



AAMS

Annals of the Academy of Medicine, Singapore

VOLUME 42 (SUPPLEMENT)

NUMBER 8

AUGUST 2013



2ND AMM-AMS-HKAM TRIPARTITE CONGRESS & 47TH SINGAPORE-MALAYSIA CONGRESS OF MEDICINE

**The New Reality in Medicine -
Caring for Patients with Multiple Co-Morbidities**

**23-24 August 2013
Grand Copthorne Waterfront**

in conjunction with:

10th Annual Scientific Meeting of the College of Physicians, Singapore (CPS)

Organised by



Academy of Medicine,
Singapore



Academy of Medicine,
Malaysia



Hong Kong Academy of
Medicine

Annals Editorial Board

Editor

Eng King [Tan](#)

Deputy Editors

Erle CH [Lim](#)

Hui Kim [Yap](#)

Associate Editors

Kah Yin [Loke](#)

Beng Yeong [Ng](#)

Pierce KH [Chow](#)

Emeritus Editor

Vernon MS [Oh](#)

Board Members

Yock Young [Dan](#)

KK [Madhavan](#)

Stefan SL [Ma](#)

Yih Yian [Sitoh](#)

Seang Mei [Saw](#)

Richard [Sim](#)

Immediate Past Editor

Vernon MS [Oh](#)

Ex-Officio

Kok Chai [Tan](#)

Boon Keng [Ng](#)

Specialist Advisory Panel

Balram [Chowbay](#)

Fun Gee [Chen](#)

Tou Choong [Chang](#)

Kok Yong [Fong](#)

Kei Siong [Khoo](#)

London Lucien [Ooi](#)

Bien Soo [Tan](#)

Hugo van [Bever](#)

Editorial Executives

Hui Chee [Chan](#)

Deborah [Tan](#)

Harcharan [Kaur](#)

International Advisory Panel

Juliana C N [Chan](#), *Hong Kong, SAR China*

Richard N [Fine](#), *USA*

Yik Hong [Ho](#), *Australia*

Edward [Holmes](#), *Singapore*

Richard H [Hunt](#), *Canada*

Ranga [Krishnan](#), *Singapore*

Edison [Liu](#), *Singapore*

Harvey [Marcovitch](#), *UK*

Albert [Singer](#), *UK*

We welcome submissions of cover images from Fellows and Friends of the Academy of Medicine for consideration for publication. Do submit interesting or unusual photographs or digitised images of original artwork, accompanied by a short write-up of about 30 words.

Format: 8 by 12 cm, resolution of at least 300 dpi, in JPEG or TIFF. Please email your submission to annals@ams.edu.sg

Printed by Straits Printers (Pte) Ltd

Proceedings of 47th Singapore Malaysia Congress of Medicine 2013

Contents

Lectures

Rumme Shaw Memorial Lecture.....	S1
23 rd Seah Cheng Siang Memorial Lecture.....	S1
10 th College of Physicians Lecture.....	S1
6 th Chapter of Neurologists Lecture.....	S2

Oral Presentation

Young Investigator Clinical.....	S3
Young Investigator Translational.....	S6
College of Surgeons, Singapore—Young Surgeon Awards.....	S9

Poster Presentation

Young Investigator.....	S11
-------------------------	-----

Oral Presentation

Senior Investigator.....	S26
--------------------------	-----

Poster Presentation

Senior Investigator.....	S29
--------------------------	-----

Speakers Abstracts

System Design to Enable Effective Caring for Patients with Multiple Comorbidities.....	S35
Clinician Scientist Symposium.....	S35
Managing Conflicts of Interest in Medicine.....	S36
Psychiatry Symposium.....	S36
Informed Consent—Setting the Professional Standards.....	S37
Tripartite Track: New Frontiers in Early Breast Cancer.....	S38
Tripartite Track: Advancing Together in Clinical Dentistry.....	S39
CPS Session: Immunisation—Shots/Vaccines are Not Just for Kids.....	S41
Elderly Care and Geriatric Medicine.....	S42
Tripartite Track: Metastatic Colorectal Cancer—Pushing Limits of Cure.....	S43
CPS Session: Management of the Patient with Diabetes and Multiple Comorbidities.....	S44
Tripartite Track: Obstetrics & Gynaecology.....	S45
Elderly in ER—An Emerging Epidemic.....	S46
Molecular Genetics.....	S46
Urology Symposium.....	S47
Paediatrics & Child Health Symposium.....	S48
Index of First Author.....	S50

Lectures

Runme Shaw Memorial Lecture

L1 Clinical Applications of Stem Cells in Medicine: 21st Century and Beyond

Ng Huck-Hui

Genome Institute Singapore, Singapore

Stem cells are unique cells with the ability to self-renew and under the appropriate conditions, they can differentiate into specialised cell-types. Among the different stem cells, pluripotent stem cell-lines have the most remarkable biological property that enables them to differentiate into cell-types of the 3 major lineages. In the past, it has been challenging to derive patient-specific pluripotent stem cell-lines. With the advent of reprogramming technologies, it is now possible to robustly generate patient-specific induced pluripotent stem cell-lines for research and potential clinical applications. Not surprisingly, 2 Nobel prizes in Physiology or Medicine had been awarded (2007, 2012) for the discovery of pluripotent stem cells and their applications. In this lecture, I will talk about the 3 recent disruptive technologies (high-throughput sequencing, reprogramming, precision genome editing) that impact on how we can use human stem cells for different applications. I will also highlight the current limitations and the future trends of the field of pluripotent stem cell research.

23rd Seah Cheng Siang Memorial Lecture

L2 Journey with Diabetes—Lessons From Outliers

Lim Su Chi

College of Physicians, Singapore

Against the back-drop of rapidly advancing medical science, my 2 decades journey in diabetology has been an exciting and humbling experience.

Several landmark clinical trials have proven the efficacy of global risk factors control in preventing major diabetic complications, especially micro-vascular diseases. Subsequent long-term follow-up of the study volunteers revealed that prior exposure to hyperglycaemia durably predisposed individuals to complications, a phenomenon referred to as metabolic memory or the legacy effect.

The expanding armamentarium of anti-diabetic medications has provided a wide range of therapeutic options to people with diabetes. Technological advances also make closed-loop insulin therapy (or artificial pancreas) a foreseeable reality. For morbidly obese individuals with diabetes, gastrointestinal metabolic surgery can decisively ameliorate

the burden of diabetes or even induce the remission of diabetes. This growing range of options results in greater complexity in clinical decision making. It also calls for the need to customised therapeutic regimen for individual patient i.e. personalised medicine, which is only at its infancy for diabetes management.

Outliers are rare occurrence in nature. Nevertheless, individual with extreme phenotype often illuminate disease patho-biology. Major disruption in a particular physiological function can lead to unusual phenotype. However, mild to moderate dysfunction of the same biological pathway forms the basis of etiologically complex but common disease like diabetes. The relationship between rare and common disease causative factors will be discussed.

A thorough understanding of disease patho-biology and the individuality of each patient is the prerequisite for personalised medicine.

10th College of Physicians Lecture

L3 The Challenges of Reinventing Medical Generalism in the 21st Century

Neil G Dewhurst

Royal College of Physicians of Edinburgh, United Kingdom

Be it anaesthetics, paediatrics or psychiatry, a workforce is needed with two populations. We need a large generalist group capable of delivering holistic care to patients with a range of problems but at some point, selected patients may also require doctors with highly specialised knowledge. Specifically, increasing numbers of older patients require medical teams with the necessary skills to manage comorbidity, polypharmacy and dementia. At present, many doctors across all specialties may not have been adequately trained in these. The emphasis towards specialisation has been driven by many factors. These include bench to bedside research delivering better patient management and guideline implementation to improve outcomes. As technology and pharmacological possibilities advance, patients and their families have increasing expectations of specialist intervention. The status of acute and general medicine is in particular danger. Trainees generally aspire to specialist posts in organ-based specialties, with any other outcome perceived as 'failure'. Also as a result of feminisation, specialties with less out-of-hours and emergency workload (e.g. dermatology, palliative care) are becoming increasingly popular. Meantime, there is a drive to increase the level of consultant-led care with at least a 12 hour/7 day presence, as

there is evidence of better patient outcomes and decreased length of stay. Postgraduate training in many countries has not kept pace with changes in patient need and there are currently significant service, recruitment and retention pressures that need to be addressed. Broader-based core training is required to maintain for longer the development potential and freedom of choice of trainees and to increase the number of trained doctors with high level generalist skills.

6th Chapter of Neurologists Lecture

L4 Update on Henipavirus Infection and Sarcocystosis— An Emerging Brain and Muscle Infection

Tan Chong Tian

Division of Neurology, Department of Medicine, University of Malaya,
Kuala Lumpur, Malaysia

Henipaviruses comprise Hendra virus and Nipah virus. Hendra virus was first discovered in Australia in 1994 with infections found in horses and animal workers. To date, there were 14 outbreaks with 7 cases of horse-to-human infection, and 4 mortalities in Eastern Australia. Nipah virus was discovered in Malaysia in 1999, causing a fatal encephalitis outbreak among pig farm workers, which subsequently spread to Singapore, involving the abattoir workers. Since 2001, almost all the yearly outbreaks of Nipah encephalitis have been reported in Bangladesh and countries located in the vicinity of India. The Bangladesh outbreaks spread from the consumption of contaminated date palm juice to human-to-human spread. The Pteropus fruit bats is the reservoir of Henipavirus. Recent studies show wide distribution of the pteropus bats with henipavirus infection from Africa to Australia, indicating the importance of Henipavirus as the cause of emerging encephalitis. Human muscular sarcocystosis is thought to be a largely asymptomatic infection. There were recent reports of returning tourists from Pulau Tioman suffering from febrile myalgia illness. A large outbreak in 2012 involved 89/92 (97%) of campers returning from Pulau Pangkor. They developed relapsing fever and myalgia. About 10% of them had a distinctive myositis of jaw muscle with facial swelling. Muscle biopsy identified *Sarcocystis nesbitti* as the aetiology. Thus, *Sarcocystis nesbitti* causes an acute, relapsing febrile myalgia with a high attack rate, with a distinctive myositis of the jaw muscle.

Oral Presentation (Young Investigator)

Young Investigator Clinical

O1 A Comparison of Measured And Calculated LDL-Cholesterol in Patients With Type 2 Diabetes

Brenda SM Chiang¹, Tavintharan S^{2,3}, Lim SC^{2,3}, Yeoh LY⁴, Ng TP⁵, Sum CF^{2,3}

¹Department of Medicine, Khoo Teck Puat Hospital, Singapore

²Diabetes Centre, Khoo Teck Puat Hospital, Singapore

³Division of Endocrinology, Department of Medicine, Khoo Teck Puat Hospital, Singapore

⁴Division of Renal Medicine, Department of Medicine, Khoo Teck Puat Hospital, Singapore

⁵Department of Psychological Medicine, National University Hospital, Singapore

Introduction: Low density lipoprotein cholesterol (LDL-C) is a key predictor and target in cardiovascular disease and risk reduction. LDL-C is derived from Friedewald formula ($LDL-C = total\ cholesterol\ (TC) - HDL-C - triglyceride/2.2$), limited by the need for fasting and the assumption that all triglycerides come from very low density lipoprotein cholesterol (VLDL-C). This assumption excludes chylomicrons, remnants and intermediate density lipoprotein cholesterol (IDL-C), possibly increased in insulin resistance and Type 2 diabetes (T2D). We hypothesise that in T2D, calculated LDL-C underestimates actual LDL-C leading to misclassification and potential under-treatment. This study aims to compare the values of measured and calculated LDL-C in T2D. **Methods:** Since August 2011, as part of an ongoing study, fasting blood was collected from all consenting patients seen in the Diabetes Centre of our institution. Lipid panel including direct LDL-C quantification was performed. LDL-C was also calculated with Friedewald formula. **Results:** A total of 1555 patients were enrolled. Patients with triglyceride >4.5 mmol/L were excluded, leaving 1525 population sample size, 51.2% males, mean age 57 (1SD) years and mean HbA1C 7.8 (1.3SD)%. Calculated LDL-C underestimated measured LDL-C (mean difference 0.35 mm). There was only fair agreement for calculated LDL-C; 34.4% (273/793) were measured LDL-C >2.6 and 13.6% (190/1397) for LDL-C >1.8, (Cohen's kappa was 0.629 and 0.499 respectively), and this was similar for patients with triglycerides above and below 1.7 mmol/L. **Conclusion:** Calculated LDL-C underestimates LDL-C in T2D. Direct measurement provides accurate LDL-C concentrations, needed to guide appropriate therapeutic choices, potentially allowing greater risk reduction in these patients with high cardiovascular burden.

O2 Parenteral Nutrition-Related Infection is Associated with Poor Outcomes

Shirley SL Teo¹, Koh SQO¹, Parmalingam P¹, Chong J², Loy KL², Tan LB³, Poh BY⁴, Beh HL⁴, Tsang WY⁴, Ng JL⁵, Liu PY⁵, Ling KL²

¹Yong Loo Lin School of Medicine, National University of Singapore, Singapore

²Department of Gastroenterology and Hepatology, Singapore General Hospital, Singapore

³Department of Dietetics, Singapore General Hospital, Singapore

⁴Pharmacy Department, Singapore General Hospital, Singapore

⁵Singapore General Hospital, Singapore

Introduction: Parenteral nutrition (PN) is an important supportive therapy although it is associated with many complications including infection. This study aims to determine the prevalence and outcomes of sepsis and catheter related blood stream infection (CR-BSI) in patients on PN and explore its associations. **Methods:** A retrospective study of patients who had received PN in the years 2006 and 2011 was undertaken. Data on infection, types of line inserted and nutritional parameters were collected. Patients who had infection prior to starting PN were excluded. CR-BSI is defined as either (i) positive blood and catheter cultures with the same organism isolated from both cultures; or (ii) reduction of systemic symptoms upon catheter removal. **Results:** Of the 380 patients who received PN in 2006 and 2011, 274 patients were included for analysis; 31.4% (n = 86) developed sepsis and 15% (n = 42) developed CR-BSI. From multivariate analysis, oncology patients were twice as likely to develop sepsis ($P = 0.022$). CR-BSI was associated with increased risk for death (OR = 3.26, $P = 0.004$). Patients with hepatobiliary cancer and who had undergone hepatobiliary surgery were more likely to develop CR-BSI (OR = 3.57, 3.48 respectively, $P < 0.05$). The development of CR-BSI was associated with the duration of PN; 12% of patients who required 14 days or less of PN developed CR-BSI compared with 22% who received more than 14 days of PN. **Conclusion:** A significant percentage of patients who received PN developed CR-BSI and sepsis. Given its association with mortality, every attempt should be made to minimise the length of PN therapy and encourage early enteral feeding.

O3 Liver Function Test Abnormalities During Parenteral Nutrition

Prathika Parmalingam¹, Teo SL¹, Koh SQO¹, Ling KL²

¹Yong Loo Lin School of Medicine, Singapore

²Gastroenterology and Hepatology Department, Singapore General Hospital

Introduction: Abnormal liver function test (LFT) results are not uncommon in patients on parenteral nutrition (PN).

This study aims to find the prevalence of such results, and investigate possible associations. **Methods:** A retrospective study was done on inpatients who received PN in 2006 and 2011. Patients with pre-PN LFT abnormalities and hepatobiliary comorbidities or surgery were excluded. Serial LFT results were recorded. Abnormal LFT was defined as raised bilirubin, aspartate transferase (AST), alanine transferase (ALT) or alkaline phosphatase (ALP) 1.5 times above the reference range's upper limit. **Results:** A total of 371 patients received PN in total. After exclusion, 244 were studied [median PN duration 11 days (range, 4 to 115)]. A total 126 patients (51.6%) developed abnormal LFT results. Elevations were as follows: ALP (n = 38), ALP and transaminases (n = 30), transaminases alone (n = 22), bilirubin (n = 11), bilirubin and transaminases (n = 7), bilirubin and ALP (n = 11). Seven patients had all parameters deranged. One week after PN cessation, 26.8% of patients had resolved LFTs; 53.7% had persisting derangements and 19.5% had no post-PN LFT done. From multivariate analysis, statistically-significant factors associated with abnormal LFT were: longer PN duration (OR 4.007, $P = 0.000$), sepsis (OR 2.294, $P = 0.002$) and need for intensive care unit (ICU) care (OR 2.481, $P = 0.001$). Total caloric content of >35 kcal/kg/day (OR 4.710) and lipid >0.8 g/kg/day (OR 1.633) had associations but they were not statistically-significant ($P = 0.157$, 0.446 respectively). Age, surgery, diagnosis and higher dextrose content had no associations with abnormal LFT. **Conclusion:** A significant percentage of PN inpatients developed LFT derangements, especially ALP elevations. These derangements are associated with longer PN duration, sepsis and ICU stay.

O4 Interaction Between Caffeine Intake and *LRRK2* Genetic Variants in Parkinson's Disease

SweSweThet Paing¹, Allen John Carson¹, Yi Zhao², Kumar M Prakash³, Eng King Tan^{1,2,3,4}

¹Duke- NUS Graduate Medical School, Singapore

²Department of Clinical Research, Singapore General Hospital

³Department of Neurology, Singapore General Hospital

⁴National Neuroscience Institute, Singapore

Introduction: Caffeine intake is associated with a reduced risk of Parkinson's Disease (PD). A recent study showed that single nucleotide polymorphisms (SNPs) in the *LRRK2* gene, G2385R (rs34778348) and R1628P (rs33949390) increase the risk of PD among the Chinese. We aim to assess if the protective effect of caffeine against PD is modulated by the presence of G2385R or R1628P in our population. **Methods:** Study participants of Chinese ethnicity were recruited prospectively and caffeine intake was assessed by clinical interview and scored into caffeine decades by multiplying the amount of caffeine taken per day with the total number

of years of consumption. Genotyping for *LRRK2* SNPs was performed according to Sequenom genotyping assay protocol. Multivariate logistic regression analysis was used to investigate association between the disease status and the independent variables: caffeine consumption and *LRRK2* genotype. **Results:** A total of 924 patients and 939 controls were included in the analysis. All SNPs were in Hardy-Weinberg equilibrium among the controls. Caffeine intake was found to decrease the risk of PD, with an OR of 0.29 (CI, 0.19 to 0.43, $P < 0.0001$) among our study population. G2385R and R1628P variants were found to increase the risk of PD with ORs of 2.80 (CI, 1.64 to 4.77, $P = 0.0002$) and 2.11 (CI, 1.28 to 3.47, $P = 0.0032$) respectively. On multivariate analysis, a significant interaction between R1628P variant and caffeine intake was found to influence PD risk ($P = 0.0214$) but the interaction between G2385R and caffeine was not significant ($P = 0.2027$). **Conclusion:** Our results suggest that the protective effect of caffeine against PD can be modulated by the presence of R1628P mutation.

Acknowledgements

Supported by grants from the National Medical Research Council, Duke-NUS Graduate Medical School, Singapore Millennium Foundation, SingHealth Foundation.

O5 Diet and Nutrition of Patients with Diabetes Mellitus Type 2 in Phnom Penh, Cambodia

Phospiseth Sean

International University, Cambodia

Introduction: The study aimed to determine the understanding of patients with diabetes mellitus type 2 for the need of diet modification in Phnom Penh, Cambodia. **Methods:** A total of 100 consecutive patients (73 females and 37 males) with diabetes mellitus type 2, seen at Preah Kosamak Hospital, Phnom Penh, were interviewed using questionnaires in May 2013. The first part focused on the diet of the patients such as frequency of consumption, types of food, and amount of various foods consumed daily. The second part assessed their dietary knowledge including awareness of the role of diet modification after diagnosis of diabetes mellitus type 2. This section was in the form of true/false questions regarding 10 types of carbohydrate foods to assess their knowledge. If they answered only 1 to 3 questions correctly, we considered them having poor knowledge; 4 to 6 as moderate knowledge and 7 to 10 as good knowledge of carbohydrate foods. HbA1c results were noted to see if the treatment met the therapeutic goal. **Results:** The ages of the patients ranged from 35 to 75 years old, and they were diagnosed with diabetes mellitus type 2 for a duration ranging from 3 months to 18 years. Of them, 85 patients had 3 meals daily while the rest had

either 2, 4 or 5 meals per day. The majority consume white rice as their main source of carbohydrates and fish as their source of protein. The study showed that among the 85 who have 3 meals a day, approximately 90% consumed starch as two-thirds of their daily meal and protein as less than a quarter portion of their daily diet. Only 9% consumed vegetables as more than a half portion of their daily meal, while 91% consumed vegetables as less than one-third of their daily meal. Eighty-seven percent of the patients consumed fats as 8% to 12% of their daily diet. Seventy-four percent of the patients were aware of the need for diet modification but did not know how to. They believed that only sweet-tasting foods were considered carbohydrates. Thirty-one percent of them were considered to have poor knowledge of carbohydrate foods (scored 1 to 3); 58% of them scored 4 to 6 (moderate knowledge) and only 11% were considered having good knowledge of carbohydrate foods (scored 7 to 10). HbA1c <7% (well controlled) was seen in 13% of the patients, 5% showed moderately good control (HbA1c 7–8%) and 82% poorly controlled diabetes mellitus (HbA1c >8%). **Conclusion:** Many patients had high daily carbohydrate consumption due to insufficient nutritional and diet modification knowledge, which resulted in poorly controlled diabetes mellitus. Therefore, there is still a need for these patients with DM type 2 to modify their diet, and for health professionals to strengthen dietary and nutritional education for patients to improve their control.

the callosal body differentiated between PIGD and PD ($P < 0.05$). Lower Tinetti scores in the PIGD correlated with lower FA and higher ADC values. **Conclusion:** We identified for the first time DTI abnormalities along the transcallosal motor tract in the corpus callosal body that differentiated PIGD from PD, and the degree of abnormality correlated with the risk of falls. Our findings have potential clinical therapeutic implications.

O6 Gait Disorders—Findings from Diffusion Tensor Imaging

Kia Min Ng¹, Chan L¹, Rumpel H¹, Tan E²

¹Singapore General Hospital, Singapore

²National Neuroscience Institute, Singapore

Introduction: Poor gait balance is a common clinical problem. It is seen in patients with postural instability and gait disorder parkinsonism (PIGD). However, the pathophysiologic differences between PIGD and idiopathic Parkinson disease (PD) are unclear. In this study, we used diffusion tensor imaging (DTI) to evaluate for differences between PD and PIGD patients. **Methods:** We evaluated the fractional anisotropy (FA) and apparent diffusion coefficient (ADC) values on DTI in the extrapyramidal, pyramidal, and transcallosal tracts, with 2-region tractography using 3T high field magnetic resonance imaging (MRI). The FA and ADC values were tabulated and compared. Multivariate analysis carried out, and correlation of the values with the Tinetti scores was also done. **Results:** We found greater ADC abnormalities in the extrapyramidal, pyramidal and transcallosal motor systems in PIGD compared to controls. In the multivariate analysis, the FA and ADC values in

O7 Peptide Hydrogels Improve Burn Wound Healing

Elijah Z Cai¹, Yihua Loo², Yong Chiat Wong³, Chuan Han Ang⁴, Ashvin Raju⁴, Eileen Chor Hoong Hing⁵, Shabbir M Moochhala³, Charlotte AE Hauser², Thiam Chye Lim^{5,6}

¹Department of Surgery, National University Health System, Singapore

²Institute of Bioengineering and Nanotechnology, Agency of Science, Technology and Research, Singapore

³Defence Medical and Environmental Research Institute, DSO National Laboratories, Singapore

⁴Yong Loo Lin School of Medicine, National University of Singapore, Singapore

⁵Department of Surgery, National University of Singapore, Singapore

⁶Division of Plastic, Reconstructive and Aesthetic Surgery, Department of Surgery, National University Health System, Singapore

Introduction: Current treatment modalities for partial and full-thickness burns are inadequate. This study evaluates the efficacy of ultra-short peptide hydrogels in promoting healing of burn wounds. The dynamic self-assembly of ultra-short aliphatic peptides forms macromolecular nano-fibrous hydrogels. The dense fibrous network forms a barrier against infection and trauma. Entrapping more than 99% of water, the hydrogels maintain tissue hydration and facilitate autolytic debridement. **Methods:** Three full-thickness burn wounds were inflicted on each Sprague-Dawley rat ($n = 10$) using a heated cylindrical stainless steel rod, 1 cm in diameter. They were dressed with peptide hydrogels PH#1 and PH#2, and polyamide-silicon Mepitel[®] (the current standard-of-care). To evaluate the rate of healing, the wound size, granulation and re-epithelialisation were quantitatively assessed using digitalised planimetry for 14 days. Harvested skin tissues were evaluated histologically for dermal and epidermal regeneration. **Results:** Both hydrogels were biocompatible and did not elicit immune or allergic reactions. No signs of infection were observed. PH#1 and PH#2 achieved a significantly greater rate of healing, with an average of 93% and 85% wound contracture respectively after 14 days. In comparison, only 62.5% of the burnt area was healed for wounds dressed with Mepitel[®] (mixed-model analysis, $P < 0.05$). The onset of autolytic debridement was earlier for wounds treated with the hydrogels (day 8) compared to Mepitel[®] (day 10). Histology showed greater extent of dermal and epidermal for wounds treated with the hydrogels. **Conclusion:** Ultra-short peptide hydrogels significantly enhance the rate of wound healing and can potentially be formulated to encapsulate therapeutics to minimise inflammation and prevent infection.

O8 Creation of Consistent Burn Wounds in a Rat Model

Elijah Z Cai¹, Chuan Han Ang², Ashvin Raju², Kong Bing Tan^{2,3}, Eileen Chor Hoong Hing⁴, Yihua Loo⁵, Yong Chiat Wong⁶, Shabbir M Moochhala⁶, Charlotte A E Hauser⁵, Thiam Chye Lim^{4,7}

¹Department of Surgery, National University Health System, Singapore

²Yong Loo Lin School of Medicine, National University of Singapore

³Department of Pathology, National University Health System,

⁴Department of Surgery, National University of Singapore, Singapore

⁵Institute of Bioengineering and Nanotechnology, Agency of

Science, Technology and Research, Singapore

⁶Defence Medical and Environmental Research Institute, DSO National Laboratories, Singapore

⁷Division of Plastic, Reconstructive and Aesthetic Surgery, Department of Surgery, National University Health System, Singapore

Introduction: Burn infliction techniques are poorly described in rat models. An accurate study can only be achieved with burn wounds that are uniform in size and depth. This study describes a simple and reproducible method for creating consistent burn wounds in rats. **Methods:** Eleven male Sprague-Dawley rats were used. The rats were anaesthetised and dorsum shaved. A 100 g cylindrical stainless steel rod of 1 cm diameter was heated to 100°C in boiling water. Temperature was monitored using a thermocouple. Immediately before burn infliction, we performed 2 consecutive toe-pinch tests on different limbs to assess the depth of sedation. Burn infliction was limited to the loin. A portion of skin was pulled upwards, away from the underlying viscera. This created a flat skin surface for burn infliction. The rod was allowed to rest on its own weight for 5 seconds, 10 seconds, 15 seconds and 20 seconds at different sites. Wounds were immediately excised for histology. Wounds were evaluated for morphology, size and depth. **Results:** Morphology: The wounds ($n = 30$) were circular, well defined, and uniformly brown with a rim of erythema; average wound size: 0.9957 cm² (STD 0.1845) ($n = 30$); depth: maximum depths of tissue damage were 1.6 mm, 2.3 mm, 1.8 mm and 2.5 mm for burn duration of 5, 10, 15 and 20 seconds respectively. Burn duration of 5 seconds resulted in full thickness damage. Burn duration of 10, 15 and 20 seconds resulted in full thickness damage, involving subjacent skeletal muscle. **Conclusion:** This is a simple and reproducible method for creating burn wounds consistent in size and depth in a rat burn model.

