative diabetic retinopathy (SNPDR) and 0% for CSME. Patients with proliferative diabetic retinopathy had poorer final visual acuity ($>6/12$) (42.1% compared to 23.7% for SNPDR and 27.5% for CSME).

Conclusion: Most patients treated for diabetic retinopathy are stable within 12 months. The final visual acuity is within one line of the initial visual acuity in 70% of cases. Patients with proliferative diabetic retinopathy had poorer outcomes, with 30% experiencing vitreous haemorrhage.

MSP29

Aortic Root Dimensions in Children with End-stage Renal Failure

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Aim: End-stage renal failure (ESRF) is associated with changes in the cardiovascular parameters. The aim of this study is to determine if ESRF and peritoneal dialysis (PD) affect the aortic root dimensions in children.

Methods: Patients who were commenced on PD between January 2001 and December 2007 were identified. Patients who developed ESRF before the age of 21 years and had a complete set of echocardiography data were included in this study. Patients with concomitant congenital heart disease were excluded. Aortic root dimensions were obtained at end-diastole in the parasternal long axis view in the standard manner. Aortic root dilatation (ARD) was defined as that greater than the 97th centile for the patient's body surface area based on reference values for children. Serial measurements were obtained just before the commencement of PD and subsequently at 6 to 12 monthly intervals.

Results: Thirty-four patients (15 male) were included in the analysis. The mean age at commencing PD was 13.5 years. ARD was seen in 59% of patients. No adverse cardiovascular outcomes were seen with ARD. Coronary artery dilatation was also seen in 74% of patients with ARD. In 68%, ARD occurred after PD was commenced. Only 2 patients showed resolution of ARD; both patients did not have ARD prior to PD.

Conclusion: ARD is seen in a significant proportion of children with ESRF on PD. This generally does not resolve with time. No adverse cardiovascular outcomes have been associated with ARD in our cohort of patients.

KEY1

Redefining the HIV Epidemic in Asia and Crafting an Effective Response

JVR PRASADA RAO

UNAIDS Asia Pacific Region, Bangkok, Thailand

As a percentage of the region's large population, HIV prevalence rates in Asia may seem low but the absolute figures are high. According to UNAIDS and WHO estimates, 4.9 million (the range being 3.7 million–6.7 million) people were living with HIV in Asia in 2007, including the 440,000 (210,000–1.0 million) people who became newly infected in that year. Approximately 300,000 (250,000–470,000) people died from AIDS-related illnesses in 2007.

Overall, an estimated 9 million Asians have been infected with HIV since it first appeared in the region more than 20 years ago, and approximately 2.6 million men, 950,000 women, and 330,000 children have died of AIDS-related diseases.

Despite a ten-fold increase in resources and growing leadership in HIV over the last decade, access to essential HIV services in Asia has remained low. Even today, prevention and treatment services fail to reach 2 out of every three people in need of them. With the exception of only two countries, and a few provinces or states of large countries, there is no sign of slowing the epidemic.

Overall, Asia's response has neither matched nor kept pace with the unfolding realities of HIV epidemics. And as Asian countries continue along this path, AIDS will account for more deaths annually among 15–44 year-old adults than do tuberculosis and other diseases.

A great deal of the epidemic's damage is concentrated on poor families who have no cushion against the consequences of AIDS-related illness, nor do they have the support of formal social protection schemes. Wives caring for HIV-infected husbands are ostracized, and widows are forced to leave their homes and land. Women and children in Asia bear a disproportionate impact of the epidemic.

It was this realization that led to the creation of an independent nine member Commission on AIDS in Asia. The Commission reviewed scientific evidence surrounding the spread of HIV in Asia, assessed the medium- and long-term impact of AIDS on Asian societies and recommended practical HIV responses that can have the maximum effect on Asia's HIV epidemics.

The Commission believes that governments in Asia have the information, the institutions and the resources to substantially reduce new infections and to provide access to treatment to all who need it. The unique nature of Asian epidemics, the currently low prevalence, the strength of public and private health systems, and economic prosperity in the region create an opportunity unavailable in many parts of the world. If governments in Asia deploy their financial and human resources prudently, and strengthen partnerships with non-government and community sectors, they will be able to halt and reverse the epidemic within the time-frame set in global declarations on Universal Access and achievement of the Millennium Development Goals (MDGs).

This talk will outline some of the main findings of the Commission and recommend key action points for countries to implement, so that battle against HIV in Asia can be decisively won.

KEY2

What Makes an Effective HIV Prevention Program: The Australian Experience

ANDREW E. GRULICH

National Centre in HIV Epidemiology and Clinical Research, UNSW, Sydney, NSW, Australia

Since the late 1990s, substantial increases in HIV incidence in homosexual men have been described worldwide, in almost every location where such data are available. During the early 2000s, a wide divergence in HIV incidence trends in homosexual men was noted in Australia. Notification rates were stable in the most populous state, New South Wales (NSW), but there were increasing rates in each other state. In 2007, a rigorous analysis of the potential reasons underlying this divergence was undertaken.

Analysis was undertaken of a range of routinely-collected surveillance data including notifications of newly diagnosed and newly acquired HIV [numbers, rates, age at diagnosis, CD4 at diagnosis], and notifications of sexually transmissible infections (STIs) including gonorrhoea, chlamydia, and syphilis. Behavioural surveillance data included rates of HIV and sexually transmissible infection (STI) testing, unprotected anal intercourse (UAI) with casual partners, and self-reported HIV prevalence. Among HIV positive men, data on receipt of antiviral therapies and viral load was collected. Data from specific cross sectional and cohort studies was used to examine whether there were subtle differences in behavioural risk practise around Australia, and data on economic inputs in HIV prevention were also analysed.

Surveillance data confirmed that HIV notifications had stabilised in NSW but had increased markedly elsewhere. The mean CD4 count at diagnosis increased with year of diagnosis, and both the absolute values and trends were very similar across states. HIV testing rates were high, with small differences between states that did not explain the differences in HIV trends. In NSW, HIV prevalence dropped significantly among homosexual men, from around 14% in 1998 to 9% in 2006. It fell slightly in Queensland (8.5% to 6.9%) and was constant in Victoria (8%). Unlike HIV, trends in STIs were very similar across Australia, with increases noted for every notifiable STI. HIV risk behaviour trends closely reflected the differences in HIV trends, with declining risk in homosexual men in NSW, and increasing risk reported elsewhere. There was some evidence to suggest that HIV serosorting was more commonly reported in NSW than elsewhere. Around Australia, 70-90% of homosexual men with HIV were receiving anti-retroviral therapy, and this did not differ by geography. Investment in HIV prevention was much higher in NSW than in other Australian states, and in particular had been sustained at a time when dis-investment occurred in other states.

There has been a natural experiment in HIV prevention in Australia, with continued high-level investment in one jurisdiction (NSW) and disinvestment elsewhere. This appears to have resulted in the containment of the NSW epidemic, and continuing increases in HIV elsewhere. The results of this analysis suggest that investment in HIV prevention can be successful. As NSW is possibly the only place worldwide with high quality data on HIV incidence where HIV is not increasing in homosexual men, there may be generalisable lessons from this experience.

SYM1-1

Parliamentarians and the Role of Legislation in Addressing HIV/AIDS

BAEY YAM KENG

People's Action Party, Queenstown Branch

Legislation can play a central role in addressing HIV/Aids. It provides the necessary framework to combat this disease and as such, parliamentarians should monitor the progress of their jurisdictions' fight against its spread and implement the necessary law reforms to deal with its changing dynamics.

