

Poster Presentation Abstracts – Day One

I/II – Day One/Day Two; xxx – Poster Board Number; GP: General Practice; MP – Medicine/Paediatrics; NUR – Nursing; PD – Paramedical Disciplines; SOGD – Surgery/Obstetrics & Gynaecology/Dentistry

1001/GP

State of Health of Community-Dwelling Elderly in Singapore – The Challenges Ahead

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Aim: To assess the state of and identify the health issues facing community-dwelling elderly in Singapore.

Methods: 1954 households were randomly selected in Toa Payoh Central, a matured housing estate with approximately 9000 households and an elderly prevalence of 11%. 1092 households (47%) were without elderly and a 1-step replacement was performed. A total of 231 households and 265 elderly participated, with 229 households declining participation, giving a household response rate of 50.2%. The study was conducted by a team of medical students in the elderly's homes. Elderly were administered a questionnaire which included basic activities of daily living (ADL, using Barthel Index), instrumental ADL, living conditions, social and medical history. Physical measurement taken includes height, weight, blood pressure, timed 'Up and Go', and mental state examination.

Results: Subjects' mean age was 72.7 ± 6.1 years. The elderly were mostly women (57.0%) and had less than 7 years of education (77.7%). Only 10.6% lived alone. Most were ADL independent (72.5%; 95% CI 67.1-77.9), and urinary incontinence and ability to climb stairs were the commonest function affected. Instrumental ADL independence was 62.6% (95% CI 56.8-68.4). Fifty percent of the elderly had Body Mass Index (BMI) ≥ 23 . The commonest chronic conditions affecting the elderly were hypertension (58.6%), arthritis (45.5%) and diabetes mellitus (23.5%).

Conclusion: While elderly studied were mostly functionally independent, the high BMI and high prevalence of lifestyle diseases like diabetes and hypertension relative to available data of elderly in other countries, will pose an enormous challenge ahead.

1002/GP

Improved Molecular Diagnostic Assays for Common Non-deletional Southeast Asian α - and β -Thalassaemia Mutations

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Aim: The thalassaemias are the most common monogenic disorders in the world, and are endemic to Southeast Asia. We previously developed a multiplex-minisequencing strategy to screen for the common nondeletional α - and β -thalassaemia mutations. Although faster and less laborious than other methods, reagent usage was high and one of the mutations (D619bp) required separate agarose gel analysis. We now describe an improved assay.

Methods: PCR amplifications were performed as described previously. Multiplex-minisequencing was performed in a total reaction volume of 2 ml. Minisequencing primers were designed to anneal next to each mutation site, and comprised a total of 7 common α -thalassaemia mutations (codon 0D1bp, Constant Spring, Paks, Quong Sze, Suan Dok, codon 30D3bp, codon 59) and 16 common β -thalassaemia mutations (Panel I: codon 41/42, IVSII nt654, IVS1 nt5, codon 17, -28, -29, codon 71/72, codon 26; Panel II: IVSInt1, codon 19, codon 0, codon 43, codon 27/28, codon 8/9, codon 35, and D619bp). Products were subjected to capillary electrophoresis on an ABI PRISM[®]3100, and analysed using GeneScan[™] and Genotyper[™]3.7 software.

Results: All mutations in all homozygous wild-type, homozygous mutant, heterozygous, and compound heterozygous samples were correctly identified using the ABI 3100. The results obtained were indistinguishable from those using the old protocol.

Conclusion: We have developed an improved, simpler and less expensive thalassaemia molecular screening assay based on multiplex-minisequencing and capillary electrophoresis. The 5-fold reduction in reagent usage resulted in a 47% reduction in per sample test costs (SGD10 vs SGD17.50) excluding manpower. The use of a single test platform for screening all mutations further simplified test procedure and reduced manpower utilisation.

1003/MP

Effective Protective Measures for Healthcare Workers in an Intensive Care Unit Dedicated for Patients With Severe Acute Respiratory Syndrome (SARS)

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Aim: A retrospective study to document the number of healthcare workers (HCW) developing severe acute respiratory syndrome (SARS) after the implementation of protective measures in an intensive care unit dedicated for patients with SARS.

Methods: Data was collected for the period of 17 March to 27 April 2003. The diagnosis of SARS was made by Infectious Disease Specialist using prevailing case definitions recommended by the World Health Organisation. The exposure risk of all the HCW in the ICU were evaluated in terms of working hours and procedures performed on patients. The protective measures were strictly applied for all HCW through organised training and regular checks. Surveillance of the staff (and their families) developing illness was effective through a centralised disease screening and reporting system.

Results: During the study period, a total of 230 HCW worked in the SARS ICU, during which 42 patients with probable SARS were progressively admitted, resulting in daily occupancies ranging from 1 to 21. One of the patients was admitted on 12 March 2003, prior to the recognition of the syndrome and the full implementation of protective measures. 19 HCW developed SARS through unprotected contact with her. Subsequent to the implementation of the protective measures, no other ICU HCW developed SARS for a period of 52 days.

Conclusion: The data in this paper demonstrated the effectiveness of the protective measures practiced in a SARS ICU. However, persistent personal vigilance in proper practice for these measures a crucial factor in its continued effectiveness.

1004/MP

The Effect of Clozapine on Brain-derived Neurotrophic Factor Distribution in the Rat Brain

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Aim: The aim of this study is to investigate the effects of acute clozapine treatment on the pattern and intensity of BDNF immunoreactivity in the rat brain, and hence the effects of D4-receptor blockade on this important neurotrophin.

Methods: A cohort design using adult Wister rats was used. At the end of the experimental period, the animals were sacrificed, transcardiac perfusion of their brains carried out, followed by removal and cryoprotection. Immunological procedures using polyclonal rabbit anti-BDNF antiserum and biotinylated goat anti-rabbit antibody were carried out. Finally, the specimens were treated with Avidin-Biotin complex and Diaminobenzidine, mounted on slides and examined under light microscopy.

Results: The results of this study show that acute blockade of the dopamine D4-receptor with clozapine exerts dramatic effects on BDNF immunoreactivity in the mesolimbic pathway and its' target regions. There was also reduced immunolabelling in the cell bodies in the extended amygdala, hippocampus, midbrain and parts of the limbic cortex after clozapine treatment.

Conclusion: The primary findings in this study show the ability of dopamine D4-receptor blockade to regulate the production of BDNF. Clozapine's effect on BDNF expression via the D4-receptors most likely contributes to its effectiveness as an antipsychotic agent, whether directly or indirectly via other neurotransmitters or second messenger systems. This may explain why it is effective in the treatment of refractory schizophrenics, who do respond to conventional D2-receptor blockade.

I005/MP**Nuclear Cardiology as the Gatekeeper – Utilisation Patterns in National University Hospital**

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Aim: Nuclear cardiology is recognised as a valuable tool for cardiac risk-stratification. The utilisation patterns of the technique in Southeast Asia have not been previously reported. Also, the prognostic value of a normal Tc-99m tetrofosmin SPECT scan in a large Asian population has not been well established.

Methods: A consecutive series of 4512 patients underwent stress Tc-99m tetrofosmin SPECT imaging over 3 years (April 1999 to July 2002) at the National University Hospital, Singapore. Uniform methods of data collection and standardised epidemiology methods for follow-up were employed. Follow-up was complete in 91% of patients.

Results: The average age was 60 years; 2585 (57%) were male. 60% had exercise stress testing. 2899 (64%) had a normal stress scan. 11 (0.004%) of these patients with normal scans underwent angiography within 3 months of the index myocardial perfusion imaging (MPI) study, of which 8 had significant lesions. At 12 months of follow-up, 0.5% of patients with a normal scan had experienced a cardiac event (myocardial infarction/cardiac death). 1613 patients had abnormal scans, of which 137 underwent angiography within 3 months after the index study. Patients with abnormal scans ($n = 766$) did not undergo angiography for the following reasons: small defect (22%); patient-request for medical therapy only (22%); elderly (12%); concomitant renal impairment (11%).

Conclusion: 1) The negative predictive value of a normal Tc-tetrofosmin stress-test in this Asian population was very high and conferred excellent cardiac prognosis. 2) The technique is utilised by physicians for cardiac risk-stratification in both patients with newly-diagnosed and established coronary artery disease.

I006/MP**Prevalence of Mitral Regurgitation Following ST-Elevation MI in Patients Treated with PPCI Compared to Thrombolytic Therapy**

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Aim: The presence of mitral regurgitation (MR) post ST-elevation myocardial infarction (STEMI) is associated with a poorer prognosis. We wish to examine if primary percutaneous intervention (PPCI) has any effect on the prevalence of MR compared to thrombolytic therapy.

Methods: We studied 402 consecutive patients admitted to our institution with a diagnosis of first STEMI from August 2001 to May 2003. MR was classified semi-quantitatively on transthoracic echocardiography into none, mild, moderate or severe. Those with mitral valve prolapse were excluded.

Results: The site of STEMI was anterior in 239 patients (59.5%) and 161 (40%) had PPCI while 160 (40%) received thrombolytic therapy; the remainder had conservative treatment. Median time of echocardiography was 3 days post STEMI. MR was more common and severe ($p = 0.0008$, $p = 0.04$) in inferior STEMI as out of 163 patients, it was mild in 85 (52%), moderate in 12 (7%) and severe in 1 (1%) patients. In 239 patients with an anterior STEMI it was mild in 95 (40%) and moderate in 8 (3%). There were no differences in the prevalence of MR regardless of therapy given. Patients with MR had a poorer ejection fraction (EF) (43% vs 46%, $p = 0.029$) but no differences in the creatinine kinase (CK), CK-Mb or Troponin-T.

Conclusion: MR is more common in inferior STEMI but the prevalence post STEMI is not reduced by choice of therapy. MR appears to be associated with a poorer EF, this may explain the poorer prognosis seen in other studies.

I007/MP**Predictors of Early- and Long-Term Mortality for Patients Undergoing Modern Primary Angioplasty for AMI**

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Aim: Primary percutaneous coronary intervention (PPCI) has been shown to be an effective and superior reperfusion therapy for patients with acute myocardial infarction (AMI). The strategy has undergone dramatic evolution with the introduction of coronary stent, adjunctive glycoprotein (GP) IIb/IIIa

inhibitor and thrombectomy devices. The goal of this study is to examine the outcomes of PPCI and to identify risk factors for early- and long-term mortality.

Methods: Our institution's angioplasty database was used to identify patients who underwent PPCI within 6 hours of AMI without antecedent fibrinolytic therapy. From January 1997 to June 2002, a total of 216 consecutive and unselected patients who underwent PPCI were analysed for this study. Multivariate analyses were performed to identify significant risk factors for short- and long-term survival.

Results: The patient cohort comprised 85% males and the mean age of all patients was 56.2 ± 12.2 years. Diabetes mellitus was a risk factor in 29%. The types of PPCI procedure carried out were: coronary stenting in 99%, adjunctive use of GPIIb/IIIa in 41%, thrombectomy in 18% and distal protection device 0.5%. Cardiogenic shock was present in 21 (10%) patients. The in-hospital mortality rate for all PPCI patients was 10.7% (95% CI 6.8%, 15.5%). This rate dropped to 5.4% (95% CI 2.7%, 9.4%) when deceased patients with pre-procedural cardiogenic shock were excluded. Cumulative mortality rates for all patients at 6 months and 1 year were 12.0% (95% CI 8.0%, 17.1%) and 13.0% (95% CI 8.8%, 18.2%), respectively. Recurrent cardiac events (angina, reinfarction and congestive cardiac failure) rate at 6 months and 1 year were 20.3% (95% CI 14.7%, 27.0%) and 26.1% (95% CI 17.3%, 38.2%), respectively; and repeat revascularisation rates were 7.9% (95% CI 4.4%, 12.9%) and 10% (95% CI 4.9%, 19.1%), respectively. Multivariate analyses identified age (>75 years) and triple-vessel coronary artery disease as significant predictors of early and late mortality. Neither gender nor diabetes mellitus was predictors of outcomes.

Conclusion: Primary PCI is a highly effective treatment strategy for AMI. Adverse cardiac events tend to occur early within 6 months and diminish at 1 year. Old age and multi-vessel coronary artery disease are predictors of poor outcomes.

I008/MP**Evaluation of Occlusive Balloon Distal Protection Device For Prevention of Distal Embolisation During PCI**

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Aim: Embolisation of atherothrombotic debris during percutaneous coronary intervention (PCI) is associated with significant increase in periprocedural major adverse cardiac events (MACE). We evaluate the safety and effectiveness of an occlusive distal protection balloon (GuardWire Plus) designed to retrieve plaque material dislodged during PCI in preventing distal embolisation.

Methods: Between June 2001 and March 2003, GuardWire device was employed in 44 patients undergoing PCI in our centre. The procedure was performed in native coronary arteries ($n = 39$) and degenerated saphenous vein grafts (SVGs) ($n = 5$) in patients with ST-elevation MI (36%), unstable angina/non-ST elevation MI (50%) and stable angina (14%). The study endpoints were clinical efficacy of the device and MACE during in-hospital and at 30 days.

Results: The patient cohort comprises 86% male with a mean age of 54 ± 10 years. The mean lesion length was 15.7 ± 6.0 mm and thrombus was present in 75%. Coronary stenting was performed in 100% of cases. Glycoprotein IIb/IIIa inhibitors were administered in 14/44 (32%) patients. The GuardWire device was successfully deployed and retrieved in all patients. The pre-PCI flow (57% TIMI 0-1) was improved procedurally (95% TIMI 3) with the device. The in-hospital MACEs were: 2/44 (4.5%) nonQ-MI, 1/44 (2.3%) stroke and 0/44 (0%) death. Device complications include: coronary perforation in 2/44 (4.5%), distal thromboembolism 1/44 (2.3%) and vascular complications 2/44 (4.5%). At 1 month, there was 1 death but no recurrent MI or repeat revascularisation.

Conclusion: This preliminary experience indicated that the GuardWire system is safe and effective in reducing atheroembolism during PCI in native coronary vessels and SVGs. The MACE rates appear to compare favourably with published data.

I009/MP**MI in Young Adults: Comparative Analysis of Risk Factor Control**

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Aim: This study compares the quality of care of hypertension, diabetes and dyslipidaemia between young (defined as age <45 years) and older patients with acute myocardial infarction (AMI).

Methods: 1867 patients were admitted to the National University Hospital with AMI from 2000 to 2002. We compared the proportion of patients with known but untreated risk factors prior to MI in those <45 years old (n = 235) and those ≥45 years old (n = 1632).

Results: 30% of those <45 years old with hypertension were untreated prior to admission compared to only 10% in those ≥45 years old; odds ratio (OR) 4.0 (2.4-6.5)*. 13% of known diabetics <45 years old were not on treatment compared to only 5% (30/659) in those ≥45 years old; OR 2.7 (1.1-6.9)*. 30% of known dyslipidaemics <45 years old were not on treatment compared to 12% of those ≥45 years old; OR 2.9 (1.6-5.2)*.

* adjusted for previous episode of MI which was 6% (<45 years) vs 17% (≥45 years); P was <0.0001 for all comparisons.

The 28-day mortality was 10% (24/235) for <45 years old vs 19% (315/1632) for ≥45 years old (odds ratio 2.1, 95% CI 1.7-4.0, p = 0.0005).

Conclusion: Control of the 3 major risk factors was uniformly and significantly poorer in those <45 years old. Singaporean males serving national service undergo a mandatory comprehensive health screening at the age of 35 years old. This provides an important opportunity for coronary disease prevention as 90% of patients under 45 years old were male.

1010/MP

Simple Echocardiographic Doppler Variables that will Predict Tricuspid Regurgitation Severity

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Aim: Currently, there is no simple reliable method for assessment of tricuspid regurgitation (TR) severity. We evaluated the utility of simple, easily derived Doppler of right ventricular filling variables to measure TR severity.

Methods: A prospective analysis of 44 consecutive patients with TR, classified into mild, moderate or severe by echocardiographic evaluation using colour Doppler. Tricuspid inflow Doppler variables of peak E wave velocity, peak A wave velocity, E/A ratio, E wave deceleration time, and the right ventricle tissue Doppler variables of E' velocity, A' velocity, E'/A' ratio and systolic velocity were analysed.

Results: Severity of TR was associated with an increase in the peak E wave velocity (p < 0.001) and E/A ratio (p < 0.001), a decrease in E wave deceleration time (p < 0.001). The right ventricular tissue Doppler variables showed a decrease in A' velocity (p < 0.001), an increase in the E'/A' ratio (p = 0.0026) and the E/E' ratio increases in proportion to TR severity (p < 0.001). Severe TR can be identified with a peak E wave velocity > 0.7 m/s (sensitivity 100%, specificity 100%), E/A ratio > 2.5 (sensitivity 94%, specificity 100%), E wave deceleration time < 160ms (sensitivity 100%, specificity 92%) and E/E' ratio > 7 (sensitivity 89%, specificity 100%).

Conclusion: Tricuspid inflow Doppler and right ventricular tissue Doppler variables are easily obtainable and useful in the evaluation of tricuspid regurgitation severity. Peak E wave velocity of > 0.7 m/s is the best predictor of severe TR.

1011/MP

Prevalence of Emotional Symptoms and the Risk of Violence in Adolescents with Psychosis and Schizophrenia

Say How ONG

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Aim: Psychotic illness in adolescents are relatively rare compared to other psychiatric diagnoses. The relationship of emotional symptoms such as anxiety, depression and obsessive compulsive disorder (OCD) with childhood psychosis is not very much known. This study attempts to examine this and assess the risk of violence and suicide ideations among these adolescents.

Methods: Adolescents (n = 13) who had been admitted to the Child and Adolescent Inpatient Unit of Woodbridge Hospital in year 2002 to 2003 were screened for psychosis and schizophrenia. The diagnosis must satisfy both the DSM-IV Criteria and K-SADS. A similar group of adolescents (n = 18) with the diagnoses of anxiety, depression or OCD was used as a control group.

All parents were given the Child Behaviour Checklist (CBCL) while the adolescents filled self-reported questionnaires on anxiety (MASC and SASC-R), depression (CDI) and suicide ideations (SIQ). The clinicians assessed their functioning using GAF scale and risk of violence with SAVRY.

Results: The subjects have a poorer GAF score with a mean of 47.31 ± 7.85 vs 58.06 ± 10.82 (p < 0.05) for control group. The 2 groups do not differ in their anxiety scores though the control group have a higher raw score in their negative self evaluation (p < 0.05). The subjects and controls do not differ in their score for suicidal ideations and risk of violence.

Conclusion: This study suggests that psychotic teenagers are not less vulnerable to emotional symptoms such as anxiety. Both groups do not differ in their suicide ideations. Adolescents with psychosis and schizophrenia are no more prone to violence than their anxious or depressed counterparts. Clinicians should pay more attention to the emotional symptoms of psychotic adolescents.

1012/MP

A Preliminary Description of Children with Attention Deficit Hyperactivity Disorder (ADHD) in Singapore

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Aim: ADHD is the most common diagnosis in the Child Guidance Clinic, the main child mental health facility in Singapore. This study aims to develop a systematic assessment procedure for ADHD in a mental health facility in Singapore.

Methods: A total of 27 children with a clinical diagnosis of ADHD were invited to participate in this study. Parents were administered the Child Behavior Checklist for Children, the SNAP (SWANSON) scale, the ADHD Rating Scale-IV and the Diagnostic Interview Schedule for Children-IV. School teachers were given the Teacher Report Form to complete. The children were assessed using the Wechsler Intelligence Scale for Children-III, the British Picture Vocabulary Scale-II, the Neale Analysis of Reading Ability-II, the Wide Range Achievement Test-3, as well as the Conner's Continuous Performance Test-II.

Results: General screening measures were not useful in identifying ADHD compared to using specific screening tests. The CPT-II was able to predict ADHD in only about half of the cases. More than 80% of the cases also met criteria for ADHD using the DISC IV, suggesting that clinical diagnoses closely correlated with a structured interview of parents. The overwhelming majority of children had average and above average intelligence and less than 25% had evidence of learning disabilities. Among co-morbid conditions, oppositional defiant disorder was present in about 50% of cases although none of them fulfilled criteria for conduct disorder.

Conclusion: ADHD is a distinct diagnostic entity in Singapore. More studies are needed to understand this group of children.