O9 Linking Human Leucine-Rich Repeat Kinase 2 (*LRRK2*) Gene Mutation to Cancer Development

Xiao Wei Heng¹, Yih Lin Lim², Lisa Helen Ong³, Murni Tio³, Yi Zhao³, Eng King Tan^{1,2,3,4}

¹Duke-NUS Graduate Medical School, Singapore

²National Neuroscience Institute, Singapore

³Department of Clinical Research, Singapore General Hospital, Singapore

⁴Department of Neurology, Singapore General Hospital, Singapore

Introduction: Parkinson's disease (PD) is a progressive, neurodegenerative condition that results in dopaminergic neuronal cell death. *LRRK2* gene mutations are found to be the single most important cause of development for both sporadic and familial autosomal dominant PD in humans. Recently, PD patients with *LRRK2* gene mutations have been clinically observed to be at a higher risk of developing cancers, including urothelial cancers. We conducted an exploratory study to determine how *LRRK2* gene mutations are linked to the cancer pathway. **Methods:** We created transgenic drosophila with *LRRK2* mutations in the kinase pathway to determine the proliferation propensity of *LRRK2* gene mutations. By comparing the eye tissues of these flies with controls (*LRRK2* wild-type, wild-type and yellow-white) under light microscope, we observed for excessive cell growth in the eye tissues of the transgenic flies. We also transfected plasmids containing *LRRK2* gene mutations into urothelial cancer cells. Ribonucleic acid (RNA) was extracted and the expression levels of various cancer pathway involving kinase proteins in these mutations was analysed. **Results:** Comparing the eye tissues between the transgenic flies and controls, the transgenic flies were observed to have increased eye growth, implying that *LRRK2* gene mutations are linked to increased cell growth via the kinase pathway. We also observed RNA expression levels of the selected cancer kinase pathway markers. **Conclusion:** Our results suggest that *LRRK2* gene mutations in PD are linked to cancer development through the process of hyperphosphorylation in the kinase pathway. However, further investigations are warranted to corroborate our findings.

O10 Thiol-Peroxidases Rescue Oxidant-Induced Mitochondrial and Neuronal Degeneration in Parkinson's Disease *LRRK2* Models

Dario C Angeles¹, Patrick Ho¹, Ling Ling Chan¹, Eng King Tan¹

¹Singapore General Hospital, Singapore

Mutations in leucine rich repeat kinase 2 (*LRRK2*) gene are causatively linked to autosomal dominant and sporadic Parkinson disease (PD). A common G2019S mutation which is responsible for up to 30% to 40% of PD cases in some ethnic populations, increases *LRRK2* kinase and

neurotoxic activities. In *Drosophila*, human dopaminergic neurons and PD patient brain, we found the mutant *LRRK2* hyperphosphorylates human peroxiredoxin-3 (*PRDX3*), a mitochondrial member of the antioxidant family of endogenous thioredoxin peroxidases. Phosphorylation of *PRDX3* was concomitant with decreased peroxidase activity and exacerbated death in *LRRK2*-expressing but not in *LRRK2*-depleted dopaminergic neuronal cells. Mitochondrial factors involved in apoptosis were activated and reactive oxygen species (ROS) and oxidative modification of macromolecules were induced. However, these effects were ameliorated when *PRDX3* was co-expressed. Further in bigenic flies that co-express both *PRDX3* and wild-type or mutant *LRRK2*, pathogenic effects including reduction in lifespan, loss of dopaminergic neurons, motor dysfunction and deterioration of musculature and mitochondria were significantly suppressed. In fibroblast cells of PD patients who carry the *LRRK2* mutation, treatment with *PRDX3* analog Ebselen led to dose-dependent increase in viability, enhanced peroxidase activity, suppressed H₂O₂ production and regulated mitochondrial integrity, suggesting modulation of oxidative stress and pathologies induced by *LRRK2* kinase mutant. Our findings provide a mechanistic link for the enhanced kinase activity and neuronal toxicity of kinase mutant *LRRK2* and show that thiol-dependent peroxidases could have promising therapeutic benefits. Further evaluation of these compounds in human *LRRK2* carriers may be clinically relevant.

O11 The Effect of Normalisation of Urinary Biomarkers to Urine Creatinine on Prediction of Glomerular Filtration Rate Decline in Chronic Kidney Disease

Gek Cher Chan¹, Peh Joo Ho, Hwee Min Loh, Qi Chun Toh,

Boon Wee Teo¹

¹Yong Loo Lin School of Medicine, National University of Singapore, Singapore

Introduction: Urine albumin to creatinine ratio (UACR) is commonly used to predict estimated glomerular filtration rate (eGFR) decline of chronic kidney disease (CKD). Novel urinary biomarkers (KIM-1, kidney injury molecule-1; liver-type fatty acid-binding protein (L-FABP); neutrophil gelatinase-associated lipocalin (NGAL); α GST and π GST, glutathione s-transferase; collagen IV) have been described for assessing acute kidney injury. The effect of normalisation to urinary creatinine (UCr) on predicting eGFR decline in CKD is unclear. We compared models of biomarkers, with and without normalisation to UCr, on prediction of eGFR decline in a population of Asian CKD patients. **Methods:** We retrieved stored spot urine samples from the Asian Kidney Disease Study (n = 81, 49.4% male).

We examined models of biomarkers against eGFR decline by univariate and multivariate analysis, using exhaustive variable selection method in multiple linear regression modeling with Akaike Information Criterion (AIC) to select the best model. Models were validated by cross-validation and ranked by prediction error. **Results:** Population means: age 58.7±12.3 years, 53.1% with history of diabetes, serum creatinine 2.03±1.17 mg/dL, serum protein 70.67±5.78 g/L, serum albumin 40.9±2.8 g/L, serum beta trace protein 1.5±1.0 mg/L, UACR 1.2±1.9 mg/g, αGST 6.5±23.8 ug/L, L-FABP 42.2±50.0 ug/L, NGAL 29.8±52.1 ug/L, baseline eGFR 45.2±28.6 mL/min/1.73m². Without normalisation, the model (AIC 197.5) included serum albumin, αGST, NGAL, and LFABP. With normalisation, the model (AIC 201.46) included initial GFR, serum protein, serum beta-trace protein, αGST, NGAL, and L-FABP. **Conclusion:** Whether or not normalisation to urine creatinine was performed, the best models for predicting GFR decline in CKD included the same novel biomarkers of kidney injury.

5 independent reviewers on coronal views of CT scans were 27.67 (±0.38) mm, 27.02 (±0.35) mm and 25.02 (±1.08) mm for patients A, B and C respectively. The means of orbital floor fracture depth measured on sagittal views were 27.12 (±1.31) mm, 37.24 (±1.13) mm and 36.32 (±0.94) mm for patients A, B and C respectively. For measurements performed with this novel protocol; inter-observer variability was minimal (similar to margin of error in mesh trimming ~ 1mm). **Conclusion:** Our novel protocol in CT measurements of orbital fractures have resulted in an improvement in the accuracy of orbital fracture measurements, as well as the overall sensitivity of orbital fracture detection by the novice readers.

O12A Protocol to Reduce Inter-Reviewer Variability in Computed Tomography Measurement of Orbital Floor Fractures

Chuan Han Ang¹, Elijah Zhengyang Cai¹, Jin Rong Low¹, Jia Yi Shen¹, Eileen Chor Hoong Hing², Yiong Huak Chan³, Gangadhara Sundar⁴, Thiam Chye Lim^{1,2,5}

¹Yong Loo Lin School of Medicine, National University of Singapore

²Department of Surgery, National University Health System, Singapore

³Biostatistics Unit, Yong Loo Lin School of Medicine, National University of Singapore

⁴Department of Ophthalmology, National University Health System, Singapore

⁵Division of Plastic, Reconstructive and Aesthetic Surgery, Department of Surgery, National University Health System, Singapore

Introduction: Orbital defect detection and size determination from computed tomography (CT) scans affect the decision to operate, type of surgical implant used and postoperative outcomes. However, lack of standardisation of radiological signs often lead to false positive detection of orbital fractures, while non-standardised landmarks lead to inaccurate defect measurements. **Methods:** A novel standardised protocol for CT measurement of orbital floor fractures was designed to reduce inter-reviewer variability. We then evaluated its efficacy on the accuracy of orbital fracture measurements on CT. Five independent reviewers without clinical experience in orbital fracture measurements measured orbital floor fractures of 3 consecutive patients following the protocol. The mean fracture widths and depths of the 3 patients, together with the 95% confidence intervals, were computed based on the measurements of the 5 reviewers. **Results:** The means of orbital floor fracture width measured by the

College of Surgeons, Singapore Young Surgeons Awards

The First Joint Meeting of the Royal College of Surgeons, Edinburgh and Chapter of Surgeons, Academy of Medicine, Singapore in November 1984 inaugurated a Surgeon-in-Training Award. The Award was presented to the best original unpublished paper read by a Surgeon-in-Training. Surgical trainees from Singapore and other countries submitted excellent and commendable work. The six papers which were subsequently shortlisted for presentation at the Award session were of remarkable standard and quality. The College of Surgeons, Singapore (then Chapter of Surgeons) agreed that the Award should be perpetuated to encourage young surgical trainees to continue pursuing surgical research and producing papers of the highest standards.

The Award will be presented biennially at the Annual Combined Surgical Meeting / Annual Scientific Meeting or in the Singapore-Malaysia Congress of Medicine when it is held in Singapore and will be given for the best original unpublished paper read by a young surgeon.

Y1.1 Fascicular Turnover Nerve Flaps vs Free Nerve Grafts for Bridging Nerve Gaps—Comparison of Outcomes in a Rat Model

Adrian SH Ooi

Singapore General Hospital, Department of Plastic, Reconstructive and Aesthetic Surgery, Singapore

Introduction: Free nerve grafts are the gold standard for bridging nerve gaps. However, the outcomes are unpredictable and donor site morbidity is incurred. Anecdotal evidence shows promising results with the fascicular turnover nerve flap. We performed a pilot study of the fascicular turnover nerve flap in a rat model to compare the efficacy of this technique with the free nerve graft. **Methods:** Twenty-two Wistar rats had sciatic nerve gaps of 5 mm created in their left hind legs. Seven received free nerve grafts, 13 received fascicular turnover nerve flaps, and 2 rats were used as negative controls. Follow-up consisted of functional testing using the Sciatic Functional Index and Extensor Postural Thrust as well as qualitative histological analysis. **Results:** Functional studies showed improvement in Sciatic Functional Index and reduction of percentage motor deficit for the fascicular turnover nerve flap, with no significant difference in recovery compared to the free nerve graft. Histological studies at the end of the 8-week study period showed longitudinal alignment and continuity of new axons across the coaptation point. **Conclusion:** The ideal nerve repair should be tension

free, replace like with like and have adequate vascularity. These points can be achieved with the fascicular turnover nerve flap. Our pilot study is the first animal study of this technique, with functional and histopathological studies showing that it has similar results to the free nerve graft, with the added benefit of avoiding donor site morbidity.

Y1.2 Evaluation of Calbindin Expression in Primary Nasopharyngeal Carcinoma Tissues

Claramae S Chia

Department of Surgical Oncology, National Cancer Centre, Singapore

Introduction: Nasopharyngeal carcinoma (NPC) is endemic in Southeast Asia and has high propensity for metastasis. Recent data suggest that Calbindin is an important mediator of tumor spread. Our aim is to determine whether Calbindin expression can be used to predict distant metastases.

Methods: From our database of patients treated between January 2004 and October 2008, 112 patients with NPC were selected with complete clinic-pathologic data and adequate tissue for immunohistochemistry (IHC). Calbindin expression (based on IHC) was assessed based on the following parameters: percentage of tumour-cells expressing Calbindin and staining intensity. Univariate and multivariate analyses were performed and a nomogram incorporating predictors was constructed. **Results:** Risk factors for distant metastasis on multivariate analysis included gender and tumour intensity. Based on the nomogram of these 2 factors, patients were stratified into 2 prognostic groups. The nomogram had poor discriminant ability with a concordance index of 0.685. There was a significant difference in overall survival between the high- and low-risk groups. **Conclusion:** Male patients with NPC and tumours showing strong tumour intensity with Calbindin may be at a higher risk for distant metastasis.

Y1.3 Cochlear Duct Length—One Size Fits All?

Thong Jiun Fong

Tan Tock Seng Hospital, Singapore

Introduction: Recent studies demonstrated the utility of high resolution computed tomography (HRCT) scans in measuring basal cochlear length and cochlear insertion depths. These studies showed significant variations in the anatomy of the cochlea among humans. The aim of our study was to investigate for gender and racial variations in the basal turn length of the human cochlea. **Methods:** HRCT temporal bone data from year 1997 till 2012 of patients with normally developed cochleae who reported

with otologic disease was obtained. Reconstruction of the full basal was performed for both ears. The largest distance from the midpoint of the round window, through the midmodiolar axis, to the lateral wall was measured (distance A). Length of the lateral wall of the cochlea to the first turn (360°) was calculated and statistically analysed. **Results:** HRCT temporal bone data from 161 patients with initially obtained. Four patients were subsequently excluded from the study as they were various other racial groups. Study group therefore comprised 157 patients (314 cochleae). Mean distance A was statistically similar between the two sides of the ear (right 9.09 mm; left 9.06 mm; $P = 0.35$). Significant gender and racial differences were also found. Mean distant A was Indian (22%). Between racial groups, mean distance A was 9.11 mm (Chinese), 9.11 mm (Malays) and 8.99 mm (Indians). With gender factored in, significant variation in mean basal turn lengths was found across all three racial groups ($P = 0.04$). **Conclusion:** The view of the basal turn of the cochlea from HRCT is simple to obtain and reproducible. This study found significant differences in basal cochlear length amongst male and female Asian patients, as well as amongst various racial groups. This has implications for cochlear electrode insertion as well as electrode array design.

Poster Presentation (Young Investigator)

P1 The Prevalence of Anxiety and Depressive Symptoms in Irritable Bowel Syndrome

Victor Kwok¹, Angeline Kuek, Ng Beng Yeong

¹Singapore General Hospital, Singapore

Introduction: Irritable bowel syndrome (IBS) is an illness affecting 10% to 15% of the Singapore population. It consists of 40% of the gastroenterologists' outpatient diagnoses and has high economic impact. Studies of populations in other countries suggest that the disease is affected by biological and also psychosocial factors, and local doctors also suspect frequent psychiatric comorbidities, although they focus only on regulating bowels. This thesis aims to study the prevalence of anxiety and depressive symptoms in IBS patients receiving treatment from gastroenterologists in Singapore General Hospital (SGH), as well as risk factors for these symptoms. **Methods:** It is a cross-sectional study consisting of patients from SGH diagnosed with IBS using the Rome II criteria recruited over 1 year. The presence of anxiety and depressive symptoms was detected using the Hospital Anxiety and Depression Scale (HADS). **Results:** A total of 231 patients were recruited into this study; 51.1% were found to have anxiety symptoms and 18.2% were found to have depressive symptoms according to the HADS. These patients were more likely to be younger and more educated. **Conclusion:** The findings show that anxiety and depressive symptoms are significant and highly prevalent among IBS patients attending a Singapore tertiary hospital, and this group is likely to be younger and more educated. Therefore it may be beneficial to offer psychological therapy to these patients.

P2 Use of Direct Intra-Arterial Contrast in CT Evaluation of Post EVAR Patients with Significant Renal Impairment

Cunli Yang¹, Kheng Ann Tan, Gopinathan Anil, Bernard Wee

¹National University Hospital, Singapore

Introduction: For post EVAR patients with borderline renal impairment, we describe a novel CT angiographic technique that can be performed with a small volume of contrast thereby decreasing the risk of contrast induced renal injury. We note that CT performed with contrast injection through an intra-arterial catheter could provide diagnostic quality images when evaluating for post EVAR endoleaks with no subsequent worsening of renal function.

Methods:

Results:

Conclusion: In post EVAR patients with significant background renal impairment, CTA performed with intra-aortic injection of contrast is a feasible option when evaluating for common endograft related complications

such as endoleak or graft thrombosis. This technique can be useful to avoid CIN and subsequent need for dialysis.

P3 Case Series: Thrombus Resolution in 2 Patients with Portal Vein Thrombosis Without Anticoagulation—Do We Need to Anticoagulate Patients with Portal Vein Thrombosis?

Ashish Anil Sule, Anna Marie Borja¹, Weili Xing, Edwin Lymen, Benedict Azucena, Tay Jam Chin, Edwin Lymen

¹Tan Tock Seng Hospital, Singapore

Introduction: Portal vein thrombosis (PVT) is thrombosis that develops in the trunk of the portal vein which can extend to its branches. It results from a combination of local and systemic prothrombotic factors. **Methods:** We describe 2 cases for this study. Patient 1 is a 77-year-old male who was admitted for cholangitis and pancreatitis and was found to have an incidental PVT. Patient 1's investigations and laboratory workup: total white count $23.0 \times 10^9/L$ (neutrophils 91.6%), haemoglobin 11.7g/dL, platelets $147 \times 10^9/L$; total bilirubin 184 $\mu\text{mol/L}$, alanine transaminase 111U/L, aspartate transaminase 113 U/L, gamma-glutamyltranspeptidase 515 U/L; amylase 641 U/L; hepatitis screening was negative. Abdominal computed tomography (CT) scan showed cholangitis with common bile duct calculi and an incidental thrombosis of the segmental branches of the right portal vein. Thrombophilia screen was negative. Patient 2 is a 60-year-old female with child's B cryptogenic liver cirrhosis and was admitted for gastroenteritis and left breast lump. She was found to have an incidental non-occlusive thrombus in the main portal vein. Her investigations and laboratory workup were as follows: total white cell $6.2 \times 10^9/L$ (neutrophils 73.1%), haemoglobin 9.1g/dL, platelets $116 \times 10^9/L$; Na 133 mmol/L, K 4.6 mmol/L, creatinine 115 $\mu\text{mol/L}$; albumin 29g/L, total bilirubin 25 $\mu\text{mol/L}$, alanine transaminase 27U/L, aspartate transaminase 42 U/L, C-reactive protein 15.5mg/L. CT scan showed left breast mass, cirrhosis with portal hypertension and non-occlusive portal vein thrombus. **Results:** Patient 1 underwent endoscopic retrograde cholangiopancreatography (ERCP), removal of stones and was given antibiotics. Patient was not anticoagulated due to the ongoing infection. A repeat CT scan 6 months later showed no evidence of PVT. Patient 2 underwent peritoneal drainage and was given antibiotics. No anticoagulation was given due to low platelet count. Eleven months later, an ultrasound Doppler of the hepatobiliary system revealed no evidence of vascular thrombosis. The left breast mass was later noted to be an invasive adenocarcinoma. **Conclusion:** The decision to anticoagulate a patient with portal vein thrombosis depends on several factors. Spontaneous resolution is possible but is an uncommon occurrence.

P4 A Rare Case of Behcet's Disease Presenting with Pyrexia of Unknown Origin, Pulmonary Embolism and Right Ventricular Thrombus

Ashish Anil Sule, Weili Xing, Anna Marie Borja¹, Girider Swaminathan, Dorai Raj Appadorai, Tay Jam Chin

¹Tan Tock Seng Hospital, Singapore

Introduction: Behcet's disease is a systemic inflammatory disorder caused by underlying vasculitis, presenting with recurrent oral ulcers and any of several systemic manifestations including genital ulcers, ocular disease, skin lesions, arthritis, gastrointestinal, neurologic, or vascular disease. **Methods:** We describe a 43-year-old woman presented with pyrexia of unknown origin (PUO) with cough, dyspnea and chest pain for 1 month duration. On detailed history taking, the patient had recurrent oral ulcers and genital ulcers. She was non-compliant to therapy and had irregular follow-ups. On the day of admission, she was pale, afebrile; blood pressure (BP) 100/60 mmHg; heart rate 90/minute. Her systemic examination was normal. Investigation and lab workup showed total white count $8.7 \times 10^9/L$ (neutrophils 74.4%, lymphocytes 15.5%, monocytes 8.6%, eosinophils 1.2%); haemoglobin 9.3g/dL; platelets $3.06 \times 10^9/L$, albumin 30 g/L; alanine transaminase 32U/L; aspartate transaminase 47 U/L; alkaline phosphatase 148U/L; C reactive protein 185mg/L; iron 2 $\mu\text{mol/L}$; transferrin 1.7 g/L; iron saturation 5%; procalcitonin 0.05 $\mu\text{g/L}$, erythrocyte sedimentation rate (ESR) was 105 mm/hr. Blood and urine cultures were negative. Chest X-ray and electrocardiogram (ECG) were normal. Computerised tomography (CT) scan of thorax, abdomen and pelvis showed a thrombus in the right ventricle and pulmonary emboli in the left lower lobe pulmonary arteries. A transthoracic echocardiography showed normal ejection fraction with mass in right ventricle (RV) 18x13x18 mm. A cardiac magnetic resonance imaging (MRI) confirmed findings. Her thrombophilia workup was not significant. **Results:** She was started on anticoagulation but refused immunosuppression therapy. She was discharged well. Outpatient follow-up revealed a reduction in the size of the RV thrombus from 18 x13 mm to 17 x 9 mm. **Conclusion:** It is very rare for patients with Behcet's disease to present as PUO with PE and RV thrombus. The management includes anticoagulation with or without immunosuppression therapy, with close follow-up on the size of thrombus by echocardiography.

P5 Reno-Splenic Shunting in the Nutcracker Phenomenon: A Discussion and Paradigm Shift in Options

Deborah CY Ng¹, Lee HC¹, Azucena B¹, Ashish AS¹, Yang CL², Sundeep JP²

¹Department of General Medicine, Tan Tock Seng Hospital, Singapore

²Department of Diagnostic Radiology, Tan Tock Seng Hospital, Singapore

Introduction: The nutcracker syndrome is a rare clinical manifestation caused by the compression of the left renal vein by an over-riding superior mesenteric artery. When symptomatic, it can present with haematuria and chronic pelvic pain. Effective treatment modalities include invasive surgical procedures such as renal vein transposition and endovascular stenting. Both are not without complications. **Methods:** We present the first reported case of spontaneous reno-splenic shunting in a 68-year-old lady with nutcracker phenomenon. Thus far, only one other case has been reported, but on a background of Childs B alcoholic cirrhosis which could well account for the portal hypertension and porto-systemic anastomosis. **Results:** Porto-systemic shunting may provide an effective conduit to relieve complications that arise from compression of the left renal vein, as evidenced in our elderly female patient with spontaneous reno-splenic shunting who had remained asymptomatic despite radiological evidence of significant pelvic congestion. There is anecdotal support from Ohio and China in which patients have described good symptomatic relief after surgical creation of reno-splenic and inferior mesenteric-gonadal bypasses respectively. Both were performed laparoscopically with minimal warm ischaemic time of 37 minutes. **Conclusion:** Surgical creation of porto-systemic bypasses for the nutcracker syndrome is a promising alternative treatment for the nutcracker syndrome. It can not only be performed minimally invasively, but also does not have complications associated with stent use. With more studies, it may be extrapolated for treatment of other conditions which may result in congestion of the left renal vein, such as pancreatic neoplasms and retroperitoneal tumours.

P6 The Impact of Psycho Education on Medication and Treatment Compliance to Patients and their Caregivers

Wong LY¹, Hendriks MM¹, Alex Su²

¹Case Management Unit, Institute of Mental Health, Singapore

²Acute General Psychiatry, Institute of Mental Health, Singapore

Introduction: A primary concern for healthcare professionals, who care for patients with psychiatric

illnesses, is patients' compliance to their medication and treatment upon discharge. This paper aims to establish if providing psycho-education to patients and their families during hospitalisation will have an impact to patients' compliance to medication and treatment. **Methods:** Data mining of patients who were case managed and discharged from an acute psychiatric ward in a tertiary hospital between June 2011 and March 2013 was done. The primary diagnoses of patients included in the survey were schizophrenia, schizoaffective, acute psychosis and delusional disorder. Face-to-face psycho-education was conducted during admission and prior to patients' discharge. Telephonic case management psycho-education was also done after their discharge. The results were analysed using Microsoft Excel programme. **Results:** Of the 128 female patients data mined, 77% had schizophrenia, 11% had schizoaffective disorder, 4% acute psychosis and 9% delusional disorder. Demographically, their racial distribution was as follows: 93 Chinese, 24 Malays, 9 Indians and 2 Thai. Their ages ranged from 20 to 80 years old and marital status; 46 patients married, 63 singles, 15 divorced and 4 widowed. A monthly average of 83% of patients came on their actual first appointment date and half of the defaulters (50%) turned up within 2 weeks after telephonic case management. This positive trend was continued when 91% of patients came for their second appointment. **Conclusion:** Psycho-education to patients and caregivers is effective in improving turn up rates for appointments when face-to-face psycho-education or telephonic calls are made.

P7 Starting Pilots in Advance Care Planning in a Tertiary Hospital in Singapore—An 1-Year Review

Raymond Ng¹, Chong Roland, Chau Hayley, Poi Choo Hwee, Wu Huei Yaw, Jessie Eng, Ramdat Tan, May Yu Zhen, Audrey Loke

¹Tan Tock Seng Hospital, Singapore

Introduction: Engagement with 'Respecting Choices' since 2009 resulted in pilot initiatives in advance care planning (ACP) starting in hospitals and the community in Singapore since 2009. The aim of this study is to audit awareness of ACP plans and congruence of patients' ACP plans with care delivery during readmission episodes and upon death in Tan Tock Seng Hospital. **Methods:** ACP outcomes for readmissions and death were analysed from retrospective audit of paper and electronic medical records. **Results:** From January 2012 to December 2012, a total of 147 'Preferred Plans of Care' were completed with patients and/or next-of-kin. Five ACP plans were revised. The medical teams were aware of patients' ACP plans in 76% of 68 readmissions. Medical interventions and initial place of care in event of deterioration were congruent with patients' stated preferences in 99% and 93% of readmissions respectively. Preferred place of death was honoured in 39% of patients

who passed away. **Conclusion:** There was high awareness of patients' advance care plans during readmissions, and high congruence between patients' preferences and care delivery. A robust ACP system is important in honouring patients' care preferences. More can be done to examine resource allocation, sustainability and reach of the programme and to address barriers to ACP.