A brief comparison of the different legislative frameworks and the impact of cultural differences on HIV policies in the US, Canada, Australia, UK, Scandinavian and Asian countries are made. Different countries have different perspectives of and approaches to balancing the rights of individuals and the need to protect public health. The impact of the cultural, ethnic and religious composition of various populations on HIV policies is examined. Useful lessons and good practices are highlighted. Transferability of such practices across borders is also discussed.

An overview of Singapore's policies on infectious diseases is given and a comparison between policies on HIV and other infectious diseases is made.

To date, most governments, including Singapore, have relied heavily on policies which penalise certain conduct and behavior, and focus on the protecting the community at large. A recent amendment to Singapore's Infectious Diseases Act is such an example. With this amendment, it is a crime for a person who has reason to believe that he has been exposed to a significant risk of contracting HIV/AIDS not to take reasonable precautions to protect his sexual partner, even if he is ignorant of his HIV-positive status.

We take a detailed look at Singapore's HIV policies, especially in the implementation of anti-discrimination legislation in the areas of employment, the protection of individual rights, the provision of a complaints mechanism against discrimination and the provision of goods and services. We also consider its effectiveness in criminal prosecution for HIV transmission and dealing with the vulnerability of the considerable number of residents who travel abroad for work and pleasure.

Another function of the law would be to promote changes in a population's value system and social behaviour in order to reduce its susceptibility to HIV infection. How this can be done, the obstacles involved and examples of such legislation are given and their effectiveness examined.

SYM1-2

Using the Media to Tackle HIV-related Stigma and Discrimination

ALAN JOHN

Deputy Editor, The Straits Times

Any group setting out to "use" the media has to start with examining ways to engage members of the media and my first questions have to be, is this happening, is it happening enough, and what more needs to be done?

Stigma and discrimination have been the motif of Singapore's HIV story from Day 1, and at different times over the years we have seen more or less fear and ignorance associated with HIV and reflected in the media. We have also moved forward in helping to identify and deal with areas in which the lack of awareness has contributed to perpetuating the stigmatisation of people with HIV and those close to them.

Every time the media has succeeded in doing right by people with HIV, there has been a brave and honest effort by those with HIV or those involved in treating or caring for them to step forward, raise a flag, discuss the issues and explain to journalists the reasons why there was a need for change. Every time the media has been praised for efforts made to present HIV-related issues well, it is because someone with HIV or HIV workers were willing to provide information, insights and personal anecdotes to help journalists do their job.

Occasionally, we also get good HIV journalism because a journalist cared enough. But those who remain involved in HIV and AIDS work cannot rely on the media to produce a steady stream of eager and interested journalists keen to report this issue. The harsh fact is that HIV is not uppermost on every news editor's list of priorities. The relatively small number of people with HIV in Singapore means that this loses out in the daily assessment of news happening at home and around the world. Even in reporting health, reporting HIV will rate behind the need to report other more common diseases and health issues likely to affect far bigger numbers of people. And the sex in the HIV story will continue to skew coverage to the sensational from time to time.

Yet HIV remains a riveting story on every front, and one that worth reporting well. Stigma and discrimination remain a part of the Singapore HIV story, along with secrecy, misperceptions and enduring ignorance. Part of the HIV story involves crime and punishment too, and the exposure of people with HIV when they go to court. Media reports about HIV infection rates, communities at risk, education efforts and those punished for HIV-related crimes continue to elicit a range of responses from the public. There are those who are sympathetic and supportive and, always, those who express their belief that many of those with HIV "asked for it", deserve their fate and that combating the spread of HIV requires only abstinence or the faithfulness of sexual partners. It reminds us every time that reporting HIV remains fraught with sensitivities, and this is unlikely to change in the short term.

Moving forward with combating stigma and discrimination will require those with HIV and those who work with HIV and AIDS to continue to engage, educate and raise awareness among journalists. Journalists do not know the issues like you do. Is enough being done by all these groups to engage the media in order to put across the key issues in stigma and discrimination in the clearest terms and enable journalists to report and explain them?

You cannot expect journalists to place HIV at the top of their list of priorities. But those who know HIV stigma and discrimination must ask themselves how they can best put the critical issues to the media, how to work with journalists who are interested and willing, and how to make even the uninterested interested. If you start viewing the media as partners in the effort to break down stigma and discrimination, we will make progress.

SYM1-3

Role of Religious Leaders in Reducing Stigma and Discrimination

KYI MINN

World Vision International

Stigma and discrimination is the worse form of social interaction faced by people living with HIV and AIDS. As the HIV infection is usually linked to sexual transmission, faith communities initially shunned them as “sinners” or immoral people. The global endemic of HIV has evoked response from many governments, NGOs, United Nations agencies and community-based organisations. The HIV and AIDS pandemic also raises the question of how we relate to one another across our differences of ‘race’, tribe, nationality, gender, class, culture and all other expressions of our human diversity. When we stigmatise or disparage those who are ‘other’, that is ‘other’ than we are, we are acting contrary to the common religious teaching for a world in which all people, regardless of our differences, live together in love and peace.

World Vision has developed a methodology called “Channels of Hope” to mobilise faith leaders, the infrastructure, organisational capacity, pool of current and potential volunteers, and faith based organisations toward positive action on HIV and AIDS. Once they have been mobilised, World Vision works with them to coordinate and equip sustainable, community based HIV and AIDS programs emphasis on non-discrimination, acceptance, care and support.

The methodology has 3 phases and the following describes the phases of implementation.

Phase 1: Sensitise

During this phase faith leaders from a specific community are challenged during a life changing 3-day workshop toward compassionate involvement with HIV and PLHIV. During these workshops participants receive in-depth HIV and AIDS information, stigma and attitudes are addressed, and participants are introduced to the strategising phase, when congregations develop their own action plans.

Phase 2: Strategise

Once faith leaders have been sensitised and mobilised, World Vision works with churches and faith communities to form Congregational Hope Action Teams (CHATs) within their congregations with the aim to develop congregational HIV and AIDS implementation plans. CHATs attend workshops with the same themes as that of the faith leaders, with additional emphasis on the planning, linked to existing community interventions, such as the Community Care Coalition (CCC) for people living with HIV.

Phase 3: Empower

After the implementation plans have been developed, the need for additional empowerment is identified, and congregations are linked to other existing empowerment possibilities. One of which is the training of volunteers to be home visitor for OVC, which is provided through the linkage with the CCC.

There are many reasons for the religious leaders to respond to this challenge to reduce stigma and discrimination, to reduce vulnerability to HIV and to provide care and support. Religions always play a significant role in health and healing process especially in the Asia and the Pacific region. Mobilisation of churches, faith communities, and other community organisations can be implemented anywhere. Faith based structure reaches all walks of life and people respect faith leaders. Faith leaders can influence and change the attitude of people. Community respects faith leader and the community response through mobilisation of faith leaders is sustainable and effective.

SYM1-4

Doctors as Advocates

ARLENE CHUA

National University Hospital, Singapore

Globally, the HIV pandemic has created challenges for doctors and health infrastructures. For the HIV doctor, his most obvious role is to give hope and advocate for HIV treatment for his individual patient. However, it is evident that there are many non-medical issues that affect the care of a person living with HIV. There is the fear of stigma and discrimination against a person with HIV that results to shame and loss of friends, family and job. For some, it is the fear that he might be separated from his/her spouse from Singapore because he has been found to be HIV and because of immigration laws he might be unable to stay in Singapore. And still for others, it is the problem of finding a way to pay for lifelong antiretroviral therapy. We usually look at these social, economic, legal and human rights factors as part of the public health dimension of HIV but as doctors we see first hand that these affect our individual patients, their decisions and their relationships.