1013/MP

Bedside Fiberoptic Bronchoscopy is a Safe Procedure if Done in the Paediatric Intensive Care Unit under Conscious Sedation

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Aim: Bedside fiberoptic bronchoscopy is a valuable tool in the diagnosis and treatment of various respiratory conditions in critically ill patients. This procedure is performed in our paediatric intensive care unit under conscious sedation. We examined complications that occurred during this procedure.

Methods: We retrospectively reviewed 107 procedures performed on 48 patients between March 2000 and November 2001. All patients were continuously monitored with cardiorespiratory and pulse oximetry monitors. Patients either received blow-by aerosolised oxygen or positive pressure ventilation via an endotracheal tube. The flexible bronchoscope used was the Olympus fiberoptic bronchoscope (model no. BFXP40) with a 2.8-mm outer diameter.

Results: The median age of the patients was 29 months (range 1 to 306 months). 55% (n = 59) of the procedures were done via the endotracheal tube, 40% (n = 43) were performed transnasally while 5% (n = 5) were done via a tracheostomy. The commonest complication was transient desaturation during the procedure. Only 6 patients (5.6%) developed transient desaturation. These patients responded to bag and mask ventilation if they were not

intubated. Those on the ventilator required transient increase in ventilator settings. 1 patient developed haemorrhage from the inflamed mucosa after suctioning. 1 patient developed transient post-procedure stridor secondary to laryngeal oedema. The remaining 2 patients had complications from sedation rather than the procedure.

Conclusion: Bedside flexible fiberoptic bronchoscopy under intravenous conscious sedation in children in the paediatric intensive care unit is safe. Complications are uncommon and if they occur, they are easily corrected. Proper monitoring and trained personnel are however important to avoid potential complications.

I014/MP

Can Histopathological Features of Breast Carcinoma Alone, Independent of Lymph Node Status, Predict a Positive Bone Scan Yield?

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Aim: To improve cost-effectiveness, some recommend staging bone scintigraphy be performed in breast cancer of higher TNM stages only. Sentinel lymph node mapping and associated surgical management impact upon these recommendations and ultimately, upon when to perform bone scintigraphy. We aim to confirm a direct positive correlation between histological grading and bone scan results, and ascertain if predictability of a positive yield of bone scintigraphy can be determined by assessment of histopathological grading of the primary tumour alone.

Methods: 120 consecutive staging bone scans for breast carcinoma were categorised as 'no metastases' or 'definite skeletal metastases' without knowledge of histopathological grading. 'Possible metastases' results were correlated with other prior/follow-up imaging and/or clinically and recategorised into either the 'no metastases' or 'definite metastases' group. Post-mastectomy histopathologic grading (the Bloom-Richardson system for infiltrative/invasive tumours and nuclear grading for in-situ tumours) was correlated with bone scan results and axillary lymph node status. Bone scan results was correlated with nodal status and size of tumour.

Results: a) Higher histopathological grading correlates with bone scan positivity, b) Positive axillary lymph node status correlates bone scan positivity, c) Histopathological grading does not predict with lymph node positivity, and d) Size of primary tumour does not predict bone scan positivity.

Conclusion: Higher histopathological grading and positive nodal status independently correlate with bone scan positivity. Grade 3 is most likely to have a positive bone scan. Histopathological grading is a better predictor than tumour size. The importance of this study lies in assisting clinical decision for bone scanning in breast carcinoma staging.

I015/MP

Therapeutic Drug Monitoring of Low-dose Paclitaxel as Radiation Sensitizer in Human Plasma Using Highly Sensitive Reversed-phase High-performance Liquid Chromatography

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Aim: Recently, there is growing interest in using paclitaxel as a radiation sensitizer. The increased cell radiosensitivity with exposure to paclitaxel is evident at drug levels much lower than the concentrations required for cytotoxic effects. In this case, the current available HPLC-UV methods would be not sensitive enough to measure all the levels of paclitaxel in patients' plasma. In this study, a highly sensitive HPLC-UV method was developed and validated.

Methods: Paclitaxel concentrations were quantified using 0.5 ml of human plasma with docetaxel as the internal standard. The sample purification was carried out through solid-phase extraction. Good chromatographic separations were achieved using a Nova-Pak C18 column (3.9 mm, 300 mm, 4 mm). The optimised mobile phase consisted of methanol and phosphoric acid solution (pH = 2.6) (70:30). Paclitaxel and internal standard were eluted with retention times of 9.5 and 11.2 min, respectively.

Results: An excellent linearity was achieved over the range of 5 to 200 ng/ml with a mean correlation coefficient (r²) of 0.9993. The limit of detection was 2 ng/ml. The accuracy (deviation) was within 12% for all quality control samples, and the precision (RSD) varied from 1.4% to 9.8%. This highly sensitive HPLC-UV method was further confirmed using tandem LC-MS assay which is 10 fold more sensitive than HPLC-UV.

Conclusion: The method has been successfully applied to determine all plasma samples with the lowest concentration of 6.8 ng/ml from phase II study of intensified concurrent chemotherapy (paclitaxel 20 mg/m²/day) and conventional radiotherapy in the treatment of locally advanced nasopharyngeal carcinoma.

I016/MP

Aneurysm Detection on Magnetic Resonance Imaging

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Aim: The 3 Tesla (T) magnetic resonance (MR) scanners yield improved signal to noise ratio and spatial resolution compared to the 1.5 T scanners. The improved resolution potentially enables MR angiography (MRA) at 3T to rival catheter angiography for evaluation of intracranial vasculature. We report our initial experience with unenhanced 3D time-of-flight (TOF) MRA in the detection of unruptured intracranial aneurysms.

Methods: From an eligible population of 850 patients who underwent unenhanced 3D TOF MRA on a 3 T MR scanner, 10 patients with unruptured intracranial aneurysms were retrospectively identified. Seven patients underwent catheter angiography and 2 patients had previous 1.5 T MRA for comparison. The aneurysms were assessed for size, location and morphology.

Results: There were 10 patients with 11 aneurysms ranging in size from 1 mm to 11 mm, with 7 of these being cavernous carotid aneurysms. Catheter angiographic correlation showed good anatomical correlation with the 3D TOF MRA findings in 7 patients. Comparison of the 2 cases with 1.5 T and 3 T MRA showed superior spatial resolution on the 3 T images.

Conclusion: Our experience suggests that with careful visualisation of a 3D TOF MRA at 3 T, even without intravenous contrast, aneurysms down to the size of 1 mm can be detected on the reformatted images with confirmation provided by the source images. This appears to be a suitable non-invasive method of monitoring patients with aneurysms under conservative management.

I017/MP

Neurogenetics and Neuroimaging in Early Alzheimer's Disease.

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Aim: Alzheimer's disease (AD) accounts for more than 40% of dementias in the elderly. Clinical manifestation of AD may be subtle. Early diagnosis is difficult but crucial, to enable early drug intervention and improved prognosis. We applied MR volumetry techniques for the hippocampus, and evaluated for the presence of the apolipoprotein E (ApoE) genotype, a risk factor for AD, to detect the early changes of disease.

Methods: From 103 eligible AD patients, 16 with early AD were recruited. All AD patients were evaluated on the NINCDS-ADRDA criteria, with staging of dementia severity by the Clinical Dementia Rating (CDR) scale. Only those with CDR 0.5–1 (the early stage) and normal unenhanced CT were recruited. 29 normal age-matched controls were also enrolled. All subjects had MR imaging on a 1.5T system, with axial T2W scans to exclude vascular dementia and 3D coronal T1W-SPGR scans for quantitative neuroimaging. Volumetry was performed on BrainVoyager software. All subjects had ApoE typing performed.

Results: Hippocampal volumes in our AD patients were significantly lower than in controls (p < 0.001), despite the clinical early stage of disease by the CDR scale. There were significantly more subjects with positive ApoE amongst the AD group than normals (p = 0.045). Presence of the ApoE genotype was associated with smaller hippocampal volumes in AD subjects.

Conclusion: MR volumetry can detect the subtle changes of hippocampal atrophy in early AD patients. This is associated with presence of the ApoE genotype. Genotypic expression of the ApoE gene results in structural volume reduction on neuroimaging.

I018/MP

Childhood Accidents and Injuries – 1 Year Experience in Children's Emergency

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Aim: To study the details and associated risk factors of childhood accidents and injuries.

Methods: Children (<16 years) with accidents and injuries from 1 February 2002 to 31 January 2003 were studied.

Results: 17032 children were included. 26.8% had accidental injuries and 72.7% without (mean age 7.6 ± 4.6 and 5.2 ± 4.5 years, respectively, $p < 0.001$). 83.6% of the accidents were physical injury (45.2% at home, 17.4% during sports, 12.4% in school, 10.3% in public area and 9.5% in the playground). Other accidents include ENT and GIT foreign body, burns, bites, inhalation injury, near-drowning and poisoning. The commonest diagnoses were scalp and facial injuries (41.0%), limbs fractures (25.1%) and minor injury of the limbs and trunk (25.1%). 60.9% of the playground injuries were fractures, OR 8.7 (95% CI 6.8–11.2, $p < 0.001$) when compared to those at home. Monkey bars were significantly associated with playground fractures (49.5%, χ^2 test, $p < 0.001$). 37.3% of home injuries were head injury, OR 8.3 (95% CI 6.3–11.1, $p < 0.001$) when compared to sports injury. 65.9% of the infants sustained head injury, OR 20.8 (95% CI 13.9–31.3, $p < 0.001$) when compared to teenagers. 94.1% of the infants and 78.4% of the preschoolers had physical injury at home, and 48.9% of the teenagers had sports injury.

Conclusion: Accidents and injuries are common presentations at Children's Emergency. There are certain associated risk factors important in identifying those at risk. The study will help to design measures to prevent such accidents and injuries.

*I019/MP

Depression in Dementia: A Comparative and Validation Study of Four Brief Scales in the Elderly Chinese

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Aim: The study aimed to determine: (i) the diagnostic accuracy of 4 brief depression scales, the Geriatric Depression Scale (GDS), Even Briefer Assessment Scale for Depression (EBAS DEP), Single Question and Cornell Scale for Depression in Dementia (Cornell) in an elderly Chinese population with varying dementia severity, and (ii) which scale had the best diagnostic performance.

Methods: All 4 scales were administered to 88 elderly outpatients with dementia; 66 without and 22 with depression. Receiver Operating Characteristic (ROC) analysis was used to establish the optimal cut-off scores of the GDS, EBAS DEP and Cornell scales. The patients' dementia-severity was categorised into mild and moderate-severe dementia, and the above analysis was repeated in these groups to look at changes in the scales' diagnostic performance as dementia advances.

Results: The best diagnostic scale for detecting depression in dementia was the Cornell scale. Its optimal cut-off score was 6/7 (sensitivity 91.7%, specificity 80.0%) in the mild dementia group and 12/13 (sensitivity 70.0%, specificity 87.0%) in the more advanced dementia group. The optimal cut-off scores of the GDS and EBAS DEP were also higher in the more advanced than the mild dementia group, indicating the increasing difficulty to detect depression with worsening cognitive impairment. The Single Question, being more robust, had lesser changes in its diagnostic parameters in both dementia cohorts: sensitivity 58.3%, specificity 90.0% for mild dementia,

and 60.0% and 84.8%, respectively, for more advanced dementia.

Conclusion: An efficient strategy to diagnose depression in dementia amongst elderly Chinese patients is to first administering the Single Question followed by, when needed, the Cornell scale.

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I020/MP

Findings in the Initial Chest Radiographs Patients with SARS

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Aim: SARS is a new infectious disease caused by a novel coronavirus. Chest radiographs are a crucial part of the initial evaluation of patients that could have SARS. We reviewed the initial chest radiographs from the patients diagnosed as probable SARS.

Methods: The initial chest radiographs from the first consecutive 37 patients diagnosed as probable SARS were reviewed. The films were read independently by 2 radiologists and the findings were tabulated.

Results: Abnormalities were found in 33 patients (89.2%). Unilateral (Right: 46.6%, Left: 10.8%) involvement was more common than bilateral involvement (29.7%). The findings were more common in the lower zone (Lower: 27/33), and in the periphery of the lung. (Peripheral: 32.4%, Central: 18.9%; Both central and peripheral: 37.8%). Ground-glass change was more common (67.6%) than consolidation (16.2%) or a combination of both (5.4%). There was no pleural effusions, masses, cavitation or hilar enlargement.

Conclusion: The chest radiograph findings are not specific and may be subtle. The combination of features in a patient with an appropriate clinical presentation is however suggestive of diagnosis of SARS. These findings are distinct from other common conditions such as pulmonary tuberculosis and classic lobar pneumonia.

I021/MP

Findings in the Initial Chest Radiographs in ICU Patients with SARS

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Aim: Severe acute respiratory syndrome (SARS) is a new infectious disease caused by a novel coronavirus. It progresses to severe acute respiratory distress in a minority of patients. In Tan Tock Seng Hospital, about 20% of patients with SARS required treatment in the Intensive Care Unit (ICU). Chest radiographs are an integral part of monitoring the progress of patients that have SARS. We reviewed the initial chest radiographs obtained after intubation in ICU for patients diagnosed as probable SARS to understand the features of worsening disease.

Methods: The initial chest radiographs from 30 patients diagnosed as probable SARS who were intubated in ICU were reviewed. The diagnosis was based on epidemiological, radiologic and laboratory evidence. The films were read independently by 2 radiologists and the findings were tabulated.

Results: There was a predisposition for symmetric involvement (24/30). Patchy consolidation and ground glass opacities were common findings. No patient demonstrated an interstitial pattern or hilar enlargement. None of the patients had a normal chest radiograph. There was a tendency for the apices and costophrenic angles to be spared. The cardiac silhouette tended to be spared despite severe bilateral involvement.

Conclusion: The chest radiograph findings are not specific and similar to other conditions that cause acute respiratory distress. The findings favor the dependent parts of the lung. This could be related to the underlying pathology of diffuse alveolar damage.

I022/MP

Deep Vein Thrombosis in Patients with SARS

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Aim: Severe acute respiratory syndrome (SARS) is a new infectious disease

caused by a novel coronavirus. It progresses to severe acute respiratory distress in a minority of patients. In Tan Tock Seng Hospital, about 20% of patients with SARS required treatment in the Intensive Care Unit (ICU). As part of protocol for the prophylaxis of deep vein thrombosis, duplex ultrasound of the legs was performed. We describe the prevalence and distribution of deep vein thrombosis in these patients.

Methods: The leg duplex ultrasound scans from 19 patients with probable SARS in ICU were reviewed. The diagnosis was based on epidemiological, radiologic and laboratory evidence. The patients were on a protocol of thromboembolic deterrent stockings and/or low molecular weight heparin. A vascular physician or a radiologist reported the scans.

Results: There was a higher than expected incidence of deep vein thrombosis (7/19) with a predisposition for isolated calf vein thrombosis (6/7). Autopsy in 1 of these patients with calf vein thrombosis showed fragmentary pulmonary thromboembolism.

Conclusion: While immobilisation is a common cause for deep vein thrombosis, the increased incidence and aggressive nature of the disease in some patients despite a protocol for prophylaxis suggest that these ICU patients may require greater intervention.

1023/MP

High-dose Methotrexate (HDMTX) up to 2 g/m² Can be Safely Administered for Childhood Acute Lymphoblastic Leukaemia (ALL) Without Need for Monitoring Serum Levels

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Aim: HDMTX is one of the cornerstones of childhood ALL therapy as it decreases both the risk of CNS and marrow relapses. However HDMTX can be fatal if the patient fails to excrete MTX completely within 72 hours, hence monitoring of serum levels are crucial. Unfortunately, in most developing countries, this is not available and HDMTX is omitted from therapy with resulting poorer outcome. We studied MTX levels at specific time points to determine MTX clearance at 3 standard dosages.

Methods: Renal and liver panels were performed before MTX infusions; MTX levels measured at 24h, 48h and 72h after start of infusion. Folinic rescue was given until MTX level is below target level (48 h <1.0 umol/L; 72 h <0.2 umol/L).

Results: 100 MTX infusions (27 patients) from 04/97-04/03 were enrolled. Mean age was 6 years (range 1-11), normal liver function and mean creatinine before MTX was normal at 39 umol/L (range 21-82). Infusions achieving levels <1.0 umol/L at 48 h or <0.2 at 72h and 120 h were: 100% (n = 12) and 0%, respectively, for 1 g/m²; 90% (n = 44) and 10% (n = 5) for 2 g/m², respectively; 77% (n = 30) and 23% (n = 9) for 5 g/m², respectively. There were no severe adverse complications noted after MTX infusion.

Conclusion: HDMTX of up to 2 g/m² can be given safely without need of serum monitoring provided patient has normal liver and renal functions before infusion. With our results, we recommend that HDMTX up to 2 g/m² can be administered in developing countries without need to monitor serum levels.

1024/MP

Psychiatric Comorbidity and Quality of Life in First Episode Psychosis

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Aim: High rates of psychiatric comorbidity have been reported in patients with psychotic disorders but data is lacking on the quality of life (QOL) in these patients. This study seeks to determine the prevalence rates of psychiatric comorbidity and its clinical correlates in an Asian patient group with first episode psychosis and compare the QOL in these patients with and without psychiatric comorbidity, hypothesising that patients with psychiatric comorbidity would have poorer QOL.

Methods: Within an Early Psychosis Intervention Programme, 131 patients with first episode psychosis were evaluated. The SCID, PANSS, SUMD and GAF were used to assess principal Axis I diagnosis and any other comorbid diagnosis, psychopathology, insight and social/occupational functioning respectively.

Results: Psychiatric comorbidity was present in 34.4 % (n = 45) of the patients. The majority (95.6%) had one comorbid psychiatric diagnosis. Patients with psychiatric comorbidity scored lower on PANSS positive symptom subscale (z = -2.84, p <0.01) but higher on anxiety (z = -3.33, p <0.001) and depression (z = -3.13, p <0.01) items. Patients with psychiatric comorbidity had a greater awareness of their mental illness (z = -3.44, p <0.001) and its social consequences (z = -3.24, p <0.001) but lower ratings on the overall QOL (z = -3.06, p <0.01) as well as in the individual domains (physical, psychological health, social relationships, environment, all p <0.05) compared to patients without any psychiatric comorbidity.

Conclusion: The high prevalence of psychiatric comorbidity with its associated poorer QOL amongst our patients with first episode psychosis warrants attention. The differences in the QOL domains and greater insight may provide potential targets for intervention.

1025/MP

Hippocampal Volume In Patients with First-episode Psychosis

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Aim: To examine the hippocampal volume in minimally treated patients with first-episode psychosis as compared to normal controls.

Methods: Consecutive referrals to the Early Psychosis Intervention Programme were assessed using the Structured Clinical Interview for DSM-IV diagnoses (SCID) and the Positive and Negative Syndrome in Schizophrenia (PANSS). The duration of psychosis (DUP) was determined from the time of onset of first psychotic symptoms to the time of definitive diagnoses. Control subjects with no personal history of psychiatric or neurological illness and no family history of major mental illness, matched for age, gender, and handedness, were recruited from the general population. Both patients and controls underwent MR imaging on a 1.5T scanner with high resolution, fast gradient recalled 3D volumetric scans for structural-anatomic detail. MR data with hippocampal volumetry measurements were analysed off-line using MReg software by an experienced reader.

Results: 32 patients with a mean age of 28.1 (±7.2) years and mean DUP of 12.9 (±18.7) years, as well as 17 controls with mean age of 26.3 (±6.8) years were recruited. Compared to controls, patients had statistically significant smaller mean bilateral (p = 0.028) and right hippocampal (p = 0.004) volumes. Within patient group there was a significant gender difference in bilateral and right hippocampal volumes, i.e. the mean volumes were significantly smaller in females than males. There was no significant correlation between mean hippocampal volumes and patients' age, DUP and PANSS scores.

Conclusion: These findings suggest that reductions in hippocampal volume are present in the early stages of the psychotic illness.

1026/MP

Insight and Attention Deficits in Asian Patients with First-episode Psychosis

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Aim: Poor insight is frequently cited as a contributory factor towards compliance and seeking treatment. The aim of the study is to examine the nature of neurocognitive impairment and explore any correlation with insight in patients with first-episode psychosis.