P8 Multi-Detector Row CT Angiography (MDCTA) versus Digital Subtraction Angiography (DSA) for Detection and Localisation of Acute Gastrointestinal Bleed

Chester LY Chong¹, Kiang Hiong Tay, Richard Lo, Manish Taneja, Terence Teo, Li Ser Khoo, Farah G Irani, Mark C Burgmans, Tow Non Yeow, Bien Soo Tan

¹Department of Diagnostic Radiology, Singapore General Hospital, Singapore

Introduction: We aimed to retrospectively evaluate the accuracy of multidetector row computed tomography angiography (MDCTA) for detection and localisation of acute gastrointestinal (GI) bleeding. **Methods:** Between 2007 and 2010, we identified 44 patients (26 men, 18 women; mean age 63; range, 27 to 88) from our Radiology Information System who underwent both MDCTA and digital subtraction angiography (DSA) for evaluation of acute GI bleeding. Five patients had repeat MDCTA and DSA. All MDCTAs were performed before DSAs. Fourteen patients underwent embolotherapy while 16 patients underwent laparotomy following MDCTA/DSA. Forty patients underwent endoscopy prior to MDCTA/DSA. Extravasation of contrast material into the lumen of GI tract was considered positive for acute GI bleeding. The site of contrast extravasation in each anatomical location was recorded. MDCTA were compared using DSA and combined endoscopy and laparotomy findings as reference standards. Accuracy for localisation of acute GI bleeding was assessed by comparing locations of active bleeding at both MDCTA and DSA patients who had positive scans. **Results:** MDCTA depicted extravasation of contrast in 29 of 51 scans. The sensitivity, specificity, accuracy, and positive and negative predictive values of MDCTA for detection of GI bleeding using DSA as reference standard were 100%, 68%, 80%, 67% and 100% respectively, while the values using combined endoscopy and laparotomy findings as reference standard were 67%, 83%, 73%, 88% and 59% respectively. The sensitivity, specificity, accuracy, and positive and negative predictive values of DSA for detection of GI bleeding using combined endoscopy and laparotomy findings as reference standard were 43%, 93%, 63%, 90% and 52% respectively. The location of contrast material extravasation on MDCTA corresponded exactly to that of active bleeding on DSA in all patients. **Conclusion:**

MDCTA appears to be more sensitive and more accurate than DSA for detection and localisation of acute GI bleed when referenced against laparotomy/endoscopy findings.

P9 Bell's Palsy—Is it Zoster Sine Herpete?

Pamela Basilio¹, Sohil Pothiawala

¹Department of Emergency Medicine, Singapore General Hospital, Singapore

Introduction: Ramsay Hunt syndrome is a varicella zoster reactivation in the geniculate ganglion, and is a less common cause of facial nerve palsy. It is classically associated with vesicular rashes and other vestibular complaints like hearing loss, tinnitus, vertigo and even hearing loss. Varicella zoster virus (VZV) infection or reactivation involving the geniculate ganglion of CN VII within the temporal bone is the main pathophysiological mechanism of Ramsay Hunt syndrome. It is estimated to account for 16% of all causes of unilateral facial palsies in children, and 18% of facial palsies in adults. It is thought to be the cause of as many as 20% of clinically diagnosed cases of Bell's palsy [Idiopathic Lower motor neuron (LMN) facial nerve paralysis]. **Methods:** The objective of this report is to highlight to emergency physicians as well as all other physicians to consider Ramsay Hunt syndrome with or without rash (Zoster sine herpete) as a possible cause of facial nerve paralysis. We present a case of a middle-aged Chinese male, who presented to the emergency department (ED) with history and clinical features suggestive of right-sided LMN Bell's palsy. He was commenced on acyclovir, prednisone and appropriate eye care instructions and then discharged. He re-presented to the ED 5 days later with complaints of vertigo associated with vomiting. He had horizontal nystagmus with fast beating phase to the left and persistent right-sided facial weakness. Rest of the neurologic examination was normal. In view of persistent vertigo, blood tests were done which were normal. Computerised tomography (CT) scan of the brain was done which was reported to be normal. He later underwent a magnetic resonance imaging (MRI) of the brain which was reported to be having smooth enhancement of the facial/vestibulocochlear nerves at the apex of the right auditory canal and the right geniculate ganglion. He was admitted to neurology and showed symptomatic improvement with continuation of antiviral medication and prednisone. He was then discharged on the third day post admission and later followed up in the specialist outpatient clinic. **Results:** Occasionally, Ramsay Hunt syndrome might occur in the absence of cutaneous rash and is called Zoster sine herpete, as is the likely possibility in our case. Zoster sine herpete is shingles, minus the rash. Hence, diagnosing Zoster sine herpete can be difficult. This may be one of the rare cases where VZV reactivation presented as Bell's palsy initially without a rash but associated vestibular

symptoms. Unlike Bell's palsy, Ramsay Hunt syndrome has a complete recovery rate of less than 50%. The paralysis is more severe, and prognosis is worse than Bell's palsy. Most experts recommend early treatment with both antivirals and steroids for these patients. Several studies have shown that few cases of Ramsay Hunt syndrome have been initially diagnosed as Bell's palsy. This is due to absence of rashes and vestibular symptoms ie. Zoster sine herpete. With the use of early MRI and serologic tests like polymerase chain reaction (PCR), VZV has been shown to be actually more common than previously thought. Furuta et al reported the early diagnosis of Zoster sine herpete using PCR, leading to early treatment with antivirals and steroids, thus achieving 100% cure rate among the study subjects after 6 months. This study points out the benefit of starting combination therapy for these patients as compared to patients with "true" Bell's palsy in which evidence shows that additional antiviral therapy does not change the outcome. **Conclusion:** Given the fact that Ramsay Hunt syndrome has a worse prognosis and patients may benefit significantly from early antiviral therapy, and that the identification of Zoster sine herpete is a challenging task without serologic confirmatory tests, the issue which needs to be addressed is the need for PCR analysis on all patients with acute facial nerve paralysis. Would it be more cost effective than simply treating all these patients with antivirals? Currently, there are no evidence based guidelines regarding the use of these diagnostic tests. This highlights the importance for further studies focused on identification and treatment of Zoster sine herpete.

P10 Role of Intra-Arterial CT Angiography in Acute Gastrointestinal Bleeding

Yan Yet Yen¹, Irani Farah G, Teo, Terence, Yeow Tow Non, Gogna Apoorva, Ramamurthy Sathesh, Patel Ankur, Chan Shaun X, Too Chow-Wei, Lo Richard, Tan Bien Soo, Tay Kiang Hiong

¹Singapore General Hospital, Singapore

Introduction: Our objective is to compare the sensitivity of intra-arterial CT angiography (IACTA) with respect to conventional mesenteric digital subtraction angiography (DSA), in detecting the bleeding vessel (BV) and region of bleed (RB). The complications, outcomes and positive predictors of IACTA are investigated. **Methods:** Patients who underwent both DSA and IACTA for acute bleeding of the gastrointestinal tract (BGIT) in our institution from September 2008 to February 2012 had their medical records reviewed. Thirty-four procedures in 31 patients were selected. The DSA and IACTA images were compared to determine the BV and RB. Univariate analysis was performed to determine any relationship between the pre-procedural clinical parameter and the positive predictors

for bleeding on DSA and IACTA. Four of the procedures were excluded from the analyses as the bleeding had spontaneously stopped on table prior to IACTA being performed. There were 11 upper BGIT cases and 23 lower BGIT cases. **Results:** Out of 30 IACTAs, 19 identified the RB compared with 13 for DSA ($P = 0.03$), and 11 identified the BV compared with 8 for DSA ($P = 0.25$). Embolisation was performed in 11 (32.4%) procedures. Complications were all minor at 14.7% rate ($n = 5$). Outcomes: full recovery ($n = 11$), surgical intervention ($n = 10$), endoscopy ($n = 5$) and repeat mesenteric angiogram ($n = 5$); 30-day mortality was 8.8% ($n = 3$). Higher Charlson comorbidity index score, prolonged PT and lower systolic blood pressure (BP) were associated with a positive DSA and IACTA ($P < 0.05$). **Conclusion:** IACTA is superior to DSA in detecting BGIT. A negative IACTA can reduce the amount of time and radiation expended in detecting BGIT.

P11 Hepatocellular Carcinoma (HCC) Resected Within AASLD Guidelines: Hepatitis C Patients Do Worse than Hepatitis B

Ernest Eu¹, Justin Leong¹, John Allen Jr², Peng Chung Cheow³, Alexander Chung³, London Lucien Ooi³, Brian Goh³, Jen San Wong³, Chung Yip Chan³, Victor Lee³, Pierce KH Chow^{2,3}

¹Yong Loo Lin School of Medicine, National University of Singapore, Singapore

²Office of Clinical Research, Duke-NUS Graduate Medical School, Singapore

³Unified Surgical Service SingHealth, Singapore

Introduction: American Association for the Study of Liver Diseases (AASLD) guidelines for resection in hepatocellular carcinoma (HCC) developed in a region endemic for hepatitis C (HCV) appear very restrictive compared to Asia-Pacific Association for the Study of the Liver (APASL) guidelines which were developed in a region endemic mainly for hepatitis B (HBV). We reviewed our patients with HCC undergoing curative resection, to determine if there is a difference in disease-free survivability (DFS) and overall survivability (OS) between HBV and HCV patients satisfying the AASLD guidelines. **Methods:** Six hundred and seventy-nine patients who underwent surgical resection for HCC at the Singapore General Hospital and National Cancer Centre Singapore between January 2000 and February 2012 were reviewed. Those with positive serology for both HBV and HCV, or negative for both, or had palliative resection were excluded. Four hundred and twelve patients satisfied the study criteria, 331 satisfying the AASLD criteria. **Results:** Within the AASLD criteria, 295 patients were HBV positive, 36 HCV positive and, differences in DFS between HCV and HBV patients were significant (15.8 vs 31.1 months, $P = 0.008$), while OS

was also shorter in HCV patients (91.6 months vs 101.9 months, $P = 0.42$). For the entire cohort ($n = 412$), HCV patients experienced shorter median DFS (14.9 months vs 25.0 months, $P = 0.015$), and shorter OS (78.1 months vs 100.6 months, $P = 0.238$). **Conclusion:** HBV and HCV-associated HCC differ in DFS and OS, with HCV patients demonstrating poorer surgical outcomes. The differences in hepatocarcinogenesis and resection outcomes suggest a possible basis for the different approaches in the AASLD and APASL guidelines.

P12 Comparison of Acupuncture versus Placebo in Pain Control during Percutaneous Transluminal Angioplasty of Stenosis in Dysfunctional Haemodialysis Arterio-Venous Fistulae: Preliminary Experience

Hlaing Hlaing Win,¹ Shu Li Cui,² Farah G Irani,¹ Chow Wei Too,¹ Shaun JM Chan,¹ Apoorva Gogna,¹ Satheesh Ramamurthy,¹ Richard HG Lo,¹ Lina HL Choong,³ Seck Guan Tan,⁴ Bien Soo Tan,¹ Kiang Hiong Tay,¹

¹Department of Diagnostic Radiology, Singapore General Hospital, Singapore

²Pain Management Centre, Singapore General Hospital, Singapore

³Department of Renal Medicine, Singapore General Hospital, Singapore

⁴Department of General Surgery, Singapore General Hospital, Singapore

Introduction: We aimed to compare the effectiveness of acupuncture versus placebo (sham needling) in pain control during percutaneous transluminal angioplasty of stenoses in dysfunctional haemodialysis arteriovenous fistulae (AVFs). **Methods:** From June 2010 to June 2013, 52 patients (20 females and 32 males) with mean age of 61 years (range, 27 to 84) were enrolled after informed consent and meeting inclusion criteria. Patients with peripheral neuropathy and those on regular medication for pain control were excluded. Patients were randomised to receive either acupuncture therapy or placebo. In the treatment arm, acupuncture was performed 30 minutes prior to commencement of angioplasty. In the placebo arm, needles were used to prick the patient's skin without actual skin penetration (at similar acupuncture points as the treatment arm) and secured with adhesive plaster. Pain levels were recorded based on a visual analogue scale from 0 to 10. Pain assessment was performed during angioplasty. **Results:** Acupuncture and sham needling were successfully performed in all patients. There were no significant procedure-related complications. The mean pain score during angioplasty was 7 (range, 4 to 10) and 8 (range, 4 to 10) for the acupuncture and sham needling arms, respectively ($P = 0.11$). There was no significant difference in pain levels between the groups during angioplasty. **Conclusion:** Our preliminary experience suggests that acupuncture is not useful for acute pain control during angioplasty of dysfunctional haemodialysis AVFs.

P13 An Australian Hospital Dementia Unit: A Description of Behaviours of Concern, Psychotropic Use and Outcomes

Jia Wei Woo¹, J Gilbert², D Liew³, A Gorelik³, D LoGiudice²

¹Box Hill Hospital, Australia

²Department Aged Care, Royal Park, Melbourne Health, Australia

³Centre Clinical Epidemiology, Biostatistics and Health Services Research, Melbourne Health and University Melbourne, Australia

Introduction: Dementia units are common in acute hospital settings. There is little descriptive data on the characteristics and outcomes of patients admitted to this type of unit. This study describes a population of elderly people with dementia admitted to a dementia unit, their levels of agitation and psychotropic use at admission and discharge, and explore factors contributing to length of stay. **Methods:** Descriptive data on a prospective cohort sample of 100 consecutive patients admitted to the dementia unit at Royal Park, Melbourne Health were collected. Variables included Cohen Mansfield Agitation Inventory Scale (CMAI) scores, functional scores, use of psychotropic medication and residential status at discharge. Association of outcomes were explored to determine impact on length of stay. **Results:** Of 100 consecutive patients, the mean MMSE score was 11.8 (7.3) and delirium was noted in 42% of the admissions. Overall, CMAI scores decreased significantly at discharge 48.3 (15.4) to 42.8 (15.3) including subscores of physical non-aggressive and verbally aggressive behaviour. Subscores of aggressive behaviour did not change and hoarding characteristics increased. The number of subjects taking antipsychotics decreased from 45 to 36 and average dose remained the same. Thirty-two percent returned to their previous accommodation and two-thirds required higher level of care. No association was noted between variables and length of stay. **Conclusion:** This study describes significant behaviours of concern displayed by those with dementia admitted to a hospital dementia unit, and their outcomes. Future planning for care of this population is required, taking into account physical environment and non-pharmacological measures.

P14 Mandibular Angle Fractures and the Third Molar Tooth: A Review of Cases at National University Hospital

Arjunan Kumaran¹, WC Chew¹, CH Hing^{2,3}, W Tan⁴, TC Lim^{2,3}

¹Yong Loo Lin School of Medicine, National University of Singapore

²Department of Surgery, Yong Loo Lin School of Medicine, National University of Singapore, Singapore

³Division of Plastic, Reconstructive and Aesthetic Surgery, National University Health System, Singapore

⁴The Oral Maxillofacial Practice, Mount Elizabeth Novena Medical Centre, Singapore

Introduction: Mandibular fractures are common; with 25% to 30% involving mandibular angle fractures (MAF). The third molar (M3) is in close proximity and studies have investigated its role in MAF pathogenesis. Few have studied its impact on postoperative complications or identified clear indications for intraoperative retention or removal. We aimed to describe MAF cases at the National University Hospital (NUH) with comparisons to non-fractured mandibular angles and to discuss the relevance of findings to clinical practice. **Methods:** All patients with MAF at NUH from January 2001 to December 2010 were studied. Hospital records and radiographs were used. Demographic data: age at time-of-fracture, ethnicity, gender, tobacco use, past medical history and medication use and fracture variables, presence of other maxillofacial fractures, degree of comminution and relation of fracture line to M3 were collated. When present and appropriate, M3 was left in-situ intraoperatively. With 3D imaging software, OsiriX[®] (Pixmeo) M3 positions were identified and tooth variables (length and width of M3, and height and width of ramus around M3) were measured. Seemann's 7 postoperative complications were screened for osteosynthesis failure, pseudoarthrosis, infection, nerve trauma, wound-healing disturbance, functional impairment and disocclusion. Any association between tooth variables and MAF was investigated using Statistical Package for Social Sciences (SPSS) v21.0[®] (IBM). **Results:** Even with M3 left in-situ, no complications were found apart from 1 report of periodontitis, secondary to poor preoperative hygiene. No significant association of investigated variables with postoperative complications or MAF was found. **Conclusion:** The presence of M3 in MAF fracture site does not complicate outcomes. Unless M3 impedes fracture fixation, removal is not indicated.

P15 The Use of Computer-Generated 3-Dimensional Surface Renders for Identification, Isolation and Measurement of the Third Molar Tooth with Mandibular Angle Fractures

Daniel WC Chew¹, A Kumaran¹, CH Hing^{2,3}, W Tan⁴, TC Lim^{2,3}

¹Yong Loo Lin School of Medicine, National University of Singapore, Singapore

²Department of Surgery, Yong Loo Lin School of Medicine, National University of Singapore, Singapore

³Division of Plastic, Reconstructive and Aesthetic Surgery, National University Health System, Singapore

⁴The Oral Maxillofacial Practice, Mount Elizabeth Novena Medical Centre, Singapore

Introduction: Surgeries around the third mandibular molar (M3) are at higher risk of postoperative complications, especially inferior alveolar nerve (IAN) injury. Preoperative

assessment is necessary but present imaging techniques of panoramic radiographs and computed tomography (CT) are limited in accuracy. Further improvements in imaging assessment need to be explored. In this study, we describe the use of free, open-source OsiriX v5.6 to create 3D reconstructions of the mandible from CT images in patients with mandibular angle fractures (MAF), facilitating preoperative assessment, planning and clinical research. **Methods:** A series of 10 patients with MAF treated at the National University Hospital (NUH) were enrolled. OsiriX was used for 3D reconstruction of craniofacial skeleton from available CT records, with isolation of M3 and measurement of fracture-related variables (concomitant craniofacial fractures, comminution, relation of fracture line to M3 socket) and tooth-related variables (presence of M3, number of roots visualised, general periodontal condition and bone changes, length of tooth in bone, height of body of mandible at M3 location, widest diameter of M3, width of mandible, and classification of M3 position by Gregory & Pell's and Winter's Classification methods). **Results:** Using the method described, OsiriX showed high ease of use and good reproducibility for 3D reconstruction of MAF. The 3D renders showed anatomical relations clearly and were easily amenable for taking measurements. **Conclusion:** OsiriX is able to illustrate clearly the anatomical relations around the M3 with good reproducibility. It has good potential for use in preoperative assessment, planning and clinical research in patients with MAF.

P16 Pilot Study for Drug Eluting Stents for Infragenicular Arterial Lesions in Patients with Chronic Limb Ischaemia: Preliminary Results with Angiographic Follow-Up

Chester LY Chong¹, Ankur Patel¹, Farah G Irani¹, Apoorva Gogna¹, Jonathan P Rombertson¹, Sathesh Ramamurthy¹, Richard HG Lo¹, Hlaing Hlaing Win, Mark C Burgmans¹, Seck Guan Tan², Siew Ping Chng², Shanker Pasupathy², Benjamin SY Chua², Kiang Hiong Tay¹, Bien Soo Tan¹

¹Department of Diagnostic Radiology, Singapore General Hospital, Singapore

²Department of General Surgery, Singapore General Hospital, Singapore

Introduction: We aimed to perform a prospective pilot study to determine if drug-eluting stents can be safely used in an Asian population to treat critical limb ischaemia resulting from occlusion or stenosis of arteries below the knee, and assess the short-term outcomes of this intervention. **Methods:** Between 2012 and 2013, we prospectively identified 10 patients at Singapore General Hospital (8 men, 2 women; mean age 66; range, 55 to 78) who underwent lower limb angiography and angioplasty for lower limb ischaemia. All patients underwent stenting for a single lower limb arterial stenotic lesion and conventional angioplasty

for other lesions. Patients were assessed prior and directly after the intervention, at 1, 3 and 6 months for complications and stent patency. An angiogram was performed at 6 months to assess stent patency. **Results:** We have preliminary data for 3 patients who completed 6 months follow-up, 2 with 3 months follow-up, 1 with 1 month follow-up and 3 with discharge assessment. One study patient died during the admission of advanced cardiac disease. Our preliminary data show promising results particularly in patients who have completed 6 months follow-up, with all 3 patients retaining primary patency. None of the 3 patients had complications, amputation, ulcer, necrosis or new lesions. All the patients and attending clinicians reported clinical improvement. Of the other 6 patients on follow-up, there was 1 patient who had forefoot amputation at 1 month for pre-existing osteomyelitis, unrelated to stent placement. In this small group of patients, no stent thrombosis has been encountered to date. **Conclusion:** Our preliminary data suggest that placement of drug eluting stents for infragenicular arterial lesions in patient with chronic limb ischaemia is safe and shows promise as a treatment modality in the current pilot study.

P17 Randomised Controlled Trial Comparing Standard Balloon Angioplasty, Placement of Drug-Eluting Stent versus Stent Graft for the Treatment of Cephalic Arch Stenosis in Patients with Haemodialysis Access Stenoses—An Interim Report of First 11 Patients

Win Htet Yin¹, A Gogna¹, BS Tan¹, KH Tay, M Taneja², FG Irani¹, S Ramamurthy¹, RHG Lo¹, A Patel¹, SXJM Chan¹, CWToo¹, JP Robertson¹, TKB Teo³, HH Win¹

¹Singapore General Hospital, Singapore

²Raffles Hospital, Singapore

³Mount Elizabeth Hospital, Singapore

Introduction: This study aimed to assess the efficacy of drug-eluting stent or stent graft placement after balloon angioplasty compared to balloon angioplasty for the treatment of cephalic arch stenosis in patients undergoing percutaneous transluminal angioplasty of haemodialysis access arteriovenous fistula (AVF) or graft (AVG) stenoses at 6 months. **Methods:** From September 2012 to January 2013, 11 patients (6 males) with cephalic arch stenosis of >50% were randomised to balloon angioplasty (PTA) (n = 2), or PTA with drug-eluting stent placement (DES) (n = 6), or PTA with stent graft placement (SG) (n = 3). Mean age was 62.94 years (range, 48 to 81). Follow-up angiograms were performed at 6 months to assess restenosis rates. Outcome was primary patency rates at 6 months. **Results:** Baseline characteristics were similar between groups. Before 6-month follow-up angiogram, 2 patients in the PTA

group, 4 patients in the DES group and 1 patient in the SG group underwent intervention. A meaningful analysis for restenosis rates could not be performed for a small group of follow-up patients. At 3 months, primary patency rates were 100% in the SG and PTA group and 67% in the DES group. However, at 6 months, primary patency rates were 66% in the SG group, 33% in the DES group and 0% in the PTA group ($P = 0.328$). **Conclusion:** Although stent graft placement for cephalic arch stenosis improved primary patency compared to PTA or PTA with DES placement at 6 months, it was not statistically significant. This trend is expected to reach a significant level with further patient recruitment.

P18 Necrotizing Fasciitis of the Head and Neck

Ming Chun Chan¹, Eileen Chor Hoong Hing^{1,3},
Thomas Kwok Seng Loh², Chwee Ming Lim², Wei Chen Ong^{1,3},
Jane Lim^{1,3}, Thiam Chye Lim^{1,3}

¹Yong Loo Lin School of Medicine, National University of Singapore

²Department of Otolaryngology (ENT) - Head & Neck Surgery, National University Health System, Singapore

³Division of Plastic, Reconstructive and Aesthetic Surgery, National University Health System, Singapore

Introduction: Necrotizing fasciitis (NF) of the head and neck is a rare, destructive soft tissue infection with a deceptively innocuous early presentation, associated with high mortality and morbidity. The objectives of this study are to present the incidence and data on patients encountered in the National University Health System (NUHS); and to propose an algorithm encompassing diagnosis, inpatient treatment, and post-discharge management. **Methods:** A retrospective review of all patients treated for NF of the head and neck in NUHS from January 2000 to June 2013. An algorithm was formulated following review of our patients and existing literature. **Results:** Of the 8 patients were treated; 7 had NF of the neck, 1 of the head. Typical presentations were rapidly progressing erythema, swelling and pain. Seven had poorly controlled diabetes mellitus. Possible aetiology included tonsillitis, insect bite, and acupuncture. All received emergency surgical debridement, intravenous antibiotics, and multidisciplinary supportive management; 6 required reconstructive surgery; 2 patients passed away and morbidity included dysphagia, renal failure, facial palsy and depression. No recurrences were recorded. **Conclusion:** The head and neck is rarely affected, consisting 4.2% (8 of 190) of all NF in NUHS during the study period. Poorly controlled diabetes mellitus was a significant comorbidity. Imaging and investigations should not delay aggressive surgical and medical therapy. Patients suffer numerous complications; from the condition itself, prolonged hospitalisation (e.g.

infections), debridements (e.g. functional impairment, wound cosmesis), and psychologically (e.g. depression). A multidisciplinary approach is crucial to treat the condition and complications. Postdischarge follow-up is essential for sequelae management.

P19 Practice Guidelines Nutritional Assessments are Valid in Asians with Chronic Kidney Disease

Qi Chun Toh¹, Pek Yee Chow¹, Hwee Min Loh², Evan JC Lee¹,
Boon Wee Teo¹

On behalf of Singapore Kidney Function Study research team

¹National University of Singapore, Singapore

²National University Health System, Singapore

Introduction: Clinical practice guidelines recommend objective nutritional assessments by body mass index (BMI), mid-arm circumference (MAC), corrected mid-arm muscle area (cAMA), and mid-arm muscle circumference (MAMC). It is unclear how protein intake associates with these assessments in an Asian population. Moreover, the standards proposed are inappropriate when risks of clinical outcomes or associated metabolic abnormalities are considered. This study assessed protein intake and its association with nutritional assessments in a multiethnic Asian population. **Methods:** We analysed the 24-hour urine collections of the Asian Kidney Disease Study and the Singapore Kidney Function Study to estimate total protein intake (TPI; g/day) using, $TPI = 6.25 \times \text{urine urea nitrogen} + 30 \times \text{weight (in kg)}$. We calculated ideal body weight (IDW; kg) = $22.99 \times \text{height}^2 \text{ (m)}$. We calculated muscle assessments: $MAMC = MAC - (\pi \times TSF)$; $cAMA \text{ (men)} = [(MAC - \pi \times TSF) / 4\pi] - 10$; and $cAMA \text{ (women)} = [(MAC - \pi \times TSF) / 4\pi] - 6.5$. **Results:** There were 232 chronic kidney disease (CKD) patients and 103 healthy participants with mean age 53.5 ± 15.1 year; comprising of 51% male, 38.5% Chinese, 29.6% Malay, 23.6% Indian, and 8.4% Others, 20.4% smokers, 35.5% diabetics, and 57.3% hypertensives. Nutritional assessments: Overall, TPI is associated with MAC ($P < 0.001$), cAMA ($P < 0.001$), and MAMC ($P < 0.001$). TPI divided by IDW (TPI-IDW; g/kg/day) also associates with MAC ($26.131472 + 4.1530665 \times TPI-IDW$; $P < 0.001$), cAMA ($23.025138 + 8.1261286 \times TPI-IDW$; $P < 0.001$), and MAMC ($19.487248 + 2.480638 \times TPI-IDW$; $P < 0.001$) but not when TPI is divided by actual body weight. **Conclusion:** TPI is associated with muscle assessments in all participants. TPI divided by IDW should only be used in CKD patients.