Many doctors have gone out of their way to help individual patients get their treatment or write that letter of appeal to immigration or get funding to finance their individual patient’s treatment. However, should we, as doctors go beyond this and be advocates for a whole class of patients? Should we have a more expansive vision of HIV that goes beyond a narrow focus on the individual?

What can a collective voice do to bring change towards better HIV care? What does it entail? How can doctors as a group make a difference and affect better HIV policy that benefits people living with HIV, their family and the community?

Traditionally, doctors as a group are reluctant participants in anything that has the notion of political action. It is easier and safer to concentrate on education and medical science and research. However, as we see how the world has changed, technologically, economically, socially and politically, there comes a point that medicine will have to speak out on behalf of patients and physicians regarding policies that affect patients. A recent example of this is how the Infectious Disease community has responded as a group during a public consultation to the changes in the Infectious disease act. More doctors are engaging themselves with the communities and groups that are vulnerable to HIV, something that is beyond the comforts of a doctor’s expected role. There is a lot of work to be done however, and as doctors we need to come together and find a consensus on the principles of advocacy that goes beyond advocating for the individual patients. It requires that we must confront not only the special reasons why one patient does not have the resources to maintain good health but the underlying social, economic or political conditions that may contribute to this deprivation.

SYM2-1**Clinical Epidemiology of HIV Infection in Singapore****LIN LI***Tan Tock Seng Hospital, Singapore*

Previous studies have unequivocally demonstrated the clinical efficacy of ARV, without which patients who develop an opportunistic infection or a CD4 <200 cells/mL have an average life expectancy of only 1 year. Even though combination antiretroviral therapy has become the standard of care for HIV infected persons in regions where antiretrovirals (ARV) is directly accessible to patients, AIDS continues to be rampant in poor countries and countries with other social and health priorities.

Since the availability of generic ARVs in neighbouring countries, the majority of patients in Singapore have been able to gain access to these equally effective yet affordable regimens. Treatment has become a reality in Singapore. Unfortunately, the majority of our patients present to various area hospitals already with AIDS. The mortality in these patients is much higher than those who start treatment early (when their CD4 number is still above 200 cells/ml), often succumbing to their first opportunistic infection. This highlights a critical need to better educate the public and at risk populations to seek HIV screening and treatment early.

The first regimen chosen for a patient is usually one that has proven efficacious and is best tolerated yet is also within the patient's financial means. The most preferred combination has been lamivudine, stavudine and nevirapine, a first-line regimen recommended by the WHO. In recent years, there has been a trend of starting patients with a combination of lamivudine, zidovudine and nevirapine. These two combinations have been widely used in resource poor regions with proven efficacy. Other commonly used agents including efavirenz, which is recommended by the health authorities in the USA as the preferred Non-Nucleoside Reverse Transcriptase Inhibitors (NNRTI) when used in combination with other ARVs. The immunological response as measured by the CD4 increase at 1 year, in our patients on these NNRTI based regimens is comparable to patients on other first-line regimens in other regions of the world. However, some side effects, which are distinctly different among the regimens, have negatively impacted treatment response, especially in initial stages. As newer ARVs become affordable to our patients, the gap between our approach to HIV treatment and that of western countries are likely to narrow in next few years.

As patients live longer and healthier, an increased proportion of our clinical care has become focused on other medical conditions such as cardiovascular diseases, tuberculosis, viral hepatitis and malignancies. Controlling and treating these co-morbidities will become increasingly important to improving the quality of life and survival of our patients.

SYM2-2**The New ARTs on the Block****NG OON TEK***Tan Tock Seng Hospital, Singapore*

The HIV epidemic was first recognised in 1981. For the first 6 years of the epidemic, no effective treatment options were available. This changed with the arrival of zidovudine in 1987 when it was approved

by the United States Food and Drug Administration. Other drugs viz. ddi (didanosine) and ddc (zalcitabine), belonging to the same class as zidovudine (nucleoside analogs), were added in 1991-1992. This initial enthusiasm was dampened by the realisation that drug resistance developed quickly in patients treated with a single or double medications resulting in loss of control of viral replication.

A major paradigm shift occurred in 1996/7 with Dr David Ho describing a "cocktail" of 3 medications as an effective means of maintaining long-term control over HIV viral replication in patients. However, this enthusiasm was again dampened when researchers discovered that HIV, although undetectable in the blood, remains hidden in immune cells with no proven means of eradication. These two discoveries frame our current treatment approach to HIV infection – that of chronic disease control without a means of cure.

Anti-retroviral treatment (ART) against HIV in the early part of this decade consisted of 3 main classes of medications, the nucleoside reverse-transcriptase inhibitor (NRTI) or nucleoside analogs, non-nucleoside reverse transcriptase inhibitor (NNRTI) and protease inhibitor (PI). NRTIs inhibit the enzyme, reverse transcriptase, which is required for replication of the HIV genome. NNRTIs also inhibit the reverse transcriptase enzyme via a different mechanism. PIs inhibit protease, an enzyme involved in processing HIV proteins. Current clinical guidelines advocate the use of medications from these classes as first-line treatment for HIV.

This decade has witnessed increasing drug resistance to these 3 classes of medications in those referred to as treatment-experienced patients. Accumulating experience also reveals that many of these agents have toxicities, which limited their use, ranging from severe anaemia (e.g. zidovudine) to drug allergy (e.g. nevirapine), body fat mal-distribution (e.g. stavudine, zidovudine and PIs) and metabolic disorders (e.g. PIs). This has contributed to the push to discover new drugs within the same class with less long-term toxicity and with no cross-resistance to existing drugs (e.g. tenofovir and the PI, atazanavir). For patients failing triple-class medications (NRTI, NNRTI, PI), new classes of medications using entirely different mechanisms are now available to achieve effective suppression of HIV, especially if at least 2 new active agents are employed.

The recent additions to our armamentarium in HIV pharmacotherapy are the fusion inhibitors, CCR5 receptor antagonists and integrase inhibitors. As the names suggest, the fusion inhibitors and CCR5 receptor antagonists block HIV entry into the cell while integrase inhibitors prevent insertion of HIV genomic material into the human genome.

In this session we will review the information of these new agents. Raltegravir and maraviroc are the most promising agents of the integrase inhibitors and the CCR5 receptor antagonists respectively. Promising candidates from established antiretroviral classes are Darunavir (protease inhibitor) and etravirine (non-nucleoside reverse transcriptase inhibitor).

Raltegravir and Darunavir hold promise both for treatment-naïve and treatment-experienced patients. The role of maraviroc is proven for treatment-experienced patients. At this time, the data for etravirine also supports use in treatment-experienced patients. Raltegravir and darunavir have been available via expanded-access to patients needing them and are soon to be sold in Singapore.

SYM2-3

HIV Medicine in Singapore

LEO YEE SIN

Tan Tock Seng Hospital, Singapore

In Singapore, the first HIV seropositive case was detected in 1985 and the first AIDS defining patient was diagnosed in the following year. My involvement in HIV medicine began as my first Infectious Disease Registrar posting with Communicable Disease Centre in 1989.

The developmental stages of HIV medicine in Singapore can be simply divided into 4 stages reflective of the availability of anti-HIV drugs; early years of HIV epidemic from detection of first case to 1990, the depressing stage from 91 to 95, hopeful stage from 96 to 2002, current stage from 2003.