Methods: Insight and cognitive performance in aspects of executive functioning and attention were assessed in 41 patients. Patients were evaluated within 2 weeks of admission to a State psychiatric hospital. The Wisconsin Card Sorting Test (WCST – computerised version) and the Trail-Making Tests were used to assess for executive functioning. The Continuous Performance Test (CPT-II) and Digit Span (WAIS-III) were used to measure for attention. The NART and Ravens Progressive Matrices (RPM) were also used to assess pre-morbid and current IQ functioning respectively. The

Birchwood Insight Scale served as a self-report measure of insight based on the awareness of illness, need for treatment and attribution of symptoms.

Results: Poor CPT performance was inversely correlated with insight scores. A subscale of the Birchwood insight measuring awareness of illness was also inversely related to deficits on the CPT and Trail-Making Test (Version B). No significant association was found between insight and other cognitive measures, age, gender, or education level.

Conclusion: The present study suggests poor insight is significantly related to attention deficits and some evidence of impairment in executive functioning. Impairment in specific aspects of attention and executive functioning suggest that first-episode psychosis patients may be experiencing difficulty in attending to information. These difficulties may have implications on psychoeducation and compliance in patients with psychosis.

1027/MP

Serum Lipids and Psychopathology in Patients with First-episode Psychosis

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Aim: Several studies have suggested an association of low serum cholesterol levels with depression and increased mortality from violence and suicide. The aim of this study was to examine the association between serum lipid levels and psychopathology in drug-naïve patients with first-episode psychosis.

Methods: All consecutive patients admitted to the Early Psychosis Intervention Programme (EPIP) who consented for the study were recruited. Psychopathology at the time of presentation was assessed using the Positive And Negative Syndrome Scale (PANSS). Blood investigations to measure fasting serum lipid levels were carried out prior to starting the patient on antipsychotic medications. Controlling for age and body mass index (BMI), correlation between serum lipid levels and psychopathology on PANSS was done using Spearman's rank order correlation co-efficient.

Results: 78 patients with the mean age of 29.0 (± 6.0) years participated in the study. 41 (52.6 %) patients were males. There was no significant correlation between serum lipid levels and PANSS total, positive and negative scores. There was a significant positive correlation between PANSS depression subscale and serum triglyceride levels ($p = 0.05$). On individual items on PANSS we found a significant positive correlation between somatic concern ($p = 0.01$) and anxiety ($p = 0.05$) with serum cholesterol levels.

Conclusion: To date, this is the first study to look at the association between psychopathology and serum lipid levels in patients with first-episode psychosis. We did not find an association between psychotic symptoms (positive and negative) and serum lipid levels. Interestingly, the co-morbid symptoms of depression and anxiety were significantly associated with serum cholesterol levels.

1028/MP

Determinants of Duration of Untreated Psychosis and the Pathway to Care in Singapore

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Aim: To elucidate the determinants of Duration of Untreated Psychosis (DUP) in a sample of patients with first-episode psychosis, and to examine the pathways to care in the context of first engagement with psychiatric services.

Methods: The sample comprised patients presenting with first-episode psychosis to the psychiatric services in the year 2000. Combining information from interviews and case records the DUP was estimated and patient's pathway to care was traced. The association between the mean DUP and demographic, clinical and social variables was examined.

Results: Of the 112 patients included in the study, 64 (57%) were men and 48 (43%) were women. The age of onset of psychosis was 38.7 ± 13.7 (mean

$\pm$ SD) years. The DUP ranged from 0.1 to 336 months with a mean $\pm$ SD of 32.6 ± 59.8 months. There was no significant difference in the DUP among those, whose, first contact was the psychiatric services and those who first sought help elsewhere ($p = 0.225$, Mann Whitney *U* test).

Conclusion: The DUP of our patients was longer than that reported in studies done in the West. The attitudes and beliefs of family in the Asian society are likely to be crucial in the pathways to care.

1029/MP

An Emergency Department Response to Severe Acute Respiratory Syndrome – A Prototype Response to Bioterrorism

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Aim: To describe the application of Tan Tock Seng Hospital (TTSH) Emergency Department (ED) disaster response plan to manage the SARS outbreak.

Methods: The ED implemented protection for staff, patients and facility, infection control measures and disaster-response workflow changes. Ministry of Health, Singapore centralised SARS cases in our hospital and our ED became the national screening centre. A screening questionnaire and a set of admission criteria were applied after assessment of clinical features and chest X-ray findings.

Results: For the first 8 weeks of the outbreak, ED attendance was 12,344, of which 8103 (65.6%) were screened for SARS. Among these 8103, 50.2% were men with a mean age of 36.2 years (standard deviation [SD] 15.1) while the mean age for women was 34.8 (SD 14.5) years. Among those screened, 885 (10.9%) were admitted to rule out SARS. Out of 885 admitted, 232 (26.2%) were confirmed to have SARS. Among 7218 persons discharged from ED, there were 28 re-attendances that were admitted and diagnosed to have SARS, giving an under-triage rate of 0.4%. The sensitivity of ED screening and admission for SARS was 89.2% and the specificity was 91.7%. No patient contracted SARS as a result of an ED visit. After full implementation of protective measures, 1 ED nurse with undiagnosed diabetes mellitus was treated for suspect SARS.

Conclusion: Though the SARS outbreak was not a bioterrorism event, the ED disaster response was applied with satisfactory results.

1030/MP

Incremental Value of Serial Closely-spaced Electrocardiograms, Bedside Serum Myoglobin and Quantitative Troponin T and Cardiac Enzymes in the Emergency Department Diagnosis of Acute Coronary Syndromes in Intermediate Risk Patients with a Normal Initial Electrocardiogram

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Aim: We evaluate the usefulness of new bedside methods i.e. closely-spaced electrocardiograms (ECGs), bedside quantitative myoglobin (Cardiac M®) and troponin T (Cardiac T®) and creatine kinase (CK)-MB mass in diagnosing acute coronary syndromes (ACS) in intermediate risk patients with a non-diagnostic initial ECG.

Methods: Patients meeting the entry criteria were recruited. The first blood samples were tested with Cardiac M® and Cardiac T® using the Cardiac Reader® and sent for CK and CK-MB mass laboratory estimations. ECGs were repeated at 15-minute intervals for the first hour. If all these tests were normal, an ECG, and all cardiac markers were repeated at 2 and 4 hours. A discharge diagnosis of acute myocardial infarction (AMI), unstable angina or other diagnoses were made by the in-hospital cardiologists.

Results: A total of 102 patients were analysed; 16 with AMI and 14 with unstable angina. Serial ECGs is the most useful individual early test for diagnosing AMI/ACS. However, 6/13 (46.2%) AMI patients had very subtle ECG changes while 3/16 (18.7%) had normal ECGs and required the cardiac markers for AMI diagnosis. A combination of all 4 tests is better than individual tests for diagnosing AMI and ACS. 100% (95% CI, 79.4 – 100) of the AMI patients were diagnosed in the ED compared to 51.7% (95% CI, 32.5

– 70.6) for ACS. There was 0% in-patient mortality amongst all patients.

Conclusion: A combination of the above 4 tests done up to 4 hours is useful for ruling out AMI but not ACS.

I031/MP

Evolution of an Emergency Department Screening Questionnaire for Severe Acute Respiratory Syndrome (SARS)

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Aim: On 13 March 2003, upon receiving notification of an outbreak of atypical pneumonia, nurses from the study emergency department (ED) started screening patients for this disease that became known as Severe Acute Respiratory Syndrome. This report describes the screening tool that was used, the 3 revisions that were made, and the factors that led to these revisions.

Methods: The ED nurses started with a simple screening tool that was incorporated into triage. The screening tool was later revised into a questionnaire. An outdoor screening station was set up and patients were subsequently screened before triage. After screening, they were assigned to different risk areas, where triage and treatment were rendered. Two further revisions were made to the questionnaire.

Results: In the first eight weeks, 8103 patients were screened. Version One of the screening questionnaire was used to screen 72 patients from 13 to 17 March, Version Two screened 95 patients from 18 to 21 March, Version Three screened 2,918 patients from 22 March to 8 April, and Version Four screened 5,018 patients from 9 April to 7 May. There was a significant ($p < 0.001$) downward trend in the proportion of admissions. Amongst those discharged from ED, 0.4% reattended and was later confirmed to have SARS.

Conclusion: The screening tool underwent 3 major revisions in response to new information. By keeping it relatively simple, user-friendly and regularly updated, nurses were able to screen patients rapidly. Risk categorisation ensured that no cross-infection occurred among patients and that no one contracted SARS in the ED.

I032/MP

Pregnancy Outcomes of Women with Pre-gestational Diabetes Mellitus in Singapore

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Aim: Pregnancy in women with pre-gestational diabetes mellitus (DM) is associated with increased risks to both the mother and her fetus. The aim of our study was to look at pregnancy outcomes in local women with pre-gestational DM, predominantly those with type 2 DM.

Methods: This was a retrospective study based on information obtained from the medical records of women with pre-gestational DM who had been managed during their pregnancy at the antenatal DM clinic at Kangar Kerbau Women's and Children's Hospital from January 2000 to July 2002. Basic biodata and information pertaining to DM were collected. Pregnancy outcomes studied included miscarriage, intrauterine death, delivery complications and mode of delivery. Neonatal complications including macrosomia, congenital malformations and hypoglycaemia were also studied.

Results: There were 151 pregnancies in 134 women. 125 (93.3%) women had type 2 DM, 6 (4.3%) had type 1 DM and 3 (2.2%) had impaired glucose tolerance. The mean gestation at first antenatal visit was 10 weeks with a mean HbA1c of 7.9%. Only 40.9% had a HbA1c of $\leq 7.0\%$. There were 138 (88%) live births, 12 (7.9%) miscarriages and 3 (2%) intrauterine deaths. The rate of caesarean section was high at 53.5%. The mean birth weight was 3261g and the rate of macrosomia amongst singleton pregnancies was 9.3%. Delivery complications included 1 woman with vaginal laceration, 2 with third degree tears and 2 with shoulder dystocia.

Conclusion: A significant proportion of women with pre-gestational DM have suboptimal glycaemic control and present relatively late for antenatal care. The rates of pregnancy complications are significant. Pre-pregnancy planning and education of women with pre-gestational DM needs to be improved to reduce complication rates.

I033/MP

Clinical Usefulness of Endoscopic Ultrasound With/without Fine Needle Aspiration in the Diagnosis and Staging of Pancreatic Carcinoma

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Aim: To show the accuracy and clinical usefulness of endoscopic ultrasound (EUS) with EUS-guided fine needle aspiration (FNA) in early diagnosis and staging of pancreatic cancer not obvious in CT scan abdomen imaging.

Methods: Five male patients were evaluated. Four presented with obstructive jaundice whereas 1 had unexplained loss of weight. Mean age was 66 years (range 40 to 77). All had CT scan abdomen imaging done which did not show any obvious pancreatic tumour. EUS with FNA was done for all cases as indicated. Surgical findings were obtained and compared to EUS findings.

Results: EUS easily detected the pancreatic tumour in all 5 cases. (a) EUS in tumour size assessment: The tumour size detected ranged from 27 mm to 40 mm in diameter. These corresponded fairly accurately with that of surgical findings for the 3 who had surgery. (b) EUS in lymph node assessment: EUS reported 3 out of 5 cases with pathological lymph node involvement. All were histologically confirmed by FNA. The remaining 2 cases of absent pathological lymph nodes were subsequently correctly verified by surgery. (c) EUS in vascular assessment: EUS was accurate in 4 out of 5 cases which reported absence of portal vein or superior mesenteric vein invasion. Surgery could not verify the fifth case. There were no complications at all from the EUS with/without FNA.

Conclusion: This series of cases showed that EUS with/without FNA is very useful to safely diagnose and stage pancreatic head tumour not detectable by CT scanning of the abdomen.

I034/MP

Efficacy of Mirtazapine in Stimulant Associated Insomnia

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Aim: Stimulants are the most commonly prescribed medications for Attention Deficit Hyperactivity Disorder (ADHD). One major side effect of these medications can be an exacerbation or induction of insomnia. In this study, an antidepressant with sedative properties was assessed for effectiveness in treating stimulant-induced insomnia.

Methods: Sixteen patients with early insomnia and ADHD, who were receiving stimulants, were offered 4 to 6 weeks of open treatment with mirtazapine, an antidepressant which is mildly sedating in the lower range of therapeutic doses. (Starting dose: 3.75-7.5 mg ON, final daily dose: 3.75-45 mg/day, mean: 9.4 ± 10.7 SD mg/day). Patients ranged in age from 12 to 47 years. All patients were receiving stable doses of stimulants and met DSM-IV and childhood K-SADS (self or parent report) criteria for ADHD. Sleep patterns were assessed by self-report of average number of hours slept nightly over the past week, at baseline and then during Mirtazapine treatment.

Results: Mirtazapine was well tolerated by fourteen patients. Sleep was improved in all 14 patients (mean hours of sleep: baseline 5.3 ± 1.2 hours; after mirtazapine: 7.9 ± 0.6 hours; $t(13) = 11.7$, $p < 0.0001$).

Conclusion: Mirtazapine significantly improved stimulant associated insomnia in this open, pilot trial.

I035/MP

A Study on Symptoms and Care of Elderly Patients Dying in an Acute Hospital in Singapore

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Aim: To assess the common physical symptoms at the end of life for elderly patients and the management of these patients.

Methods: A retrospective case-control study of symptoms and management

of all elderly patients (>75 years) who died in the year 2001 in Alexandra Hospital using information in their case records.

Results: 189 patients were analysed. The commonest physical symptom at the end of life was difficulty with breathing (58.7%), followed by fever (46.6%), pain (30.7%), and problems with respiratory secretions (14.8%). Other symptoms include vomiting (10.6%), confusion (9.0%) and agitation (5.8%), 72 (38.1%) were comatose. 13 (6.9%) were depressed. 16 (8.5%) of them had smelly wounds and 37 (19.6%) had contractures. Of the group whose death were expected, 52 out of 167 (31.1%) had input from palliative care. Patients who had palliative care input were more likely to be on treatment for pain ($P < 0.05$), and difficulty with breathing ($P < 0.5$).

Conclusion: Elderly patients at the end of life suffer from a number of symptoms which potentially can be controlled with palliative medical treatment. An increase in the treatment of these symptoms is seen with palliative care input.

1036/MP

Nursing Home Falls – A Local Perspective

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Aim: To examine the demography of falls, factors contributory to falls and fall risk factors in residents of a local nursing home.

Methods: A cohort study was carried out on 95 nursing home residents. Each subject's potential fall risk factors was analysed through review of the case records and physical examination. After 18 months, the subjects were reviewed for documented falls, the circumstances surrounding each fall and complications from the fall. The likely factors associated with each fall were categorised where possible. Logistic regression was performed to determine the fall risk factors.

Results: A total of 63 falls contributed by 38 (40%) subjects occurred, giving a fall incidence of 0.5 fall per bed per year. Many subjects were above 75 years old (72.6%), required assistance in basic activities of daily living (71.6%), cognitively impaired (52.6%), diagnosed with mental illness (49.5%), and non-ambulant (43.2%). Thirteen (20.6%) injuries resulted from the falls. Falls associated with both intrinsic and extrinsic factors were identified in 38.1% of falls. The most common intrinsic factors were gait disorders (31.7%) and confusion/difficult behaviour (31.7%). Contributory extrinsic factors include wheelchair/commode (22.2%) and bathroom (15.9%) related incidents. Most falls occurred during ambulation (31.7%) and transfers (17.5%). On multivariate analysis, the only significant risk factors for falls were "need for ambulatory aids" (OR 24.8) and "cognitive impairment" (OR 8.1).

Conclusion: Majority of falls were related to intrinsic factors such as gait disorder and difficult behaviour, and extrinsic factors involving use of wheelchair/commodes and bathroom activities. Thus, nursing home falls reduction protocols should include behavioural measures, enhanced care practices and environmental modifications to be effective.

1037/MP

Novel and Recurring hMLH1 Mutations in Singaporean Families with Hereditary Non-polyposis Colorectal Cancer

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Aim: Hereditary non-polyposis colorectal cancer (HNPCC) is the commonest known form of hereditary colorectal cancer (CRC), and is predominantly due to germline mutations in the mismatch repair genes hMLH1 and hMSH2. Data of the prevalence and spectrum of hMLH1 and hMSH2 mutations in Asians is sparse.

Methods: Singaporean CRC patients diagnosed below age 40, and/or with strong familial cancer clustering suggestive of HNPCC, were tested for tumor microsatellite instability (MSI) and hMLH1 germline mutations.

Results: Forty-seven unrelated high-risk CRC patients were recruited, of which 39 were Chinese, 5 Malay, and 3 Indian. 5/47 fulfilled the Amsterdam I/II criteria, 24/47 were suspected HNPCC kindreds with at least 2 family

members with CRC or HNPCC-like cancer, 5/47 had multiple primary CRC or HNPCC-like cancers, and 13/47 had early-onset CRC. 11/35 patients with tissues available for MSI testing had MSI-high tumors. Five deleterious hMLH1 mutations were identified in 5 Chinese and 2 Indian families, of which 2, the 887T>G (Leucine>termination) and 1851delGAA (deletion of Lysine), in Chinese families, were novel. The other 3 mutations, 380+2T>C (splice defect), 1459C>T (Arginine>termination), and 350C>T (Threonine>Methionine) were previously reported in Caucasians, of which the latter 2 were recurrent in 2 unrelated families each. The data in our Indian families represents the first such data in this ethnic group. In addition, the previously reported 1151T>A (Valine>Aspartate) missense mutation was identified in 3 Chinese families.

Conclusion: Novel and recurring hMLH1 mutations occur in Singaporean HNPCC families. This information is of relevance in formulating molecular diagnostic strategies for HNPCC in Asia.

1038/MP

Effect of ABO Blood Group on von Willebrand Disease Diagnostic Tests in a Chinese Donor Population

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Aim: Diagnosis of von Willebrand disease (vWD) utilizes a combination of quantitative and qualitative tests: ristocetin co-factor assay (vWF:RicoF), and vWF antigen quantification (vWF:Ag). ABO blood group contributes significant to the variation in vWF:Ag levels possibly through differences in vWF glycosylation and clearance. Collagen binding assay (vWF:CBA) is a new test suggested by some to be more sensitive than vWF:RicoF for functional defect of vWF. A study suggests that loss of group A and B antigen affected vWF:RicoF but not vWF:CBA. We investigated the effect of ABO blood group on these tests.

Methods: Citrated blood samples were collected from 55 healthy blood donors (20 group O and 35 non-group O) after informed consent. vWF:CBA and vWF:Ag were performed by ELISA. vWF:RicoF assay was performed by standard method measuring effect of ristocetin on platelet aggregation.

Results: Consistent with previous studies, group O donors had significantly lower vWF:RicoF ($p = 0.0004$), vWF:Ag ($p = 0.0074$) and vWF:CBA ($p < 0.0001$). But in contrast to a previous study, reduction in vWF:CBA is greater than vWF:RicoF in group O donors (48% versus 28%). This leads to higher vWF:Ag/vWF:CBA ratio ($p < 0.0001$) in group O donors whereas vWF:Ag/vWF:RicoF ratio is unaffected ($p = 0.2$). Using our reference range for these tests, 6 O donors would be diagnosed with vWD if only vWF:Ag and vWF:CBA were used.

Conclusion: ABO blood group has significant effect on tests employed in vWD diagnosis. vWF:CBA is affected more than vWF:RicoF by blood group. These variations should be borne in mind when interpreting results of these tests in our population.

1039/MP

Cytotoxicity of Doxorubicin Antiresistant Stealth Liposome on Multidrug Resistance Rat Prostate Cancer Cells

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Aim: To investigate the efficacy of a novel doxorubicin antiresistant stealth liposomes (DARSLs) on multidrug resistance cancer cell.

Methods: Doxorubicin (DOX) and verapamil (VER) were co-encapsulated in liposomes with ammonium sulfate gradient approach. Cytotoxicity of

DARSLs on rat prostate cancer cell line (Mat-LyLu-B2, MLLB2), which expressed multidrug resistance (MDR) gene, was investigated by 3-(4,5-dimethyl-2-thiazolyl)-2,5-diphenyl tetrazolium bromide (MTT) assay. Real-time uptake of DOX in cells was monitored by confocal microscopy.