P20 Methanol Poisoning and Parkinsonism

Donna Mae Lyn V Buhat¹, Eng King Tan¹

¹Singapore General Hospital, Singapore

Introduction: Methanol poisoning is an acute medical emergency. Robust researches focus on the acute intervention as it is lifesaving. However, treatment should not end on its acute damaging effect as survivors may be left with devastating chronic neurologic consequences such as parkinsonism. **Methods:** We present a teenage male who was brought to hospital due to vomiting, drowsiness and disorientation after ingestion of methyl alcohol containing liquid. He had severe metabolic acidosis and became comatose. On regaining his consciousness, he developed akinetic-rigid syndrome. Cranial magnetic resonance imaging (MRI) showed bilateral and symmetrical haemorrhagic putaminal and frontal deep white matter necrosis. Hyperintensity of subcortical white matter of the parietal, temporal and occipital lobes were noted in T2 sequence. **Results:** Upon initiation of levodopa treatment, his parkinsonism improved dramatically and was maintained on same medication until present. Levodopa as mainstay treatment for parkinsonism induced methanol ingestion have not yet been fully established. In this report, we highlight the importance of the long-term beneficial effect of levodopa in a patient with subacute to chronic akinetic rigid syndrome as a result of bilateral haemorrhagic putaminal and frontal deep white matter necrosis due to methanol ingestion despite the presence of poor prognostic factors. **Conclusion:** In conclusion, physicians who treat patients with methanol poisoning should be aware that early recognition and intervention to start one's treatment is better to define the prognosis of the condition. However, delayed neurological condition should never be set apart and trial of treatment should still be initiated as this may have beneficial effect.

P21 Active Monitoring of Blood Glucose Levels Reduces Hyperglycaemia in Patients on Parenteral Nutrition

Koh SQ¹, Parmalingam P¹, Teo Suat Lay¹, Chong J², Loy KL², Tan LB³, Poh BY⁴, Beh HL⁴, Tsang WY⁴, Ng JL¹, Liu PY¹, Ling KL²

¹Yong Loo Lin School of Medicine, National University of Singapore

²Department of Gastroenterology & Hepatology, Singapore General Hospital, Singapore

³Dietetics Department, Singapore General Hospital, Singapore

⁴Pharmacy Department, Singapore General Hospital, Singapore

Introduction: Hyperglycaemia is a complication of parenteral nutrition (PN). It is associated with poor clinical outcomes. A previous study showed that 49.7% of patients on PN in 2006 developed hyperglycaemia. The PN team subsequently actively monitored for hyperglycaemia

through electronic tracking of blood glucose levels and encouraged primary teams to start insulin once high glucose levels were found. Our objective is to determine if these new measures have reduced the incidence of hyperglycaemia.

Methods: This is a retrospective study of patients who had received PN in 2006 and 2011. Hyperglycaemia was defined as random glucose >10 mmol/L persistently over a 24-hour period. **Results:** A total 255 patients [135 males, 120 females; median age 62 years (range, 16 to 99)] received 255 courses of PN. The mean length of stay (LOS) was 38.6 (SD 31.1), total parent nutrition (TPN) duration 15.34 (SD 15.1) and caloric intake 23.34 kcal/kg (SD 6.17). A lower percentage of patients developed hyperglycaemia in 2011 (31.5%) compared with 2006 (49.7%) ($P = 0.06$). Interestingly, patients in 2011 had been on PN for a longer period of time compared with 2006. There was no association between higher caloric PN and hyperglycaemia in both years. Hyperglycaemia during PN was associated with a longer LOS ($P < 0.001$), longer PN duration ($P < 0.001$) and the need for intensive care unit (ICU) care ($P = 0.004$). Patients with DM were more likely to develop hyperglycaemia ($P < 0.001$). **Conclusion:** We observed significant improvement in glucose control with the new glucose monitoring protocol. We also found that illness severity, as indicated by ICU care and LOS, was a stronger predictor of hyperglycaemia than increased caloric content.

P22 Percutaneous Insertion of Covered Self-Expandable Metallic Stents for Obstructive Jaundice—A Singapore Experience

Perry JR Liew¹, BS Tan¹, T Hui¹, YS Choo¹, FG Irani¹, S Ramamurthy¹, A Gogna¹, CW Too¹, RHG Lo¹, A Patel¹, S Chan¹, KH Tay¹, TKB Teo¹

¹Department of Diagnostic Radiology, Singapore General Hospital, Singapore

Introduction: We aimed to study the use of covered self-expandable metallic stents in the treatment of patients with biliary pathologies. **Methods:** A retrospective study was performed of 10 patients between January 2010 to February 2013 who had undergone covered self-expandable metallic stent insertion for either biliary strictures or leakage. The mean age of the patients was 68.4 years and 8 were male. Seven patients had malignant obstruction, 2 benign obstructions and one had biliary leak. All patients underwent percutaneous transhepatic biliary drainage before staged covered self-expandable metallic stent insertion. **Results:** Although technical success was 100%, in 2 of the patients, the covered stents did not fully expand after initial deployment and required balloon dilatation to achieve full expansion. The mean follow-up period was 5.4 months (range, 1 to 9 months). One patient presented with cholangitis at 4th day which was treated conservatively. This patient again

presented with stent obstruction at 4th month. On follow-up, 2 patients had died from their underlying malignancy without obstruction, and 1 from sepsis. **Conclusion:** In this small study, covered self-expandable metallic stents appear effective in treating biliary obstruction and leaks and potentially offer an alternative for patients with these pathologies.

P23 Evaluation Of The Link Between *ZFHX3* And *NINJ2* With Ischaemic Stroke

Ebonne Ng¹, E Ang¹, G Ong¹, D De Silva¹, EK Tan¹, WL Lee¹

¹National Neuroscience Institute, Singapore

Introduction: This study aimed to determine if the genome wide linked variants, *ZFHX3* and *NINJ2* single nucleotide polymorphisms, SNPs, rs7193343 and rs12425791 are risk factors for ischaemic stroke in Singapore. **Methods:** A total 921 individuals diagnosed with ischaemic stroke and 687 controls were recruited from both the Singapore General Hospital (SGH) and National Neuroscience Institute (NNI) campuses. These controls had no history of ischaemic or haemorrhagic stroke. Genomic DNA was extracted from venous blood drawn from these subjects and genotyped, using Taqman based platform to detect the single-nucleotide polymorphisms (SNPs) of interest. **Results:** *ZFHX3* and *NINJ2* were found to be in Hardy-Weinberg Equilibrium among controls using Fisher's exact test after adjusted by Bonferroni correction. *ZFHX3* SNP tends to increase the risk of ischaemic stroke among males via an overdominant model (OR [95% CI] = 1.22 [0.94 to 1.60], $P = 0.1$) and *ZFHX3* and *NINJ2* SNPs tend to increase the risk of ischaemic stroke among the Chinese men via an overdominant (OR [95%CI] = 1.30 [0.96 to 1.77], $P = 0.08$) and recessive model (OR [95% CI] = 1.98 [0.88 to 4.46], $P = 0.08$) respectively. **Conclusion:** *ZFHX3* and *NINJ2* may be linked with ischaemic stroke in our population.

P24 Genetic Analysis of *SCA8* Trinucleotide Repeats in Parkinson's Disease

Helen Ong¹, C Lin^{1,2}, Y Zhao¹, EK Tan²

¹Department of Clinical Research, Singapore General Hospital, Singapore

²National Neuroscience Institute, Singapore

Introduction: Spinocerebellar ataxia (SCA) is a progressive, degenerative genetic disorder. The typical SCA is characterised by the triplet repeat (CAG) expansion in the relative SCA genes. The trinucleotide repeats of SCA genes have attracted interest due to their involvement in human neurodegenerative disorders. The association

between SCA gene mutation and Parkinson's disease (PD) has been reported. Abnormal expansions of *SCA8* gene was detected in patients with PD. In this study, trinucleotide repeats of *SCA8* were screened in the local ethnic Chinese PD patients to identify the associations between *SCA8* trinucleotide repeats and PD. **Methods:** A total of 169 subjects comprising 87 PD cases and 82 healthy controls were examined. Polymerase chain reaction (PCR), DNA sequencing and GeneScan were used to analyse CAG/CTG trinucleotide repeats expansions of *SCA8* gene. **Results:** Based on results of *SCA8* trinucleotide repeats, the average repeat numbers of CAG/CTG in PD group appear to be higher than healthy controls. The large expanded molecular of *SCA8* with approximately 97 CAG/CTG repeats was observed in 2 PD patients yielding a prevalence of 2.3% in our PD group. No controls were positive for *SCA8* trinucleotide repeats. **Conclusion:** The abnormal expansions of *SCA8* gene was detected in the local Chinese PD patients. The results suggest that *SCA8* should be a minor cause of parkinsonism in local Chinese populations.

P25 Study of Lipid Abnormalities in Patients with Type 2 Diabetes Complicated with Chronic Kidney Disease

Jeremy Hoe¹, Tavintharan S^{2,3}, Lim SC^{2,3}, Yeoh Ly⁴, Sum CF^{2,3}

¹Department of Medicine, Khoo Teck Puat Hospital, Singapore

²Diabetes Centre, Khoo Teck Puat Hospital, Singapore

³Division of Endocrinology, Department of Medicine, Khoo Teck Puat Hospital, Singapore

⁴Division of Renal Medicine, Department of Medicine, Khoo Teck Puat Hospital, Singapore

Introduction: Two large randomised control trials in chronic kidney disease (CKD) showed no reduction in cardiovascular outcome despite reduction in LDL-cholesterol with statin treatment. We hypothesise non-LDL-cholesterol-lipoproteins contributed to increased cardiovascular events in CKD. This study describes the lipid profile and goal achievements in patients with Type 2 diabetes (T2D) and CKD. **Methods:** A total of 1246 patients with T2D from our institution's Diabetes Centre were recruited from August 2011. Demographic, anthropometric parameters and fasting lipids were measured. Patients with CKD3 or above ($n = 321$) were included for this study. **Results:** Mean age was 63 (1SD) years, 45% males, 48% Chinese. Of them, 74% had CKD3, 15% CKD4, 8% CKD5. Mean LDL-C was 2.83 mmol/L (SD=0.93), non-HDL-C: 3.34 mmol/L (SD=1.05), triglyceride: 2.00 mmol/L (SD = 1.29) and HDL-C 1.18 mmol/L (SD = 0.31). Non-HDL-C and triglyceride were significantly higher ($P < 0.01$) and HDL was significantly lower ($P < 0.001$) in CKD, compared to patients with no CKD. There was significant correlation between serum creatinine and LDL-C ($r = 0.121$, $P < 0.03$), non-HDL-C

($r = 0.176$, $P < 0.001$) and triglyceride ($r = 0.119$, $P < 0.03$). Mean LDL-C, non-HDL-C and triglyceride were higher in CKD 4/5 compared to CKD3 ($P < 0.02$, $P < 0.001$, $P < 0.001$ respectively). Forty-three percent achieved LDL < 2.6 mmol/L; 60% had non-HDL-C < 3.4 mmol/L. Among those with cardiovascular disease, 8% had LDL-C < 1.8 mmol/L and 23% non-HDL-C < 2.6 mmol/L. **Conclusion:** Non-LDL-lipoproteins (representing chylomicron remnants, VLDL, IDL), measured in non-HDL-C, were significantly elevated in later stages of CKD, likely contributing to increased atherosclerotic burden. Clinical trials are needed to show if treatment targeting non-HDL-C will lower cardiovascular outcomes in CKD.

Abbreviations and Definitions

LDL-C: Low-density lipoprotein cholesterol;

Non-HDL-C: Non-high density lipoprotein cholesterol (total cholesterol -HDL-C);

CKD3: Estimated glomerular filtration rate (eGFR**) 30 to 59.9 mL/min/1.73m²;

CKD4: Estimated glomerular filtration rate 15 to 29.9 mL/min/1.73m²; CKD5: Estimated glomerular filtration rate < 15 mL/min/1.73m²; LDL-C target: < 1.8 mmol/l if cardiovascular disease present, < 2.6 mmol/L for rest;

Non-HDL-C target: < 2.6 mmol/l if cardiovascular disease present, < 3.4 mmol/L for rest

*eGFR estimated by MDRD equation from <http://www.mdcalc.com/mdrd-gfr-equation/>

P26 Subcutaneous Injection is a Simple and Reproducible Option to Restore Parathyroid Function After Total Parathyroidectomy in Patients with Secondary Hyperparathyroidism

Jeremy CF Ng¹, Weining Wang^{2*}, Min Jia Chua^{1*}, Mui Suan Tan^{1*}, Ngian Chye Tan^{1,2}, Khee Chee Soo^{1,2}, Hiang Khoon Tan^{1,2}, N Gopalakrishna Iyer^{1,2}

¹Head and Neck Service, Department of Surgery, Singapore General Hospital, Singapore

²Head and Neck Service, Department of Surgical Oncology, National Cancer Centre, Singapore

*These authors contributed equally to the manuscript.

Introduction: Secondary hyperparathyroidism is a common clinical problem seen in patients with endstage renal disease (ESRD) undergoing haemodialysis. In patients with severe persistent hyperparathyroidism, parathyroidectomies are often required. We evaluate the feasibility and efficacy of total parathyroidectomy followed by subcutaneous injection of parathyroid autograft when compared with surgical implantation. **Methods:** A retrospective study was conducted in 167 patients with confirmed diagnoses of ESRD treated with haemodialysis or peritoneal

dialysis, with secondary hyperparathyroidism and undergone parathyroidectomies. Clinical and biochemical characteristics, including preoperative and postoperative iPTH levels were recorded and compared between patients who had undergone subcutaneous injection or surgical implantation of autograft. **Results:** From January 2005 to March 2012, 167 patients who had undergone parathyroidectomies were included in our study. Immediate success rate of total parathyroidectomies was noted to be higher than subtotal parathyroidectomies (94.7% vs 48.6%). Kaplan-Meier plots showed that the recurrence rates were significantly higher in patients who had undergone subtotal parathyroidectomies compared to total parathyroidectomies ($P < 0.001$). In comparing the techniques of subcutaneous injection and surgical implantation, pre and postoperative biochemistry was recorded and analysed. Preoperative biochemistry was comparable in both groups. However, autograft recovery was significantly shorter in the group with subcutaneous injection compared to surgical implantation ($P = 0.03$). Median time to parathyroid recovery was 2 months for injection compared to 9 months for implantation. There was no remarkable difference in recurrence rates between the 2 groups ($P = 0.277$). **Conclusion:** Subcutaneous injection of parathyroid tissue is a feasible and simpler alternative to the more commonly used method of surgical implantation.

P27 Squamous Cell Carcinoma of the Ear Arising in Patients After Radiotherapy for Nasopharyngeal Carcinoma

Tay Gerald¹, Tan Hiang Khoon², Iyer NG Gopalakrishna², Soo Khee Chee²

¹Singapore General Hospital, Singapore

²National Cancer Centre, Singapore

Introduction: Radiation induced malignancies are a rare but serious complication arising in patients receiving radiotherapy for nasopharyngeal carcinoma. Our objective was to characterise patients who develop postirradiation squamous cell carcinoma (PISCC) of the ear after radiotherapy for nasopharyngeal carcinoma and to compare their outcomes with patients who have de novo SCC of the ear. **Methods:** Clinical and pathological characteristics and their outcomes were analysed and compared between postirradiation and de novo squamous cell carcinoma cases. **Results:** From 2002 to 2011, 25 patients were treated at our institution for squamous cell carcinoma of the ear, of which 8 (32%) occurred after prior irradiation. There were no significant differences between the 2 groups with regards to age, gender, race, smoking status, tumour size, grade, stage and differentiation. Patients in the PISCC group appeared to have inferior overall survival (median survival 71.2 vs

85.6 months; $P=0.292$) and disease specific survival (mean 59.6 vs 71.5 months; $P=0.441$). **Conclusion:** PISCC of the ear in long standing survivors of NPC has a poor prognosis despite advances in medical care. Surgical resection with clear margins seems to offer the best outcomes.

P28 Do Post-Irradiation and De Novo Head and Neck Squamous Cell Carcinomas Have Different Clinical and Pathological Features?—A Matched-Pair Analysis

Gerald Tay¹, Iyer N Gopalakrishna², Ong Whee Sze²,
Tai Wai Meng David², Ang Mei Kim², Ha Tam Ca², Soo Khue Chee²

¹Singapore General Hospital, Singapore

²National Cancer Centre, Singapore

Introduction: Post-irradiation squamous cell carcinoma (PISCC) of the head and neck is a feared complication of radiation therapy. It is not known if PISCC have different clinical outcomes and pathological features than de novo SCC cases. **Methods:** A total of 34 cases of PISCC of the head and neck matched with 136 cases of de novo squamous cell carcinoma of the head and neck by age, gender, site of primary tumour and smoking status. Clinical and pathological features of both groups of patients were compared. **Results:** PISCC patients had poorer median 5-year overall survival (33.6 vs 50.5%, $P=0.018$) and disease specific survival (35.3 vs 66.1%, $P=0.001$). Patients able to undergo curative treatment had no significant difference in overall survival, disease specific survival, disease free interval or locoregional recurrence free interval. PISCC patients were more likely to have no disease at diagnosis (70.6 vs 42.9%, $P=0.024$). There was no significant difference between the 2 groups in terms of tumour size at diagnosis, overall stage, extracapsular spread, lymphovascular invasion or perineural invasion. **Conclusion:** PISCC patients have worse survival compared with de novo squamous cell carcinoma patient. However, those able to undergo curative treatment have equivalent overall survival or disease specific survival.

P29 Biomechanical Investigation into “Figure of 8” Flexor Tendon Repair Techniques

Agrawal Aditya¹, Mat JaisItaSuzana, Chew Darryl Ee Ming,
Yam Andrew Kean Tuck, Tay Vincent Shian Chao

¹Singapore General Hospital, Singapore

Introduction: We aimed to investigate the “Figure of 8” flexor tendon repair first described by Al-Qattan, who reported this technique to be both simple and strong (93N). **Methods:** Thirty digits from 6 upper limb cadavers provided

56 flexor tendons (including flexor pollicis longus (FPL)) with intact tendon sheaths. In all flexor tendons, clean lacerations were created in zone 2. The cut tendons were divided into 4 groups and repaired using the placement of 1, 2 or 3 “Figure of 8” sutures across the tendon laceration, using Fibrewire (Arthrex) of either 2 to 0 or 4 to 0. **Conclusion:** In flexor digitorum profundus (FDP) only repairs, 3 “Figure of 8” Fibrewire 4/0 suture is recommended. For combined FDP and flexor digitorum superficialis (FDS) repairs, we recommend using 2 “Figure of 8” sutures in each tendon. Further studies are currently in progress to compare this “Figure of 8” repair technique with other “Figure of 8” repair techniques in human flexor tendons.

P30 Dynamic Imaging with Dual-Source Gated CT: Implications of Motion Parameters on Image Quality for Wrist Imaging

Neo Puay Yong¹, ItaSuzanaMat Jais¹, Christoph Panknin²,
Lau Chin Cheung¹, Chan Lai Peng³, An Kai Nan⁴, Tay Shian Chao^{1,5}

¹Wrist Analysis Research Laboratory, Singapore General Hospital, Singapore

²Siemens Healthcare – Forchheim, Germany

³Department of Diagnostic Radiology, Singapore General Hospital, Singapore

⁴Biomechanics Laboratory, Mayo Clinic College of Medicine, USA

⁵Department of Hand Surgery, Singapore General Hospital, Singapore

Introduction: Dynamic computed tomography (CT) imaging promises insights into the pathophysiology of carpal instability by recording images of the carpus while it is in motion. The purpose of this study was to investigate the effect of motion velocity on image quality for dynamic carpal imaging applications using a clinical dual-source CT (DSCT) scanner. **Methods:** An acrylic geometric spatial resolution phantom with targets in the axial, coronal and sagittal planes was attached to a motion simulator and imaged using a 64-slice DSCT scanner. Data were acquired when the phantom was stationary and during periodic linear motion. Spatial resolution, motion artifacts and banding artifacts were assessed. **Results:** Mean spatial resolution was 0.82 mm at 36 mm/s and 0.79 mm at 18 mm/s. Banding artifacts were mild at 36 mm/s and minimal at 18 mm/s. Motion artifacts were minimal at motion velocity of up to 36 mm/s in both the coronal and sagittal planes. Axial plane motion artifacts were moderate at 36 mm/s and mild at 18 mm/s. **Conclusion:** Submillimeter resolution is achievable with commercially available DSCT scanners with mild to moderate amounts of motion artifacts at velocities of 18 mm/s and 36 mm/s respectively.

P31 Quantification of Carpal Hysteresis Curve Area: Inter- and Intra-Rater Reliability

Ita Suzana Mat Jais¹, Liu Xuan², An Kai Nan³, Tay Shian Chao^{1,4}

¹Wrist Analysis Research Laboratory, Singapore General Hospital, Singapore

²Duke-NUS Graduate Medical School, Singapore

³Biomechanics Laboratory, Mayo Clinic College of Medicine, USA

⁴Department of Hand Surgery, Singapore General Hospital, Singapore

Introduction: Carpal bones exhibit hysteresis that is dependent on the direction of wrist motion, which can be seen during 4-Dimensional (3D plus time) imaging of the wrist. In-vitro studies have demonstrated the phenomenon of carpal hysteresis and have shown that the hysteresis area increases with carpal instabilities. However, their techniques required implantation of bone markers and thus cannot be used clinically. The objective of this study is to measure carpal hysteresis using 4-dimensional computed tomography (4DCT) which is a noninvasive technique, and to determine the reliability of this technique. **Methods:** A cadaveric wrist mounted on a custom motion simulator was imaged in a dual-source CT scanner while undergoing periodic radioulnar deviation. Ten image phases of this motion was reconstructed through retrospective cardiac gating. The Euler angles of the scaphoid, lunate and triquetrum in each phase was derived by manual registration in Matlab after segmentation in Analyze 8.1. These angles were then plotted against wrist positional angles to produce the hysteresis curves and the area within these curves was measured. The registration and measurements were performed by 2 raters to derive intra- and inter-rater reliability assessments. **Results:** Carpal hysteresis area was found to be larger in the lunate (96.5 deg²) followed by triquetrum (92.3 deg²), and smallest in the scaphoid (67.5 deg²). However, only scaphoid total hysteresis area measurement had high reliability, with intra- and inter-rater reliability of 4.7% and 4.8% respectively. **Conclusion:** We have demonstrated that 4DCT of the wrist can be used to quantify scapholunate instability with consistent reliability. At this time, the reliability for measuring triquetrum hysteresis is not as reliable. Thus, carpal hysteresis measurement for lunotriquetral instability is currently not recommended.

P32 Prognostic Value of Lymph Node Density in Tongue Squamous Cell Carcinoma

Runfeng Zhao¹, Lui LJ¹, Ong YF¹, Tan WJ², Tan NC², Tan HK², Soo KC², Iyer NG²

¹Yong Loo Lin School of Medicine, Singapore

²National Cancer Centre, Singapore

Introduction: Compared with the conventional nodal

staging, lymph node density (LND) may be superior in predicting survival for squamous cell carcinoma (SCC) of tongue. It takes into account the total number of lymph nodes removed which is a surrogate for nodal disease clearance. This study evaluates the utility of LND in predicting survival for patients with SCC of tongue. **Methods:** A retrospective review of 100 patients with SCC of the tongue who underwent curative surgery and neck dissection was conducted. LND calculated as the ratio of positive lymph nodes to total lymph nodes removed. Median values were considered in lymph node density assessment. LND were divided into 3 groups: (A) LND = 0, B) LND <median value, and C) LND >median value. Overall survival (OS) for each group were calculated and compared. Univariate analysis of LND, pN status (positive or negative), pN staging (N0, N1, N2&3) in predicting OS was performed using Kaplan-Meier analysis. Survival differences within the groups were elicited through the log-rank test. **Results:** Median age of patients is 62.0 years (range, 23 to 94); 57% were male and 43% were female. Thirty-one percent of patients were on stage I disease, 28% on stage II, 17% on stage III, 24% on stage I; 42% of the patients reported positive lymph node involvement (pN+). Density of positive lymph nodes for pN+ patients ranges from 0.01 to 0.43, with a median value of 0.0928. Univariate analysis shows 5-year OS rates were 91.2% for LND = 0, 75.8% and 61.5% for the groups with lymph node densities below and above the median respectively ($P = 0.013$). In comparison, conventional nodal staging was not significant in predicting 5-year OS ($P = 0.122$). **Conclusion:** Lymph node density is a superior prognostic indicator for SCC tongue compared to the conventional nodal staging.

P33 Role of Fine Needle Aspiration Cytology and Frozen Section for Surgical Decision-Making in the Management of Parotid Gland Neoplasm

Chian Myau Soon¹, Iyer N Gopalakrishna², Khee Chee Soo², Hiang Khoon Tan²

¹Singhealth, Singapore

²National Cancer Centre, Singapore

Introduction: The objective of this study is to analyse the contributing roles of fine needle aspiration cytology (FNAC) and frozen section (FS) in diagnosis and surgical management of parotid gland neoplasm which is often complicated by the diverse pathologic subtypes. **Methods:** This is a retrospective review of 489 patients who underwent parotidectomy between February 2002 and December 2012. One hundred and thirty-five patients had preoperative FNAC, 307 patients had intraoperative FS and 71 patients both. FNAC and FS were compared with final histology

for sensitivity, specificity, positive and negative predictive values, histopathologic accuracy, and grading accuracy. **Results:** In this cohort, 398 cases (81.4%) were benign, 88 cases (18%) were malignant and 3 cases of normal parotid gland. FNAC has a sensitivity of 93%, specificity of 95%, positive predictor value (PPV) of 85%, and negative predictor value (NPV) of 98%; while FS has a sensitivity of 90%, specificity of 99%, PPV of 94%, and NPV of 98%. For malignant parotid gland tumours, histopathological accuracy was 55% (17/31) for FNAC and 78% (40/51) for FS; while grading accuracy was 65% (20/31) for FNAC and 88% (45/51) for FS. For benign parotid gland lesions, histopathologic accuracy was 66% (69/104) for FNAC, and 90% (231/257) for FS. **Conclusion:** We propose that future algorithms in managing parotid gland lesions should incorporate both FNAC and FS. FNAC facilitates preoperatively screening to identify malignancy with its high sensitivity; while FS assists intraoperative management with high histopathologic and grading accuracy, the ability to determine the surgical margins, lymph nodes involvement, and local invasion.