HIV medicine in Singapore is an extremely challenging field not solely because of the rapid advancement of clinical management but the toughest challenges in fact are the social and financial aspects. The most impressive rapid progression in this field is the 180° change in disease outlook from a deadly one to a treatable disease today. What has not changed in tandem is the societal perception of the disease. Stigma and discrimination impede the full recovery of many.

From zidovudine as the only drug in the late 80s to more than 30 FDA approved drugs for HIV treatment spreading over 5 different classes, practicing HIV medicine in Singapore however is smack in a peculiar situation of using resource limited approach in a developed country.

The geographical location of Singapore coupled with its financial role as a travel hub places it in a vulnerable situation to the spread of any infectious diseases. HIV is no exception. Moving forward, the current initiative to early diagnosis of HIV infection is a commendable one for early treatment intervention and an attempt to control the rate of spreading. To follow on the momentum, several downstream efforts ought to be put in place. These include universal access to anti-retroviral treatment, accessible laboratory tests and monitoring to effective use of anti-retroviral therapy, optimal management of medical complications related to treatment or primary disease itself, research into best management and prevention strategies. Most importantly, the urgent need is to motivate positive societal integration of an infected person. HIV is no longer a shadow.

SYM2-4

The National Behavioural Surveillance Survey

CHAN MEI FEN

Health Promotion Board, Singapore

The incidence rate of HIV/AIDS has been increasing. Information on knowledge gaps and behaviour regarding such sexually transmitted disease is not collected on a regular basis. The National Behavioural Surveillance Survey (2007) is the first large population-based survey in Singapore conducted among over 1700 adult Singaporeans. This study, which will be conducted on a 3-yearly basis, ascertained baseline levels of knowledge, attitudes and perceptions of participants towards STDs/HIV/AIDS, and to understand sexual practices in the local context.

Method: Participants were sampled from a random sample of household addresses, which had been obtained from the Department of Statistics. Fieldwork was conducted in the early part of 2007 and was self-administered using the Audio Computer-Assisted Self-Interviewing (ACASI) system which affords the participants privacy in completing a questionnaire on this sensitive topic without the unnecessary intrusion of the interviewer.

Key findings: The knowledge of participants with regard to HIV prevention pertaining to the key educational ABC public health messages of the Health Promotion Board viz. Abstaining from casual sex; Being faithful to their partner; and Correct and consistent use of Condoms every time they had sex, was generally high — 75.2% for Abstinence message, 81.6% for Being faithful message. However, 1 in 2 participants (54.4%) replied correctly with regard to Condom use. Knowledge regarding misconceptions of various modes of transmission of the disease was high for 'sharing needles for injection' (95.2%), and transmission from mother to child during pregnancy (89.1%). Over 6 in 10 (68%) were aware that infection could not be spread through sharing meals with a person infected with the disease while only 1 in 2 (49.3%) were aware that the disease could be transmitted through an infected mother breastfeeding her newborn.

Participants exhibited a mixture of accepting or stigmatizing attitude towards people living with HIV/AIDS (PLWA) depending on the context viz, whether they were caring for a close relative with the disease, sharing meals, or buying food from someone with the disease. Measurement of attitude on a Likert scale towards use of condom appeared to be positive with regard to ease of use and prevention of STDs if used properly.

A subset of over 300 participants (18%) were defined as 'at-risk' including those with multiple sex partners, those who engaged in commercial sex, men who have sex with men amongst others. They had higher knowledge about the importance of condom use in prevention of the disease (77.1%). In this at-risk group, 24% reported ever having had an HIV test of which under half had the test conducted in the 12 months preceding the study.

Conclusion: Programmes for the population based on relevant demographic profiles will be conducted to address knowledge gaps, misconceptions as well as stigma. HPB will continue to work through its partnerships with relevant community stakeholders in educational and prevention strategies among the at-risk population.

SYM3-1

Is Opting-out In?

PAUL A TAMBYAH

National University Hospital, Singapore

With the advent of newer and safer drugs for the treatment of HIV, many countries have made these therapies widely available for all individuals known to be affected with HIV/AIDS thus resulting in major declines in mortality and morbidity due to the disease. In fact, a recent study has shown that the life expectancy of a 39-year-old man infected with HIV with appropriate treatment will be up to 63 years of age — still lower than one without HIV who could expect to live past 70 years but the gap is narrowing. In these countries, the impetus is to increase the reach of treatment programs by increasing testing to detect individuals who are potentially candidates for treatment before they are symptomatic. Various methods have been proposed in these countries including “Opt-out” testing in which individuals are tested routinely for HIV unless they specifically decline. In return, they are promptly channelled to appropriate treatment programs, which are generally funded by the state. This has been shown in mathematical models to reduce not only the morbidity and mortality due to the disease but also the transmission of the virus as individuals with lower viral loads have a lower rate of transmission. In Asia, universal access to HIV treatment has been associated with reduced HIV transmission in Taiwan. Other countries have also attempted “Opt-out” testing but with varying degrees of efforts to combat stigma and discrimination and varying degrees of equity in providing access to treatment. Without a comprehensive approach, there are risks that the widespread use of “Opt-out” testing will lead to unintended consequences including driving people at risk underground and paradoxically increasing transmission. In addition, there are ethical considerations involved in the process.

SYM3-2

Time to Deliver in the Workplace: Intensifying HIV/AIDS Prevention and Education

RAY FERGUSON

Regional CEO, South East Asia, Standard Chartered Bank

Over 33 million people around the world are infected with HIV and over 80% of them are in their prime of their working lives. The consequences are felt by economies, businesses and communities, and the impact of HIV at the workplace needs to be examined on a deeper level.

Standard Chartered’s journey in response to the HIV pandemic has taken almost 10 years. It’s response to AIDS started from Africa where top executives were seeking for policy advice on the management of employees living with HIV. As HIV started to impact profitability through absenteeism, loss of staff and medical costs, the Bank realised that the impact of HIV was likely to be significant and decided that it must take action. In 2000, Standard Chartered launched a pioneering workplace programme “Staying Alive” with the primary objective of empowering people to protect themselves from infection, to promote compassion and support for those infected and affected.

The success of the “Staying Alive” programme resulted in the development of the **“Living with HIV” programme which was introduced globally in 2002 in all 56 countries** which we operate in. The programme focused on educating staff on prevention to encourage changing risky behaviour; reducing stigma in the workplace and encouraging HIV testing so that those living with the virus can get appropriate support.

Since then, Standard Chartered has pledged to educate one million people by 2010 as part of our commitment to the Clinton Global Initiative. We believe **education is key to reducing the number of new infections** (currently standing at 6,800 per day) which, without a cure or vaccine, is the only way to get control over the spread of HIV.

Standard Chartered won the **Global Business Coalition award for Workplace Excellence in 2006** and was **commended by UNAIDS** on our workplace programme in 2008. We recently collaborated with an expert external healthcare agency, BroadReach **to update our HIV education toolkit**.

The ‘Living with HIV’ education session gives people an opportunity to discuss issues around HIV in a safe, non-threatening environment. The sessions are conducted by “HIV Champions” – staff who volunteer to spread the word about HIV. We currently have over 800 HIV Champions across more than 50 countries and they will work with partner companies to help roll out HIV education in your workplace.

As a pioneer corporate in the response to HIV/AIDS, we are **freely sharing our intellectual capital on HIV with any company that wishes to partner with us as a means of combating this global pandemic**. This is an area we know we cannot be competitive about and we have to collaborate on intensifying HIV prevention and education at the workplace.