Results: The average particle size of DARSLs was 118.6 ± 22.3 nm. Encapsulation efficiencies of DOX and VER in DARSLs were >95% and 70%, respectively. The cytotoxicity of DARSLs on Mat-LyLu-B2 cell line was about 1783 folds higher than that of free DOX. The photographs of confocal microscopy showed the intracellular DOX fluorescence distributed exclusively in cytoplasm after incubation with free DOX (5.5 μ M) for 4h due to expression of multidrug resistance. For DARSLs (DOX 5.5 μ M, VER 5 μ M), DOX fluorescence was mainly in the cytoplasm and slightly in nucleus within 30 min, but, when exposed for more than 150 min, DOX fluorescence was evenly distributed in the nucleus as well as the entire MLLB2 cells.

Conclusion: Our results demonstrated that the formulation of DARSLs can increase DOX accumulation in Mat-LyLu-B2 cell and result in effective inhibition of MDR cell proliferation in vitro.

I040/MP

Flow Cytometric and Histopathological Correlation in the Diagnosis of Lymphoproliferative Disorders

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Aim: To correlate flow cytometry (FCM) and histopathology in lymphoproliferative disorder diagnosis.

Methods: Over 1½ years, 134 consecutive specimens from 110 patients were analysed concurrently by FCM and histopathology/cytology to detect and characterise lymphoproliferative disorders. Specimens submitted for FCM were stained with monoclonal antibodies and their surface and cytoplasmic antigen expressions analysed. Specimens submitted for histopathological analysis were examined by histochemical and/or immunohistochemical stains.

Results: Among 134 specimens, 92 were bone marrow specimens, 23 were lymph node (LN) biopsies, 10 were fine needle aspirates (FNA) of LNs. FCM and histomorphology concurred in 72.4% of specimens (59 negative, 38 positive) regarding the presence or absence of a lymphoproliferative process. FCM and histomorphology were discrepant in 27.6% (37/134). 33 specimens had a lymphoproliferative process by histology but were negative by FCM. 4 specimens had a lymphoproliferative process by FCM but were negative by histology (2 T-lymphoblastic lymphoma, 1 mantle cell lymphoma, 1 Sezary syndrome; all were trephine specimens). All diffuse large cell lymphomas (DLCL)/high-grade lymphomas (29) were diagnosed by histology; 52% (15/29) were detected by FCM. All follicular lymphomas/low-grade lymphomas (15) were diagnosed by histology; FCM detected a higher proportion (80%) compared to DLCLs ($p = 0.002$). Diagnoses solely made by histology included 3 Hodgkin's lymphomas and 2 anaplastic large cell lymphomas. FNAs of LNs yielded 1/6 positive results by FCM. LN biopsies yielded 12/20 positive results by FCM ($p = 0.001$).

Conclusion: Yield in a FCM analysis of a suspected lympho-proliferative disease over histological diagnosis is dependent on the specific diagnosis and type of specimen analysed.

I041/MP

Motivations and Barriers in Attending Cancer Genetics Counselling in Singapore

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Aim: Cancer genetics is an emerging new field. A formal service has been established in Singapore, providing cancer risk assessment, genetic counselling, screening and preventive recommendations. The acceptance and utilisation of such a service has not been studied in Asians.

Methods: We conducted a questionnaire survey in breast cancer patients, cancer-free women, and female health-care professionals (nurses and medical students), asking respondents if they would attend cancer genetics counselling if medically indicated, and to grade the importance of potential motivators and barriers.

Results: 434 women participated, including 164 breast cancer patients, 144 cancer-free women and 125 health-care professionals. The majority had at least "O" level education (67%), used English (64%), was married (56%), and had children (57%). More than 75% indicated willingness to attend genetics counselling if medically warranted, and more than 65% felt they would benefit somewhat to greatly. More than 85% rated 'learning about cancer risk' and 'learning to detect cancer early' as important. Breast cancer women also cited 'helping their family understand cancer risk' as important (94%). Among potential barriers, concerns about 'cost' (57%) and 'inability to comprehend and use the information' (40%) were important. Factors relating to family members (family tells me not to go, not interested, may get upset, may have trouble getting insurance) were not important (less than 30%).

Conclusion: The majority of Singaporean women indicated willingness to attend cancer genetics counselling. Financial cost and inability to comprehend medical information are important barriers, and should be addressed to optimize utilisation of cancer genetics service.

I042/MP

Dorsal Plating for Distal Radius Fracture Using a Low-profile Matrix Plate

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Aim: Dorsal plating in the treatment of displaced unstable distal radius fractures has been associated with complications such as extensor tendon irritation and rupture and dorsal wrist pain. We evaluate the clinical results of a series of patients with dorsal plating using a relatively new implant, the Leibinger Matrix Plate.

Methods: Twenty consecutive patients with displaced unstable distal radius fractures who had undergone fixation using the Leibinger Matrix Plate were reviewed. Only patients with minimum 6 months follow-up were included. The fractures were classified using Frykman, AO and Fernandez classifications. Radiological outcome was assessed using Sarmiento's modification of Lidstrom's scoring system and clinical outcome was assessed using Cooney's modified clinical-scoring system.

Results: The mean age of the patients was 43.2 years (range 24-59 years). There were 13 males and 7 females. 9 of the patients injured their dominant hand, and all fractures occurred after a fall. The results at 6 months according to Sarmiento's modification of Lidstrom's scoring system were 'excellent' in 95% and 'good' in 5%. Post-operatively, the average final radial tilt was 22.2 deg, radial height was 12.7 mm, and palmar tilt was 12.5 deg respectively. Functional end results at 6 months were 'excellent' in 10%, 'good' in 50% and 'fair' in 40%. There were no major complications and no extensor tendon ruptures or irritation.

Conclusion: This study suggests that the Leibinger Matrix Plate is an effective treatment for displaced unstable distal radius fractures, minimizing the complications usually associated with dorsally placed implants.

I043/MP

Can Medical Students Learn Auscultation Without Patient Contact? – Lessons from the 2003 SARS Outbreak

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Aim: The SARS outbreak prevented medical undergraduates from entering teaching hospitals. This study aimed to determine the validity and effectiveness of the electronic stethoscope in teaching auscultation under "no contact" circumstances.

Methods: We used 3M E4000 electronic stethoscopes to record sets of 5 cardiac and 6 respiratory conditions from 11 different patients, using these to teach simulated auscultation to 234 clinical skills foundation course students. Clinical tutors, blinded to diagnoses, independently diagnosed the sets of conditions played on the electronic stethoscope. We measured percentage accuracy to evaluate the validity of these sets. After tutorials, students were tested on a different panel of 5 cardiac auscultations played on the electronic stethoscope. 123 were cluster randomised to a teach cohort which received additional electronic stethoscope teaching, and 111 to a control cohort which did not. We conducted a second test 1 to 12 days after the first with the same auscultations in a different sequence, and mean scores were compared.

Results: Mitral stenosis, mitral regurgitation and aortic stenosis achieved 100% accuracy, normal heart 80% and prosthetic valve 40%. The quality of respiratory auscultations was unacceptable to tutors, thus their use was terminated prematurely. The teach cohort had a higher mean score for correct auscultatory signs during the second test: 3.62 versus 2.94 among controls ($p = 0.001$). There was no difference in this score during the first test.

Conclusion: The electronic stethoscope was a reproducible tool for teaching cardiac but not respiratory auscultations during “no contact” circumstances, producing an incremental learning effect among students with additional use.

1044/MP

Gender Differences in the Endothelial Function of Individuals with Type 2 Diabetes – The Role of Oxidative Stress

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Aim: We hypothesised that endothelial function is impaired in diabetic men compared to women and this impairment is related to oxidative stress.

Methods: We employed 2 dimensional laser Doppler flowmetry to measure the forearm skin perfusion in response to iontophoresis of 1% acetylcholine (ACh, endothelium-dependent) and 1% sodium nitroprusside (NaNP, endothelium-independent) in 100 subjects with uncomplicated type 2 diabetes and correlated the results with plasma ubiquinone (the oxidised subfraction of co-enzyme Q10). Plasma ubiquinone was measured using automated high-performance liquid chromatography (HPLC).

Results: The men ($N = 63$) and women ($N = 37$) were 48 ± 8 (mean $\pm$ SD) and 47 ± 7 years old, respectively. The 2 groups did not differ in terms of clinical and metabolic profile including blood pressure, BMI, waist circumference, fasting blood glucose, HBA1c and lipid profile except HDL was lower in men [1.07 ± 0.26 mmol/L vs 1.37 ± 0.33 mmol/L ($P < 0.01$)]. Ubiquinone was higher in men 38 ± 20 vs. $29 \pm 19 \pm 10.2$ μ mol/L ($P < 0.05$). After adjusting for all the above-mentioned clinical and metabolic profile, the microvascular endothelium dependent and independent vasodilation were reduced in men (1.43 ± 0.79 mV) (Peak mean red blood cell flux after ACh challenge) compared to women (1.71 ± 1.13 mV) ($P < 0.05$). Similarly, endothelium independent vasodilatory response was also reduced in men (1.08 ± 0.67 mV) compared to women (1.50 ± 0.92 mV) ($P < 0.05$). When all the individuals were pooled together, there was a significant negative correlation between plasma ubiquinone concentration and endothelium dependent ($R = -0.26$, $P < 0.05$) and independent ($R = -0.23$, $P < 0.05$) vasodilation.

Conclusion: We conclude that endothelial function is impaired in type 2 diabetic men compared to women. The impaired endothelial function may be related to higher oxidative burden in men.

1045/MP

Persistence of Viruses in the Respiratory Tract in Asthma

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Aim: Respiratory viral infections are common triggers for asthma exacerbations. It is unclear whether viruses can persist in the lower respiratory tract during quiescent asthma. To compare the prevalence and pattern of

common respiratory viruses in the stable, quiescent phase of asthmatic patients with that of healthy individuals.

Methods: Twelve patients with near fatal asthma [NFA], 21 patients with acute asthma [AA] and 52 healthy individuals [C] have been studied. All subjects studied had not been vaccinated against influenza virus. Lower respiratory tract secretions were collected by sputum induction. Specimens underwent RT-PCR for picornavirus; respiratory syncytial virus; influenza A and B; parainfluenza 1 and 3. Fisher's exact test was used to compare prevalence and pattern of respiratory viruses between the 2 groups.

Results: The asthmatic subjects were 41.8 (35-55) [mean range] years in age and the healthy subjects were age 31 (26-35). Viral RT-PCR was positive in 5/12 (42%) NFA, 5/21 (24%) compared with 5/52 (10%) healthy subjects [$p = 0.015$]. Coexistence of viruses [rhinovirus and influenza virus] was found in 5/33 (15%) of asthmatic patients but not in healthy individuals.

Conclusion: These results suggest a tendency for the respiratory tract of asthmatics to be “colonised” by viruses more often than healthy individuals. Further studies will explore this tendency in larger numbers of participants.

1046/MP

The MELD Score is Useful in Determining Optimal Time for Liver Transplantation and Post-transplant Survival for Hepatitis B

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Aim: The aim of our study is to determine if pre-transplant MELD is able to predict post liver transplant survival for Hepatitis B patients.

Methods: This retrospective study included 46 adult patients who underwent primary liver transplantation at the National University Hospital Singapore from January 1996 to December 2002. Pre-transplantation MELD was calculated according to the United Network for Organ Sharing formula. Patients were followed up to the most recent visit or death. Survival analysis was performed using Cox regression for continuous variables and Kaplan Meier for categorical variables

Results: The mean age at transplant was 51 years. The majority of the patients transplanted had Hepatitis B (43%) and were Chinese (72%) and male (80%). 33% had underlying hepatocellular carcinoma and the majority were of blood group O (43%). The median MELD score at transplantation was 17 and the median Child's score was 11(C). There was a correlation between pre-transplant MELD and survival at 1 year post transplant (HR 1.05, 95% CI 0.99-1.12). We found that a pre-transplant MELD score of $\geq$ or equal to 32 had significantly higher mortality at 1 year post transplant compared with those < 32 (HR 9.18, 95% CI = 1.16-72.44). There were no differences in the pre-transplant MELD (OR 1, 95% CI 0.9-1) as well as survival at 1 year for patients with Hepatitis B and those with other aetiologies (HR 0.72, 95% CI 0.22-2.35).

Conclusion: Pre-transplant MELD scores correlate well with survival 1 year after liver transplant and a score of $\geq$ or equal to 32 is associated with a significantly higher mortality at 1 year. There is no difference in survival for patients transplanted for Hepatitis B compared to other etiologies.

1047/MP

The Empirical Antibiotic Treatment of Continuous Ambulatory Peritoneal Dialysis (CAPD)-related Peritonitis – Is it Appropriate?

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Aim: CAPD-related peritonitis is serious and it can be life-threatening if treatment is delayed. Empirical antibiotic at initial presentation is therefore necessary. This is affected by the likely results of the peritoneal fluid culture. To determine the appropriateness of current empirical antibiotic treatment in relation to peritoneal effluent culture result at presentation of CAPD related peritonitis.

Methods: All patients ($n = 45$) with peritonitis episodes in the NUH CAPD programme from 1/1/2002 till 31/12/2002 were studied retrospectively. There were 57 episodes of peritonitis. Microorganism culture, antibiotics used and the treatment outcomes were analysed. All patients received

empirical intra-peritoneal vancomycin and gentamicin at presentation. Antibiotic treatment was subsequently altered according to culture and sensitivity results.

Results: Eleven of 57 episodes (19%) had negative cultures. Forty-one of 57 episodes (72%) were associated with 1 microorganism, 4/57 was associated with 2 organisms and 1/57 episodes was associated with 3 microorganisms. Of the 46 episodes with positive cultures, gram-positive organisms accounted for 40% and gram-negative organisms were responsible for 37%. The remaining were either fungus or negative culture. The 3 commonest gram-positive organisms isolated were coagulase negative Staphylococcus (7 isolates), Streptococcus sp. (6 isolates) and Staphylococcus aureus (3 isolates). The 3 commonest gram-negative organisms isolated were Klebsiella pneumoniae (4 isolates), E. coli (3 isolates) and Acinetobacter sp (2 isolates). Response rate to this antibiotic regimen was 87%.

Conclusion: The current empirical intraperitoneal antibiotic regimen that covers both gram-positive and gram-negative organisms is appropriate in treating more than three-quarter of the CAPD related peritonitis.

1048/MP

Risk Factors for Near-fatal Asthma – A Prospective Study

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Aim: The purpose of the study was to identify factors distinguishing patients with Near Fatal Asthma (NFA) from hospitalised (non near-fatal) acute asthmatic patients (AA) and from community-based asthmatics (CA).

Methods: The design was a multi-centre, prospective study of 81 NFA [mean age, 48.6 (15.6)] who were intubated for acute respiratory failure in the intensive care unit and 311 patients with AA in Singapore. An interviewer administered questionnaire and knowledge assessment were conducted 24-48 hours after admission. A random sample of community-based asthmatics [n = 46] were recruited for comparison with hospital controls.

Results: Age distribution was similar between AA, NFA and CA. There were more women than men in the NFA and AA groups [58% and 66%] compared with the CA [36%] [p = 0.001]. There was no difference in the history of allergies, age of onset or years of treatment for asthma. Compared with CA, patients with NFA and AA had previously received more asthma education, inhaler and peak flow training [p = 0.001], had better inhaler technique [p = 0.003], had better knowledge scores for asthma medication and acute attack self-management, but had poorer scores for therapeutic compliance, self-efficacy and patient-doctor relationship [p = 0.001]. NFA patients were more likely than AA to have a previous ICU admission and recent poor asthma control [p = 0.001].

Conclusion: Poor control of asthma and reduced therapeutic compliance are associated with NFA despite good asthma education.

1049/MP

Vasomotor Reflexes of the Radial, Ulnar and Brachial Artery – A Study of Normal Range, Repeatability and Influencing Factors in Healthy Humans

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Aim: Vasomotor reflexes (VMRs) are a useful test of small unmyelinated (sympathetic) nerve fibers. VMRs are usually measured from skin vessels but can be elicited in many vascular territories. Since skin VMRs are particularly susceptible to emotional and environmental stimuli and represent only a relatively small portion of the vascular innervation, it is useful to establish VMR of other vascular territories. This study investigates the range of VMR in vessels supplying skeletal muscles of the upper limb, their repeatability and influencing factors (age, gender, weight, height, blood pressure).

Methods: Bilateral vasomotor reflexes of the radial, ulnar and brachial arteries were recorded using Ultrasound Doppler. Testing was repeated at 3

separate times. VMR was determined by measuring the pre and post inspiratory gasp difference in diastolic blood flow and expressed as a percentage.

Results: 64 healthy adults (age 21-78) participated. Ranges (mean $\pm$ SD) for radial VMR (right to left respectively) were 78% ($\pm$ 12.9)/ 85% ($\pm$ 12.5), ulnar 86% ($\pm$ 11.6) / 88% ($\pm$ 13.0); brachial 68% ($\pm$ 14.5) / 72% ($\pm$ 16.3). Radial, ulnar, brachial VMR correlation was good (P <0.01). Repeatability using intraclass correlation was 0.5390-0.6782. Ulnar VMR was best (P <0.01). Diastolic BP affected ulnar VMR (P <0.05). Age, gender, weight, height had no effect at all locations (P for all >0.1).

Conclusion: Mean VMR for all vessels was above 68% and highest for the ulnar artery which is best suited for studies. Repeatability was good at all sites. Apart from diastolic BP, age, gender, weight and height did not significantly affect vasomotor reflexes.

1050/MP

Preventable Causes of Hospital Admissions Due to Epilepsy: A Prospective Study in Singapore

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Aim: Chronic conditions such as epilepsy exert considerable strain on health services resources in part due to repeated hospital admissions for seizures. To prevent unnecessary admissions, it is important to first understand the reasons for admission. This study examines the preventable causes for admission to hospital for patients suffering from epilepsy in Singapore.

Methods: Over a 6-month period, patients with a generalised seizure due to epilepsy and on antiepileptic medication admitted to the Neurology inpatient service of 2 hospitals (National University Hospital and Alexandra Hospital) were prospectively studied for the cause of hospital admission. Using a structured interview and additional tests, the following seizure precipitants were sought: compliance, serum antiepileptic levels, sleep deficit, alcohol, dyselektrolytemia and infections.

Results: Of the 42 enrolled patients (25 male, 17 female), 28 suffered from idiopathic, 9 from scar and 5 from a variety of causes of epilepsy. In 33, at least 1 seizure precipitant could be identified. Of the total of 35 identified precipitants, 27 subjects had 1, 7 subjects had 2 and 1 subject had 3 precipitants. 20 patients were non-compliant, 28 had subtherapeutic serum antiepileptic levels, 7 had sleep deprivation and in 1 each, alcohol abuse, low sodium and infection was identified. 9 had no identifiable precipitant.

Conclusion: Our prospective study examining potentially preventable causes for seizures leading to hospital admission for patients with epilepsy identified that the majority of patients have potentially preventable causes of their seizures and thus hospital admission. Targeted education will be an important public health strategy.

1051/MP

Skin Nerve Fibre Density and Neurophysiological Parameters in Neuropathy

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Aim: The method of counting skin intraepidermal nerve fiber density (IENFD) for diagnosing sensory small nerve fiber neuropathy is established. But, its role in the overall assessment of sensory polyneuropathy remains unclear. This study investigates the relation of hand IENFD with neurophysiological parameters of large and small nerve fibre function of upper and lower limbs in predominantly sensory neuropathies.

Methods: In patients with predominantly sensory polyneuropathy, sensory motor nerve conduction of ulnar, peroneal and sural nerves as well as palm, sole sympathetic skin response (SSR) were performed. Skin biopsy for IENFD was taken from the mid-hypothenar region, nerve staining used PGP 9.5 antibodies.

Results: Tests were performed in 33 patients (13 male, 20 female; mean age 57 years; range 20-88) with neuropathy. SSR was done in 26 (16 male, 10 female). Neuropathy was due to diabetes mellitus (type 2) in 11, 9 cryptogenic,

4 diabetes and renal failure, 3 renal failure, 3 diabetes and alcohol, 2 CIDP and both 1 with diabetes mellitus (type 1) and vitamin B12 deficiency. IENFD nerve counts/mm ranged from 0.0-3.76 (mean laboratory control value = 4.72; SD 1.6). IENFD correlated significantly with ulnar (motor $p = 0.008$; sensory $p = 0.0135$), sural ($p = 0.008$) conduction velocity and hand SSR ($p = 0.012$) but not peroneal nerve ($p = 0.072$) or sole SSR parameters ($p = 0.134$).