P34 Hepatic Resection for Malignancy in Octogenarians

Gerald Tay¹, Peng Chung Cheow¹
¹Singapore General Hospital, Singapore

Introduction: With an increased life expectancy, more elderly patients are presenting with surgically resectable tumours. The purpose of the study was to analyse the results of liver resections in patients older than 80 years of age in a tertiary referral hepatobiliary surgical unit. **Methods:** A retrospective review of the departmental operative records was performed to identify patients 80 years of age and older who underwent hepatic resections for malignancy. A detailed retrospective case-note review was done to identify perioperative morbidity and mortality. The main outcomes measured were 30-day mortality, inpatient mortality. An analysis of postoperative complications was also performed. **Results:** From 2000 to 2010, there were 24 patients who were 80 years old of age or older (who underwent hepatic resection for malignancy). The median follow-up time was 30.3 months. Twenty patients (83.3%) underwent surgery for hepatocellular carcinoma, 2 (8.3%) for colorectal liver metastases, 1 (4.2%) for cholangiocarcinoma and 1 (4.2%) for gallbladder carcinoma. There were 2 (8.3%) perioperative deaths. One patient died from a myocardial infarction and the other from sepsis from pneumonia and a biliary leak. The remaining patients were all alive at 30 days and 6 months. Median survival of patients was 39.0 months. **Conclusion:** Age alone should not be a contraindication for surgery and selected octogenarians can safely undergo hepatic resection with acceptable risks and survival.

P35 Reasons for Hospital-Acquired Methicillin-Resistant *Staphylococcus Aureus* (MRSA) Colonisation in an Isolation Ward: The Importance of the Environment?

Sean Ong¹, Cathrine Teo, Dale Fisher, Anupama Vasudevan, Paul Ananth Tambyah

¹National University of Singapore, Singapore

Introduction: The objective of this study is to identify risk factors associated with newly-acquired methicillin-resistant *staphylococcus aureus* (MRSA) colonisation among patients in an isolation ward. **Methods:** A retrospective case control study of patients admitted to the 2 isolation wards at a large teaching hospital in Singapore in 2011 and 2012 was conducted. There were 43 case patients who were negative on MRSA screening upon admission to the ward but found to be colonised upon discharge from the ward. Eighty-six age- and gender-matched controls were selected from patients admitted in that same period with negative MRSA screening results upon both admission and discharge. Information about patient demographics, comorbidities, antibiotics, invasive devices, hospital movements and the MRSA status of the prior patient in the same room were collected. Univariate analyses were done to identify risk factors associated with newly acquired MRSA colonisation. **Results:** Univariate analysis showed that the only risk factor trending towards significance for the acquisition of MRSA colonisation was the positive MRSA status of the prior patient occupant of the same room (OR 3.150, CI, 0.937 to 10.594, $P = 0.103$). The other variables collected, eg. surgery (OR 1.896, CI, 0.638 to 5.631), antimicrobial usage (OR 1.353, CI, 0.449 to 4.080) were not significantly different. **Conclusion:** The major risk factor identified for MRSA colonisation was positive MRSA status of the prior room occupant. This suggests that interventions aimed at improving environmental decontamination between patients may be beneficial in reducing the rate of MRSA acquisition especially where contact isolation is already being practised.

P36 Operative Outcomes of Unilateral Axillo-Breast Endoscopic Thyroid Surgery for Benign and Malignant Thyroid Diseases: An Experience in 2793 Patients

Nguyen Thien Khanh¹, Tan Hiang Khoon², Tran Ngoc Luong³

¹Duke-NUS Graduate Medical School, Singapore

²Department of Surgical Oncology, National Cancer Centre, Singapore

³National Endocrine Hospital, Vietnam

Introduction: Distal approach thyroidectomy negates the unsightly anterior neck scar associated with traditional open thyroidectomy technique. Here, the authors present a series of endoscopic thyroidectomy (ET) using the unilateral axillary-breast approach in 2793 patients. **Methods:** From

July 2003 to November 2012, 2793 patients who underwent endoscopic thyroid surgery at the National Hospital of Endocrinology in Hanoi, Vietnam were retrospectively reviewed. **Results:** There were 173 males (6.6%) and 2620 females (93.4%). The mean age was 29.93 years (range, 6 to 66 years). The average size of lesion removed was 3.2 cm (range, 1 to 8 cm). The average volume of thyroid lobe was 36 ml (range, 26 to 120 mL). Benign conditions, which include adenoma, nodular goiter, Hashimoto and Grave's disease (GD) consisted of 96.6% of all the cases. There were 95 cases of carcinoma (3.4%) with tracheoesophageal lymph node metastases in 12 cases. Perioperative complications were: 4 conversion to open surgery, 4 reoperations due to postoperative bleeding, 2 tracheal perforations, 1 hypocalcemia, 3 retropharyngeal lymph node (RLN) injuries with partial recovery at 6-month follow-up, and 41 transient voice hoarseness. The mean operative time was 88.5 minutes (range, 30 to 130) for all operations without lymph node (LN) clearance. The mean for both hemi and total thyroidectomy with LN clearance (n = 12) is 108.7 minutes (range, 80 to 180). **Conclusion:** Complications associated with ET are similar and comparable to that of open thyroidectomy. The advantage of ET over open thyroidectomy is the absence of a cervical neck scar.

P37 Analysis of N551K and R1398H LRRK2 Variants in an Asian Cohort

Aroma Agape Gopalai¹, Hui Hua Li², Shen Yang Lim³, Soo Kun Lim³, Li Ping Tan³, Yip Boon Chong³, Zariah Abdul Aziz⁴, Norlinah M Ibrahim⁵, Santhi Datuk Puvanarajah⁶, Thien Thien Lim⁷, Yi Zhao³, Eng King Tan², Azlina Ahmad Annuar¹

¹Department of Biomedical Science, University of Malaya, Malaysia

²Departments of Neurology and Clinical Research, Singapore General Hospital, Singapore

³Department of Medicine, University of Malaya, Malaysia

⁴Department of Medicine, Hospital Sultanah Nur Zahirah, Kuala Terengganu, Malaysia

⁵Department of Medicine, University Kebangsaan Malaysia, Malaysia

⁶Department of Neurology, Hospital Kuala Lumpur, Malaysia

⁷Department of Neurology, Hospital Pulau Pinang, Malaysia

Introduction: We investigated for the first time in a Malay population, the frequency of the N551K and R1398H LRRK2 variants and assessed the possible functional effect conferred by these variants on Parkinson's disease (PD) pathogenicity. A recent multicentre case control study suggested that the individuals carrying the rs7308720 (C>A, p.N551K) and rs7133914 (G>A, p.R1398H) variants had a 20% reduced risk of developing PD. We sought to replicate this study in our Asian cohort. **Methods:** PD patients were diagnosed based on the UK PD Brain Bank Criteria, and healthy individuals with no history of neurological conditions were recruited as controls. Written consent was obtained from these individuals. Samples were genotyped

through Taqman[®] allelic discrimination assay. Cell lines were transfected with the construct carrying the variants. Transfected cells were exposed to oxidative stress to assess the possible protective effect in cells carrying the N551K and R1398H variants. **Results:** The rs7308720 (C>A, p.N551K) and rs7133914 (G>A, p.R1398H) variants in our cohort suggested protective effect for N551K and R1398H respectively. The minor alleles for both these variants are present at a frequency of approximately 2 folds higher in the control than in the patients. **Conclusion:** The N551K and R1398H variants were found to be protective in our population. These findings are coherent with what have been found in both the Asian and Caucasian population. We are currently exploring the mitochondria involvement of these 2 variants. This could potentially serve as a genetic biomarker for clinical trials and drug targets.

P38 Bystander First Aid and Injury Prevention of Childhood Injuries

Jade Kua¹, V Anantharaman²

¹Children's Emergency Department, Kandang Kerbau Women's and Children's Hospital, Singapore

²Department of Emergency Medicine, Singapore General Hospital, Singapore

Introduction: Childhood injuries are the leading cause of death for children between 5 and 14 years of age in Singapore. What is not known is the rate, type and appropriateness of bystander first aid (BFA) for childhood injuries and the impact of these on outcomes, and how to address the gaps in bystander management of childhood injuries. Our aim was to conduct a preliminary survey of these issues so as to document the current baseline for these and identify the next steps for an organised framework towards prevention of and public education in childhood injury management. **Methods:** Over a 1 week period, from 10 to 17 June 2013, questionnaires were distributed to doctors attending to major and minor trauma at Children's Emergency (CE) in KK Hospital. The questionnaire assessed patient demographics, mechanism of injury, type of accident and provision and appropriateness of BFA, if any. The results were analysed using SPSS. **Results:** The commonest place where injuries occurred in children with trauma was the home (61%) followed by public places (31%), schools (7%) and on the road (1%). Falls (67%) constituted the leading cause of injuries. BFA was provided in 41% of home accidents, 56% of school injuries and 51% of the others. **Conclusion:** Lack of BFA at the home remains a significant issue from a public health and health services research perspective. This will need to be addressed through careful evaluation of the causes of such.

Oral Presentation (Senior Investigator)

O13 When Atrial Fibrillation Co-Exists with Coronary Artery Disease in Patients with Prior Coronary Intervention—Does Ablation Benefit?

Eric Chong¹, Yen Jiang Lin², Kian Keong Poh³

¹Jurong Health, Singapore

²Taipei Veterans General Hospital, Taiwan

³National University Heart Centre, Singapore

Introduction: Atrial fibrillation (AF) increases risk of developing coronary artery disease (CAD) due to fulfillment of Virchow's triad of thrombogenesis, increment of inflammation, endothelial dysfunction and negative remodeling. It is unclear if patients with CAD can benefit from AF ablation. We hypothesise that AF ablation can reduce adverse cardiac events in patients with underlying CAD. **Methods:** A total of 310 patients with drug-refractory paroxysmal AF and prior history of elective percutaneous coronary intervention (PCI) for CAD were recruited in this cohort study. One hundred fifty-five patients (Ablation Group) underwent AF ablation 3 months after PCI, 155 patients (Medical Control Group) received only medical treatment. Patients were followed up for major adverse cardiac events including acute coronary syndrome requiring hospitalisation, stroke and cardiac mortality. **Results:** The baseline patient characteristics were comparable between the 2 groups. During a follow-up duration of 61 ± 32 months, all-cause mortality (8.4% vs 1.3%, $P = 0.004$) and the overall major adverse events (47.7% vs 12.3%, $P < 0.001$) were significantly higher in the medical than the ablation group. There were also more strokes (10.3% vs 3.2%, $P = 0.013$) and acute coronary syndrome requiring hospitalisation (29% vs 7.1%, $P < 0.001$) in the medical than the ablation group. Multivariate analysis confirmed non-ablation was an independent risk factor for major adverse cardiac events ($P < 0.001$, HR 3.4, 95% CI, 1.9 to 5.9). **Conclusion:** In drug refractory paroxysmal AF and CAD patients who underwent PCI, AF ablation reduced future major adverse cardiac events and stroke when compared to medical therapy alone.

O14 Treatment of Right-Sided Hepatocellular Carcinoma with Uni-Lobar Y-90 Radioembolisation Induces Significant Hypertrophy in the Contralateral Left Lobe

Teo JY¹, Cheah FK, Allen JA, Ng D, Lo R, Goh A, Tay KH, Khor A, Chow PK

¹Singapore General Hospital, Singapore

Introduction: Sir-Spheres are yttrium-90 microsphere (Y-90) is currently used to treat locally advanced hepatocellular

carcinoma (HCC) including those where resection is precluded because of inadequate future remnant liver. There have been anecdotal reports of hypertrophy of the contralateral lobe after Y90 treatment. We aim to quantify the effect of Y90 on this hypertrophy, as well as to identify factors predictive of the degree of hypertrophy. **Methods:** A retrospective review of patients undergoing Y-90 other than those enrolled into a clinical trial at a single institution between January 2008 and January 2012 was performed. Diagnosis of HCC was by American Association for the Study of Liver Diseases (AASLD) criteria and patients must have at least 1 follow-up scan in our institution. Inclusion criteria were: treatment delivered via right hepatic artery. Excluded were patients with tumour in the contralateral lobe and patients with concomitant other treatment for HCC. Imaging was by quadriphasic computed tomograph (CT) scan. Pre- and post-treatment images were reviewed and volumes were measured using a 3D software (Vital's Vitrea Advanced CT Liver Oncology package). Statistical analysis was conducted using Statistical Package for Social Sciences (SPSS) version 16.0. **Results:** During this period, 50 patients treated with Y90 for HCC outside of an ongoing clinical trial had follow-up imaging at our institution. Of these, 7 received treatment to the left/middle hepatic artery and 6 received treatment via the middle hepatic artery in addition to the right hepatic artery. Of the remaining 37 patients who underwent right-sided Y-90, a further 20 were excluded—11 had concomitant left-sided disease which was treated with a variety of methods including TNF- α converting enzyme (TACE), and radio frequency ablation (RFA), 7 had follow-up scans of inadequate quality to perform accurate volumetric assessment and 2 had pre-treatment scans performed at another institution which were not accessible for study purposes. Seventeen patients thus fulfilled criteria. The mean and median percentage left lobe hypertrophy were 34.2% (SD \pm 35.9%) and 31.7% (range, 19.0 to 106.5%) respectively at a median of 5 months post-treatment. Univariate analysis showed no specific pre-treatment factor predictive of the degree of left lobe hypertrophy. There were no cases of acute liver failure after administration of SIRT in this study and none of the patients developed disease in the contralateral lobe over the study period. **Conclusion:** In patients with HCC receiving SIRT to the right lobe via the right hepatic artery, a significant degree of left lobe hypertrophy results. This opens the possibility of the utilisation of SIRT as neoadjuvant therapy for borderline resectable HCC, thus increasing the pool of potentially operable and curable patients. Percentage left lobe hypertrophy versus time of post-treatment scan.

O15 Transarterial Embolisation of the Hepatocellular Carcinoma with Doxorubicin Eluting Beads

Gopinathan Anil¹, Yeong KY, Tan Lenny

¹National University Hospital, Singapore

Introduction: We aimed to analyse the safety and efficacy of transarterial chemoembolisation with doxorubicin loaded drug-eluting beads (DEB-TACE) in the treatment of hepatocellular carcinoma (HCC). **Methods:** Between February 2008 and November 2011, 116 patients with HCC underwent 182 sessions of DEB-TACE. Excluding the patients with inadequate follow-up, 83 patients (60 males; 23 females; mean age: 66.74 years) from the above cohort were included in this study. DEB-TACE was done with 100-300, 300-500 and 500-700 micron beads. Follow-up computed tomography (CT) or magnetic resonance imaging (MRI) were reviewed. The average pre-treatment tumour volume was 105cc. The mean number of DEB-TACE sessions per patient was 1.7. The median follow-up was 9 months (range 1-40). **Results:** At first follow-up, 68.7% of patients showed an objective response (OR) with complete response (CR) in 31.3%, partial response (PR) 37.3%, stable disease (SD) in 19.2% and progressive disease (PD) in 12% of patients. The CR, PR, SD and PD at 6 months were 56.4%, 32.7%, 3.6% and 7.3% respectively. Overall response (ie. response to TACE and other locoregional treatments) at 1 year was 66.1% CR, 5.7% PR, 26.4% SD and 1% PD. Tumours with marked arterial enhancement at angiogram had significantly better response than those with only capillary phase enhancement. The only notable complication was a non-flow limiting hepatic artery dissection seen in one patient. **Conclusion:** DEB-TACE is safe and effective in the treatment of HCC as demonstrated by our low complication rate and good response to treatment. Tumours with arterial hypervascularity have a better response to DEB-TACE.

O16 Intensive Case Management for High-Risk Patients in a Tertiary Psychiatric Hospital in Singapore

Rosemary Tan¹, M Hendriks¹, A Su²

¹Case Management Unit, Institute of Mental Health, Singapore

²Department of General Psychiatry, Institute of Mental Health, Singapore

Introduction: Literature does support that intensive case management for high-risk patients assist them to cope more effectively in the community. In the Institute of Mental Health (IMH), patients identified with high-risk tendencies, namely violence and aggression, are provided with intensive case management which entails comprehensive active care in the community (regular telephonic case management calls, letter reminders for their appointments and meeting them for their appointments at the outpatient clinics). This intensive

care commences even at the inpatient setting where patients and their caregivers are psycho-educated on their illness and multidisciplinary team discharge plans are discussed. This paper highlights the clinical outcomes of patients provided with intensive case management. **Methods:** All patients with high-risk tendencies, case managed from January to December 2012 were identified and enlisted. Analysis was done using Microsoft Excel. **Results:** One hundred and forty-eight patients were identified to be placed on intensive case management care, 779 telephonic calls and psycho-education were provided. The Case Manager rang all patients within 2 days of discharge and 3 days before their clinic appointments. Reminder letters were also sent if they missed on their appointments. Eighty-four percent came for their follow-up, 13% defaulted, later re-attended and resumed their treatment. Three percent were readmitted to hospital, these rates are lower than the hospital rates of 14%. **Conclusion:** It is encouraging that with intensive case management, our patients are able to cope more effectively in the community with lowered risk of violence and aggression and minimal readmissions. This in turn, benefits them as well as the community and our organisation.

O17 Caring for Patients with Major Psychiatric Conditions in the Community with Case Management

V Tamilselvi¹, Lee Cheng, M Hendriks, Reena Poo, SM Tay, T Vamadevan

¹Institute of Mental Health, Singapore

Introduction: It is vital that patients with major psychiatric conditions namely schizophrenia and delusional disorders receive continuous integrative, supportive and coordinated care in the community. The objectives are to reduce relapses and rehospitalisation. This paper highlights the clinical interventions of community psychiatric case managers to achieve these objectives. **Methods:** Data mining of patients' case managed from January 2012 to December 2012 in 3 psychiatric outpatient clinics of a tertiary hospital was done. The results were analysed using Microsoft Excel. **Results:** One thousand one hundred and thirty patients who had issues with medication compliance; frequent readmissions and psychosocial support were referred for case management. Clinical interventions included 1197 psycho education and counselling sessions to patients, 458 psycho education and supportive therapy sessions to carers, 3110 telephonic case management contacts and 188 linkages to helping services and agencies, namely medical social work and occupational therapy for financial support and job placement. Sixty-eight patients who were assessed to be stabilised and compliant to treatment were rightsited to general practitioners for long-term treatment in the community. **Conclusion:**

Various innovative and creative strategies are required to holistically care for patients with psychiatric conditions in the community. Case management, with its emphasis on coordination and continuity of care, through assessment, planning, implementation and evaluation of patient care using various strategies namely regular telephonic case management, linkages, and psycho education can support patients to live well in the community.

O18 Which CKD-EPI Cystatin C and Creatinine Glomerular Filtration Rate Estimation Equation is Valid for a Multiethnic Asian Population?

Boon Wee Teo¹, Yun Yin Koh¹, Qi Chun Toh¹, Hwee Min Loh², Hui Xu¹, Jialiang Li¹, Arvind Kumar Sinha¹, Borys Shuter¹, Sunil Sethi¹, Evan JC Lee¹

¹National University of Singapore, Singapore

²National University Health System, Singapore

Introduction: Current practice guidelines recommend using serum creatinine-based equations for predicting glomerular filtration rates (eGFR). These equations apply to Caucasian-American patients and include an adjustment coefficient for African-Americans, but are not validated for other ethnicities. New CKD-EPI equations using both cystatin C and creatinine were recently developed and combination biomarkers equations may improve accuracy and remove the need for ethnicity adjustments. We assessed the accuracy of GFR prediction in a multiethnic Asian population of participants with normal kidney function and chronic kidney disease (CKD) using these new equations. **Methods:** We used serum samples from the Asian Kidney Disease Study and the Singapore Kidney Function Study (n = 335, 69.3% CKD, 38.5% Chinese, 29.6% Malays, 23.6% Indians, 8.3% Others), which had measured GFR by plasma clearance of ^{99m}Tc-DTPA. We estimated GFR using the CKD-EPI equations. We examined the performance of GFR estimation accuracy with median bias, interquartile range (precision), and accuracy to within 20% and 30% of the measured GFR. **Results:** Population means: age of 53.5 ± 15.1 years, mean standardised serum creatinine 1.44 ± 0.97 mg/dL, standardised serum cystatin C 1.43 ± 0.74 mg/L, measured GFR 67 ± 33.3 mL/min/1.73 m². Overall, the CKD-EPI cystatin C and creatinine combination equation performed the best, eGFR 67 ± 34.9 mL/min/1.73m². **Conclusion:** The new creatinine-cystatin C equation estimated eGFR with little bias, increased precision and accuracy in a multiethnic Asian population. This 2-marker equation will greatly increase the accuracy of population studies of CKD without the need to consider “ethnicity”.

O19 Exercise to Prevent Disability in Older Adults—The LIFE Study

Marco Pahor¹

¹University of Florida, Gainesville, Florida, USA

Introduction: The ability to move without assistance is a fundamental feature of human functioning. Regular physical activity improves physical performance, but definitive evidence showing that mobility disability can be prevented is lacking. A Phase 3 randomised controlled trial is needed to fill this evidence gap. **Methods:** LIFE is a Phase 3, multicentre randomised controlled trial which compares a physical activity (PA) with a successful ageing (SA) programme in 1635 sedentary older persons over approximately 3 years. The primary outcome is major mobility disability (inability to walk 400 m). Secondary outcomes include cognitive function; serious fall injuries; persistent mobility disability; major mobility disability or death; disability in activities of daily living; and cost-effectiveness. PA consists of walking at moderate intensity, resistance exercises, balance, stretching and behavioral counselling. SA consists of health education seminars regarding health-related matters and upper extremity stretching exercises. **Results:** The 21-month recruiting period resulted in 14,812 telephone screens; 1635 participants were randomised ahead of schedule. Among the telephone-screened participants, 37.6% were excluded primarily because of regular participation in physical activity, health exclusions, or self-reported mobility disability. Direct mailing was the most productive recruitment strategy (57.9% of randomised participants). Preliminary results from the LIFE pilot study support the hypothesis that PA is effective in preventing major mobility disability. **Conclusion:** The LIFE Study achieved all recruitment benchmarks. Bulk mailing and newspaper advertisements are efficient methods for recruiting high-risk community-dwelling older persons, including minorities, from diverse geographic areas for this long-term behavioral trial. The completion of the trial is expected by November 2013.

Poster Presentation (Senior Investigator)

P39 Initial Experience with the Use of Metformin to Treat Diabetes Mellitus in Pregnancy

Tan Khai Tong¹, Tan JZC²

¹The Diabetes & Endocrine Clinic, Mount Elizabeth Medical Centre, Singapore

²Yong Loo Lin School of Medicine, National University of Singapore, Singapore

Introduction: Metformin has gained increased acceptance for use in pregnancy. We report our initial experience using metformin in pregnancy. **Methods:** This is a retrospective study of 13 patients (aged between 30 and 40 years; mean 35.2 years). Nine had a family history of diabetes; 5 patients had previous gestational diabetes (3 treated with insulin) and 2 of the 5 patients had previously delivered babies above 4 kg. Six patients had established diabetes diagnosed prior to this pregnancy. All the patients were put on diet and home glucose monitoring. Three patients were on metformin prior to this pregnancy. The other 10 had metformin added if diet control was not sufficient to achieve good control. Only 1 patient required addition of insulin to metformin.

Results: All the patients had no significant side effects from metformin (dose ranged from 500 mg daily to 1.5 g daily). The 13 patients successfully delivered 16 live births (3 sets of twins) at 36 to 39 weeks gestation with no major complications and no congenital abnormalities. Eleven delivered by caesarean section (LSCS) of which 5 had previous LSCS. Birth weights ranged from 2370 g to 3700 g. Apgar scores (1 minute and 5 minute) were 9 and 10 for 15 babies and 7 and 9 for 1 baby. One baby had mild transient hypoglycaemia (2.5 mmol/L), which required feeding but not intravenous dextrose. **Conclusion:** In this limited study, the use of metformin in pregnancy appeared well tolerated and associated with good outcome.

P40 Four Cases of Medullary Thyroid Carcinoma Presenting as Asymptomatic Elevation of CEA Level

Tan Khai Tong¹, Tan JZC²

¹The Diabetes & Endocrine Clinic, Mount Elizabeth Medical Centre, Singapore

²Yong Loo Lin School of Medicine, National University of Singapore, Singapore

Introduction: Medullary thyroid carcinoma (MTC) is a relatively uncommon malignancy. The causes of elevated carcino-embryonic antigen (CEA) level, detected on health screening are many, but often doctors come in on carcinoma of colon. We report 4 patients with MTC presenting with asymptomatic elevation of CEA. **Methods:** All 4 (3 men, 1 woman) (age 38 to 52 years) had negative colonoscopy. Presenting CEA ranged from 6.5 to 58 ug/L, later rising to

10.5 to 74.7 ug/L. Two patients had repeated colonoscopies over several years of follow-up. Three patients had initial computed tomography (CT) scan or positron emission tomography (PET) scans that detected thyroid nodules. 1 (case 2) did not have a biopsy till it enlarged later. The other 2 had thyroid biopsies. 1 biopsy did not pick up malignancy (case 1) but proceeded to surgical excision. The fourth patient (case 4) had a negative PET scan 6 years after presentation. Only the second PET scan at 8 years detected a thyroid nodule. Biopsy showed MTC. **Results:** Time from elevation of CEA to MTC diagnosis ranged from 19 months (cases 1 and 3) to 8 years (cases 2 and 4). All had total thyroidectomy done (tumour sizes 1 cm to 2.8 cm with no lymph node involvement or metastases). All 4 were sporadic cases with no family history and no signs of MEN. All remained well with normal calcitonin levels on follow-up (5 to 55 months). **Conclusion:** MTC is associated with elevated CEA. Lack of awareness of this possibility can lead to delay in diagnosis.

P41 The Diagnosis of Early Diabetes Mellitus can be Challenging and may be Challenged

Tan Khai Tong¹, Tan JZC²

¹The Diabetes & Endocrine Clinic, Mount Elizabeth Medical Centre, Singapore

²Yong Loo Lin School of Medicine, National University of Singapore, Singapore

Introduction: There is no gold standard for diagnosis of diabetes mellitus. The diagnostic criteria underwent many changes. The latest is the introduction of HbA1c by American Diabetes Association (ADA) (2010) for diagnosis of diabetes and prediabetes and by the World Health Organisation (WHO) (2011) for diabetes only. **Methods:** A total of 111 asymptomatic subjects (91 foreigners) underwent 75 g oral glucose tolerance test (GTT) and HbA1c on the same morning to clarify their glucose tolerance status. Seventy had family history of diabetes, 81 were told elsewhere that they have diabetes (44) or prediabetes (37) but were not convinced. **Results:** Thirty-eight classified as diabetic on GTT (of these, 34 by HbA1c) (concordance of 89.5%). Of the 24 classified as impaired glucose tolerance (IGT) or impaired fasting glycaemia (IFG) by GTT, only 12 classified prediabetes by HbA1c (concordance 50%). Of 44 subjects told on having diabetes, GTT classified 26 as diabetic, 7 as IGT or IFG and HbA1c, 30 as diabetic, 9 as prediabetes. Of 37 subjects told to have 'borderline diabetes', GTT classified 5 diabetic, 10 IGT and HbA1c, 10 diabetic, 22 prediabetes. Subjects may have altered their diet or even taken medications before presenting themselves to

another clinician for 'clarification'. **Conclusion:** With the introduction of new criteria for diagnosis, more patients may challenge their diagnosis. HbA1c for diagnosis of diabetes has good concordance with GTT, but for prediabetes, concordance is poor. Where there is doubt, follow-up and subsequent evaluations are necessary. Non-pharmacological and lifestyle changes can be prescribed while awaiting further clarification.