SYM3-3

Safer Sex Campaigns Targeted at High-risk Heterosexual Males

LIONEL LEE

Action for AIDS, Singapore

Hitherto safer sex education efforts targeted at high-risk heterosexual males have been problematic due to the lack of understanding of their attitudes and behaviours. Awareness regarding HIV & STIs, condom use and regular HIV testing were often lacking among this group, as a result there is a large number of heterosexual male patients who are diagnosed at the AIDS stage, according to the statistics from Ministry of Health (MOH). In 2007, 53% of the new cases already had late-stage HIV infection when they were diagnosed.

This paper aims to document the surveys and the field experiences undertaken by Programme members. It also outlines how educational campaigns were designed in response to these experiences and specific insights derived from the surveys.

Surveys and experiences on high-risk heterosexual males

The HMO Programme was started in 2004. Surveys were conducted into their socio-demographic profile, behavioural aspects viz. condom usage, risk-taking as well as health seeking behaviour. It was found that condom usage and health seeking behaviour amongst the men were low while risk-taking behaviour was high. Qualitative research comprising of in-depth interviews with two specific groups of heterosexual males were conducted - HIV positive males and HIV negative males – in order to gain insights into the attitudinal and knowledge differences. The study found that the HIV positive group felt that they should have gone for screening sooner and that condom should always be used while the HIV negative group felt otherwise.

Field experiences provided insights into understanding the target groups. This is especially relevant for Riau-islands outreach components of the HMO. Informal conversations with the men, ferry operators, hotel owners, tour agents, on-site taxi drivers and girls serving Singaporean men were conducted. Volunteers also conducted

“mystery shopper” visits to KTV bars and pubs; conversations with patrons, owners and the working girls also provided invaluable information. Volunteers go online regularly to talk to channel operators of forums and chat-rooms to understand heterosexual commercial sex on the Internet. These field experiences thus helped AfA to validate the key findings from our research.

Campaigns for the high-risk heterosexual men

The first campaign launched in 2005 was the “Nikki” campaign; this was followed by the “Temptation Night” campaign in 2006. Both campaigns had similar themes that included sexy women. In 2007, AfA decided to take a different approach by coming up with the “I am responsible” campaign. This aims to shift the responsibilities for safer sex behaviour into the hands of the men. The campaign delivered its key messages through materials posted and distributed at ferry terminals and selected Riau-island hotels. Condom vending machines were installed at the ferry terminals and budget hotels. A Getai was also organised in Chinatown People’s Park Complex which was well attended. More than 96% of the respondents for the post event evaluation supported that the Getai as an effective approach to outreach.

Conclusion

In conclusion, AfA decided to take a different approach in addressing the needs and issues concerning the men in hope to encourage the men to take responsibility and not on the commercial sex workers to initiate condom use and to go for regular screening. In the survey, it was found that more than 60% of these men were willing to use the condoms provided to them by AfA and that they were aware of our outreach efforts indicating that the HMO Programme is moving in the right direction. With this in mind, AfA will be adopting similar approaches to further expand the reach and scope into untapped areas in order to provide further in-depth knowledge in the socio-demographics of this complex group.

SYM3-4

“Open Your Heart” – A Youth-centric Approach to Raise HIV/AIDS Awareness and Reduce Discrimination

ANNE NG

B2B Marketing PR Consultant

Entirely conceptualised and produced by a bunch of young mavericks/volunteers, “Open your Heart” is an experiential audio-visual exhibition comprising of a photo exhibition and short film titled, *August 29*. Supported by Health Promotion Board and Citibank-YMCA, this event took place over three days outside Orchard Cineleisure in March this year.

The movie *August 29* was created by local filmmaker, Lawrence Ong, and Alvin Lim; it centres on themes of love, faithfulness and abstinence. In this fictional story, the protagonist is a fashion photographer who takes pictures of beautiful people everyday. He falls in love with an ex-girlfriend but is forced to deal with her past when he finds out she has contracted HIV from another man. The film’s protagonist must face the brutal effects of the disease upon his sweetheart and document her physical decline in photographs – as her dying request. Interviews with Singaporean AIDS patients were also aired at the end of the film to lend it a realistic touch.

At the “Open Your Heart” event, audiences were treated to a visual experience created by JimOrca; a prominent local shutterbug known for his conceptual artistic photography. His images explored themes such as personal responsibility and ‘irreversible actions’ determined

by one’s life-style choices. A photo-documentary of Singaporean AIDS patients, shot for the first time in Singapore, provided deep insight into these patients’ daily struggles. This shoot was undertaken by Alvin Lim who volunteered at the Patient Care Centre over a course of time in order to accurately depict these people’s lives.

The project founder, Anne Ng, will be sharing her team’s experience and challenges putting together this event, Singaporean youth’s perception on sex and HIV, and how to effectively reach out to this young demographic via creative marketing tactics. She will also be showing selected clips from the movie as well as pictures featured in the photo exhibition.

SYM3-5

An Update on STI & HIV Prevention Technologies

MARTIN CHIO

National Skin Centre & DSC Clinic, Singapore

According to the World Health Organisation, sexually transmitted infections (STIs) rank in the top 5 disease categories for which adults seek health care in developing countries. In Singapore, the clinic attendance of public patients at the Department of STI Control (DSC) has risen from 27,676 in 2004 to 29,650 in 2007. The incidence of HIV diagnoses in Singapore has increased from 311 cases in 2004 to 422 cases in 2007. There has also been a steady rise in the number of notifications of genital herpes, genital warts and Chlamydia diagnoses being made at the DSC.

We are well aware that STIs may lead to acute symptoms, chronic infection and delayed sequelae such as infertility, chronic pelvic pain, adverse pregnancy outcomes, cervical cancer and also morbidity in neonates/infants. Psycho-socio-sexual issues are not uncommon too. The presence of undiagnosed and untreated STIs may increase the risk of both acquisition and transmission of HIV; therefore the management & control of STIs is important in preventing HIV in high-risk groups and the general population. With the significant morbidity of STIs and HIV, there has been a global initiative to develop safe and effective prevention technologies.

There is ongoing research into vaginal and rectal microbicides with focus on membrane disruptive agents and surfactants, vaginal defence enhancers, entry and fusion inhibitors and anionic polymers.

Vaccines are available for hepatitis A and B and the human papilloma virus (HPV). There have been numerous trials in HIV vaccines with variable results. Herpes simplex virus (HSV) vaccines are being developed based on the viral envelope glycoproteins. Chlamydia vaccines are current undergoing phase I trials. Unfortunately the lack of suitable animal models and antigenic variability of *N. gonorrhoeae* are hampering progress and development of that vaccine.

Various studies have been done focusing on male circumcision in developing countries, pre-exposure + post-exposure HIV prophylaxis and suppression of concomitant viral infections (Hepatitis B and C, HSV).

We must not forget targeted counselling with education to effect behavioural change and improving access to testing, diagnosis, management and care of HIV.

This lecture aims to provide an update on the recent developments in prevention technologies and highlight those that may be applicable in Singapore.

SYM4-1**Community Outreach to HIV/AIDS Patients****JEREMY CHOY***City Harvest Community Services Association, Singapore*

City Harvest Community Services Association (CHCSA) has continually endeavoured to express our ethos of faith and hope in the human spirit through practical demonstrations of love to the community; especially to the less fortunate, regardless of race or religion.

From a humble beginning of 139 service users in 1996, we have grown to helping 11,508 unique individuals in 2007.