Conclusion: In sensorimotor polyneuropathy of different aetiologies, IENFD and neurophysiological parameters of large and small nerve function correlate well if test sites are matched. This supports the usefulness of IENFD as a parameter of sensory polyneuropathy in general.

I052/MP

Angiotensin Receptor Blockers are Superior to Angiotensinogen Converting Enzyme Inhibitors in Preserving Renal Function in Patients with Nephropathy from Type 2 Diabetes Mellitus

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Aim: Selective angiotensin receptor I blockers (ARB) have been demonstrated to reduce proteinuria and preserve renal function in diabetic nephropathy (DN) due to type 2 diabetes (T2DM). The evidence for angiotensinogen converting enzyme inhibitors (ACE-I) in this area is not as clear. We hypothesize that ACE-I and ARB are equally efficacious in terms of renal protection in DN due to T2DM.

Methods: We analysed the 6-months follow-up data of 53 patients with DN from T2DM, comparing the change in creatinine clearance (CCT) over 6 months (calculated from Cockcroft-Gault equation) with ACE-I and/or ARB use.

Results: The percentages of patients on no ACE-I/ARB, ACE-I alone, ARB alone and combination therapy with ACE-I and ARB were 10%, 32%, 25% and 33%, respectively. The changes in calculated CCT over 6 months in the 4 groups were -4.03 ± 1.33 ml/min, -3.64 ± 6.68 ml/min, 1.56 ± 6.60 ml/min and 2.20 ± 6.40 ml/min, respectively. The differences in CCT change between patients on ACE-I alone compared to patients on either ARB alone or combination therapy were statistically significant ($p < 0.05$). There was no statistically significant difference in CCT change between patients on ARB alone or on combination therapy. Baseline renal function, blood pressure, HbA1c and lipid profile were similar among the 4 groups. The improvement in CCT with ARB and combination therapy was independent of change in blood pressure. There was no statistically significant difference in serum potassium levels in all 4 groups.

Conclusion: ARB and combination therapy appeared to be superior to ACE-I in preserving renal function in patients with DN from T2DM.

I053/MP

Treatment Outcome of Continuous Ambulatory Peritoneal Dialysis (CAPD)-related Peritonitis at National University Hospital (NUH)

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Aim: Management of CAPD-related peritonitis involves consideration of appropriate use of antibiotics and timely removal of Tenckhoff catheter if treatment fails. To review treatment outcome of CAPD related peritonitis in relation to culture results.

Methods: Thirty-two patients with CAPD-related peritonitis presented from 1/1/2002 till 31/12/2002 were included. Data on microorganism culture, antibiotics used were collected and analysed in relation to treatment outcome. Treatment failure defined as failure of significant clinical improvement after initiating therapy for 72 hours that required Tenckhoff catheter removal.

Results: There were 55 episodes of CAPD-related peritonitis between 1/1/2002 and 31/12/2002. Forty-four episodes were due to bacteria, while 11 episodes were culture negative. All patients received intra-peritoneal vancomycin and gentamicin at presentation. Twelve episodes required the use of either ciprofloxacin or ceftazidime. Fifty episodes (90.9%) resolved after treatment while 5 episodes (9.1%) had treatment failure. For treatment

failure group, culture results revealed *Pseudomonas aeruginosa* (2), *Staphylococcus aureus* (1) and culture negative (2). Percentage of treatment failure by different culture results were 6.8 and 18.2 for bacterial and culture negative peritonitis respectively. Interestingly, about one-fifth of culture negative peritonitis group required Tenckhoff catheter removal. There may be an increase trend of catheter removal in the culture negative group, however, this has to be further elucidated.

Conclusion: Our empirical antibiotic regimen has a very high success rate for treatment of CAPD peritonitis. However, effective treatment has to be balanced with culture and sensitivity results and prudent use of antibiotics, which needs to be tailored accordingly.

I054/MP

Detection and Cloning of a luxS-encoded Autoinducer from Toxigenic *Clostridium difficile*

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Aim: Bacteria regulate gene expression in a cell-density dependent manner in response to extracellular signaling molecules by a process called quorum sensing. These signaling molecules, called autoinducers (AIs) play important roles such as bioluminescence, sporulation, virulence, conjugation and biofilm formation. Recently, a novel autoinducer called autoinducer-2 (AI-2) was discovered. AI-2 production is luxS-dependent and was hypothesised to be a "universal" signaling molecule for interspecies communication. Does *C. difficile* possess a LuxS-based quorum sensing system?

Methods: Cell-free supernatant from *C. difficile* CCUG 19126 was tested for AI-2 activity in the AI-2 bioassay which uses *V. harveyi* BB170 as the reporter strain. Degenerate oligonucleotide primers were designed to amplify a portion of luxS from *C. difficile* genome by polymerase chain reaction (PCR). The PCR product was cloned and used as a probe in Southern blot hybridisation for subgenomic library construction. About 10,000 library colonies were screen via colony hybridisation. The putative luxS homologue was identified and cloned into luxS mutant *E. coli* DH5 α for complementation studies.

Results: Toxigenic *C. difficile* CCUG 19126 produces functional AI-2 in a growth phase dependent manner. Maximal activity was observed during early to mid-exponential phase of growth. Southern blot hybridisation indicated that the gene involved in the synthesis of this signal exist as a single copy in the genome. A luxS homologue from *C. difficile* was identified, cloned and showed to complement AI-2 production in the luxS mutant *E. coli* DH5 α . Amino acid alignment analysis indicated high homology with LuxS from various bacteria.

Conclusion: A LuxS-based quorum sensing system exists in *C. difficile* and further studies would be important to elucidate the roles AI-2 may play in this pathogen.

I055/MP

A Study of the Birth Weight Distribution in Healthy-term Newborns Among Different Races

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Aim: To define the range of birth weight of healthy babies for different races at increasing gestational age after 37 weeks.

Methods: Birth weight, race, gestation, gender and other demographic data were prospectively obtained from the neonatal notes and entered into the NHG electronic database from 1 July 2002. During the period from 1 July 2002 to 31 May 2003, there were 2184 healthy term babies born during this period. Of these, complete data from 1102 babies were available for analysis. Babies included were those whose gestation were >37 weeks. There were 542 Chinese babies, 343 Malay babies and 94 Indian babies. The frequency distribution of birth weights by race and by gestation was analysed.

Results: The mean birth weights for Chinese, Malays and Indians were 3219 g, 3129 g, and 3099 g, respectively. The mean birth weight for Indian babies appeared to peak at an earlier gestation of 40 weeks compared to Chinese and Malay babies which peaked at 41 weeks. An average female baby weighed 3120g, 122g lighter than an average male baby. The percentages of small for

gestational age (SGA) (<2.5 kg) babies for Chinese, Malay and Indians were 3.3%, 6.7% and 6.5%, respectively. The 10th and 90th percentiles in the entire study population were 2650 g and 3739 g, respectively.

Conclusion: This study provides current data on birth weights of healthy term babies from different races in Singapore. This helps doctors to better evaluate newborns in the local population and provide optimum care for them.

1056/MP

Neurological Diseases Among 15,000 Older Singaporeans – A Community-based Prevalence Survey

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Aim: This paper describes the self-reported prevalence of dementia, epilepsy, parkinsonism and stroke among Singapore adults aged > 50 years.

Methods: This is a cross-sectional community-based survey of neurological diseases 25,000 Singaporeans aged >50 years living in central Singapore. Cross-sectional disproportionate stratified random sampling by ethnic group was used. Trained interviewers conducted face-to-face interviews with subjects using a standardised questionnaire and validated screening tools. Subjects were also asked if they had ever been told by a doctor to have had dementia, epilepsy, parkinsonism or stroke. Data was entered into an Excel file, and analysed using SPSS for Windows.

Results: 14906 subjects participated, response rate 66.6% (2698 ineligible). Female to male ratio was 1.2:1. 41.2% were aged 50-59 years, 34.2% 60-69 years, 18.4% 70-79 years, 6.5% 80 years. Self-reported prevalence of stroke was 3.9%, dementia 0.6%, parkinsonism 0.3% and epilepsy 0.2%. Stroke prevalence was higher among females (4.5% vs 3.3%, $p < 0.001$), older subjects (trend $p < 0.001$), and those with less formal education ($p < 0.001$). Dementia prevalence was similar for females and males, higher among older subjects (trend $p < 0.001$), and those with less formal education ($p < 0.001$). Parkinsonism prevalence was similar for females and males and across educational levels, more prevalent among older subjects ($p < 0.001$). Epilepsy prevalence was similar for females and males and across educational levels, more prevalent among older subjects ($p < 0.02$). No inter-racial differences in prevalence rates were found.

Conclusion: The prevalence of self-reported stroke was 3.9%, dementia 0.6%, parkinsonism 0.3% and epilepsy 0.2%. Stroke was more prevalent among males. Stroke, parkinsonism, epilepsy and dementia were more prevalent among older subjects. Funding: National Medical Research Council, National Healthcare Group.

1057/MP

Clinical and Electrophysiological Correlation in Patients with Suspected Carpal Tunnel Syndrome – NNI Experience in 2002

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Aim: 1) Clinical profile of patients presenting with carpal tunnel syndrome (CTS). 2) Correlation of clinical parameters with electrophysiological tests.

Methods: A retrospective study of 120 patients with clinical suspicion of CTS was performed. The parameters included were age, gender, side affected, duration and type of symptoms, associated conditions, treatment and outcome. Electrophysiological studies were performed and the results were graded into mild, moderate and severe CTS.

Results: 120 patients referred here met the electrodiagnostic criteria for CTS. The mean age was 53.1 years. Most patients were female (87.5%) and Chinese (84.2%). Sensory symptoms like numbness and paresthesias were the predominant symptoms (90.8%); only 14.2% patients showed abnormal findings of weakness (10%) and wasting (4.2%). 27 (22.7%) was documented to have diabetes mellitus and 6 (5%) had hypothyroidism. On electrophysiologic testing, 47 patients (39.2%) had unilateral and 73 (60.8%) had bilateral hand involvement, curiously only 48 of these 73 patients had

bilateral hand symptoms. 71 patients (59.2%) had the involvement of right hand. Overall, 41 patients (34.2%) had mild, 57 (47.5%) had moderate and 22 (18.3%) had severe CTS. 15 patients with moderate and severe CTS patients underwent surgical treatment with 12 showing improvement of symptoms post operatively.

Conclusion: Our study shows that: 1) Chinese women account for majority of the patients; 2) Most patients present in the 5th decade; 3) Asymptomatic bilateral hand involvement is seen commonly in the electrophysiologic tests despite unilateral hand symptoms; 4) Right hand involvement is more common; 5) Most patients present with sensory symptoms. Abnormal physical findings are less common; and 6) Surgical treatment results in resolution or improvement of symptoms in those with moderate and severe CTS.

1058/MP

Identification of Mutations in X-linked Charcot-Marie-Tooth Patients in Singapore

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Aim: Charcot-Marie-Tooth disease comprises a group of clinically and genetically heterogeneous inherited motor and sensory peripheral neuropathies. The X-linked dominant form of Charcot-Marie-Tooth disease (CMTX) is due to mutations in the connexin 32 (CX-32) gene located on the X-chromosome. It is the second most common form of hereditary motor and sensory neuropathy after PMP22 duplication and shows both demyelinating and axonal features. Although the clinical, pathophysiological and genetic basis of CMTX has been intensely studied, mutations in the CX-32 gene have not been systematically screened for in Singapore.

Methods: We screened 15 patients for mutations in the CX-32 gene by direct sequencing. In addition to patients suspected to have CMTX by their clinical or electrophysiologic findings, patients suspected to have CMT1 and who had a negative test for PMP22 duplication were also included.

Results: Three unrelated patients showed distinct missense mutations in their CX-32 gene. These are an A→G base change at codon 34 (Met34Val), an A→G substitution at codon 73 (Met73Val), and a G→A alteration at codon 159 (Gly159Asp).

Conclusion: These mutations have been previously reported in the literature but they are the first to be described in the Singapore population. These findings suggest that CMTX is not uncommon in Singapore. Coupled with the clinical heterogeneity of CMTX patients, it would be advisable to include CX-32 screening in patients with inherited peripheral neuropathies.

1059/MP

A Homozygous Mutation in UDP-acetylglucosamine 2-epimerase/N-acetylmannosamine kinase gene (GNE) in a Patient with Distal Myopathy with Rimmed Vacuoles (Nonaka Myopathy)

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Aim: The study aims to identify mutations in UDP-N-acetylglucosamine 2-epimerase/N-acetylmannosamine kinase (GNE) gene, a causative gene for distal myopathy with rimmed vacuoles (DMRV), also known as Nonaka myopathy. DMRV causes distal weakness and wasting of the lower limbs, occurs with young adult onset and shows autosomal recessive inheritance. The GNE gene maps to the chromosome 9p12-p11.

Methods: cDNA was isolated from blood samples of a patient with the clinical and histopathological phenotype of DMRV. All 13 GNE exons were amplified from the patient's cDNA by PCR with specific sets of primers and sequenced using the ABI Prism 3100 Genetic Analyzer (Applied Biosystems).

Results: Direct sequencing of the GNE coding region revealed a homozygous

missense substitution G→A, converting valine to methionine (V696M) in exon 12. This missense mutation (V696M) was previously reported (Eisenberg et al, *Nature Genetics*, 2000) in a compound heterozygous form in a patient with autosomal recessive inclusion body myopathy, another form of hereditary myopathy which is allelic with DMRV.

Conclusion: This is the first report of a patient with DMRV showing this homozygous mutation in exon 12 of GNE. It is also the first mutation identified in a patient with DMRV in Singapore.

1060/MP

The Blood Oxygen Level Dependent (BOLD) Response to the Temporal Distribution of Interictal Epileptiform Discharges

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Aim: The BOLD response to the distribution of interictal epileptiform discharges (IEDs) has not been systematically characterised. Stimuli timing in conventional fMRI is crucial and affects efficiency, which relates inversely to the variance of the parameter estimates. We investigated the BOLD response to IED distribution using the concepts of detection (DE) and estimation efficiency (EE), hypothesising that efficiencies and BOLD response levels would positively correlate.

Methods: Data acquired from 5 idiopathic generalised epilepsy patients with 3Hz spike-and-wave IEDs (simultaneous EEG-fMRI: 1.5T scanner, referential EEG). DE and EE were calculated using Friston et al's (1999) formula. BOLD responses were modelled, based on the different aims of DE and EE, using different basis functions. Event onsets and durations were considered individual parameter estimates. Maximum F-ratios were correlated with corresponding efficiency values.

Results: Number of EEG events: 6-138; event interval range: 0.4-627.9 s; event duration range: 0.3-15.1 s. Significant BOLD activations ($p < 0.05$) were revealed in 22 of the 24 analyses. For models featuring event onsets alone, no significant correlations between efficiencies and F-ratios were found [DE: $r_s = 0.657$ ($p = 0.156$); EE: $r_s = 0.60$ ($p = 0.208$)]. There was also no significant correlation for the models including event durations [DE: $r_s = 0.086$ ($p = 0.872$); EE: $r_s = 0.086$ ($p = 0.872$)].

Conclusion: The temporal distribution of EEG events did not appear to be the main determinant of significant BOLD responses. All events and durations entered as parameters were assumed equally meaningful, however later events within a cluster could reflect propagation effects. Including event durations in the model yielded smaller lower F-ratios and correlation coefficients, possibly reflecting the inferiority of the models.

1061/MP

Cerebral Venous Thrombosis: Subtle Signs on Neuroimaging

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Aim: Cerebral venous thrombosis (CVT) is a potentially fatal condition. The clinical presentation is non-specific, and without a high index of suspicion, the diagnosis is often missed. We reviewed neuroimaging findings in patients to determine if there were subtle signs of CVT that might be helpful in patients in whom the diagnosis is not suspected.

Methods: An imaging database of final diagnosis of CVT was created from picture archive and communications system in the National Neuroscience Institute. Patients with confirmed diagnosis of CVT and at least 1 imaging study performed in our institution were included. Retrospective analysis of the CT, MR and angiography studies was carried out. Computed tomography, with or without intravenous contrast, was performed in all patients. MR study comprised at least T1- and T2-weighted and in some cases post-enhancement sequences and time of flight MR venography.

Results: There were 19 patients with dural sinus thrombosis (7 male, 12 female; age 15 to 81 years). All diagnoses were confirmed on either MRV or

angiography. There were 5 cases with parenchyma hematomas, 2 of which also had subarachnoid haemorrhage (SAH). In all patients who had contrast-enhanced CT studies, the "empty delta" sign was detected. There were prominent venous collaterals present in 12 patients manifested as dural or leptomeningeal enhancement in 3 patients.

Conclusion: CVT can present with the empty delta sign or isolated subarachnoid haemorrhage on CT. On MR imaging, abnormal combined leptomeningeal and dural enhancement are findings that support the diagnosis of CVT.

1062/MP

Hypoxia Inducible Factor-1 α and Expression of Vascular Endothelial Growth Factor and its Receptors in Cerebral Arteriovenous Malformations.

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Aim: In previous studies, vascular endothelial growth factor (VEGF) and its tyrosine kinase family of receptors (VEGFR) have been implicated in vascular angiogenesis and remodelling in cerebral arteriovenous malformations (CAVM). In this study we investigate the role of hypoxia inducible factor-1 α (HIF-1 α) in CAVMs and its relationship with VEGF and VEGFR.

Methods: We studied 26 patients who underwent surgery for CAVM. Patient demographics, clinical presentation and AVM characteristics were obtained from our prospectively maintained database. The specimens were studied for HIF-1 α , VEGF, Flt-1, Flk-1 and Flt-4.

Results: The mean age was 34.08 ± 14.18 years. Twenty-one patients presented with intracerebral haemorrhage. VEGF, Flt-1 and Flt-4 were expressed in all specimens. Flk-1 was expressed in 15 of 26 patients. HIF-1 α was expressed in 15 of 26 patients. HIF-1 α expression was not associated with patient age, gender, nidus size, haemorrhage, timing of surgery and GCS at surgery ($p > 0.05$). However it was significantly associated with VEGF, Flt-1 and Flk-1 expression ($p < 0.05$).

Conclusion: The expression of HIF-1 α is related to VEGF and VEGFR expression, suggesting a possible role for its induction and role in maintaining angiogenesis and vascular remodelling.

1063/MP

Exogenous Spermine Reduces Infarct Volume in the Rat MCA Occlusion Model

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Aim: The role of polyamines in the pathophysiology of cerebral ischemia has not been well elucidated. Spermine augments the excitotoxicity mediated by the N-methyl-D-aspartate (NMDA) receptor because this receptor is activated at micromolar spermine concentrations. However at higher concentrations, spermine could be neuroprotective because it blocks the NMDA receptor and voltage-activated calcium channels. In this study, we aim to investigate the role of spermine in focal ischemia using MRI diffusion imaging techniques.

Methods: Adult Sprague-Dawley rats (300-330 g) were anesthetised with a clinical research cocktail. The left middle cerebral artery was occluded with intraluminal suture. IV infusion of 10 mg/kg spermine (or saline for the control group) was administered via the femoral vein 30 minutes post occlusion. 24 hours later an MRI was performed with the Bruker 2T MRI machine with a custom made rat coil. Coronal images 1.2 mm thick with 3 mm gaps were acquired with TE 52.6 msec, TM 29.2 msec, big delta 50 msec and b values of 300 s/cm² and 30,000 s/cm².

Results: The mean volume of cytotoxic edema as reflected by abnormal apparent diffusion coefficient in the spermine group was 170.25mm³ compared with 472.12 mm³ in controls (2 tailed t-test $p = 0.016$).

Conclusion: Exogenous spermine administered 30 minutes after MCA occlusion ameliorates infarct/ injury volume. Further study is required to ascertain if this may translate in the human setting to significant neuroprotection from acute brain injury.

1064/MP**Intravenous Immunoglobulin Treatment for Toxic Epidermal Necrolysis: Are There Ocular Benefits?**

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Aim: To evaluate acute ocular complications of toxic epidermal necrolysis (TEN) following treatment with human intravenous immunoglobulin (IVIG) compared to a historical cohort not treated with IVIG.