P42 Percutaneous Transluminal Angioplasty of Transplant Renal Artery Stenosis

Kumar S Krishna¹, Chew Li Lian², Tan Bien Soo¹, Tay Kian Hiong¹, Christopher Cheng Wai Sam¹, Wong Kok Seng¹, Lina Choong Hui Lin¹, Austin Htoo Maung Myint¹, Farah Gillan Irani¹

¹Singapore General Hospital, Singapore

²MOHH, Singapore

Introduction: We aimed to assess the outcome of percutaneous transluminal angioplasty (PTA) as the primary treatment for transplant renal artery stenosis (TxRAS). **Methods:** A retrospective review of PTA of TxRAS from April 1999 to December 2008 was performed. Twenty-seven patients (17M:10F) with the mean age of 49.5 years underwent PTA of TxRAS in the review period. Indications for PTA were suboptimal control of hypertension (n = 12), impaired renal function (n = 6) and both suboptimal control of hypertension and impaired renal function (n = 9). All patients had doppler ultrasound scans prior to their PTA. In addition, 5 of these patients had computed tomography angiography (CTA) and another 7 had magnetic resonance angiography (MRA) evaluation. Mean follow-up period was 57.0 months (range 7 to 108 months). **Results:** The stenotic lesions were located proximal to the anastomosis (n = 2), at the anastomosis (n = 15), and distal to the anastomosis (n = 14). Technical success rate was 96.3%. One case was complicated by extensive dissection during PTA, resulting in subsequent graft failure. The overall clinical success rate was 76.9%. Seven out of 26 patients had restenoses (26.9% of cases). These were detected at a mean of 14.3 months post angioplasty (range, 5 to 38 months). All 7 patients underwent a second PTA successfully. Three of these patients required more than 1 repeat PTA. **Conclusion:** PTA is safe and effective in the management of symptomatic TxRAS and should be the primary treatment of choice. Close surveillance for restenosis is required and when diagnosed re-angioplasty can be performed.

P43 Role of Stent Assisted Endovascular Management in Carotid Blow-Out Syndrome

Sarat Kumar Sanamandra¹, Tay Kiang Hiong, Lim Eng Hoe

¹Singapore General Hospital, Singapore

Introduction: Carotid blow-out syndrome (CBS) is classically defined as weakening and rupture of the extra-cranial carotid arteries, which is usually a late complication of surgery or radiation therapy for head and neck malignancies or as a result of trauma. The aim of this article is to discuss various aspects of CBS with particular attention on the current role of reconstructive endovascular management using covered stents and to discuss its potential complications. **Methods:** This is a retrospective review of 3 cases of CBS which were successfully treated with endovascular covered stent placement. Their clinical presentation, diagnosis, management, outcome and complications are discussed. **Results:** A review of the literature describing the use of this therapeutic method for treatment of CBS is presented. **Conclusion:** Stent directed carotid sparing endovascular management has become an effective and minimally invasive method of treatment in unstable patients with CBS, with high technical success rate, good initial control of bleeding and lesser neurovascular complications. However, in view of significant delayed complications, this may be considered only as a temporary measure to stabilise the patient from CBS, before more definitive treatment with affected artery embolisation and carotid bypass. In stable patients with CBS involving the internal or common carotid arteries, the parent vessel sacrifice may be considered after a satisfactory balloon occlusion test. The stenting and vascular bypass with surgery are the options for those who fail balloon occlusion test.

P44 The New Reality in Medicine Caring for Patients with Multiple Comorbidities

Benedict Lau¹

¹Tan Tock Seng Hospital, Singapore

Introduction: Ménière's syndrome is an inner ear disorder marked by spontaneous attacks of vertigo, fluctuating sensorineural hearing loss, aural fullness, and tinnitus. When the syndrome is idiopathic and not attributable to a specifically identified cause, it is Ménière's disease. The pathologic process involves distortion of the membranous labyrinth with the formation of endolymphatic hydrops. The symptoms usually start in middle age but rarely in the elderly. It affects men and women equally. **Methods:** In a recent case study, a morbidly obese patient (BMI 44.9) with a recent upper respiratory tract infection presented with episodic vertigo, diplopia and unsteady gait. Initial impression was

acute labyrinthitis. In view of the patient's comorbidities which included hypertension, hyperlipidaemia, coronary artery disease and atrial fibrillation, computed tomography of the brain was performed to exclude possibility of cerebrovascular disease. The results showed mild intracranial atherosclerotic changes. Subsequent, magnetic resonance imaging of the brain suggested no restricted diffusion or flow limiting large vessel stenosis. Magnetic resonance imaging of internal acoustic meatus was normal. Magnetic resonance imaging of cervical spine revealed C3/4 and C5/6 degenerative disc disease. **Results:** The patient was treated conservatively with cinnarizine for 4 weeks as resolving labyrinthitis. He continued to complain of recurrent dizziness and vertigo which failed to respond to all forms of rehabilitation. He was poorly able to mobilise and became wheelchair bound. Subsequently, the patient suffered major depressive disorder. After a period of 10 months, he was seen in the Otolaryngology Balance Clinic where a diagnosis of probable Ménière's disease was made. Most patients with Ménière's disease are able to achieve control of their symptoms through a combination of lifestyle modification and prophylactic and 'rescue' medications. Patients with refractory symptoms can be treated with intratympanic steroids or aminoglycosides to either modulate or ablate vestibular function. Unfortunately this patient had a previous mastoid operation in his right ear that had left him with no vestibular function nor hearing in that ear. Consequently, when he developed Meniere's disease in his good left ear, it was much harder for him to compensate for the impaired vestibular function in his left ear. Together with his comorbidities, the patient failed to respond to rehabilitation and ended up wheelchair bound. **Conclusion:** Ménière's disease is a chronic and, in part, intermittent illness that poses multiple challenges to both the physical and psychological well being of affected individual, and also to those around the patients, their family and friends. People with Ménière's disease experience increasing levels of physical disability reducing their generic quality of life. Those with the condition face psychosocial consequences, including restrictions in employment, income, relationships, leisure activities and activities of daily living.

P45 Red Wine Antioxidant Resveratrol Reduced Atrial Fibrillation Susceptibility in Ischaemic Heart Failure Model by Molecular Mechanism of PI3K/AKT and Endothelial Nitric Oxide Synthase Pathway Activation

Eric Chong¹, Shih Lin Chang², Kian Keong Poh³

¹Jurong Health, Singapore

²Taipei Veterans General Hospital, Taiwan

³National University Heart Centre, Singapore

Introduction: The study aimed to assess the efficacy of red wine antioxidant, resveratrol in reducing atrial fibrillation (AF) susceptibility in heart failure (HF) model and to explore the molecular and electrophysiological mechanisms. **Methods:** HF rabbits were created by coronary artery ligation. Group 1a-e (n = 6/group) were (a) normal; (b) HF sham; HF rabbits treated with 1-week intraperitoneal injection of (c) resveratrol, (d) resveratrol+Pi3K inhibitor (wortmannin) and (e) resveratrol+eNOS inhibitor (DPI). All rabbits underwent epicardial stimulation. Histology and PCR mRNA analysis were performed in atrial appendage (LAA). Additional 5 subgroups, group 2a-e (n = 6/group) were subjected to Langendorff perfusion to investigate the acute drug effect on atrial electrophysiology. **Results:** AF was easily inducible in HF group and groups receiving Pi3K/eNOS inhibitors during epicardial stimulation but not in the normal and resveratrol groups ($P = 0.001$). Histology of LAA showed reduced fibrosis in resveratrol than HF group ($8.95 \pm 1.53\%$ versus $26.62 \pm 2.19\%$; $P < 0.001$). In PCR analysis, ionic channels including Kv1.4, Kv1.5, KvLQT1, Nav1.5, Cav1.2, Kir2.1, NCX, SERCA2a and PLB were up-regulated after resveratrol treatment. Protein expressions of ionic channels were up-regulated in western blot analysis. Pi3K, AKT and eNOS were up regulated in mRNA and protein levels after resveratrol treatment. Adding Pi3K and eNOS inhibitors reversed these changes by blocking the Pi3K/AKT/eNOS pathway. **Conclusion:** Our study demonstrated efficacy of resveratrol in reducing AF susceptibility in HF model. Loss of Pi3K activity and down-regulation of eNOS increased AF susceptibility. Increasing Pi3K/eNOS activity reduced atrial fibrosis and improved cardiac conduction. Our results suggested that resveratrol could reduce AF in HF via the Pi3K/Akt/eNOS signaling pathway.

P46 Thrombophilia Due to MTHFR Mutation and Neural Tube Defect

Toh Keng Kiat¹

¹Monash University, Malaysia

Introduction: The prevalence of thrombophilia is not fully known, although a thrombophilic state has been reported in 50% of persons who have been investigated for clinically diagnosed deep vein thrombosis (DVT) and/or venous embolism (VE) and in family studies. Thrombophilia exists as a result of deficiency of natural anticoagulants like protein C, protein S and antithrombin. Mutations that result in factor V Leiden, prothrombin G20210A and MTHFR (5-10 methylene tetrahydrofolate reductase) have also been reportedly associated with thrombotic events. Because of its pivotal role in folate metabolism, MTHFR mutation may result in congenital defects as well. **Methods:**

A report of a cohort of patients with thrombotic events and MTHFR mutation is reviewed. A case report of 1 patient with MTHFR mutation and a pregnancy with neural tube defect is presented. **Results:** Because she had adequate folate intake, it is concluded that this may be due to the MTHFR mutation reducing availability of folate during development. However, the possibility of antibodies to folate receptors has to be considered. The possible role of folic acid as an alternative to circumvent the MTHFR pathway is proposed. The patient's first pregnancy resulted in encephalocele in the baby which did not survive. A subsequent pregnancy, during which she consumed folic acid, resulted in the birth of a normal child.

P47 Case Series: Superior Mesenteric Vein Thrombosis, Gut Malignancy and Intra-Abdominal Infection? Is it Difficult to Treat with Anticoagulation?

Ashish Anil Sule, Benedict Azucena Cesar¹, Annamarie Borja, Weili Xing, Tay Jam Chin

¹Tan Tock Seng Hospital, Singapore

Introduction: Superior mesenteric vein thrombosis is rare but can be potentially fatal. Diagnosis may be elusive due to its asymptomatic presentation. We describe Patient 1, a 65-year-old female with rectal adenocarcinoma. She presented with intra-abdominal infection manifesting as abdominal pain and fever few days following bowel resection. Superior mesenteric vein thrombosis was incidentally found during investigation for infection on abdominal computed tomography (CT) scan. Patient 2 is a 79-year-old male who had past history of sigmoid adenocarcinoma, post resection. He presented with hepatobiliary sepsis and incidental finding of superior mesenteric vein thrombosis. **Methods:** For Patient 1, investigations and laboratory workup showed: total white cell 8.9×10^9 g/L, C-reactive protein 174 mg/L, abdominal CT scan showed thin walled locules of low density fluid, but infection cannot be excluded. Incidentally found to have superior mesenteric vein thrombosis partially filling the vein without extension to the portal vein. For Patient 2, investigations and laboratory workup showed: total white count 9.1×10^9 /L, total bilirubin 55 μ mol/L, aspartate transaminase 203 U/L, alanine transaminase 77 U/L, alkaline phosphatase 310 U/L, gamma-glutamyl transpeptidase 341 U/L. C reactive protein 140.9 mg/L, erythrocyte sedimentation rate 126 mm/hr. Abdominal CT scan showed cholelithiasis and choledocholithiasis associated with moderate dilatation of hepatic ducts. Also seen were partial thrombosis at the superior mesenteric vein with extension up till the portal confluence. **Results:** Patient 1 improved with antibiotics but not anticoagulated. Three months later, patient was completely asymptomatic

despite progression from partial to complete thrombosis on repeat CT scan. Anticoagulation was then initiated. For Patient 2, stone extraction and biliary stenting was done. Anticoagulation was initiated. There was no recurrence of malignancy on endoscopy. A repeat CT scan showed no resolution of thrombus. **Conclusion:** Superior mesenteric vein thrombosis may be asymptomatic and difficult to treat with anticoagulation in a setting of malignancy and infection.

P48 Traditional Medical and Alternative Therapy

Amy EL Stebbings¹, Kwee Yi Ning

¹Gleneagles Medical Centre, Singapore

Introduction: We have observed that patients use traditional and alternative therapies. However there is no data published to confirm or dispute this observation. Our objective is to find out the frequency of traditional and alternative therapies and the spectrum of therapies used. **Methods:** We conducted a pilot study by providing questionnaires to patients regarding traditional medicine usage in a specialist respiratory clinic over a period of 2 months. **Results:** A total of 40 respondents: 62.5% female; race (%): Caucasians (43), Chinese (35), Indian (15), others (7); age group (%): >70 years old (2.5), 51 to 70 years (25), 31 to 50 years (67.5), 21-30 years (2.5), <21 years (2.5). Educational background (%): tertiary and above (87.5), secondary (12.5). Use of therapies: 70% used traditional medical and alternative therapies, of which 52.5% used more than 1 form, 27.5% used more than 2 forms. Spectrum of therapies used (%): yoga (43), Chinese massage (43), acupuncture (43), homeopathy (36), traditional Chinese medicine (36), ayurveda (14), jamu (11), taichi (7), acupressure (4). Spectrum of illnesses: sinus relief, breathing difficulty, muscle aches, headache, general wellbeing improvement. The majority (96%) did not experience any unwanted side effects. Overall, respondents' opinion was that 72% felt that traditional therapies were effective. **Conclusion:** The use of traditional therapy is common (70%). The majority (87.5%) of respondents had tertiary education. A wide spectrum of traditional therapies was used. The majority felt these therapies were effective. Minimal negative side effects were experienced.

P49 Retrievable Inferior Vena Cava Filters—Insertion, Complications and Retrievability

Alomari Ali¹, Farah G Irani¹, Richard Lo¹, Terence Teo¹, Apoorva Gogna,¹ Sathesh Ramamurthy¹, Ankur Patel¹, Chow Wei Too¹, Bien Soo Tan¹, Kiang Hiong Tay¹

¹Department of Diagnostic Radiology, Singapore General Hospital, Singapore

Introduction: Temporary placement of inferior vena cava (IVC) filters has a role in the prevention of pulmonary embolism in at-risk patients. We aim to evaluate the insertion, retrievability and safety of retrievable IVC filters in our institution. **Methods:** From June 2009 to June 2012, we performed a retrospective review of all the BARD G2X retrievable IVC filters inserted and retrieved at our institution. The patient's case notes and imaging were reviewed. **Results:** Eighty-eight temporary IVC filters were inserted for the standard indications; 85 filters were inserted in the infrarenal location with 3 being inserted suprarenal [double IVC (n = 2); infrarenal IVC thrombus (n = 1)]. The commonest route for insertion was right IJV (n = 57) followed by right common femoral vein (n = 27). Angulations <10 degrees (n = 2) and non-opening of struts (n = 3) were noted at insertion, but this did not adversely affect outcome. Only 36 came for retrieval after a mean in-dwelling time of 9.5 weeks (range, 1 to 23 weeks). No patient developed major pulmonary embolism, but 5 filters showed minor trapped thrombi (<5 mm) on removal. Successful retrieval was performed in 34 patients for infrarenal IVC filters. Unsuccessful retrieval (n = 2) were noted for suprarenal filters which had severe tilt, distal migration and penetration of the IVC wall. Both filters were left in situ with no adverse sequelae. **Conclusion:** BARD G2X infra-renal IVC filter insertion and retrieval is safe and effective; associated with minor complications. However suprarenal insertion of the filter is associated with tilt, migration and penetration making retrieval challenging

P50 The Gatekeeper Injectable Bulking Agent: A Novel Treatment for Faecal Incontinence

Mark Wong¹, Choong Leong Tang

¹Department of Colorectal Surgery, Singapore General Hospital, Singapore

Introduction: Faecal incontinence is a condition that is stigmatised and often under-reported. A literature review of prevailing data from the West has shown highly variable rates ranging from 0.8% to 18%. A recently concluded study in our unit has revealed a 4.8% prevalence rate in our general population. Treatment options at present are limited to conservative measures and potentially morbid surgical procedures. We present a novel surgical modality for treating faecal incontinence that is minimally-invasive and safe.

Methods: The Gatekeeper™ procedure can be performed as a day case. Using a specially designed delivery device, 6 prostheses are injected into the intersphincteric anal space under ultrasound guidance. Unlike other injectable products, the Gatekeeper™ prostheses comprise thin solid cylinders (length 21 mm, diameter 1.2 mm) of polyacrylonitrile, a hydrophilic material that, within 24 hours of implantation in contact with human tissue, changes configuration to become thicker and yields a 720% volume increase. The aim is to add bulk to the native musculature and improve the seal of the anal canal, thereby reducing leakage of faeces. **Results:** We performed the first 2 cases outside of Europe in January 2013. After a 6-month follow-up, both patients are doing well with significant and sustained improvements in both faecal incontinence severity and quality-of-life scores. There were no reported complications and postoperative anorectal ultrasounds confirmed all prostheses were in place. **Conclusion:** The Gatekeeper™ procedure offers a safe and effective treatment option for faecal incontinence, particularly in patients who have failed conservative management.

P51 Transplantation of Umbilical Cord Lining Stem Cells as a Promising Novel Method for Treating Eye Diseases

Leonard PK Ang^{1,2,3,4}, Boon Yee Ng³, Federico L Gimeno², Toan Thang Phan^{5,6}, Roger W Beuerman^{3,4}, Hasan M Reza³

¹Lang Eye Centre, Singapore

²Singapore National Eye Centre, Singapore

³Singapore Eye Research Institute, Singapore

⁴Department of Ophthalmology, Yong Loo Lin School of Medicine, National University of Singapore, Singapore

⁵Department of Surgery and Faculty of Dentistry, National University Health System, Singapore

⁶Cell Research Corporation Pte Ltd, Singapore

Introduction: Transplantation of umbilical cord stem cells is a promising new treatment modality. Corneal disease is a leading cause of blindness worldwide. Our aims were to isolate a novel stem cell population from human umbilical cord and to develop a bioengineered tissue-equivalent for epithelial regeneration for treating cornea and ocular surface diseases. **Methods:** A new cell-type, mucin-expressing umbilical cord lining cell (CLEC-muc), was isolated from umbilical cord. These cells were cultured on an amniotic-membrane substrate in PTTe-1 media. Bioengineered CLEC-muc cell sheets were transplanted onto cornea stem cell-deficient eyes in a rabbit model and compared with eyes without transplants. The eyes were monitored by slit-lamp examinations and fluorescein staining. CLEC-mucs were analysed by histology, immunohistochemistry and RT-PCR for stem cell markers and cell adhesion proteins. **Results:** CLEC-mucs were highly proliferative and formed a stratified

cell sheet on the amniotic-membrane substrate. They expressed putative cornea stem cell markers p63, ABCG2, HES1, BMI1, CK15. Transplantation of the bioengineered CLEC-muc sheets regenerated a smooth and clear epithelialised corneal surface with phenotypic expression of corneal-specific cytokeratins CK3, CK12. The epithelial sheet remained well attached to the underlying substrate and expressed cell adhesion-associated proteins Integrins- α 6, - α 9, - β 1, collagen-IV and laminin. **Conclusion:** We isolated a novel stem cell population, CLEC-muc, from umbilical cord that was highly proliferative and possessed stem cell characteristics. CLEC-muc cells were able to regenerate the cornea surface in a stem cell-deficient eye. This has potentially important clinical applications as CLEC-muc may be a readily available source of stem cells for clinical transplantation for treating eye diseases.

P52 Health in Times of Crisis: System Effects of the Privatisation of Primary Care

Neda Milevska Kostova¹

¹Centre for Regional Policy Research and Cooperation 'Studiorum', Republic of Macedonia

Introduction: The purpose of this research is to investigate the effects that privatisation of primary level in 2005 had on the healthcare system and its stakeholders in Macedonia. The transition of the country from command to market economy has also imposed reforms in the healthcare sector, bringing the concession model as an outcome of the intended improvement of the efficiency of service delivery on primary level. And while the primary healthcare has been reformed with success in regard to some financial indicators, undertaking it as isolated segment, has imposed other challenges to its structural and functional existence within the healthcare system. **Methods:** Through desktop research and questionnaire survey, this research is looking into the effects of the transformation of primary healthcare on the functionality of the delivery of health services, especially focusing on the links between the primary on one side, and the preventive and secondary levels on the other. **Results:** The initial findings show that the links between the primary healthcare and the preventive and secondary levels of care have been disrupted, and that the regulatory and policy mechanisms are yet to be established in order to regain the continuum of care for the patients. **Conclusion:** Primary care together with the preventive services, provides the essential healthcare based on practical, scientifically sound and socially acceptable methods and technology made universally accessible to individuals and families in the community at a cost that the community and the country can afford. Due to its crucial role as main pillar of

an effective healthcare system, the primary care should be placed at the focus of every healthcare reform, especially in the developing countries and the transition economies alike, towards providing sustainable healthcare systems that can provide patient-centred care for all.

P53 Bystander First Aid in Singapore Adults—A Pilot Survey of Injuries Presenting to an Emergency Department

Fua Tzay Ping¹, Wee Choon Peng Jeremy, V Anantharaman

¹Department of Emergency Medicine, Singapore General Hospital, Singapore

Introduction: Bystanders are important as they enable the emergency services to be notified in an injury. If trained in first aid, bystanders can also provide on-site assistance to the injured victim. What is not known is the current rate, type and appropriateness of bystander first aid for injuries and the impact of these on outcomes. Our aim was to conduct a preliminary survey to document the current baseline and design a framework for injury prevention of and public education. We wanted to determine how many of the injured victims that presented to our emergency department (ED) were rendered first aid by bystanders. **Methods:** Over a 1-week period in June 2013, questionnaires were distributed to doctors attending to trauma at the ED, Singapore General Hospital. The questionnaire assessed patient demographics, mechanism of injury, type of accident and appropriateness of bystander first aid. **Results:** We surveyed 101 injured victims. The commonest place where injuries occurred was at home (28.7%), followed by workplace (24.7%), other public places (24.7%) and on the road (17.8%). Falls (47.5%) constituted the leading cause of injuries. This was followed by road traffic accidents (13.8%). Bystander First aid was provided in only 16.8% of instances. **Conclusion:** This data provides information on how prepared the public is to provide first aid to injured victims. Lack of bystander first aid at home, on roads and at the workplace remains a significant issue from a public health perspective.

Speakers' Abstracts

S1 System Design to Enable Effective Caring for Patients with Multiple Comorbidities

S1.1 Caring for Patients with Multiple Comorbidities—A Population Health Approach

Eugene Shum

Eastern Health Alliance, Singapore

The increasing prevalence of chronic diseases together with a raising life expectancy have led to a growing number of patients with multiple comorbidities. The Singapore Health Care System has been evolving to meet these challenges. In 2000, 2 healthcare clusters were formed with a focus on the integration of care. In the recent years, the 2 healthcare clusters have further evolved into 6 regional health systems.

The regional health systems allows for a population health approach to be taken. While each of the regional health systems are anchored by an acute care hospital, a large emphasis for them is to focus on the population in the community. Through collaboration and partnerships with a range of healthcare and social services providers, a range of primary and secondary prevention, and intermediate long-term care initiatives have been introduced.

The Eastern Health Alliance is the regional health system for the eastern part of Singapore. It comprises 5 foundation partners—Changi General Hospital, Health Promotion Board, Singhealth Polyclinics, St Andrew's Community Hospital and the Salvation Army Peacehaven Nursing Home. Its programmes spans from the prevention and management of chronic diseases, to rehabilitation and social care. More recently, it has been developing the Neighbourhood for Active Living programme. This enables the development of long-term relationships with residents living in the east with the aim of promoting good health and facilitating ageing in place in the community.

S1.2 The New Reality in Medicine—Caring for Multiple Comorbidities: Experiences from Hong Kong

Donald KT Li

Hong Kong Academy of Medicine, Hong Kong

Hong Kong's health indices rank among the best in the world. However, like many developed economies, Hong Kong faces the challenges posed by changes in health risk profile with her ageing population. An increasing disease burden from managing non-communicable disease (NCD) is evident. Moreover, the reality of the existence of multiple comorbidities and its management pose a challenge to the public health challenge.

Hong Kong established a working group that set the scope, vision, goals and strategic directions for prevention and control of NCDs. As part of our ongoing healthcare reform, a working group on primary care was also set up which has produced reference frameworks for the management of some NCDs in Hong Kong. This presentation will describe the epidemiology and determinants of common NCDs in Hong Kong. The influence of the healthcare system and financing mechanisms on the effective management of comorbidities will be discussed and the problems of fragmented care, and limitations of public primary care services associated with hospitals, will be presented. Possible models and solutions, including the establishment of family doctor led multidisciplinary primary healthcare teams with the appropriate resource allocation, and public private service provider co-operation will be presented.

S1.3 Am I Forgotten?—A Look at Singapore's Dementia Services

Kelvin WB Koh

St Luke's Hospital, Singapore

Singapore prides herself in being one of the world's best in multiple domains of society. In areas that we have yet to achieve that status, we are striving hard towards excellence. In our pursuit to become sterling, have we forgotten and left behind the vulnerable groups of the old, sick, disabled and marginalised?

Singapore must embrace the oncoming silver tsunami in the years to come and be prepared to deal with the impact. The inevitable reality is that the prevalence of people with dementia will increase. What have we done for our people with dementia? Have we even done the bare minimum in caring for them and their caregivers? Singapore recognises this growing need to care for people with dementia and has begun her journey with new care services in the recent years.

The session will review the current care options available, attempts to explore apparent gaps in our system and discuss the different components of a holistic approach that can improve dementia care services in Singapore.

S2 Clinician Scientist Symposium

S2.1 'Clinician Scientist': Talking About the Walk

Michael Chee¹, Ong Sin Tiong¹, Tai E-Shyong², Oei Eng Eong¹

¹Duke- National University of Singapore, Singapore

²National University Hospital Singapore, Singapore

Being a clinician scientist means different things to different

people. A debutant is often faced with the challenge of ‘where to fit and how to distinguish oneself’. Each of the four speakers with at least 10 years experience being a clinician scientist will share their career journeys in a nutshell. Each panelist will present for up to 15 minutes allowing half an hour for lively audience participation.