As of 31 August 2007, we have a dedicated group of 8 full-time staff and 736 volunteers who work towards fulfilling our vision of making a difference in our society.

FIRST Hand (Friends In Reaching out and Serving the Terminally-ill) seeks to help the terminally ill (HIV) patients lead dignified and meaningful lives through heart felt care and services through our various key services that includes:

- Befrienders' Program
- Food and Groceries welfare Programme
- Touch Therapy
- Counselling Programme
- Patient Get-Together Events/Excursions

In this presentation, we would share with you our journey in serving HIV/Aids patients in the community.

SYM4-2**HIV in Marriage & Pregnancy****LIM POH LIAN***Tan Tock Seng Hospital, Singapore*

HIV infection has been transformed from a terminal disease to a chronic viral infection over the past 2 decades as a result of active research and advocacy efforts leading to effective treatments becoming available. While HIV is transmitted via injecting drug use and infected blood products, sexual transmission remains the predominant mode of transmission worldwide. Addressing these sexual transmission issues continues to be an important and challenging dimension of the care for HIV-infected persons as they recover health and near-normal lifespans.¹

We will provide a brief overview of medical, ethical, legal and socio-economic challenges encountered by clinicians in the area of HIV in marriage and pregnancy, including ID Act requirements, and the tension between patient confidentiality and problems in spousal notification.

We will discuss issues for couples where one or both partners are infected.^{2,8} Decreased HIV transmission occurred with the introduction of highly active antiretroviral therapy,³ leading some experts to declare that HIV-infected persons with undetectable viremia may not be sexually infectious.⁴ However, this remains highly controversial – other experts cite the resurgence in HIV infection rates even in communities with access to effective antiretroviral therapy,^{5,6} and analyses that show a potential fourfold increased incidence over a 10-year period if condom use is discontinued between serodiscordant couples.⁷

Using case-based discussion, we will present brief updates for HIV-discordant couples considering pregnancy, sperm-washing and in

vitro fertilisation.^{9,10} We will also discuss recent recommendations and findings on prevention of mother-to-child transmission, treatment of HIV during pregnancy and lactation.^{11,12}

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SYM4-3**Discrimination at the Workplace****HO LAI PENG***Tan Tock Seng Hospital, Singapore*

As we are crossing the threshold to the fourth decade of the HIV pandemic, we have made significant and dramatic advances in medical technology, which has effectively changed HIV from a terminal to a chronic medical condition. With this, it has also changed the lives of those suffering from this once debilitating disease.

This is especially so for those who have lived through the terrible '80s and '90s where many with AIDS died soon after diagnosis. Many did not expect to survive more than a few years and had sometimes, "waited for their time to come".

As people with HIV/AIDS live longer and maintain productive lives, work becomes an important issue. Having a job has become essential to support their daily needs and treatment expenses. Perhaps, just as important as the practical issues, having employment is vital to a person's sense of self-worth and it helps one to maintain social connections. It gives life meaning and purpose.

Although work is a basic need and right, getting employment can be complex for people with HIV. Most do not disclose their diagnosis to their employers. Many who did were terminated. Even if they were

not terminated, they were re-deployed and disclosure may mean that their career prospects could be in jeopardy. Many looking for employment also had to choose between making false declarations in their job applications or disclose their diagnosis and risk not getting the job. In addition, the psychological stress caused by the fear of being found out and discriminated is ever present.¹

Dr Vivian Lim's study of 550 HR managers revealed that although most surveyed were generally knowledgeable about the modes of transmission, there were reservations about employing people with HIV.² 64% believed that having to work alongside a person with HIV would cause some employees to quit altogether. Although there is a need for a follow-up study, one can almost predict based on patient accounts that the results may not be very different.

The issue of stigma and discrimination in the workplace needs to be examined and studied. There has to be proactive action towards developing employment policies to prevent blatant termination of people with HIV because of their medical condition. Although this seems obvious, it is fraught with difficulty and complexities. Support is needed from various sectors – governmental and non-governmental organisations – to manage HIV at the workplace. The task may be difficult but if we work together, it is not insurmountable.

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SYM4-4

Living with HIV

THEO CHONG

Action for AIDS, Singapore

HIV and AIDS, what do these 2 terms mean to you? Would you feel that we PLWHA (People Living with HIV and AIDS) deserve it, or would you feel that we are a bunch of very weak people who always needed financial assistance and medical support? Think again.

Would you feel that our psychological well-being and our health is constantly unstable or would you feel that we should be cast aside "away in an island" (reference from a local talk show some time back)? Think again.

Before I share about what living with HIV really mean, let us look briefly at HIV figures we have in 2006 and 2007. In 2006, we had a total of 357 new infections and 325 are males. Of the 357 infections, we had 222 heterosexuals, 151 were married and 206 were singles. In 2007, the number of males increased to 392 cases, an increase of about 15%. Heterosexual infections rose to 255 and 187 were married. What can we derive from these figures? Do these figures involved foreigners who were diagnosed locally but were sent back to their country? How about people who were tested at the anonymous testing site but did not follow up at CDC? How about people who are

rich enough to seek treatment overseas? Are infected Singaporeans who are working overseas but receiving treatment there counted? With all these questions in mind, do you think the figures reflect best about HIV/AIDS situation in Singapore? Just think again!

In January this year, the school that I was posted to fired me. I do understand that the general public have a long way to go in terms of accepting a positive teacher in school. My argument here is that I was not in any sense an MOE teacher. All that I taught was just music. My performance in my own understanding and even among the people that I had worked with is of high standard.

I take the responsibility and accept this harsh dismissal. But what I could not accept is the dismissal was based on an anonymous call to the school. All it took is one call that caused the principal to sack me. I was told that she even wanted my medical records! Being someone who is of a certain standard of influence, is it right for her to even ask for my records? To make matter worse, a few of the staff knew about this too. I came to know this truth only through my direct boss and not from the principal. Is it right to buy in to any calls? Does public opinion really matters? One phone call was all it takes. Senior citizens were reminded not to buy in to any calls that claimed their grandchildren were kidnapped. But how easy it is to make calls that would trigger fear in schools! For a while I slipped into depression. My confidence was totally smashed.

After the whole incident, one issue keeps on repeating in my mind. What if one day, a pupil in her school is positive? What would be her reaction? How about if a close kin is infected? In my own opinion, schools should be a place that emphasises HIV AIDS awareness and not discriminate! Yes, I take responsibility for my infection. I do not blame anyone for where I am today. I went through a period of great difficulty. I had paid a heavy price. After my diagnosis, I went through a long period of adjustment. My health went downhill within a year and a half. I started my HAART treatment in November 2004. I changed my combinations a few times because of allergies. The price of medication was rather hard for me to swallow too. I would not want anyone to go through the same path that I had walked. My Medisave was depleted quickly within 1 to 2 years. After the struggle to lead a normal life, the news of the dismissal only cause nothing more than a major setback.

Is school a good place for yellow ribbon project? With the recent news about the rise of glue sniffing among school children, there may be a lack of public awareness about emerging psychosocial health issues in the young. School is a hot bed for many issues to take root. School is also a place that determines the outcome of individuals. Should we not focus on our future leaders and train them about HIV and AIDS awareness more than ever?

There is an increase of teenagers infected with HIV over the years. Are people ignoring this trend because it is taboo? Is sex education really enough? Where do we go from here? Many doctors, nurses, healthcare workers, social workers had given their life in HIV AIDS awareness work. Is it not enough? With knowledge comes responsibility. Schools, being the centre of learning, should also educate and emphasise on responsibility.