Methods: Consecutive patients with TEN as defined by Bastuji-Garin et al. presenting between 1 July 2001 and 30 June 2002 were treated with high dose IVIG (2 g/kg body weight over 2 days). Patients' records were retrospectively reviewed for their demographic characteristics, causative drug, treatment, ocular involvement (if any, as assessed by an ophthalmologist) and its severity. A historical cohort was obtained from patients coded with a diagnosis of TEN (ICD Code 695.1) between 1 July 1995 and 30 June 2001.

Results: Nine (90%) of 10 patients treated with IVIG had ocular involvement. Phenytoin was the implicated drug in 3 (37.5%) patients. IVIG was initiated within 6.8 ± 3.9 days (range 3 to 14) of onset of TEN. Of the 9 patients, 1 died of septic shock. Of the 8 survivors, ocular complications were mild in 2 (25%) (lid oedema or mild conjunctival injection), moderate in 5 (62.5%) (conjunctival injection, pseudomembrane, symblepharon, corneal epithelial loss which healed with conservative treatment) and severe in 1 (12.5%) (non-healing epithelial defect requiring surgery, visual loss). The historical cohort comprised 10 (55.6%) of 18 patients with TEN who had acute ocular involvement. Three patients died. Ocular involvement was mild in 6 (60.0%) cases and moderate in 4 (40.0%) with no severe cases.

Conclusion: IVIG did not appear to reduce the rate or severity of visually significant ocular complications.

1065/MP**Hollenhorst Plaques in the Retinal Arterioles – A Case Series**

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Aim: The significance of embolic cholesterol crystals, also known as Hollenhorst plaques, in the retina of patients with occlusive cerebrovascular disease is well established. However, the relationship between Hollenhorst plaques with the status of the carotid artery is not a direct one. We report a case series of 7 patients with cholesterol emboli in the retina and correlate the findings to their ultrasound carotid findings, medical risk factors as well as lipid profile.

Methods: All patients seen in the eye clinic with positive findings of Hollenhorst plaques between year 2000 to 2001 were identified. Clinical risk factors were recorded and all patients underwent carotid duplex doppler study and a lipid profile assessment.

Results: A total of 7 patients were identified. Six patients had unilateral embolus and 1 had bilateral emboli. All patients were male with diabetes mellitus. Six patients had concomitant hypertension. Calcified plaques were noted in the carotid arteries of all subjects and were associated with varying degrees of stenosis on both sides. All patients had dyslipidaemia.

Conclusion: Patients with Hollenhorst plaques should routinely be screened for risk factors such as diabetes, dyslipidemia and hypertension. Varying degrees of carotid stenosis can occur in patients with Hollenhorst plaques and carotid ultrasound remains an important non-invasive tool in assessing its severity.

1066/MP**Steroid-resistant Focal Segmental Glomerulosclerosis in Children – Predictors of Non-response to Therapy**

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Aim: Focal segmental glomerulosclerosis (FSGS) is a common cause of primary nephrotic syndrome in childhood and has been associated with a poor response to corticosteroids and progression to end-stage renal disease.

Cyclophosphamide and cyclosporine, which have potential long-term complications, are often used as second-line treatment in these patients. This study aimed at identifying the parameters that could be predictive of poor outcome to non-corticosteroid immunosuppressives and progression to chronic renal failure in children with steroid-resistant FSGS.

Methods: The results from 210 consecutive renal biopsies at the Department of Paediatrics, National University Hospital, were examined. The medical records of patients with steroid-resistant nephrotic syndrome due to FSGS, were analysed. Factors studied, using both univariate and multivariate logistic regression analyses, included gender, race, age at diagnosis, hypertension, haematuria and serum creatinine at initial presentation, tubular atrophy, and initial or late steroid-resistance.

Results: 23 children with steroid-resistant FSGS were included in the study. 3/14 (21%) children responded to cyclophosphamide. 8/17 (47.1%) children responded to cyclosporine. 11/23 (47.8%) children progressed to renal failure. Haematuria at first presentation ($p < 0.03$) and tubular atrophy ($p < 0.05$) were associated with non-response to immunosuppressives. Multivariate analysis showed that only haematuria was predictive of non-response to non-corticosteroid immunosuppressives ($p < 0.03$, OR 16.0, 95% CI 1.7-176.5). Non-response to immunosuppressives ($p < 0.02$, OR 24.0, 95% CI 2.1-279.6) was predictive of progression to renal failure.

Conclusion: By identifying patients with steroid-resistant FSGS who are less likely to respond to immunosuppressive therapy and therefore at risk of progression to renal failure, potential side effects of these drugs can be avoided.

1067/MP**Reference Values for Lung Function in Healthy Asian Preschool Children by the Impulse Oscillation Technique**

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Aim: Asthma is the most common chronic childhood disorder with peak prevalence at preschool age. Preschool children are unable to perform standard lung function tests like spirometry. Novel techniques like impulse oscillometry are required. Reference values for preschool lung function are established in Caucasian children but not previously studied in Asian children. The objectives were to determine reference values for lung function in Asian preschool children (aged 2-6 years old).

Methods: Healthy preschool children (without a history of asthma, chronic cough or wheeze; and with a normal respiratory examination) were identified from kindergarten. Dual measurements of respiratory resistance (Rrs) at 5, 10, 15, 20, 25, and 35 Hz; respiratory reactance at 5 Hz (Xrs5) and total respiratory impedance at 5 Hz (Zrs5) were performed by impulse oscillometry.

Results: Measurements were successful in 36 (94.7%) of 38 children with a mean age of 4.2 years (range 2.3 to 6.6 years). None of the indices of respiratory function differed between boys and girls. The regression equation for Rrs5 in kPa L⁻¹ s with height in cm was $Rrs5 = -0.021 \text{ height} + 3.2585$. The regression equation for Xrs5 in kPa L⁻¹ s with height in cm was $Xrs5 = 0.008 \text{ height} - 1.1687$. The regression equations for Rrs5 and Xrs5 in this study of healthy Asian preschool children compare favourably to the equations obtained previously from healthy Caucasian preschool children.

Conclusion: The reference values for lung function in healthy Asian preschool children established using the impulse oscillation technique can be applied in future clinical and epidemiological studies in Asian children.

1068/MP**The Combination of Multiplex RT-PCR and DNA Index is Superior and Can Effectively Replace Conventional Karyotyping in Stratifying Childhood Acute Lymphoblastic Leukaemia (ALL)**

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Aim: Accurate risk stratification in childhood ALL is crucial to optimize the risk-benefit ratio of treatment. This is currently achieved by grouping patients into specific genetic subgroups with differing prognoses. Unfortunately, conventional karyotyping is both laborious and only successful in ~40-70% of patients. We evaluated the combination of a multiplex RT-PCR panel and DNA index (multiplex RT-PCR/DI) against current gold standard karyotyping

in risk stratification in B-lineage ALL.

Methods: We utilised a multiplex RT-PCR assay which detects 29 chromosomal translocations/aberrations in 7 parallel reactions including more than 80 mRNA breakpoint or splice variants. The freshly obtained mononuclear cells for flow cytometry were fixed and stained with propidium iodide. DNA Index (DI) was calculated as the ratio of peak channel number of aneuploid and diploid G1 phase cells. Conventional karyotyping of bone marrow samples was performed in the Karyotyping Laboratory with standard techniques.

Results: Diagnostic RNA samples were available in 59 out of 72 patients. The combination of multiplex RT-PCR/DI successfully assigned 60% (43/72 patients): 21% (15) TEL-AML1, 6% (4) E2A-PBX1, 4% (3) BCR-ABL, 3% (2) MLL-AF4, 1% (1) TLS-ERG, hyperdiploid 24% (17) and hypodiploid 1% (1). Karyotyping successfully assigned 36% (26/72) patients. Specifically, karyotyping failed to detect all TEL-AML1 ($n = 15$) patients who have excellent prognoses, 2 patients with MLL-AF4 as well as 1 patient each with E2A-PBX1 and TLS-ERG that have adverse prognoses.

Conclusion: The combination of multiplex RT-PCR/DNA index is superior to conventional karyotyping in risk stratification of childhood ALL (60% vs 36%). It is most useful for detection of important oncogene fusions arising from submicroscopic chromosomal translocations, eg. TEL-AML1, MLL rearrangements that are missed by karyotyping.

1069/MP

MTT Assay is a Valuable New Marker for Determination of Prednisolone Sensitivity in Childhood Acute Lymphoblastic Leukaemia (ALL): An *In vitro* Evaluation Model Using Leukaemia Cells Lines

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Aim: Cellular resistance to treatment is the most important cause of relapse in childhood ALL and is biggest problem that prevents further improvement beyond 75% long-term cure currently attained. Accurate and reproducible measurements of cellular drug resistance may provide prognostically significant information that is useful for improved risk-group stratification. Poor prednisolone response at day 8 is a powerful determinant of outcome but is only applicable to 10% of patients. Our objective was to determine if *in vitro* sensitivity to prednisolone (PRD) using methyl-thiazol-tetrazolium (MTT) assay is feasible, reproducible and applicable to all patients. We first seek to explore this in 3 established leukaemia cell lines.

Methods: The sensitivity of 3 ALL cell lines were measured using colorimetric MTT assay at 6 different concentrations of prednisolone over 4 days.

Results: Interestingly, REH cell line was found to be most resistant, followed by 697 (E2A-PBX1) then SUP-B15 (BCR-ABL) to prednisolone. Prednisolone concentration of 0.4 $\mu\text{g/ml}$ was the optimal concentration that distinguishes the cell lines from sensitive to resistant. The reproducibility of the assay was studied in multiple duplicates at this concentration and the average viability at day 4 post prednisolone was 88% (REH – resistant) versus 45% (697 – intermediate) and 30% (SUP-B15 – sensitive) with good reproducibility. Interestingly, this is different from conventional wisdom that REH (TEL-AML1) is more sensitive than SUP-B15 (BCR-ABL). But this may be due to these cell lines were derived from relapsed patients and may have unpredictable sensitivity.

Conclusion: MTT assay can be a valuable *in vitro* assay for prednisolone sensitivity in childhood ALL and may be useful for gene expression profiling studies.

1070/MP

Estimation of Pulmonary Vascular Resistance in Congenital Ventricular Septal Defects: A Simplified Approach

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Aim: Quantification of the magnitude of left to right shunt (Qp/Qs) and determination of pulmonary vascular resistance (PVR) remain a major indication for cardiac catheterisation for patients with congenital left to right

shunt. However, computation involves multi-step mathematical calculations, different methods of estimation of mixed venous oxygen saturation (MVO₂) and different assumptions of oxygen consumption (VO₂), resulting frequently in manual calculation errors. The purpose of this study are: (1) to simplify computation of all the relevant haemodynamic indices using computer-assisted calculations, with input of relevant parameters by user, and (2) to propose a simplified equation to calculate PVR, using only Qp/Qs and assumed cardiac index.

Methods: All computer-assisted computations are manually checked and verified to be correct. To compare PVR obtained using conventional methods and that using the simplified equation, clinical data of 207 consecutive patients with isolated ventricular septal defects (VSD) were entered into an Excel file. The purpose-written computer programme in C-language computed all the derived indices, including MVO₂, Qp/Qs, VO₂ and PVR.

Results: The correlation coefficients between PVR by simplified equation and conventional methods (using LaFarge and Kappagodda formulae) were 0.946 and 0.957, $p < 0.0001$, respectively. There was no systemic bias comparing the conventional and simplified approach by Bland and Altman analysis. The positive predictive and negative predictive values of high PVR by the simplified approach vary from 0.75 to 1.00.

Conclusion: The simplified approach allows error free computation of all haemodynamic parameters and a quick reliable estimate of PVR in patients with congenital ventricular septal defects.

1071/MP

Molecular Involvement of JAG1 Gene in Patients with Alagille Syndrome (AGS)

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Aim: The JAG1 gene codes for a ligand in the Notch signalling pathway which plays a critical role in cell fate determination and differentiation. Abnormalities in this gene have been associated with Alagille syndrome, a multisystem developmental disorder involving the liver, heart, skeleton, eye and facial features. This study aims to investigate the molecular basis of 5 patients with clinical features suggestive of Alagille syndrome (AGS).

Methods: Clinical assessment was carried out based on histologic findings from liver biopsy, and involvement of cardiac (most commonly pulmonary vascular defects), skeletal, ocular, facial and pancreatic abnormalities. Molecular analysis was performed by DNA sequence analysis of all 26 exons and flanking regions of the JAG1 gene.

Results: Five patients were identified based on histologic findings of paucity of intrahepatic bile ducts, and association of at least 3 of the 5 major clinical findings: cholestasis (80% of cases), cardiac abnormalities (100%), skeletal abnormalities (80%), ocular abnormalities (50%) and characteristic facial phenotype (50%). Molecular characterisation of the JAG1 gene revealed the presence of truncating mutations which are predicted to lead to premature truncation in translation of normal JAG1 protein. All the nonsense codons were generated from frameshift insertions or deletions of single or multiple nucleotides.

Conclusion: The molecular basis of 5 patients with features of AGS was determined and the involvement of JAG1 was confirmed from the truncating mutations identified. Molecular analysis of JAG1 gene is useful for confirmation of clinical cases of AGS especially due to the high phenotypic variability of this disease which range from subtle sub-clinical findings to life-threatening liver or heart disease.

1072/MP

Hand Injuries in Children

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Aim: To understand the epidemiology, sites and mechanism of hand injuries that occur in children. To consider safety measures that can be implemented with the above-mentioned knowledge.

Methods: A retrospective study was carried out with a specifically designed questionnaire. Data is taken from attendees from the National University

Hospital Children's Emergency over the period of February 2002 to January 2003. Using the database available, information on the diagnosis, mechanism of injury and x-ray findings reported by the radiologists were extracted.

Results: 4568 trauma cases were seen over this period of time, of which 414 (9.1%) patients had hand injuries (250 were male and 164 were female). The mean age was 8.8 years with a range of 2 months to 16 years. The right hand was injured in 207 patients (50.0%), the left hand in 199 patients (48.1%) and both hands in 8 patients (1.9%). Laceration was the most common reason for presentation with a total of 121 (26%) patients, Seventy-six (18.6%) patients had fractures while 85 (20.5%) had minor sprains and strains. "Jamming/crushing" was the commonest reason (24.4%) for isolated finger injuries.

Conclusion: Although hand injuries are not life threatening, they are sources of pain for children and of psychological trauma for children and caregivers. They are usually due to jamming in doors, resulting in cuts of soft tissue, nail or bony injuries, including amputation. Both children and adults should be educated about the mechanism and causation, emphasizing that injuries can be prevented by safety measures.

1073/MP

Molecular Pharmacological Mechanisms of PX3.102 – An Active Component of a Chinese Medicinal Herbal Decoction For Autoimmune Disease Treatment

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Aim: CMX-13, a bioactive component of a Chinese herbal decoction, was found to be effective for the treatment of lupus nephritis as well as prevention of rat lung allograft rejection. Recently PX3.102, its active compound has been purified and it was shown to suppress PHA stimulated PBMC proliferation in a dose dependent manner. This study further investigated its molecular pharmacological mechanisms using cDNA microarray assay.

Methods: PBMCs were isolated from 2 normal healthy subjects by Ficoll-Hypaque. PBMCs were stimulated by PHA and treated with PX3.102 (dissolved in DMSO) at 5 ng/ml and 10 ng/ml, respectively at 37°C. PHA-stimulated PBMCs treated with DMSO served as controls. Proliferation assay was performed simultaneously to evaluate PBMC responsiveness. After 24 hours of incubation, cells were washed with PBS and harvested for cDNA microarray analysis (Clontech). Genes with ratio more than 1.8 were considered as upregulated, whereas those with ratio less than 0.56 were considered downregulated.

Results: 8 genes were found upregulated by PX3.102 in PBMCs, including interleukin 6, interleukin 1, placental growth factor. In contrast, 22 genes (metallothionein 2A and 1G, cathepsin B and D for example) were downregulated. These genes involved multiple pathways including transcriptional activation, antigen degradation, immunoglobulin production as well as apoptosis, which was in agreement with our previous functional study.

Conclusion: These findings suggest that PX3.102 may work through multiple pathways in PBMCs including apoptosis pathway. Further studies are ongoing to confirm its role in these pathways, and their interactions will be determined.

1074/MP

The Effect of CETP Taq1B Polymorphism on Plasma Lipid Levels Among Singaporean Neonates

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Aim: The Taq1B polymorphism, a silent base change at nucleotide 277 in intron1 of the cholesteryl ester transfer protein (CETP) gene, has been reported to be associated with plasma HDL-cholesterol levels. The association has not been investigated in neonates

Methods: Allele frequency determination and plasma lipid profiles were determined in; Chinese (n = 435), Malay (n = 308) and Indian (n = 223) neonates who had no history of mixed heritage in the preceding 3 generations. Deviation of genotypes from Hardy Weinberg proportions were tested by the chi-square analysis. Significance of differences in allele frequencies between

groups were determined by the z-test while differences in lipid profile levels between genotypes were tested by analysis of covariance.

Results: The B2 allele frequency was significantly higher (P < 0.02) among the Indians (0.43) when compared to Malays (0.37). Chinese male homozygotes for the B2 allele had higher levels of apoA-1 (P < 0.0005) and lower levels of triglycerides (P < 0.009) when compared to subjects with B1B2 and B1B1 alleles. In both sexes in all ethnic groups there were no statistically significant differences among the genotype groups in the plasma levels of total cholesterol, HDL-cholesterol, LDL-cholesterol, apoB levels and lipoprotein(a) levels.

Conclusion: The study showed significant influence of the Taq1B polymorphism on HDL related plasma apoA-1 and triglyceride levels at birth among the Chinese subjects only. However, no significant association with HDL-cholesterol levels were observed.

1075/MP

The Changing Prevalence of Asthma and Allergies in Singapore – Suggestion of a Plateau in Trends

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Aim: The prevalence of asthma in Singapore has been increasing over the last few decades. More recent reports have suggested a plateau in this trend in many countries around the world. The aim of this study was to evaluate the current asthma prevalence amongst Singapore schoolchildren and its changing trends.

Methods: A cross-sectional study using the standardised ISAAC questionnaire-based protocol was carried out in 2001 and the findings compared with those of previous studies in Singapore (1997, 1987 and 1967).

Results: 9308 children were surveyed using instruments identical to a previous study in 1994. Over the last 7 years, the symptoms of current wheeze (wheeze in the last 12 months) showed a decreasing trend [1994: 12.0% vs 2001: 11.0%]. This trend was not in the same direction in both age groups, decreasing in the 6-7 year age group (16.6% to 10.2%) but increasing in the 12-15 year age group (9.9% to 11.9%).

Conclusion: The prevalence of current wheeze, a surrogate measure of asthma prevalence, has not increased substantially in Singapore schoolchildren in recent years and there is a suggestion of a plateau in its upward trend.

1076/MP

Acute Drug-Induced Dystonias in the Children's Emergency

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Aim: To describe the important clinical features of 5 patients that presented with acute drug-induced dystonias to the Children's Emergency over a ten-month period, and to highlight the risks of anti-emetic-induced dystonias in children.

Methods: Medical records of the 5 patients were reviewed and a literature review was conducted.

Results: We report 5 boys aged 6.8 to 15.3 years (median age 14.8 years), of which 4 were 12.7 to 15.3 years old. All had no previous dystonias. Among them, 3 had reactions to metoclopramide, 1 to prochlorperazine and 1 to haloperidol. Metoclopramide and prochlorperazine were prescribed for acute gastroenteritis and haloperidol for severe tics. Three of them had dosages above recommended ranges. The dystonias occurred 21 to 72 hours (median 26 hours) after starting the medications and involved extraocular, buccolingual and/or cervical muscles. All responded readily to intravenous benzotropine and/or diazepam. One patient had a recurrence. Literature review shows that in patients less than 30 years old, the incidence of acute dystonia-dyskinesias is 1:81 for metoclopramide and 1:464 for prochlorperazine. Males, age group 10 to 19 years and patients with previous dystonias have higher risks. The commonest implicated drugs in children are anti-emetics. Dystonias are more likely if the dosages exceed recommended doses and/or are repeated. Common differential diagnoses include meningitis, seizures and tetany.