S3 Managing Conflicts of Interest in Medicine

S3.1 Financial Conflict of Interest

Yeoh Swee Choo

College of Obstetricians and Gynaecologists, Singapore

The question raised in this symposium refers to concerns over financial conflicts which may arise from time to time, and which may adversely affect patient care as well as other duties and responsibilities of medical professionals.

In order to discuss managing financial conflicts, it is necessary to first identify areas where conflicts may arise. While it may be tempting to assume that such situations could arise only in private practice, it would not be untrue to posit that conflicts could also arise in institutional practice. Some examples of financial conflicts in medical practice will be discussed.

The primary goals of conflict of interest policies in medicine are to protect the integrity of professional judgment and to preserve public trust. Medical institutions and individual practitioners should act together to strengthen their conflict of interest policies and procedures.

S3.2 Ethical Principles for Managing Financial Conflicts of Interest in Medicine

Tan Chi Chiu

Gleneagles Medical Centre, Singapore

Medical practice is a profession bound by a strong code of ethics. The fundamental principles of medical ethics include concepts of beneficence, non-maleficence, respect for autonomy and justice. In addition, it is important to understand the concept of the “best interests” of patients. In modern day practice, potential financial conflicts of interest can occur in numerous areas. Examples of such areas are managed or contracted care; medical assessments for third parties, medical research, financial relationships with patients and families, gifts and bequests from patients, doctors in healthcare and non-healthcare businesses, relationships with medical industry and the concept of an “ethical limit” to doctors’ fees for services. This talk will scan these territories, identify risks and give some guidance on how best to mitigate these risks and act ethically in a

variety of situations so as to avoid financial conflicts of interest or even the appearance of such conflicts.

S3.3 Conflict of Interest in Research—The Clinician Scientist’s Perspective

Pierce Chow

Department of General Surgery, Singapore General Hospital, Singapore

Conflict of Interest (COI) in research represents situations that may generate a risk that unduly influences scientific objectivity and judgment because of a secondary interest. This is complex but relevant to biomedical research. The role of a clinician scientist can be conflicted when scientific objectivity is perceived to compete with scientific success (publications, grants), partiality to patients (clinical trials), obligations to colleagues (allowing poor scholarship to pass) and research sponsors (industry) and financial gains (patents, royalties). While there are many ways which COI can occur in research, COI mitigations remain reliable. For example the importance of ties between investigators and industry are valuable to the development of novel therapies and continued discouragement of these relationships may inadvertently harm the advancement of healthcare. As a result, the proper management of COI is fundamental and crucial to the maintenance of long-termed, mutually beneficial relationships between industry and academia.

S4 Psychiatry Symposium

S4.1 Translation of Epidemiological Evidence into Policy

Chong Siow Ann

Department of Early Psychosis Intervention, Institute of Mental Health, Singapore

Mental disorders impose tremendous burden on national economies not only because they are prevalent and chronic but also many mentally ill people are not treated despite the availability of effective evidence-based treatments. Using a study conducted by Chong Siow Ann et al as an example, the presentation will highlight the findings of a population-based epidemiological study that had established the rates of various mental illnesses and its associated factors, describe the measures that have been initiated to address some of the unmet needs identified by the study, as well as other policy implications.

S4.2 An Update on the Treatment of the Anxiety Disorders

Leslie Lim

Department of Psychiatry, Singapore General Hospital, Singapore

Anxiety disorders (ADs) are one of the commonest psychiatric conditions to afflict mankind. We discuss the latest evidence-based findings on psychopharmacological and psychological treatments for the ADs. As expected, SSRIs and SNRIs are the first-line pharmacological treatments. Among the psychological therapies, cognitive behavioural therapy (CBT) has demonstrated efficacy in randomised control trials.

However, a meta-analysis of placebo controlled trials of CBT yielded an average effect size of 0.73 suggesting that many patients do not improve after an adequate course of therapy. Similarly, traditional pharmacological treatments are only modestly effective. Recently, there have been favourable reviews on the use of D-Cycloserine as an augmentation strategy.

Although there are some studies that seem to suggest that medications can support CBT, most studies reveal only modest benefits of combined interventions. There are studies suggesting the combined use of CBT and medications are superior to monotherapy but only in certain kind of ADs. Newer methods of overcoming treatment resistance e.g. in PTSD and OCD as well as safety issues during pregnancy and breastfeeding will be examined.

S4.3 Rights Based Parity of Esteem Between Mental and Physical Health—Whole-person Care

Sue Bailey

Royal College of Psychiatrists, United Kingdom

Parity of Esteem is best described as valuing mental health equally with physical health.

This should mean:

- Equal access to the most effective and safest care and treatment.
- Equal efforts improve the quality of care, the allocation of time, effort and resources on a basis commensurate with need.
- Equal status within healthcare education and practice. Equally high aspirations for service users.
- Equal status in the measurement of health outcomes.

Globally, just only a minority of people with mental health problems receive any intervention for their problem and those with mental illness die some 15 to 20 years earlier than the rest of society. This is true across the lifecourse, for children, working-age adults and older adults. However, this would be a situation not tolerated in cancer or coronary heart disease.

In England, working through lobbying of Parliament, *Parity of Esteem* became enshrined in the new healthcare legislation. This has given us a lever to drive up quality and resources being brought into mental health services. This paper will describe how the principle of parity has been achieved and now how parity is being turned from rhetoric into reality.

However, the following exist:

- Leadership for parity.
- Policy changes to promote parity.
- Parity of professional and public respect.
- Tackling stigma and discrimination parity of outcomes: preventing premature mortality.
- Parity of care and treatment.
- Parity and integrated care: addressing co- and multi-morbidity of mental and physical health conditions.
- Parity across the life course.
- Parity and funding and parity and research.

With the aim that all countries across the world will incorporate parity into their health legislation to improve outcomes for those with mental illness, and to improve the overall health and resilience of individuals families and communities, this study will discuss the issues above.

S5 Informed Consent—Setting the Professional Standards

S5.1 The Ethical and Professional Perspective

Chin Jing Jih

Department of Geriatric Medicine, Tan Tock Seng Hospital, Singapore

Not Available

S5.2 Informed Consent—Setting the Professional Standard

Lek Siang Pheng

Rodyk & Davidson LLP, Singapore

How is the professional standard of care determined when there is a legal dispute arising from a claim or complaint by a dissatisfied patient? How much input do the medical

practitioners themselves have in this process of the determination of the standard of care? Or is the standard of care to be solely decided by the Courts or a Disciplinary Tribunal?

Most concerned medical practitioners are generally familiar with the Bolam/Bolitho test. In ascertaining what the relevant standard of care is, the Court or Tribunal ought to look at whether what was done (or not done) by the medical practitioner is “in accordance with a practice accepted as proper by a responsible body of medical men skilled in that particular art”.

Where the evidence relating to such practice can be found and how such evidence is to be presented to the Court or Tribunal are usually hotly contested matters when there is a legal dispute. The recent Singapore High Court decision in the *Tong Joanne* case is instructive in this regard.

In the current medico-legal landscape, medical practitioners can proactively help themselves if they can work with their professional bodies to push the development of professional standards in informed consent. Informed consent is a fertile area for legal disputes. Indeed, clarity in this area will be useful for patients too.

S5.3 Informed Consent and the Surgeon

Swaminathan Ikshuvanam

College of Surgeons, Singapore

Consent taking has come a long way since our undergraduate days. It used to be a one-step action, but now it is more accurate to say it is a process. Instead of “Doctor knows best”, it is now a collaborative effort involving the patient, relatives and the surgeon. Good communication skills are essential, as are a discussion of the risks and benefits, as well as alternative treatments available. This presentation will focus on these subjects, as well as provide examples from past cases and from the surgeon’s personal perspective. It will end with some practical advice for all.

S6 Tripartite Track: New Frontiers in Early Breast Cancer

S6.1 Soy and Breast Cancer Risk: To Eat or Not to Eat?

Woon-Puay Koh

Duke-NUS Graduate Medical School, Singapore

Breast cancer is top cancer among women in developed countries and increasing in incidence among women in

developing countries. Soy food contains soy isoflavones, which belong to a class of plant compounds called phytoestrogen, and is postulated to have beneficial effects in reducing breast cancer risk. Using data from the Singapore Chinese Health Study, which is made up of 35,303 women and 27,959 men recruited between 1993 and 1998, we investigated the effects of soy intake on breast cancer risk among middle-aged and elderly Singapore Chinese women. Relative to postmenopausal women with lower (below median) soy intake, those with higher intake showed a statistically significant 18% reduction in risk. The inverse association between soy intake and breast cancer risk was apparent mainly in postmenopausal women. These prospective findings strengthen earlier observations from other Asian populations, and suggest that soy isoflavones may have lasting beneficial effects against breast cancer development. Furthermore, our case-control study on soy isoflavone intake, *MDM2* gene polymorphism and breast cancer risk nested within this Singapore cohort suggests that soy isoflavones may act via the down-regulation of the *MDM2* oncoprotein as one of its mechanistic anti-carcinogenic pathways in breast cancer.

S6.2 Breast Imaging—Pearls and Pitfalls

Wansaicheong Gervais Khin-Lin

Department of Diagnostic Radiology, Tan Tock Seng Hospital, Singapore

Detection of early breast cancer is largely dependent on the use of imaging. The current widely available modalities that we have include mammography, sonography and magnetic resonance imaging (MRI). While each has its own advantages, the majority of asymptomatic women are likely to benefit from screening mammography.

One of the unique features about mammography is that it is used in screening and diagnosis. However, the radiologist uses additional techniques in the work up of abnormalities such as spot magnification views, tangential views and axillary views. These permit greater specificity and analysis of lesions.

Sonography and MRI are supplementary imaging modalities that are used in diagnostic work up. They are also used independently. Advances in sonography like elastography and volume acquisition have continued to increase the usefulness of this modality. MRI is now considered a mainstream application that has seen computer-assisted detection (CAD) applications and the use of parametric calculations improve the usability of the technique.

Like any other diagnostic test, imaging has its pitfalls. These include a failure to order the appropriate test, a lack of understanding of the report and limitations in perception and analysis by the interpreting radiologist. The use of imaging guided biopsy may be underutilised in some situations.

Interpreting the pathology results after an imaging guided biopsy is also an important part of managing a patient well. A combined multidisciplinary effort is the way forward for modern oncology and the fight against early breast cancer is no different in this respect.

S6.3 Hormonal Therapy in Breast Cancer—What’s New?

Marniza Saad

University of Malaya Medical Centre, Kuala Lumpur, Malaysia

Breast cancer is a heterogeneous disease composed of several biologic subtypes with distinct behaviour and response to therapy. Hormonal regulation is one the major signaling pathways involved in the development and progression of breast cancer. Hormone receptor (HR) positive breast cancer is a subtype with oestrogen receptor (ER) and/or progesterone receptor (PR) positive disease. It accounts for approximately 70% of all cases. The targets for therapy include the oestrogen receptors, oestrogen biosynthesis pathways and other signaling pathways which interact with hormonal regulation pathway. Tamoxifen is an ER antagonist and has been the sole endocrine therapy for several years until the introduction of aromatase inhibitor (AIs), drugs which inhibit the production of peripheral androgens. Several randomised controlled trials (RCTs) have confirmed the benefits of AIs as adjuvant therapy in postmenopausal women. This has now become a standard of care treatment in this group of patients. More recently results from 2 large RCTs showed benefits of adjuvant tamoxifen beyond 5 years. Further research has shown interaction of hormonal pathway with other signaling pathways resulting in resistance to endocrine therapy. There are great interests in combining endocrine therapy with molecular targeted agents but its use in the early breast cancer setting remains investigational at present. This presentation will cover the development of endocrine therapy in breast cancer concentrating on early breast cancer.

S6.4 Advances in Radiotherapy in Breast Cancer—Longer or Shorter?

Josephine WM Ng

Department of Clinical Oncology, Queen Elizabeth Hospital, Hong Kong

Postoperative radiotherapy after breast conservative surgery or mastectomy is used to reduce loco-regional recurrence, improve breast cancer specific survival and overall survival. Conventional external radiotherapy delivers a total dose of 45 to 50 Gy in 1.8 to 2Gy/fraction over 5 to 6 weeks ± boost

to tumour bed of 10 to 16 Gy over 1 to 2 weeks. Advances in breast cancer radiobiology such that a more precise estimation of biological equivalent dose, and improvement in radiotherapy delivery technology with better dose homogeneity in the target volume resulted in the increasing use of hypofractionated scheme (i.e. larger daily fraction dose) to shorten overall treatment time. Recently, there were clinical trials comparing the delivery of radiobiologically-equivalent total dose using the hypofractionated scheme with overall shortened treatment time, with conventional 1.8 to 2 Gy daily fraction scheme. These trials showed equivalent locoregional recurrence rate, disease-free survival and overall survival without significant increase in acute and late toxicities, including late breast cosmetic complications. Concerns were raised as these trials included mainly low risk, elderly patients treated by breast conservative surgery without chemotherapy such that generalisation to all patients may not be appropriate. Also, the optimal hypo-fractionated schedule remains to be defined.

Accelerated partial breast irradiation (APBI) greatly reduced the overall treatment time of breast radiotherapy. Intra-operative radiotherapy (IORT) employing single fraction treatment given during operation is particularly appealing as the treatment is convenient, fast with good sparing of normal structures. However, due to the lack of long-term follow-up data, APBI is considered not a standard option and should be performed in a clinical trial setting.

S7 Tripartite Track: Advancing Together in Clinical Dentistry

S7.1 Predictable Dental Implant Placement

Edmond Pow

Faculty of Dentistry, The University of Hong Kong, Hong Kong

The long-term success of an implant-supported prosthesis depends much on whether the implant was placed in its optimal position and angulation during surgery. Transferring the implant planning to the surgical site is always a challenge. In this lecture, various popular methods and surgical guides for implant placement will be revisited. New advances in implant surgery will also be discussed.

S7.2 Material Selection for Implant Prostheses: Metal vs Ceramics

Edmond Pow

Faculty of Dentistry, The University of Hong Kong, Hong Kong

Although the survival rates of dental implants are shown

to be high, various biological and technical complications are not uncommonly found. The management of such complications is usually uncomplicated but it can also be very demanding in certain situations. The occurrence of some of the complications might be prevented by the good selection of materials during planning and fabrication of the prosthesis.

S7.3 The Challenge and the Response in Daily Implant Practice

Sungmin Chung^{1,2,3,4}

¹College of Dentistry, Kyung Hee University, South Korea

²Implant Center, Tuebingen University, Germany

³Implant Center, Loma Linda University, USA

⁴Well Dental Clinic, USA

With implant treatment, the quality and span of life have been levelled up. Implant itself is very interesting, exciting and satisfactory for dentist and patient. We have been satisfied with typical implant treatment, but over the limitation of our concept, there are many possibilities of the change of treatment concepts. Still, we do develop various materials to overcome difficulties of typical implant treatment.

Contents of presentation are:

- Anaesthesia in 2nd stage surgery and prosthetic treatment.
- Implant surgery; implant selection now and future possible implant system. One stage vs staged approach simple gingival augmentation with CaP + collagen-based materials bone graft concepts simple sinus augmentation materials.
- Prosthetic materials ready made vs customised abutment Zr prosthesis with metal base Precise cross arch Zr prosthesis minimal porcelain build up with reinforced fluorescence or opal porcelain.
- Tools for maintenance care and complications ultrasonic interproximal tooth brush implant removal and fractured screw removal tools.

With innovative material development, the concepts of treatment have been developed and upgraded. We also wish to discuss about the daily implant treatment concepts.

S7.4 Advances in Restoration of Mandibular Defects

Andrew Tay

College of Dental Surgeons, Singapore

Mandibular bone may be lost as part of the resorption pattern seen after tooth loss or through diseases such as bone infections (osteomyelitis, osteoradionecrosis). Intraosseoustumours and oral malignancies often require mandibular resection with significant bone loss. These often severely diminish a patient's quality of life and daily function, affecting the patient's ability to speak and eat, and significantly impairing facial appearance with detriment to social interactions and self-esteem.

Current surgical techniques of reconstructing mandibular defects, e.g. free vascularised composite flaps, are not ideal, with long operation time, donor site morbidity and long hospitalisation. Depending on the method of reconstruction, the restoration of functional dentition is often difficult or impossible. Efforts to develop alternative methods of mandibular reconstruction have been made for both small and large defects. This lecture will provide an update of these new alternative methods of restoring mandibular defects.

S7.5 Facial Injury Among Motorcyclists—The Effect of Helmet Visor

Rosalina Ramli

Department of Oral & Maxillofacial Surgery, Faculty of Dentistry, University Kebangsaan Malaysia (UKM) & Universiti Kebangsaan Malaysia Medical Centre (UKMMC), Malaysia

The function of a helmet visor is to protect the motorcyclist's face from small objects, i.e. dirt, insects and others. The visor was not designed to protect face against impact. To date, there is no literature addressing facial injury and motorcycle-helmet visor. However, clinical examination showed that a visor whether in intact or damaged form could cause facial soft tissue injury.

The objective of this study was to quantify the association between motorcycle-helmet visor and facial injury. Among the 145 helmets collected from participants involved in motorcycle crash, 140 were helmets with a visor while the rest were without a visor. However, only 103 visors (73.6%) were available for examination. Examination involved basic and physical characteristics of the visor, damage assessment, material characterisation and scanning electron microscopy (SEM). Univariate and multivariate analysis showed significant association between visor type and damage with facial injury.

S7.6 Management of Irradiated Patients Undergoing Minor Oral Surgery

Roszalina Ramli

Department of Oral & Maxillofacial Surgery, Faculty of Dentistry, University Kebangsaan Malaysia (UKM) & Universiti Kebangsaan Malaysia Medical Centre (UKMMC), Malaysia

Minor surgery to the jaw bone especially after radiation therapy is shown to be the most common precipitating factor for developing osteoradionecrosis. Ideally, patients going for radiotherapy to the head and neck area or bisphosphonate therapy should be referred for comprehensive dental care prior to their treatment. However, most of the patients were referred too close to the treatment date and some were not referred at all. We wish to highlight the management of these cases which consists of therapeutic ultrasound and buccal pad of fat flap following minor oral surgery.

S7.7 Current Concepts in the Restoration of Endodontically Treated Teeth

Seow Liang Lin

Royal College of Surgeons, England

Factors influencing the strength of endodontically treated teeth have been extensively reviewed in the literature. It has been demonstrated that the strength of an endodontically treated tooth is directly related to the bulk of remaining dentine. It has been observed that fracture of root-filled teeth is relatively common and can be devastating to both patients and dentists. Therefore, root canal therapy cannot be considered complete until the tooth has been restored to ensure its viability clinically. Inadequate coronal restoration and coronal microleakage has been cited as one of the important factors determining the successful outcome of endodontically treated teeth. The ideal restoration for an endodontically treated tooth should therefore restore form, function and aesthetics. This lecture aims to present an overview of the current concepts pertaining to the restoration of endodontically treated teeth, the various types and designs of posts and cores available, and also the role of adhesives and all-ceramic restorations.

S7.8 Endodontic Decision-Making in An Era of Advancing Clinical Dentistry

Victoria SH Yu

College of Dental Surgeons, Singapore

The past 60 years have seen the art and science of endodontic

therapy being transformed. Traditional stainless steel instruments give way to sophisticated instrument designs promising ease of operation, more effective cleaning of root canals and higher cost effectiveness. Current root-filling materials are constantly being challenged as the search for a replacement of the lost dental pulp continues. The past 60 years have also seen much effort invested in evaluating healing after root canal treatment, providing evidence for modern clinical practice guidelines. Yet, endodontic lesions that resist treatment continue to exist and challenge clinicians regarding their management.

This lecture will examine the persistent endodontic lesion with regard to its prevalence, its risk of exacerbation and its potential impact on patient well-being and the practice of clinical dentistry. At conclusion, participants should be able to:

- Appreciate the concepts of treatment success and failure, healing of disease and tooth functionality.
- Appraise available evidence for clinical practice guidelines.
- Develop a strategy for the management of endodontic lesions that persist after root canal treatment.

S8 CPS Session: Immunisation—Shots/Vaccines Are Not Just for Kids

S8.1 Should I Vaccinate My Teenage Son/Daughter with the HPV Vaccine?

Elisa Koh

KK Women's and Children's Hospital, Singapore

The majority of infections caused by the human papilloma virus (HPV) are clinically insignificant. Cervical cancer represents the most serious consequence of the infection, but occurs as a relatively uncommon event as compared with precancerous lesions of the cervix and genital warts. The HPV deoxyribonucleic (DNA) is present in more than 99% of cervical cancer lesions, making it suitable as a target for prevention with vaccines. Apart from the cervix, HPV is associated with pre-cancerous lesions of the vulva and vagina as well. These conditions are less common than cervical disease, and are potentially preventable with vaccines. HPV-related conditions in men include penile and anal warts, penile and anal cancers, head and neck cancers and respiratory papillomatosis. However, majority of men are asymptomatic. The incidence of genital warts are on the rising trend in Singapore and are severely under-reported. The use of quadrivalent HPV vaccines have the potential

to significantly reduce not only the incidence of cervical cancer and genital warts in women, but also HPV-related diseases in men.

S8.2 Should I Take Any Vaccinations for My Wilderness Trip?

Emily Rowe

Department of Infectious Diseases, Tan Tock Seng Hospital, Singapore

Wilderness trips have become increasingly popular as travellers seek out adventure and the chance to experience natural wonders. Travellers to remote regions often undertake extensive outdoor activities increasing their risk of infectious diseases. The wilderness traveller is at potential risk of life-threatening infections including rabies, Japanese encephalitis and yellow fever.

Rabies infection is transmitted through the saliva of a rabid animal through bite, scratch or mucus membrane exposure resulting in fatal encephalitis. Rabies can be prevented with prompt administration of postexposure prophylaxis. However in remote locations this is often unavailable, inadequate or incorrectly administered. Failure of postexposure prophylaxis has been reported in patients who had not received pre-exposure vaccination. Pre-exposure rabies vaccine should be encouraged for travellers to the wilderness.

Japanese encephalitis is a potentially fatal arboviral infection that is endemic to many countries in Asia. Clinical disease occurs in <1% of infected individuals and usually manifests as acute encephalitis with a case-fatality ratio of 20% to 30%. Travellers from non-endemic areas are susceptible to infection and can be protected by immunisation.

Yellow fever is endemic in sub-Saharan Africa and South America where non-human and human primates are the main reservoirs of the virus. There is no effective antiviral therapy and case-fatality for severe cases is 20% to 50%. Yellow fever is preventable by an effective and relatively safe vaccine.

S8.3 Should I Vaccinate My Elderly Parents/ Grandparents?

Paul Tambyah

Department of Medicine, National University Hospital, Singapore

Vaccinations in the elderly are complicated because of concerns about safety and immunogenicity in addition to the usual issues of efficacy. While the elderly are susceptible to mortality and morbidity from vaccine preventable illnesses, there is a concern that they might not be able to mount a good immune response to vaccines such as the influenza or pneumococcal vaccine. In addition, there are new vaccines

such as the shingles vaccine which have entered the market. It is important to carefully review the literature to determine the risk benefit ratio of vaccines in older people.

S9 Elderly Care and Geriatric Medicine

S9.1 The Role of the Geriatrician in the Acute Hospital Setting

Graeme Dewhurst

Royal College of Physicians of London, United Kingdom

Worldwide, there is increasing demand on medical services from older and frailer patients and the United Kingdom (UK) is no exception to this. Geriatric medicine in the UK is an important and expanding specialty which is very much at the forefront of promoting comprehensive and innovative approaches to these challenges facing all medical services. This presentation will address the ways in which physicians in the UK have developed a wide range of approaches to ensure that this vulnerable group receive access to high quality medical-led multidisciplinary care and how the geriatrician is at the heart of much of this. Increasingly, such physicians will seek out their patients not only in the emergency and medical departments but also on surgical, orthopaedic and psychiatric wards to make certain that they receive prompt and accurate diagnostic assessments, holistic care and are properly supported to ensure they can be safely discharged back into their local communities. This requires a range of skills and approaches, including excellent diagnostic acumen, teamwork among doctors and primary care providers, and effective communication with patients, their carers and families.

S9.2 The Geriatric Day Hospital

David Black

Education and Training, Royal College of Physicians, United Kingdom

The geriatric day hospital evolved during the 1950s and 60s in the United Kingdom (UK) to support discharge and continuing rehabilitation of patients at a time when there were very few community services. Over the last 20 years, the evidence for the cost-effectiveness of the geriatric day hospital has been questioned, and the numbers in UK have fallen. However, the evidence base for comprehensive geriatric assessment is strong, and the use of remaining day hospitals has evolved, in particular offering a response to subacute crisis. Whether or not it is called a day hospital, a community facing a multidisciplinary team focussing on the complex needs of older people, particularly those frail and in crisis, remains an important function in the future

hospital.

S10 Tripartite Track: Metastatic Colorectal Cancer —Pushing Limits of Cure

S10.1 Imaging and Detection of Colorectal Metastases —The Role of PET/CT

Abdul Jalil Nordin

College of Radiology, Malaysia

Integrated Positron Emission Tomography - Computed Tomography (PET-CT) imaging system has gained wide access in the clinical management of most cancer patients including colorectal carcinoma (CRC). The discovery of 2-deoxy-2- (18F) fluoro-D-glucose (18F-FDG), a glucose analogue and a powerful tracer, shared the success story of PET-CT imaging in cancer, expanding its clinical role in a variety of cancer management. Combined functional and morphological diagnostic information from the system improved staging accuracy by increasing the sensitivity and specificity in identifying cancerous lesions. Although its role in colorectal carcinoma is not yet established following initial diagnosis, studies have shown that it may impart influence in the course of treatment. 18F-FDG PET-CT is a recognised clinical method in detecting metastases (mCRC) and local recurrence (rCRC) through its capability in differentiating tumour tissue metabolism. Despite being a powerful tool in distinguishing candidates with operable lesions for curative from palliative intent, understanding the limitations can improve its use effectively, thus clinical outcome.

S10.2 Advances in Systemic Therapy of Colorectal Cancers—Chemotherapy and Beyond

Patricia Kho

Parkway Cancer Centre, Singapore

Colorectal cancer is the 3rd most common cancer globally and the 4th most common cause of cancer death. With advances in both medical treatments and surgical techniques and the introduction of population-based screening programme, the mortality of colorectal cancer is steadily decreasing in certain countries such as the United Kingdom (UK) and the United States of America (USA). As we move into the era of personalised medicine in oncology, the understanding of cancer genomics has confirmed the heterogeneity of cancers, thus leading to the development of molecularly-targeted therapy. Such therapy against specific molecular targets in cancer cells would minimise effects on normal cells while increasing cancer cell

kill. In the treatment of colorectal cancer, there have been significant advances both in available treatment strategies and the use of biomarkers towards a more personalised therapy. This allows for individual and personalised treatment tailoring, maximises a patient's exposure to currently available active treatments and modalities including selection of patients for surgical resection. All this has resulted in an improvement in 5-year overall survival of metastatic colorectal cancer patients. In addition, with the introduction of multidisciplinary teams, improvement of staging techniques with PET-CT and interventional radiological techniques and surgical techniques, resection of liver metastases in well selected metastatic colorectal cancer patients with liver-only disease can result in a cure for a small but significant subset of patients. This talk aims to summarise the latest advances in the systemic treatment of colorectal cancers.