SYM5-1**Advancing the Research Agenda in HIV Prevention in Men Who Have Sex with Men****ANDREW E. GRULICH***National Centre in HIV Epidemiology and Clinical Research, UNSW, Sydney, NSW, Australia*

The widespread and substantial increases in HIV incidence that have been seen worldwide in homosexual men demand an intensified HIV prevention response targeted at this population. Australia was affected by the HIV epidemic as early as the early 1980s and initial studies in the mid 1980s suggested that more than one in four homosexual men in Sydney were HIV infected. Australia has seen considerable success in controlling its HIV epidemic, and this has been underpinned by an evidence-base informed by a comprehensive research response.

There are multiple components to Australia's research agenda in HIV prevention in MSM. The importance of an active HIV research program has been written into Australia's national HIV strategy since the 1980's. Investment has been sustained and well-coordinated, with much of the research effort being conducted in separate National Centres in HIV social research, clinical and epidemiological research, and basic research.

An effective surveillance system provides evidence on recent trends in HIV incidence. Only trends in HIV incidence can shed light on recent successes or failures in HIV prevention. Thus surveillance data must include information on trends in recently acquired HIV infection, and must be tabulated by risk behaviour. Behavioural surveillance is necessary to provide more timely information on the forces that underlie trends in HIV. This should include monitoring of measures of risk behaviour (unprotected anal intercourse with potentially serodiscordant partners), and rates of HIV and STI testing. Special studies of HIV risk behaviour can provide in depth information about the contexts in which risk behaviour is occurring, and to allow the targeting of these behaviours in education campaigns.

An important characteristic of an effective research response is that it should be led by academic university researchers. Such an environment provides a guarantee of quality of research data and ensures that data are interpreted correctly. The research must occur in partnership with the community, and preferably with official representation by community organizations of those most at risk.

SYM5-2**Homophobia and HIV Prevention: Why is Research-based Public Policy not the Gold Standard?****ROY CHAN***Action for AIDS, Singapore*

MSM have higher HIV prevalence than general population in almost every country. Recent surveillance in many developed as well as developing nations indicate increasing epidemics in MSM populations.

The long list of reasons advanced to explain high and increasing HIV among MSM include – cultural environments that facilitate high-risk

behaviour (discrimination, homophobia, barebacking, HAART optimism); growth of sexual marketplace (Internet, sex on premises venues, circuit parties, sex parties, sex tourism); socio-economic factors (lower socio-economic status, lower educational attainment); Individual level factors (increasing numbers of MSM, increasing numbers and survival of HIV+ MSM, mental ill-health – depression); changes in sexual risk behaviours (high and increasing unsafe sex, sex partner change, increase sex partner concurrency, increasing recreational drug use); infectious agents (resistance and interaction between STIs); biomedical factors (Inability of health services to effectively intervene). Homophobia as predictor of HIV risk in MSM has been documented in studies in the West, and more recently in China. Psychological distress could lead to a pattern of sexual recklessness, characterised by a lack of attention to self-preservation and self-protection. Internalised homophobia has been associated with avoidance of homosexual self-identification, anxiety about same-sex sexual behavior, and consumption of drugs and alcohol in connection with sex among MSM. It may prevent MSM from participating in the broader stream of the gay culture, such as being a member of a safe sex positive gay organisations.

Section 377A of the Penal Code empowers the state to punish MSM behaviour with imprisonment of up to 2 years. The presence of Section 377A has profound effects on programmes to educate MSM community and prevent HIV transmission, including isolation and discrimination against MSM, barriers obtaining accurate information on MSM behaviour, barriers to accessing non-gay identified MSM, extreme difficulty in addressing needs of young MSM, Interference with gay businesses, entrapment, censorship of MSM educational materials and events. Hong Kong, New Zealand and Australia - 3 former British colonies decriminalised around the start of the AIDS pandemic, are more successful in their AIDS control programmes targeting MSM.

Summary - HIV infection increasing, particularly among MSM, current policies appear to be inadequate in controlling HIV infection, educational campaigns and interventions that address the needs of MSM need to be increased, education and provision of services for young MSM are particularly deficient, prevention programmes to reduce transmission in MSM are weakened by anti-homosexual laws.

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SYM5-3

MSM and the Internet: Opportunities and Challenges in HIV Prevention

STUART KOE
Fridae Pte Ltd

Men who have sex with men have a unique, if sometimes foolhardy ability to adapt to any environment, no matter how hostile, to seek one another out for the purpose of having sex. On the fringes of society, and often against the law, these men carry on in such public places as parks and beaches, alleys and toilets despite threat of arrest, harassment, and bodily harm.

It should thus come as no surprise that MSM have adopted the Internet earlier and in greater numbers than any other "community". The Internet offers MSM the opportunity to connect to one another in the privacy of their own homes, off the streets and away from any threat from the authorities. Due societal taboos and restrictions, there is also a lack of gay media such as newspapers or magazines, and few gay social venues and outlets, resulting in the Internet playing an even more central role as information resource and social networking venue for anyone who has access to it.

The advent of the Internet has been responsible for a seismic shift in the behaviours of MSM. Research has shown that more young gay men are meeting their first sexual encounters online. In countries with high Internet availability, a majority of MSM report using the Internet to meet partners for sex, and for a significant number of them, the Internet is the only channel through which they meet other men.

Whilst the Internet may be responsible for empowering MSM and increasing the number of sexual encounters, it also provides a unique opportunity for research, customised interventions. It allows agencies to effectively target otherwise hard to reach subpopulations, such as transgendered or those engaging in high-risk sexual behaviour such as "party and play".

Yet, Aids NGOs and government health agencies have been slow to respond to the changing environment and behavioural shifts. Traditional models relying messaging via known gay venues and media is no longer sufficient. In a community that now relies primarily on the Internet to meet other people, any effective HIV response must integrate an Internet strategy as its core component.

In this presentation, we shall examine both the evidence, as well as selected case studies on what an effective Internet response might include. Taking a strategic and multi-pronged approach, the Internet could well prove to be the most effective channel for HIV prevention and an indispensable tool for HIV behavioural research.

SYM5-4

MSM+ and the Positive Prevention Program

ARTHUR LIM
Action for AIDS, Singapore

Background

Club Genesis, a support network for HIV+ Singaporeans, was set up in 1994. From their monthly meetings, the network now includes weekly cell groups for newly diagnosed individuals and 1-to-1 counselling for members.

Description

The first Positive Prevention workshop, sponsored by HPB & AFA, was very well received by the 32 participants. Many realised that HIV was not the end of their world and that they could continue to lead long and economically productive lives with proper medication and still contribute to society, in their various spheres of influence. Participants also learnt about sexually transmitted infections and their impact on one's immune system and ARV drug regime.

Issues

Several issues arose out of the workshop and further interactions among members.

The issue of **Disclosure** (of one's medical status) was very sensitive. Although the Infectious Diseases Act stipulates that a HIV positive individual must inform his partner of his status, in casual encounters, this may not be practical. No one would want to compromise their position in their workplace, should their medical status be made known in public, because of the stigma associated with HIV/AIDS in Singapore.

This leads to the related issue of **Discrimination**. Our Employment Act does not protect employees from unscrupulous employers who freely terminate the services of their workers should the latter become a liability to their organization (to confirm). Those with physical, mental or any health related problems are not welcome in the workplace and some employers will remove them swiftly. From the newspapers, we regularly read about the plight of pregnant mothers who are terminated from their workplace, because the employer does not want to pay full salary for 3-4 months maternity leave.