Conclusion: Judicious use of anti-emetics in children is crucial, especially if risk factors are present. Practitioners should be familiar with the recommended dosages, risks, clinical features and management of acute dystonias.

1077/MP

Cell Block Immunocytochemistry Helps in the Differentiation Between Adenocarcinoma and Mesothelial Lesions

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Aim: The differentiation of adenocarcinomas and mesotheliomas is of prognostic, therapeutic and medico-legal importance. With pleural fluid being an initial early sample often obtained from such patients, we seek to validate the usefulness of cell block immunocytochemistry as a diagnostic aid and to propose a simple panel for the diagnostic work-up.

Methods: Cell blocks were prepared from pleural fluid of 5 cases of adenocarcinomas, 4 cases of mesotheliomas and 3 cases with reactive mesothelial cells (RM), all of which had diagnoses established clinicopathologically. The panel of immunostains evaluated comprised Ber-EP4, CEA, B72.3, Leu-M1, EMA, Calretinin and Thrombomodulin.

Results: All cases of mesotheliomas and RM were negative for Ber-EP4 and CEA while all except 1 case of adenocarcinoma were positive for these stains; there was generally stronger and more extensive staining for Ber-EP4 in adenocarcinoma. B72.3 and Leu-M1 appeared to be slightly less discriminatory. All cases of mesotheliomas and RM were positive for Calretinin, displaying the characteristic fried egg cytological appearance, while adenocarcinomas were negative/weakly staining. Thrombomodulin staining was generally selective for mesothelioma, except for a single case of adenocarcinoma with aberrant staining. EMA was positive in all cases, although a differential staining pattern was sometimes discernable (cytoplasmic for adenocarcinoma cells; cell surface accentuation for mesothelial cells).

Conclusion: Cell blocks provide good cytology material for the immunocytochemical analysis of suspected adenocarcinoma /mesothelial lesions. They should always be prepared whenever possible. An initial immunocytochemistry panel comprising Ber-EP4, CEA, Calretinin and Thrombomodulin is suggested as an indispensable aid in the cytodiagnosis of these lesions.

1078/MP

RAS Oncogene Mutations in Intestinal and Diffuse Type Gastric Carcinomas in Singapore

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Aim: Gastric cancer is the third most common cancer in Singapore. We had previously studied the 2 main subtypes of gastric cancers in Singapore and found that there is a differential expression for a variety of antigens, including the RAS oncoprotein. Subsequent studies from Japan, Korea and Florence (Italy) have also provided conflicting data. The incidence of RAS mutations also appear to vary and these regional variations could be due to whether the studies were conducted in high incidence (eg. Florence and Japan) or low incidence regions.

Methods: The methods used were 3-fold. Genomic extraction of DNA from paraffin-embedded tissue slides, PCR amplification of RAS exons and Denaturing Gradient Gel Electrophoresis (DGGE) of PCR -amplified exons for point mutation analysis.

Results: A total of approximately 70 patients were selected for this project. Exons 1 and 2 of the Ki-ras2 and N-ras genes were analysed. No mutation were detected for any of the exons for either of the genes with the exception of a mutation on exon 1 of the Ki-Ras2 gene for 1 of the patients. This mutation occurred consistency on DGGE gels and demonstrated a unique DGGE band profile consisting of 4 bands. DNA sequencing confirmed the presence of this mutation occurring on codon 12 of the exon in which a G had been changed to a T on the first base of the triplet. A functional mutation was apparent possibly altering glycine to cysteine on the protein.

Conclusion: RAS mutations are an infrequent occurrence in gastric carcinogenesis. Our rates are similar to those in countries with a low incidence.

1079/MP

Venous Thromboembolism in Intensive Care Patients with Severe Acute Respiratory Syndrome

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Aim: Severe acute respiratory syndrome (SARS) is a flu-like coronavirus infection with progression to pneumonia. A proportion of patients develop respiratory failure requiring intensive care (ICU) management. We report a high incidence of venous thromboembolism (VTE) in SARS patients in ICU and our evolving management strategies.

Methods: A retrospective review of all probable SARS patients admitted to ICU from March 15 to May 12, 2003 was conducted. Deep vein thrombosis (DVT) was diagnosed by compression Doppler ultrasound (CUS) or at post-mortem. Pulmonary embolism (PE) was identified at post-mortem or diagnosed clinically. Low-molecular-weight heparin (LMWH) thromboprophylaxis evolved from none to high dose anti-Xa level guided dosing.

Results: 18 VTE events were identified in 31.1% of this cohort (14/45). Mean age of patients with VTE was 46.8 years. 7 patients had DVT alone, 3 had PE alone and 4 patients had both. Other than the first 2 patients who had PE and DVT diagnosed at post-mortem, the rest of these patients had LMWH thromboprophylaxis. Despite increasing dose of LMWH, VTE were still encountered. No established pre-ICU VTE risk factors were identified. Mortality for the VTE group presently stands at 57.1%.

Conclusion: A significant proportion of SARS patients in ICU developed VTE despite aggressive thromboprophylaxis. This leads to considerable mortality. Further studies are needed to elucidate pathogenesis of VTE in SARS to guide future management.

1080/MP

Tubularised Incised Plate (TIP) Urethroplasty: Expanded Use in Primary and Secondary Hypospadias Repair

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Aim: We evaluated our experience using the TIP technique for primary distal, proximal hypospadias as well as re-operated cases.

Methods: We retrospectively reviewed the records of 56 boys (mean age of 3.02 years) operated by 4 consultant surgeons in our institution between December 1998 and December 2002. 53 patients had primary repairs while 3 were secondary reconstruction following failed urethroplasty with alternate techniques. The meatal positions were coronal in 15 (27%), distal in 19 (34%), mid-shaft in 19 (34%) and proximal in 3 (5%). TIP urethroplasty consisted of tubularised widened hinge urethral plate with 6/0 absorbable PDS suture. The neourethra was further reinforced with 2 layers of de-epithelialised dartos tissue. Glanuloplasty and meatoplasty were completed with interrupted sutures. All patients were stented postoperatively with the duration of urinary diversion range from 3 to 14 days (mean 8.5 days).

Results: Mean follow-up was 14.3 months (range 3-45 months). 53 (95%) patients had the meatus in the glanular position with vertical orientation. Complications of urethrocutaneous fistula occurred in 6 (11%) of patients while meatal stenosis was found in 5 (9%) patients. No urethral stricture or recurrent chordee has been encountered thus far.

Conclusion: The TIP urethroplasty achieved satisfactory functional and cosmetic outcome in both primary and complicated hypospadias repair in our centre.

1081/MP

Highly Specific and Sensitive Molecular Diagnosis of Fragile X Syndrome Using a Triple Ms-PCR Strategy

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Aim: Fragile X syndrome is the most common inherited form of mental

retardation, and is caused by hyperexpansion and hypermethylation of a polymorphic CGG repeat in the 5' untranslated region of the FMR1 gene, in >95% of cases. Normal (NL) alleles contain 6-55 CGGs, while full mutation (FM) alleles have >200 CGGs, are silent, and are derived from at-risk but functional premutation (PM) alleles (55-200 CGGs). More than a decade after its gene identification, Southern blot analysis remains the only reliable method to detect all possible FMR1 alleles in both sexes, due to the refractiveness of this locus to PCR. We wished to devise a simpler, more rapid alternative to Southern blot analysis for the molecular diagnosis of fragile X syndrome, but with equivalent specificity and sensitivity.

Methods: DNA samples were subjected to sodium bisulfite conversion, and a triple PCR protocol (nonmet-PCR, met-PCR, and mTP-PCR) was utilised to unambiguously genotype NL, PM, and FM males and females by simple agarose gel analysis.

Results: Using this protocol, we correctly determined the FMR1 (CGG)n genotype of 44 male and 45 female samples that have been genotyped previously by Southern blot analysis. Including the pre-PCR sodium bisulfite genomic modification step, results were obtained within 2 days, compared with 1 to 2 weeks for Southern blot analysis.

Conclusion: The triple ms-PCR assay is the most comprehensive PCR-based system available for the diagnostic evaluation of fragile X syndrome in both males and females, and represents a significant advance over Southern blot analysis.

1082/MP

Pharmacokinetics of Vancomycin in Asian Patients Undergoing Intermittent Hemodiafiltration

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Aim: This study characterised the pharmacokinetics of vancomycin in Asian patients undergoing intermittent hemodiafiltration (HDF).

Methods: Postdilutional HDF was performed in ESRD patients who had suspected or documented infections requiring vancomycin therapy. 1.0 gm vancomycin was infused over 60 minutes within 30 minutes of commencement of HDF. Serum samples were simultaneously sampled, in duplicates, before and after the dialyzer at 1 h, 2 h, and at the end of HDF. Three other samples were collected at the start, 1 h post-HDF and just before the next scheduled HDF session. Serum vancomycin was measured using fluorescence polarisation immunoassay. The pharmacokinetics of vancomycin was determined using a 1-compartment model. Student's t test was used for statistical analysis.

Results: Seven patients (mean age $\pm$ SD; 57.6 $\pm$ 9.52) were studied. Serum vancomycin concentrations decreased 53% from 25.0 $\pm$ 6.3 mg/L to 10.3 $\pm$ 2.5 mg/L at the end of HDF. Correcting for rebound, the actual concentration at the end of HDF was 11.6 $\pm$ 2.7 mg/L. The calculated volume of distribution was 0.41 $\pm$ 0.08 L/kg. The intra- and interdialytic half-lives were 2.95 $\pm$ 0.68 hrs and 128.9 $\pm$ 68.8 hrs respectively. The serum vancomycin concentration before the next HDF session, 48 hours later, was 9.13 $\pm$ 2.86 mg/L.

Conclusion: A 3-hour HDF treatment session significantly reduces vancomycin levels in patients with renal failure. This is in contrast to conventional hemodialysis treatment in which there is little clearance of vancomycin. Assuming a thrice weekly intermittent HDF treatment prescription similar to our study conditions, vancomycin should be dosed at each HDF treatment. The patient's residual renal function should be taken into consideration to further optimise dosing.

1083/MP

Low Concentrations of Resveratrol Inhibits Apoptosis-induced by Known Chemotherapeutic Agents in Human Leukemia Cells: A Word of Caution and an Insight into an Environment Non-permissive for Apoptotic Execution

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Aim: Recently, we have highlighted the critical role of a permissive intracellular milieu in the efficient execution of the apoptotic signal. Consistent with that, we showed that apoptosis induced by exogenous or drug-induced intracellular

hydrogen peroxide (H₂O₂) was mediated by a decrease in intracellular superoxide (O₂⁻) concentration and cytosolic acidification. Contrarily, a slight increase in intracellular O₂⁻ concentration inhibits apoptotic signaling.

Methods: MTT and propidium iodide staining for cell death, fluorometric analysis of caspases, mitochondrial membrane potential and hydrogen peroxide production.

Results: Here we show that low concentrations of the chemopreventive agent resveratrol (4-8 μ M), trigger a substantial increase in intracellular O₂⁻ production in HL60 human leukemia cells. Pre-incubation of tumor cells to resveratrol blocks apoptosis induced by exogenous H₂O₂ or by exposure to anti-cancer drug merocil that kills via intracellular H₂O₂ production. Cells pre-incubated with resveratrol neither undergo a decrease in intracellular O₂⁻ nor a drop in cytosolic pH in response to H₂O₂ or merocil. Consequently, there is a decrease in caspase activation, and a block in H₂O₂-induced mitochondrial engagement. Interestingly, we have observed that this phenomenon of resveratrol induced inhibition is common to modern anti-cancer drugs such as vincristine, paclitaxel and daunorubicin.

Conclusion: These results suggest that unlike its pro-apoptotic activity at higher concentrations, resveratrol at relatively low concentrations can act as a pro-oxidant and by doing so inhibit the execution of the apoptotic signal. Our data could have tremendous implications for the use of resveratrol in combination chemotherapy regimens, particularly with compounds that signal through intracellular H₂O₂ production.

1084/MP

A Study of a Programme to Improve Vestibular Function in Patients with Multiple Sclerosis who are Community Ambulant – A Pilot Study

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Aim: To determine the efficacy of a tailored, supervised programme to improve vestibular function in patients with multiple sclerosis (MS). It also aims to investigate the correlation between the balance and mobility measures and a self-perceived disability measure.

Methods: Seventeen subjects with MS were randomly allocated to the experimental and control groups. The experimental group participated in a customised and supervised intervention in the form of workstation model twice a week for 6 weeks. The control group received a "sham" home exercise programme for 6 weeks. The unipedal stance, sharpened Romberg, modified Clinical Test for the Sensory Interaction on Balance (mCTSIB), and the functional reach (FR) tests measured balance. Functional mobility measures included the time up and go test and the dynamic gait index. The dynamic visual acuity test and dizziness handicap inventory evaluated dizziness and gaze stability respectively. The Multiple Sclerosis Impact Scale measured self-perceived measure of disability of MS.

Results: The experimental group demonstrated a significant improvement in FR compared to the control group post-intervention ($P = 0.046$, $P < 0.05$). The improvement in FR was not significant after 1 month follow up ($P = 0.309$, $P > 0.05$). The group did not demonstrate significant improvement post-intervention and after 1 month with the other dependent variables ($P > 0.05$). The sharpened Romberg and dizziness handicap inventory had moderate correlation with most of the other balance and functional mobility measures.

Conclusion: The vestibular function of MS subjects was not significantly improved following a 6-week tailored intervention. However, frequently practised tasks such as reaching significantly improved.

1085/MP

Do Severe Acute Respiratory Syndrome (SARS) Precautionary Measures Affect Patient's Satisfaction with Doctor-patient Interaction?

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Aim: Measures have been implemented by Singapore's hospitals to contain Severe Acute Respiratory Syndrome (SARS), including personal protective

equipment, week-on week-off rosters, mandatory temperature checks and visitor restrictions. We assessed the impact of these measures on patient satisfaction.

Methods: As part of the department's quality improvement programme, out-patients seen at National University Hospital Radiotherapy Centre during the SARS outbreak completed an anonymous, previously validated questionnaire assessing satisfaction with doctor-patient interaction. Items also assessed patient perception of SARS measures.

Results: Of 149 patients, 97% had heard of SARS and 92% believed SARS precautions necessary. 54% believed contracting SARS was possible despite the measures. Patients were satisfied with doctors wearing masks (97%), temperature checks (97%), patients wearing masks (96%) and visitor restrictions (88%). 24% believed SARS measures had adversely affected doctor-patient interaction. 94% of patients were satisfied with their doctor-patient interaction. Issues patients were most satisfied about included understanding their treatment plan (100%), doctor being honest (97%), being understood (96%), explanation of treatment (95%) and addressing patients' concerns (94%). However, 61% believed they could have been told more about how to care for their illness, 59% felt that the visit could have been better, 58% believed the doctor could show more interest, and 21% felt rushed during consultation. Patients who were less satisfied with SARS measures were significantly less satisfied with doctor-patient interaction ($p = 0.0001$).

Conclusion: Overall, patients were satisfied with doctor-patient interaction despite implementation of SARS prevention measures. We identified specific areas of interaction for targeting by the departmental quality improvement programme.

1086/MP

Gender Differences in a 1-year Cohort of Patients with First-Episode Psychosis in Singapore

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Aim: To examine gender differences in age of onset of illness, duration of untreated psychosis (DUP), demographic parameters and response to treatment in a 1-year cohort of patients with first-episode psychosis.

Methods: The sample comprised 94 Asian patients presenting with first-episode psychosis in the year 2001. Detailed demographic information was collected, and patients were assessed regularly on the Positive and Negative Syndrome Scale (PANSS), Global Assessment of Functioning Scale (GAF) and WHO-Quality of Life Scale (QOL-BREF).

Results: The group comprised 54 (57%) men and 40 (43%) women. The men were significantly younger ($p = 0.03$), single ($p < 0.005$) and had received more years of education ($p = 0.05$). There were no significant differences in the DUP among men and women. There were no significant differences in the GAF, PANSS [although poor impulse control was assessed to be significantly higher in men ($p = 0.009$)] or QOL-BREF scores at baseline. Men had significantly more readmissions ($p = 0.03$) in the 1-year follow-up period, however response to treatment did not vary within the groups.

Conclusion: Gender differences in patients with first-episode psychosis were similar to those of chronic patients. Rehospitalisation rates also followed a similar pattern with men having significantly more hospitalisation and longer stays.

1087/MP

The Unmet Need for Effective Therapy in Ankylosing Spondylitis

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Aim: We evaluated how many of our patients would meet the proposed ASAS criteria for initiation of biologic therapy in ankylosing spondylitis (AS) (BASDAI > 40), and aimed to establish robustness of the criteria, evaluating quality of life and work disability

Methods: 325 consecutive clinic attendees with a diagnosis of AS were

mailed a postal questionnaire, of whom 228 (70%) returned it. We assessed disease activity (BASDAI), function (BASFI, HAQ, LDQ), quality of life (ASQoL), and work instability (WIS). Student t-tests were used for comparison between groups.

Results: The mean age of these patients was 47.4 ± 12.4 years and 25% were female. Mean BASDAI was 48.9 ± 23.6 , with 65% of patients had BASDAI > 40 . The ASAS cut-off point was proven to be robust, with highly significant differences between the 2 groups in functional ability (BASFI [$p < 0.001$] and HAQ [$p < 0.001$]), quality of life (ASQoL [$p < 0.001$]), and predictably pain ($p < 0.001$). BASDAI > 40 was also found in 44% of those who were working and associated with a significantly higher risk of work instability ($p < 0.001$). Overall, 20% of them had lost their job because of AS. Of those who remained working, 46% showed WIS > 10 (high risk of job loss).

Conclusion: There is a large unmet need for effective therapy in AS with 65% of unselected clinic attendees meeting the ASAS criteria for biologic therapy. The criteria are robust and predict patients with worse functional status and quality of life. This makes the need for effective intervention a priority area with the aim of job retention, which is of significant economic benefit.

1088/MP

Behcet's Disease: A Case Series from Singapore

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Aim: To study the manifestations of patients with Behcet's Disease (BD) at a tertiary rheumatology center in Singapore.

Methods: The case records of patients diagnosed with BD using either the International Study Group (ISG) or the O' Duffy (OD) classification criteria, were studied. Their demographics, clinical features and outcome were recorded

Results: Thirty-seven patients were diagnosed with BD. 24 (64.9%) satisfied both ISG and OD criteria. 13 (35.1%) did not fulfill the ISG criteria but fulfilled the OD criteria. Based on the OD criteria, 7 (18.9%) were incomplete form and 6 (16.2%) the complete form. The male to female ratio was 1:1.1 (18 males, 19 females). There were 27 Chinese (73%), 7 Malay (18.9%), 2 Indian (5.4%) and 1 Caucasian (2.7%). The mean age of onset of disease manifestation was 32.7 years (range 15-58). The commonest presentations were recurrent oral ulcers (100%), genital ulcers (64.9%), joint (56.8%) and cutaneous manifestations (48.6%). Erythema nodosum (15) and papulopustular lesions (12) were the cutaneous manifestations. Systemic manifestations included arthritis (16, 43.2%), gastrointestinal manifestations (15, 40.5%) and uveitis (14, 37.8%). Recurrent abdominal pain (10, 66.7%) and diarrhoea (7, 46.7%) were the commonest manifestations of gastrointestinal BD. Gastrointestinal ulcers occurred in the ileocaecum (3), sigmoid (1) and rectum (1) of which 2 patients with ileocaecal ulcers perforated. There were only 2 cases of neuroBehcet's presenting with transient ischaemic attack/meningoencephalitis. Venous thrombosis was found only in 2 patients. Visual impairment from uveitis was the commonest cause of morbidity (25%) in our BD patients. There were no mortality.

Conclusion: BD is a rare rheumatologic condition in Singapore but its presentation and manifestations are similar to other epidemiological studies published in the literature.

1089/MP

Changing Patterns of Lupus Mortality in a Tertiary Centre in Singapore

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Aim: To compare the mortality among patients with systemic lupus erythematosus (SLE) who died in our hospital during 24-year review periods.

Methods: We retrospectively reviewed the patient and disease characteristics and causes of death of all SLE inpatients ($n = 88$) during the 24-year periods. Group A was from January 1992 to December 1995 and group B was from January 1998 to December 2001.