S10.3 Loco-Regional Therapies for Hepatic Colorectal Metastases—Interventional Radiology

Tan Bien Peng

Tan Tock Seng Hospital, Singapore

Surgical resection of colorectal metastases provides the best survival benefit with overall 5-year survival rate of about 50%. However, only about 25% of patients with hepatic colorectal metastases are candidates for surgery. Minimally invasive interventional approaches have been developed with the intent for cure, to downstage disease for resectability or to provide palliative options. These well established techniques are broadly classified into vascular and percutaneous approaches.

Vascular approaches include portal vein embolisation which improves on the resectability of hepatic metastases by increasing the volume of the future remnant liver. Another technique is hepatic artery infusion chemotherapy which relies on the mainly hepatic arterial source of tumour blood supply to deliver higher doses of cytotoxic drugs. Transarterial embolisation techniques in the form of chemoembolisation using Irinotecan eluting beads (DEBIRI) and selective internal radiation (SIRT) with Yttrium-90 microspheres are well established treatment modalities. They combine high dose local chemotherapy or radiation therapy together with particle embolisation to achieve tumour ischaemia. With SIRT, time to progression is improved when combined with chemotherapy. Significant survival benefit is also seen with DEBIRI when compared with systemic chemotherapy alone.

The percutaneous approach consists of mainly thermal ablation provided by radiofrequency and the newer techniques (microwave, cryotherapy). Although very few prospective trials comparing ablation with surgery have been

performed, when radiofrequency ablation was employed in a select group of patients with tumour size of less than 3 cm, 5-year survival has been found to equal that of resection.

S10.4 Surgical Approach to Treatment of Hepatic Colorectal Metastases—When and How?

Ronnie TP Poon

College of Surgeons of Hong Kong, Hong Kong

Not Available

S11 Management of the Patient with Diabetes and Multiple Comorbidities

S11.1 Endocrinologist's Perspective

Steve Jones

Royal College of Physicians, London, United Kingdom

This lecture will explore the targets and therapeutic options for a patient with type 2 diabetes who has failed to achieve good glycaemic control on a combination of standard oral agents. There has been considerable debate in recent years on the best target for glucose control in patients with type 2 diabetes. The position has shifted away from a target of (near) normo-glycaemia for all to a more individualised approach, particularly when insulin is being considered. There are now many more options that could be used when the combination of metformin and sulphonylurea is no longer sufficient. In addition to insulin we could now consider using a glitazone, a gliptin, a glucocagon like peptide 1 a (GLP-1) agonist and most recently the sodium-glucose co-transporter 2 (SGCT 2) inhibitors have emerged. Initial enthusiasm for these newer agents has been tempered by the emergence of side effects. In addition the lack of long-term studies with hard end-points has resulted in a plethora of guidelines in which the final choice is often not clear and clinicians are left to help their patient make the best decision they can. We will consider the alternatives in the lecture. The scenario on which the lecture is based involves a complex patient with diabetes complications that include stage 3 chronic kidney disease (CKD). We will also explore therefore how this affects the choice of blood glucose lowering agent, and when we should consider stopping metformin treatment.

S11.2 Nephrologist's Perspective

Grace Lee

Gleneagles Hospital, Singapore

Type 2 diabetes is the leading cause of chronic kidney disease (CKD) and accounts for between 30% and 50% of new cases of kidney failure around the world. Albuminuria is the earliest manifestation of kidney involvement and is prevalent in 25% of patients after 10 years of diabetes. The annual rate to overt nephropathy is approximately 3%. Diabetes increases the risk of cardiovascular disease (CVD) and this risk is further potentiated by the presence of CKD. Therapeutic strategies to retard the progression of CKD and/or the risk of CVD in diabetic patients include management of (i) blood pressure (BP), (ii) glycaemic control, (iii) dyslipidaemia and (iv) dietary/lifestyle manipulations.

BP management: In diabetic patients with normoalbuminuria (<30 mg/day), the BP target is consistently ≤ 140 mmHg systolic and ≤ 90 mmHg diastolic. In diabetic patients with albuminuria (>30 mg/day), the BP target is consistently ≤ 130 mmHg systolic and ≤ 80 mmHg diastolic. An angiotensin receptor blocker (ARB) or ACE inhibitor (ACE-I) is the drug of choice in those with albuminuria. There is insufficient evidence to recommend an ARB/ACE-I combination. **Glycaemic control:** The target HbA1c is about 7% but may be higher in patients with comorbidities, limited life expectancy or risk of hypoglycaemia. Metformin should be avoided when GFR <30 mL/min/1.73m².

Dyslipidaemia: LDL-cholesterol lowering medicines such as statins or statin/ezetimibe combination reduce the risk of major atherosclerotic events.

Dietary/lifestyle manipulations: These include lowering salt intake to <2g/day, undertaking physical activity, achieving a healthy weight and smoking cessation.

S11.3 Cardiologist's Perspective

Terrance Chua

College of Physicians, Singapore

Diabetes is considered a coronary heart disease (CHD) equivalent, although there is some heterogeneity of risk and not all diabetes are at high risk. However, given this patient's age, risk profile, and duration of diabetes, he is clearly at high risk with a United Kingdom Prospective Diabetes Study Group (UKPDS) calculated risk of CHD over the next 10 years of 68%, and should be treated accordingly. In addition, his high triglyceride (TG) and low high density lipoprotein (HDL) are indicators of increased risk. There is clear evidence of benefit with the use of statins to lower low density lipoprotein (LDL) in RCTs such as CARDS, HPS and CARE, regardless of baseline LDL, aiming for a target LDL of <2.6 mmol/L (<2.0 mmol/L in the presence of proven CAD). Statins remain the mainstay of treatment

for dyslipidaemia in diabetes. Using pharmacologic therapy directed solely at low HDL has not yet to be shown to be effective. Weight reduction, exercise and diet are needed for this patient. Fenofibrate might be considered if the TG remains high although the evidence of benefit from the addition of fenofibrate in the ACCORD study was limited. There is clear evidence from UKPDS and other studies that blood pressure control in diabetics should be aimed at achieving at least below 140/90 mmHg, and there may also be benefit if BP below 130/80 mmHg could be achieved from HOT and other studies. Antiplatelet therapy has also been recommended for all diabetics with a 10-year CAD risk higher than 10%, though the evidence for this is weak, based on the available trials. Given his overall high risk, it would be reasonable to add antiplatelet therapy provided there are no contraindications. Finally, given the high risk of coronary heart disease, and the possibility of silent ischaemia in diabetics, it is tempting to consider screening for CAD with a view to more aggressive medical therapy or revascularisation. However, one randomised controlled trial (DIAD—Detection of Ischemia in Asymptomatic Diabetics) failed to show evidence of benefit, hence screening for CHD is currently not recommended in the absence of symptoms. There may be a role for exercise testing in the assessment of diabetics who are planning to start a more active exercise programme, especially if they have been sedentary previously.

S11.4 Ophthalmologist's Perspective

Gemmy Cheung

Vitreoretinal Service, Singapore National Eye Centre, Singapore

Diabetic retinopathy is one of the complications of diabetes. About 30% of diabetics will have any retinopathy, and approximately 10% will have sight-threatening retinopathy. Known risk factors for development of retinopathy include duration of diabetes, poor glycaemic control and poor blood pressure control. Therefore satisfactory management of the eye complications should include a multidisciplinary approach to address the underlying risk factors too.

Currently, specific treatment for retinopathy is only recommended for advanced, sight-threatening retinopathy. Often, patients with advanced retinopathy have suboptimal control, and multiple comorbidities, including ischaemic heart disease and renal impairment. Success of the management of the ocular complication in isolation is often limited, unless control of other systems is also optimised. Challenges in the management of these patients include minimising hospital visits to multiple specialties, improving communication between multiple specialists looking

after the same patients and ultimately, more holistic care. Specifically for the treatment of diabetic macular oedema, anti-vascular endothelial growth factor injected intravitreally has now been proven to be effective. However the systemic safety of these drugs, particularly in individuals already at risk of cardiovascular and cerebrovascular events remain unclear.

Finally, for diabetic patients with earlier stages of retinopathy, the challenge is early detection and timely modification of risk factors. Photographic screening for all diabetic patients is potentially an important step in the near future, but require significant collaborative efforts between stake-holders including polyclinics, general practitioners, eye specialists and diabetologists.

S12 Tripartite Track: Obstetrics & Gynaecology Symposium

S12.1 Role of Molecular Genetics in Obstetrics—An Overview

Leung Tak Yeung

Hong Kong College of Obstetricians and Gynaecologists, Hong Kong

Rapid advances in molecular genetics have not only provided a more accurate and comprehensive prenatal screening and diagnosis of fetal diseases, but also allow us to make the diagnosis as early as in the 11 weeks of gestation, and in a shorter period of time.

The most important advances in this decade is the clinical application of maternal plasma cell-free fetal DNA in the non-invasive prenatal testing of fetal Down syndrome, which give a sensitivity of >99% with a false-positive rate of <1%. It has revolutionised the fetal Down screening model and practice. The technology may also provide non-invasive detection of microdeletion diseases and single gene diseases in the future. Array comparative genomic hybridisation (aCGH) has now been proven as an effective tool to reveal fetal microdeletion/microduplication syndromes that the traditional karyotyping is unable to reveal. It is strongly indicated when fetal nuchal translucency is very thick (>3.5 mm) or multiple fetal malformations are found. aCGH has challenged karyotyping as the first-line investigation for fetal chromosomal disorders. The place of polymerase chain reaction (PCR) and fluorescence in situ hybridisation (FISH) as conventional rapid testing for common aneuploidies has also been challenged with the BoBs assay, which allows detection of not only common aneuploidies but also 9 well-defined microdeletion syndromes. Its high throughput may prove that it is the most cost-effective rapid test among all. As fetal Down syndrome has now been effectively

screened prenatally, the next most common genetic cause of mental retardation, fragile X disease, is on target. PCR method specifically designed for accurate detection of fragile X pre-mutation is now available for population screening for maternal carriers of the diseases. Lastly, exon or whole genome sequencing will be the ultimate tool for discovery of new genetic or genomic disorders in the future.

S12.2 What is ArrayCGH, SNP Array, Targeted vs Non-targeted Array Analysis, Copy Number Variants and Next Generation Sequencing?

Mahesh Choolani

College of Obstetricians and Gynaecologists, Singapore

What is arrayCGH, SNP array, targeted vs non-targeted array analysis, copy number variants and next generation sequencing ?

A mutation is a change in the DNA sequence of a genome which may or may not alter the phenotype of the organism, and can range in size from a single nucleotide polymorphism (SNP), or an insertion or deletion of a few base pairs, to a copy number variant of between 1kb and 5Mb, or a gain or loss of a whole chromosome. Conventional cytogenetic techniques, such as G-banding, are able to detect numerical and/or large structural rearrangements, but have a limit of resolution of 4 to 6Mb. Technological advances have opened up the possibilities for molecular karyotyping, allowing rapid and precise detection of genetic variation on a whole-genome scale at the level of a single nucleotide. The uses and limitations of array CGH (aCGH), SNP arrays and next generation sequencing for prenatal diagnosis will be presented, and future applications for these technologies, including third generation sequencing, will be discussed.

S13 Elderly in ER—An Emerging Epidemic

S13.1 Geriatric Emergency Care: What Evidence is There?

Juliana Poh

Department of Emergency Medicine, Singapore General Hospital, Singapore

Geriatric emergency medicine is an emerging subspecialty that is highly relevant to our practice today. However, is there enough evidence to guide us in best practices for the care of the elderly emergency department (ED) patient? Are we able to apply what we know in adult medicine to the care of elderly patients in ED? This lecture reviews some of

the current recommendations based on the existing studies of the elderly.

S13.2 Caring for Older Persons with Acute Emergency Presentation, A Sentinel Event

Ng Yuen Yen

Alexandra Hospital, Singapore

Not Available

S13.3 Geriatric Emergency Medicine Education: How to Introduce Training in Caring for Elderly Persons in the Busy Emergency Department

Vivian Siu

Chapter of Emergency Physicians, Singapore

The proportion of the aged in society today is greater than ever. Singapore's ageing population rose from 7% (2000) to 9% (2010) in a period of 10 years. It is projected to rise to 13% in 2020 and 19% in 2030. The number of elderly persons seeking care in emergency departments (EDs) is increasing due to this rise in the older population as the baby-boom generation ages. Some of the discernible healthcare issues faced by EDs with aged population include that of overcrowding, access block, and strained manpower. However, little attention is being paid to the special needs of elderly persons in ED. Emergency healthcare professionals feel less comfortable caring for elderly than for non-elderly patients. The social and personal concerns of the elderly frequently are not addressed in ED encounters. There is minimal education and training in geriatric emergency medicine.

Strategic planning has to be made to prepare all healthcare professionals to take on the challenge of the Silver Tsunami. In particular, the emergency healthcare professionals have to be educated in caring for elderly persons to meet their specific needs.

S14 Molecular Genetics

S14.1 Role of Chromosomal Microarray in Children

Angeline Lai

KK Women's and Children's Hospital, Singapore

Since chromosomes were identified in the 1960's, the ability to visualise the human genome has progressed tremendously.

In the 1970s and 1980s, banding techniques were developed, allowing identification of individual chromosomes and detection of chromosome imbalances larger than 3 to 5Mb. Development of fluorescence in-situ hybridization (FISH) in the 1990's led to the detection of microdeletion syndromes, such as Williams syndrome. In the last 10 years, array technologies have been developed, and are now widely used. These arrays, commonly referred to as chromosome microarray analysis (CMA), offer resolution of 50 to 500kb. The diagnostic yield of CMA in developmental delay/intellectual disability (DD/ID) is 15% to 20%, compared to 3.7% to 9.5% for standard karyotyping. In 2010, the American College of Medical Genetics (ACMG) recommended CMA as first-tier genetic testing, in place of standard karyotyping, for patients with unexplained DD/ID, autistic spectrum disorders (ASD) or multiple congenital anomalies (MCA).

CMA has been offered on a research basis in KK Women's and Children's Hospital since 2007. More than 300 patients with DD/ID, ASD and/or MCA have been tested, with approximately 25% found to have copy number variants (CNV) that are either pathogenic or likely pathogenic. The main challenge is the interpretation of the clinical significance of CNVs detected, as many CNVs are present in asymptomatic individuals. Our results are consistent with other studies showing that CMA is highly useful in the diagnostic workup of patients with DD/ID, ASD or MCA. Making a genetic diagnosis in these patients allows clinicians to provide appropriate anticipatory management and genetic counselling regarding recurrence risks.

S14.2 Biomarkers of Neonatal Infection and Necrotising Enterocolitis—The State of the Art Approach

Pak C Ng^{1,2}

¹Department of Paediatrics, Prince of Wales Hospital, Hong Kong

²The Chinese University of Hong Kong, Hong Kong

Despite advances in the management of preterm infants, neonatal infections and necrotising enterocolitis (NEC) remain important causes of neonatal morbidity and mortality. Over one-fifth (21%) of very low birth weight (VLBW) infants have at least one episode of late-onset culture-proven sepsis. These infants require prolonged hospital stay and have significantly higher chances of developing bronchopulmonary dysplasia and adverse neurodevelopmental complications during infancy and early childhood. Preterm infants with NEC also have 3-fold increased risks of mortality compared with those who did not have the disease. However, early clinical features of

infection and NEC are often subtle, non-specific and difficult to recognise. Further, non-infected infants such as those with apnoea of prematurity, acute exacerbation of chronic lung disease, functional gastrointestinal dysmotility and ileus are often clinically indistinguishable from infants who are in the early stages of sepsis or NEC. Hence, there is considerable interest in studying biomarkers of infection that can reliably differentiate between infected and non-infected infants. With increasing understanding of the inflammatory cascade of sepsis and rapid advances in diagnostic technologies, many potential infection markers have been investigated. We examine the research in this area and focus on major developments in recent years. Recent research has led to the discovery of cell surface antigens, chemokines, cytokines and acute phase proteins that can potentially be used to 'rule in' or 'rule out' neonatal sepsis and sinister intra-abdominal pathologies. The diagnostic values of key inflammatory mediators, including neutrophil CD64, IL-6, IL-10, and IP-10, are promising and likely to become increasingly used as biomarkers for diagnostic and prognostic purposes. It is unlikely that a single compound can possess all the characteristics of an 'ideal' diagnostic biomarker. Serial measurements and the use of combination of biomarkers have been reported to improve sensitivity and negative predictive value of these tests. Although current biomarkers are not infallible, judicious selection of a panel of mediators with complementary properties could greatly increase the ability of neonatal clinicians and microbiologists to diagnose infection and NEC, and discern valuable prognostic information. New techniques such as proteomic and nucleic acid studies may also be used to discover new inflammatory mediators for diagnosis of sepsis and NEC.

S14.3 Non-invasive Prenatal Testing (NIPT)—What the Clinicians Need to Know

George SH Yeo

College of Obstetricians and Gynaecologists, Singapore

Not Available

S15 Urology Symposium

S15.1 Recent Advances and New Concepts in the Pathogenesis, Diagnosis and Treatment of Urinary Tract Infections

Swaine Chen

Genome Institute of Singapore, Singapore

Urinary tract infections (UTIs) are exceedingly common infections, affecting mostly women. A subset of these women suffer from severe recurrent UTIs for which we have no effective treatment. I will discuss recent advances in our understanding of how *E. coli*, the most common causative agent of UTI, can persist in the urinary tract within epithelial cells themselves, avoid killing by antibiotics and the host immune system, and re-emerge to cause recurrent disease. I will also highlight additional lab studies that are elucidating how *E. coli* can survive intracellularly within the urinary tract and how we might be able to treat them, and thus provide the possibility of radical cure for recurrent UTI patients.

S15.2 Participating in Medtech: Opportunities and Pitfalls

Casey Chan

National University of Singapore, Singapore

Many technological advances in medicine and surgery often originate with doctors who encounter unsolved problems in their everyday medical practice. Surgeons in particular are in a unique position to identify and collaborate with technologists to solve some of these medical problems. This presentation will address the factors for successful clinical deployment. The medical device industry has gotten more complex in the last 10 years and there are many pitfalls in commercialising medical devices.

S16 Paediatrics & Child Health Symposium

S16.1 Recurrent Abdominal Pain in Children

Lee Way Seah

Department of Paediatrics, University Malaya Medical Center, Kuala Lumpur, Malaysia

Recurrent abdominal pain (RAP), a common gastrointestinal complaint in children, affects approximately 10% of school aged children and adolescents. Epidemiological studies have shown that its prevalence is similar in both the Western and Asian populations. It is more commonly seen in girls than in boys, and often there is a family history of RAP among first degree relatives. It is generally agreed that the complaint of pain made by children with RAP is genuine. There are no consensus with regard to aetiology, investigation and management of RAP. The original study by Apley suggested

that organic pathology cannot be identified in 90% of children with RAP. However, during the last half century, new diagnostic methods have contributed to improved knowledge of the pathophysiology of RAP. The constant challenge faced by paediatricians is one of detecting those with organic from the majority who have a functional pain disorder. The presence of RAP associated with other symptoms such as vomiting, dysphagia or heartburn, impaired growth, chronic diarrhoea should suggest about the possibility of an underlying organic disorder. A detailed history and systematic physical examination is important. Once an organic cause has been excluded, functional pain, which include functional dyspepsia, irritable bowel syndrome, functional abdominal pain and abdominal migraine, should be considered. New evidence suggests that emotional stress, visceral hyperalgesia and gastrointestinal motility disorders may play a vital role in its origin. Pharmacological treatments are commonly used to manage symptoms, but data supporting their efficacy, particularly in children, are lacking.

S16.2 Transient Adrenocortical Insufficiency of Prematurity (TAP) and Refractory Hypotension in Preterm Infants

Pak C Ng^{1,2}

¹Department of Paediatrics, Prince of Wales Hospital, Hong Kong

²The Chinese University of Hong Kong, Hong Kong

Systemic hypotension is a frequent complication of sick preterm infants. It is commonly associated with hypovolaemia, myocardial dysfunction, and vascular tone deficiency. Prompt and efficient treatment is essential because persistent low blood pressure has been shown to increase the risk of intraventricular haemorrhage, periventricular leukomalacia, and long-term neurodevelopmental sequelae. Conventionally, volume replacement with either crystalloids or colloids, and inotropic support with dopamine, dobutamine and/or adrenaline are the preferred treatments. However, recent reports suggest that a significant proportion of very low birth weight (VLBW) infants suffers from refractory hypotension that is resistant to both volume expansion and high dose inotrope treatment. These patients respond readily to corticosteroids, hydrocortisone or dexamethasone, suggesting that an inadequate hypothalamic-pituitary-adrenal (HPA) response to stress may be an important aetiological factor. The method of diagnosing TAP using serum cortisol will be discussed in the lecture. Recent studies suggest that a physiologic or stress dose (2 to 3 times physiologic dose) of hydrocortisone is effective in treating refractory

hypotension in VLBW infants. Although routine and prophylactic use of systemic corticosteroids could not be recommended because of their potential adverse effects, low-dose hydrocortisone would be preferable to high-dose dexamethasone for treatment of TAP in emergency and life-threatening situations.

S16.3 Approach to the Baby with Prolonged Jaundice

Marion M Aw

Children's Medical Institute, National University Hospital, Singapore

Prolonged neonatal jaundice is commonly encountered by doctors. Whilst the most common cause of persistent jaundice would be breast milk jaundice in breastfed infants, it would be important to screen them for evidence of concomitant pathological aetiologies.

A history suggestive of cholestasis (pale stools, dark coloured urine), or a clinically unwell child, should prompt immediate assessment. Even in the absence of these or abnormal physical findings, any infant older than 14 days of age, would warrant at least testing to determine if his jaundice was an unconjugated or conjugated hyperbilirubinaemia. In the breastfed infant, unconjugated jaundice may persist beyond a month. As long as this jaundice decreases with time, no intervention other than watch waiting is required. The approach to an infant with conjugated jaundice is completely different. Whilst the most common cause for conjugated jaundice is "neonatal hepatitis syndrome", (i.e. no specific aetiology), it would be important to look for biliary atresia, as this would require early surgical intervention. Other causes of cholestatic jaundice include urinary tract infection, endocrine and inborn errors of metabolism.

A number of genetic or inherited causes of jaundice can present in infancy. These include disorders of bilirubin metabolism that result in unconjugated hyperbilirubinaemia (e.g. Gilbert syndrome and Crigler-Najjar Type I and II) or conjugated hyperbilirubinaemia (e.g. Dubin-Johnson syndrome and Rotor syndrome). In addition, there is a group of inheritable conditions that result in progressive liver disease, known as the progressive familial intrahepatic cholestasis (PFIC) types 1, 2 and 3.

Index of First Author

Name	Page	Name	Page
Agrawal Aditya	S22	Ikshuvanam Swaminathan	S38
Alomari Ali	S33	Jones Steve	S44
Ang Chuan Han	S8	Kho Patricia	S43
Ang PK Leonard	S33	Koh Elisa	S41
Angeles Dario Cruz	S7	Koh WB Kelvin	S35
Anil Gopinathan	S27	Koh Woon Puay	S38
Aw M Marion	S49	Kua Jade	S25
Azucena Benedict Cesar	S32	Kumar S Krishna	S30
Bailey Sue	S37	Kumaran Arjunan	S16
Basilio Pamela	S14	Kwok Kah Foo Victor	S11
Black David	S42	Lai Angeline	S46
Borja Annamarie	S11	Lau Benedict	S30
Borja Annamarie	S12	Lee Grace	S44
Buhat Donna Mae Lyn	S19	Lee Way Seah	S48
Cai Elijah Zhengyang	S6	Lek Siang Pheng	S37
Chan Casey	S48	Leung Tak Yeung	S45
Chan Gek Cher	S7	Li KT Donald	S35
Chan Ming Chun	S18	Liew J R Perry	S19
Chee Michael	S35	Lim Leslie	S37
Chen Swaine	S47	Lim Su Chi	S1
Cheung Gemmy	S45	Mat JaisIta Suzana	S22
Chew Daniel	S16	Mat JaisIta Suzana	S23
Chia Claramae S	S9	Milevska Kostova Neda	S34
Chian Myau Soon	S23	Ng C Y Deborah	S12
Chiang Shu Min Brenda	S3	Ng Ebonne	S20
Chin Jing Jih	S37	Ng Huck Hui	S1
Chong Chester Lun Yin	S13	Ng WM Josephine	S39
Chong Chester Lun Yin	S17	Ng Kia Min	S5
Chong Eric	S26	Ng Raymond	S13
Chong Eric	S31	Ng Yuen Yen	S46
Chong Siow Ann	S36	Nguyen Thien Khanh	S24
Choolani Mahesh	S46	Nordin Abdul Jalil	S43
Chow Pierce	S36	Ong Lisa Helen	S20
Chua Terrance	S44	Ong Sean	S24
Chung Sungmin	S40	Ooi SH Adrian	S9
Dewhurst Graeme	S42	Pahor Marco	S28
Dewhurst Neil G	S1	Paing Swe Swe Thet	S4
Eu Wencong Ernest	S15	Pak C	S47
Fua Tzay Ping	S34	Pak C	S48
Gopalai Aroma Agape	S25	Parmalingam Prathika	S3
Heng Xiao Wei	S7	Poh Juliana	S46
Hoe K M Jeremy	S20	Poon TP Ronnie	S44

Name	Page	Name	Page
Pow Edmond	S39	Teo Boon Wee	S28
Ramli Roszalina	S40	Teo Jin Yao	S26
Ramli Roszalina	S41	Teo Suat Lay	S19
Rowe Emily	S42	Teo Suat Lay Shirley	S3
Saad Marniza	S39	Thong Jiun Fong	S9
Sanamandra Sarat Kumar	S30	Toh Keng Kiat	S31
Sean Phospiseth	S4	Toh Qi Chun	S18
Seow Liang Lin	S41	V Tamilselvi	S27
Shum Eugene	S35	Wang Weining	S21
Siu Vivian	S46	Wansaicheong Gervais Khin Lin	S38
Stebbings Amy	S32	Win Hlaing Hlaing	S15
Tambyah Paul	S42	Wong Li Ying	S12
Tan Bien Peng	S43	Wong Mark	S33
Tan Chi Chiu	S36	Woo Jia Wei	S16
Tan Chong Tian	S2	Yan Yet Yen	S14
Tan Khai Tong	S29	Yang Cunli	S11
Tan Rosemary	S27	Yeo SH George	S47
Tay Andrew	S40	Yeoh Swee Choo	S36
Tay Gerald	S21	Yin Win Htet	S17
Tay Gerald	S22	Yu SH Victoria SH	S41
Tay Gerald	S24	Zhao Runfeng	S23