Similarly, HIV+ people are not welcome at the workplace, because bosses and co-workers are ill-informed, are fearful and think HIV can be spread through casual contact, etc.

Hence MSM+ primary focus is still on **Treatment and Care**, while Positive Prevention maybe relegated a lower priority. This is because many want to focus on getting better first, before they can decide on their next steps. It is also crucial to understand that HIV+ individuals on proper treatment and with undetectable viral loads, are less likely to transmit the disease than those not on treatment, or unaware of their medical status.

Lessons Learnt

Therefore **Defending Positives**, should also be our primary focus. We should prevent them from getting any illnesses and ensure their immune system is 'healthy', before talking about using them to promote HIV education and spreading the safer sex message. We should help them advocate for more affordable medication in HIV treatment, as Singapore is the only developed country that does not provide free HIV medication for her citizens. Even Malaysia, Thailand and Taiwan are already doing this in support of their citizens.

Next Steps

Our government is providing funding towards prevention strategies. But this focus should be coupled with strategies for treatment and care. To have effective programs, we also need greater involvement of People living with HIV/AIDS in all these programs. They can contribute expertise and abilities that HPB/MOH can tap on. Second, link up with regional positive networks to build the necessary capacity locally. Lastly embrace them as you would your love ones and work together with them to bring infection rates down. They are **our best** resource people, thus support and capitalise on them.

SYM6-1

“Love Them. Talk about Sex”: Overcoming Barriers to Communication to Children about Sexuality Issues

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The rate of STI/HIV infections among Singaporean youths has been rising in recent years. There is no formal survey done with local parents on communication on sexuality issues with their children; however, studies in the United States have shown that parent-adolescent discussions can have positive effects on the sexual behaviour of their children. In 2007, a parent education programme entitled “Love Them. Talk about Sex.” was developed to complement school-based prevention programmes targeting youths. The programme aimed to (i) increase awareness of the need to start talking to children early about sexuality issues, (ii) impart basic information and skills to enable parents to communicate effectively with their children about sexuality issues.

A 1-hour interactive session was developed and piloted in 5 workplaces in 2007, reaching about 200 parents. Pre/post session feedback showed significant improvements in participants’ comfort and confidence levels with regards to talking to their children about sexuality issues.

In 2008, community outreach efforts will complement the sessions at workplaces. A skit for parents will be conducted in various community settings such as public libraries and community clubs/centres.

SYM6-2

Violence Against Women Intersecting with HIV/AIDS

CONSTANCE SINGAM

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There is a whole host of forms of violence that women experience that put them at risk of more violence and HIV/AIDS. For instance,

- How can a woman abstain if she is coerced into sex? This raises the question of marital rape.
- How can a woman change behaviour if she is not in control of her sexual behaviour?
- How can a woman negotiate condom use in a violent relationship?

Many women are subjected to violence from an early age to very old age. This experience disempowers them and makes them vulnerable. All of these impose incredible barriers on women being able to protect themselves from HIV. There is:

- child sexual abuse
- partner and non-partner sexual violence.
- physical violence in intimate partnerships
- psychological abuse
- economic abuse
- extremes in violence such as trafficking of women into sex work. Singapore is both a destination and a transit point – an important issue for HIV.

As we can see there are many forms of violence against women. There are also many ways in which violence puts women at risk. There is, for instance:

- transmission resulting from a forced sexual occurrence. Use of force results in genital lesions, which can have the potential to facilitate HIV transmission.

A report at the XVII International Conference on Women’s Rights

Equal Women’s Lives: Violence Against Women and HIV” in Mexico in August, this year, noted that “we have not even begun to understand the complexity of the issue” of violence and HIV/AIDS. Studies, reported at the conference, show that women with violent partners were 50% more likely to be infected than other women. In Tanzania, the odds of reporting violence are 10 times higher for young HIV positive women if you compare them with HIV negative.

A very new study that has come out from Goa in India has found that amongst married women, the risk of incident HIV is three times higher for married women whose partner has been sexually violent towards them than compared with other women.

Another issue that is emerging from further analysis of WHO data and from other studies is the clustering of risk behaviours. There is growing evidence that men who are abusive to their partners also have a number of other risk behaviours that are associated with HIV. There are studies showing that these are more likely to have more sexual partners, more likely to have an STI, to potentially problematic use of alcohol and to refuse to use a condom.

These observations made at the conference and the reports quoted show that our current strategy of HIV prevention, in Singapore, is appallingly inadequate. There are many challenges that confront us as we address the issue of Violence Against Women intersecting with HIV/AIDS.

SYM6-3

Overcoming Barriers to Treatment Access

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In managing HIV/AIDS, Singapore has emphasised PREVENTION. While our patients enjoy subsidised care for medical treatment e.g. (ward charges, consultation fees, investigations and standard medications), cost of antiretrovirals (ARVs) critical to their survival, is borne fully by patients.

HIV treatment is extremely efficacious in prolonging lives for many years and can PREVENT AIDS if started early.¹ Free ARVs are associated with improved adherence.² Free or easy access to ARVs is available in most developed countries e.g. United Kingdom, Western Europe, Spain, Australia, Japan, Hong Kong, Taiwan etc and developing countries e.g. Brazil, China, India, Botswana, Ethiopia, Tanzania, Senegal, Zambia etc.³ Free access to ARVs has facilitated voluntary HIV counselling and testing.³ Benefits and cost-effectiveness of early access to HIV care and treatment has been demonstrated internationally (both in developed and developing countries) and locally.⁴⁻⁶ Notably, expanded free ARV access can decrease transmission and ENHANCE PREVENTION. This was well documented in British Columbia, Spain and Taiwan, which have declining HIV incidence of 50-53% despite stable or increasing syphilis rates (i.e. decreased HIV is not due to safer sex).^{2,7,8} Subsidised first line ARVs should be considered because there is no effective alternative for HIV treatment.

ARVs are highly effective in PREVENTING MOTHER TO CHILD (MTC) transmission of HIV. A mother given ARVs with resultant undetectable HIV viral load has a <1-2% (from 15-30%) risk of HIV transmission to her baby. Singapore introduced the opt-out HIV testing for all pregnant women in 2004 to avert MTC transmission. ARVs are given to all HIV-infected women to prevent MTC transmission and discontinued after delivery in those who do not need

treatment. Currently, ARVs given to these women with financial constraints are fully supported by donated funds from well-wishers. Subsidised ARVs for PREVENTION of MTC transmission should be considered in Singapore.

ARVs for treatment and MTC prevention for some patients were subsidised or offered free by some organizations/persons. Fund raising is difficult and often insufficient to support many patients in need. Pharmaceutical companies have decreased ARVs cost via negotiation/ advocacy but patented ARVs remain expensive. Many other patients at Communicable Disease Centre (90%) seek generic ARVs from overseas to support their treatment, which is inconvenient and unreliable.⁹

In essence, prescribing ARVs is also about PREVENTION. Treatment and Prevention are inextricably linked. Treatment can prevent AIDS, new infections by reducing HIV transmission and mother to child transmission. The problem for many of our patients is access to ARVs.

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SYM6-4

Human Rights and HIV: What's the Connection

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The paper explores the basic tenets of a rights-based approach in dealing with people with HIV and makes an argument for protection of people with HIV without compromising public health. The discussion will also explore the effectiveness of policies and practices nationally and at the local practitioners' level that minimise discrimination against people with HIV.