Results: Mortality has decreased in the recent years (54 vs 34). There were no significant differences in the gender ratio (female-to-male ratio 50:4 vs

28:6 [$p = 0.18$]), mean age at diagnosis (30.9 ± 14.1 years vs 35.6 ± 16.7 years [$p = 0.16$]) and mean age at death (36.1 ± 14.3 years vs 42.1 ± 15.4 years [$p = 0.07$]). Median disease duration was longer in group A (44 months vs 24 months). The main cause of death for both groups was infection (48.2% vs 61.8%; $p = 0.27$). In the recent years fewer patients died from active SLE alone (33.3% vs 8.8%; $p = 0.01$), but infection with active SLE accounted for proportionately more deaths (24.1% vs 47.1%; $p = 0.04$). Infection without active SLE accounted for similar proportions of death in both groups (24.1% vs 14.7%; $p = 0.4$). Atherosclerosis, malignancy and thromboembolism secondary to antiphospholipid syndrome were not the major causes of death. Other manifestations (cerebral lupus, thrombocytopenia, pulmonary haemorrhage, leukopenia, cardiomyopathy, vasculitis and serositis) were not significantly different between the 2 groups.

Conclusion: Inpatient SLE mortality has decreased in the recent years with fewer deaths from active SLE alone. However, more patients died from infection in the setting of active SLE.

1090/MP

TGF Beta Polymorphisms and Serum TGF Levels in Oriental Patients with Ankylosing Spondylitis

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Aim: To study the association between TGF β 1 gene polymorphisms and susceptibility to disease in our oriental ankylosing spondylitis (AS) patients, and to determine whether this is related to the expression of TGF β 1 in serum and in vitro peripheral blood mononuclear cell (PBMC) cultures.

Methods: Genomic DNA was extracted from PBMC of AS ($n = 70$) or unrelated healthy controls ($n = 96$). The codon 10 and 25 polymorphisms in the TGF β 1 gene were analysed using standard polymerase chain reaction (PCR)-based methods. Levels of TGF β 1 in serum were measured by enzyme-linked immunosorbent assay (ELISA). In addition, the ability of PBMC to synthesise TGF β 1 and other cytokines was assessed by in vitro cultures stimulated with mitogen.

Results: There was no statistical difference in the distribution of codon 10 and 25 TGF β 1 genotypes between AS patients and controls. However, serum TGF β 1 levels in AS patients were significantly higher than those in controls ($P < 0.001$). Incubation of AS and normal PBMC with phytohaemagglutinin (PHA) led to upregulation of TGF β 1, IL-10, TNF α and IFN γ as assessed by ELISA. Importantly, PHA-induced TGF β 1 production was significantly enhanced in AS patients when compared to normal controls whereas proinflammatory cytokines TNF α and IFN γ were reduced.

Conclusion: Our results show that AS patients expressed significantly higher levels of serum TGF β 1. Activation of AS PBMC led to enhanced TGF β 1 production accompanied by reduction of TNF α and IFN γ . These data suggest that TGF β 1 protein expression is independent of the genotype variants in our oriental AS patients.

1091/MP

A Pilot Study on the Clinical Utility of Functional MRI in the Evaluation of Suspected Neuropsychiatric Lupus

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Aim: To evaluate the clinical utility of functional MRI (fMRI) in the diagnosis of neuropsychiatric lupus (NPSLE).

Methods: Sixteen consecutive patients with SLE and suspected neuropsychiatric syndromes (classification according to the American College of Rheumatology Ad Hoc Committee on Neuropsychiatric Lupus Syndromes) underwent clinical neuropsychiatric evaluation, autoantibody testing and fMRI (DWI, FLAIR and MR-Spectroscopy).

Results: There were 3 (18.7%) males and 13 (81.3%) females, with mean age 34.2 ± 16.2 years (13-62). The mean SLEDAI (SLE disease activity) score was 18.1 ± 10.1 (2-36). Four patients were deemed not to have NPSLE after

evaluation. Of the remaining 12 patients, the manifestations were cerebrovascular disease (CVD) (stroke, transient ischaemic attack) (41.7%), psychosis (18.2%), seizure disorder (18.2%) or combinations of syndromes including the above and cognitive dysfunction or acute confusional state (27.3%). Three patients positive for anticardiolipin antibody or lupus anticoagulant all presented with CVD. None of the patients with psychosis were positive for serum anti-ribosomal P antibody. Functional MRI facilitated the diagnosis of NPSLE in patients with neurological deficits: cerebrovascular disease and seizure disorders via its ability to detect consistent neurometabolic changes and reversibility of structural changes following immunosuppressive therapies. However, fMRI was unable to facilitate the diagnosis of NPSLE in patients with psychosis or cognitive dysfunction.

Conclusion: The clinical utility of fMRI is limited to certain subsets of NPSLE manifestations. It appears to be useful in patients presenting with CVD and seizure disorders, but not with psychosis or cognitive dysfunction.

1092/MP

Primary Non-Hodgkin's Lymphoma of the Nasal Cavity: Evaluation of the Prognostic Significance of Local Tumor Extension and Combined Modality Treatment

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Aim: The aims of this study were to evaluate the impact of local tumour extension in early stage non-Hodgkin's lymphoma of the nasal cavity and to compare the treatment outcome of radiation (RT) alone with those of combined chemoradiation (CRT).

Methods: Between March 1991 and June 1997, 90 consecutive patients with Stage IE-IIIE Non-Hodgkin's Lymphoma (NHL) were diagnosed and treated in the Shanghai Cancer Hospital. Thirty-one patients have the primary disease limited in the nasal cavity (Group 1); 35 patients had disease invading 1 adjacent structure beyond nasal cavity (Group 2); and 24 patients had disease invading 2 or more adjacent structures beyond nasal cavity (Group 3). Eighty patients received combined chemoradiation and 10 patients received radiation only.

Results: The median survival for all 90 patients is 58.7 months (range 13-81 months). The actuarial 5-year overall survival (OS), disease-free survival (DFS) and local control (LC) rate were 46%, 42.5% and 92%, respectively. The extent of local disease had significant impact on OS (68.3%, 43.2% and 27.7%, $p = 0.001$), LC (100%, 90.8% and 77.5%, $p = 0.002$), and distant metastasis (11.6%, 30.4% and 51.1%, $p = 0.0001$). Multivariate analysis also showed combined chemoradiation significantly improved the 5-year OS (48.1% vs 40.2%, $p = 0.05$) and reduced the distant metastasis (27.2% vs 51.1%, $p = 0.014$).

Conclusion: Extent of local disease is a strong prognostic factor in patients with early stage nasal cavity NHL treated with combined chemoradiation or radiotherapy alone. The addition of chemotherapy to EBRT significantly improves the treatment outcome.

1093/MP

Beta-microseminoprotein in Pterygium, a Prostate Specific Protein, Highly Expressed in Ocular Surface Disease

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Aim: In microarray studies of human pterygium, an overgrowth of the cornea, we found that beta-microseminoprotein to be one of the most significantly upregulated genes when compared to normal conjunctiva tissue. We have applied PCR to validate the presence of this gene and the level of its expression for comparison to the microarray results.

Methods: One group of 8 pterygium samples and another group of control conjunctiva tissues (3 groups each with 5 pooled tissues) were prepared for

microarray analysis using the standard Affymetrix protocol. Each of the samples was hybridised into HG U133A Chip and the results were scanned 2X. The data analysis and visualisation were performed using Statistica 6.0, MAS 5.0, DMT 3.0 and GeneSpring v.5. Five additional pterygium samples and 1 conjunctiva sample (pooled normal conjunctival tissues from the same 5 patients) were prepared for PCR. The primers flanked 452bp of the 572bp total length of the gene.

Results: Data was filtered using Mann-Whitney test with p cut-off of 0.05 to determine the significance and the direction of the 'Change Call'. In 22,283 total probe sets in HG U133A Chips, 21 genes were found significantly up regulated 2 fold or more compared to the control tissue. beta-microseminoprotein increased 3.46 times (SLR = 1.79) on average compared to normal conjunctiva. PCR confirmed the up regulation of the gene in pterygium compared to normal conjunctiva.

Conclusion: This novel gene may be uniquely associated with the mucosal tissue of the ocular surface and signal the development or growth of pterygium.

1094/MP

Muscarinic Acetylcholine Receptors (mAChR) Regulate proliferation of Human Scleral Fibroblasts (SFs)

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Aim: Atropine sulfate, a muscarinic antagonist has been shown to retard axial elongation in experimentally induced myopia and in clinical myopia. Muscarinic receptors appear to affect human and mouse scleral fibroblasts (SF); however, their role in regulating cell physiology is not clear. We have investigated the effect of muscarinic agents on human SF.

Methods: Human SF, used between passages 2-4. SFs were plated into 96 well plates containing DMEM + 10% FBS, after being allowed to attach, they were serum starved overnight. SFs were treated with either a muscarinic antagonist (atropine, pirenzepine) or agonist (carbachol) at 0.1, 1, 10, 100 μ M. Bromodeoxyuridine (BrdU) was added to the fibroblast culture at the same time as the test agent, to be incorporated into newly synthesised DNA. DNA synthesis was measured after 24-hour incubation. BrdU incorporation into SF was measured by ELISA.

Results: BrdU incorporation into SF was inhibited by the presence of atropine or pirenzepine, a general muscarinic antagonist (0.1, 1, 10, 100 μ M) in a dose dependent manner ($p < 0.05$, ANOVA, $n = 4$). In contrast, BrdU incorporation of SF was found to increase in a dose dependent manner with carbachol ($p < 0.05$, ANOVA, $n = 4$). Atropine was able to block the effect of carbachol when SFs were pre-treated (3 hours) with an equimolar amount of atropine ($p < 0.05$, ANOVA, $n = 4$).

Conclusion: Our results suggest that the muscarinic receptors exist on human SF and are involved in the regulation of cell proliferation. Their effects may be mediated through G-protein linked receptor in the SF membrane.

1095/MP

Effect of Muscarinic Antagonist (Atropine) on Experimental Model of Myopia in the Mouse

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Aim: The purpose of this study was to use form deprivation to develop experimental myopia in the mouse and to use this model to investigate the effect of atropine in vivo.

Methods: A negative (-10D) contact lens was attached over the right eyes of 80 mice. Two experiments were carried out with 20 mice in the atropine treatment group, and 20 mice in the control group for a total of $n = 40$, and $n = 40$ for saline control group. The atropine group received a single sub-conjunctival injection (12 μ l) of atropine (1 μ M) a day for 14 days, and the control eye received 12 μ l of normal saline. After 14 days eyes were refracted, axial length measured with a digital calliper, the eye embedded in plastic.

Results: Axial length of myopic eyes receiving saline was 3.811 ± 0.005 mm and the refractive error -4.75 ± 0.004 , while myopic eyes receiving atropine were 3.577 ± 0.007 mm long, and the refractive error was 1.5 ± 0.006 , the control eyes for these groups were 3.439 ± 0.005 mm, $6.25D \pm 0.007$, and 3.467 ± 0.007 mm, $6D \pm 0.007$ respectively ($p < 0.05$, ANOVA, $n = 80$).

Sclera thickness increased from anterior to posterior in atropine myopic eyes and control eyes. In NS group myopic eyes, sclera was thinner at equator and posterior.

Conclusion: Present study shows that atropine reduces the experimentally induced myopia in the mouse. The mouse may be a promising model for the analysis of myopia. We are continuing the molecular analysis of this potentially useful new model.

1096/MP

In vitro Studies of Lactobacillus on Bladder Cancer Cells

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Aim: Previous studies with Lactobacillus rhamnosus strain GG (LGG) demonstrated that LGG is capable of eliciting anti-tumour activities through a proteinaceous product. This series of studies serve to further evaluate and characterise the cytotoxic protein(s).

Methods: 1×10^5 cells/ml murine bladder cancer cells, MB49, were incubated with 1×10^8 and 1×10^9 colony forming units/ml LGG for 72 hours before the spent culture supernatant is harvested. The harvested supernatant was filtered first before Proteinase K (Sigma) treatment (1 unit/2 ml). In a separate experiment, the filtered spent supernatant was subjected to size fractionation using centrifugal filter devices (10 kD, 30 kD, 50 kD) (Millipore). Following Proteinase K and filter fractionation, 100 ml of the supernatants were separately inoculated into freshly cultured cells (1×10^4 cells/100 ml) in 96 well plates. After 72 hours, the number of living cells in culture was determined with the MTS colorimetric method (Promega). Two-dimensional gel electrophoresis was also used to identify and determine the protein profile in the culture systems following LGG treatment. The results obtained were statistically analysed with one-way ANOVA.

Results: Cells incubated with Proteinase K-treated supernatant proliferated as well as control cells. However, the wells incubated with untreated spent supernatant had significantly fewer cells than the controls. The cytotoxic effect was also found to be dose-dependent. In the filter fractionation experiment, most activity was observed in the less-than-10 kD fraction, where these wells had significantly fewer cells than the controls.

Conclusion: The results obtained confirm the presence of a cytotoxic protein and strongly suggest that it is less-than-10 kD in size.

1097/MP

Prospective Study on Delays in the Diagnosis and Treatment of Tuberculosis

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Aim: We determine the extent of diagnostic delay for infectious tuberculosis (TB) patients referred to TB control unit (TBCU) and to identify patient factors and points of delay.

Methods: 87 symptomatic patients started on TB treatment at TBCU from April to October 2002 were interviewed. Data were collected on nature and duration of symptoms before first medical consultation, number of medical consultations and doctors seen, duration of symptoms before chest x-ray was done.

Results: The median patient delay (time from onset of symptoms to medical consultation) was 2 weeks (range 1-52 weeks), 4 weeks for smear positive compared to 1 week for smear negative patients. The median patient delay was significantly longest at 6 weeks for those aged 20 to 29 years (Mann Whitney U Test, $p = 0.049$). Patient delay did not vary by gender, ethnic group, nature of symptoms and nationality. At 4 weeks of symptoms, 62% had a chest X-ray done. The median health care system delay (time taken from first medical consultation to start of treatment) was 21 days. There was no significant delay on health care system by AFB smear status and chest X-ray

findings. At TBCU, 59% of patients were started on treatment on first consultation and by 2 weeks, 95% were on treatment. The median time from onset of symptoms to treatment was 51 days.

Conclusion: There is a delay in the diagnosis of tuberculosis, particularly at primary health care level. Primary care physicians should be made more aware of the disease so that treatment would not be delayed.

I098/MP

Development of Free Statistical Software Enabling Researchers to Calculate Confidence Levels, Clinical Significance Curves and Risk-benefit Contours

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Aim: Confidence levels, clinical significance curves, and risk-benefit contours are tools improving analysis of clinical studies and minimizing misinterpretation of published results, however no software has been available for their calculation. The objective was to develop software to help clinicians utilize these tools.

Methods: Excel 2000 spreadsheets were designed for use in studies comparing 2 patient groups. The workbook was protected and encrypted so that users can modify only input cells.

Results: The workbook has 4 spreadsheets. Sheet-1 comprises instructions and graphic examples for use. Sheet-2 allows the user to input study results (e.g. survival rates) into a 2-by-2 table. Confidence intervals (95%), p value and the confidence levels are automatically generated. An additional input cell allows the user to determine the confidence associated with a specified level of benefit; thus if the user wishes to know the confidence that Treatment A is truly at least 10% better than B, 10% is entered. Sheet-2 automatically displays clinical significance curves, graphically illustrating confidence levels for all possible benefits of one treatment over the other. Sheet-3 allows input of toxicity, determining the confidence that the relative toxicity of the most effective arm does not exceed user-defined tolerability. Sheet-4 automatically calculates risk-benefit contours, displaying the confidence associated with a specified scenario of minimum benefit and maximum risk of 1 treatment arm over the other. The spreadsheet is freely downloadable at http://www.theshakespeares.com/confidence_calculator.html

Conclusion: A simple, self-explanatory, freely available spreadsheet calculator was developed. The incorporated decision-making tools can be used for data-analysis and improve the reporting of scientific research results.

I099/MP

Radiation Oncology Professional Revalidation: Is it the Instrument and Not the Doctor that First Needs to be Valid?

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Aim: The Royal Australian and New Zealand College of Radiologists (RANZCR) developed a draft audit checklist for testing as a competency assessment instrument for Radiation Oncologists (ROs) in Australia, New Zealand and Singapore. We evaluated the reliability of this instrument as well as our own The Cancer Institute (TCI) designed instrument.

Methods: Competency instruments: The RANZCR instrument contains 11 competency items scored using various scoring categories. The TCI-Singapore instrument includes 19 competency items scored as "adequate" or "inadequate". Evaluation: Two ROs performed independent chart review of 80 randomly selected patients seen in TCI Radiation Oncology. Both RANZCR and TCI-Singapore instruments were used to score each chart. One week later 1 RO repeated the process. Instruments were compared for inter- and intra-observer reliability using misclassification rates

Results: Misclassification of RANZCR items ranged from 0-39% (median 8%) for intra-observer reliability, and 0-81% (median 9.5%) for inter-observer reliability. For example, inter-observer reliability for non-radiation management items ranged from 69 to 81% misclassified, and "Examination" and "Dose ICRU" items were 46% and 38% respectively. The TCI-Singapore instrument demonstrated higher reliability, with misclassification rates ranging

from 0 to 7.5% for both intra- and inter-observer reliability (median 2.5% and 1.3%, respectively).

Conclusion: Ensuring revalidation instrument validity is critical to reliably judge clinician competency. The draft RANZCR instrument is not valid in its present form and requires modification. The TCI-Singapore instrument demonstrated higher reliability, maintains relevance for competency assessment, and has the added advantage of incorporating a simple scoring system and criticality index to allow comparisons against future college standards.

I100/MP

Evaluation of the Efficacy, Participant Satisfaction and Cost-effectiveness of an Oncology Continuing Medical Education (CME) Programme

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Aim: Audit with feedback (AWF) is considered effective CME, however educational efficacy for oncologists is unknown. We evaluated efficacy, cost-effectiveness and participant satisfaction of an AWF-CME intervention for radiation oncologists (ROs).

Methods: CME programme: incorporated fortnightly random patient chart audit, scoring management adequacy via checklist. Scores and educational feedback were provided at a same-day institutional meeting. Evaluation: RO behavior/performance was evaluated via chart review of new patients seen 2 months before commencement of AWF-CME (T0), and after 12 months (T1). A validated instrument scored 19 items as "0" (inadequate/inappropriate) or "1" (adequate/appropriate). We compared mean point-score for 10 behaviour items targeted by the AWF-CME checklist, 3 non-targeted behaviour items, and 6 performance items; also percent charts scoring "1" for each item at T0 vs. T1. A 14-item questionnaire measured participant satisfaction before and after efficacy results were known. Annual cost and cost-per-point gained incorporated salaries of organizers/participants, and consumables.

Results: 113 and 118 charts were evaluated at T0 and T1. Targeted behavior improved between T0 and T1 (8.7 to 9.2 out of 10, $p = 0.0001$), with no change for non-targeted behavior/performance items. Improvement occurred for targeted items "Letter to referrer" (percent charts scoring "1" increased from 53% to 66%, $p = 0.04$), "Treatment intent" (54% to 77%, $p = 0.0002$), "Laterality doubler" (91% to 98%, $p = 0.04$), and "Isodose-plan signed" (94% to 100%, $p = 0.006$). Improvements varied between ROs. Participant satisfaction was positive, increasing after efficacy result distribution ($p = 0.0001$). Annual costs and cost-per-point gained were \$13,820 and \$27.

Conclusion: Audit with comparative, educational feedback is cost-effective and positively-perceived CME, significantly improving targeted RO behaviour.

I101/MP

Outcome of Treatment of Multi-drug Resistant Tuberculosis at the Tuberculosis Control Unit, 1988-2000

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Aim: We evaluated the outcome of multi-drug resistant tuberculosis (i.e., resistance to at least rifampicin and isoniazid) (MDR TB) cases treated at the Tuberculosis Control Unit (TBCU) from 1988 to 2000.

Methods: Data on MDRTB patient demographics, disease characteristics, treatment course and outcome were obtained from the TBCU case records.

Results: 61 out of 65 case records were available for analysis. There were 42 males, 19 females; age range 17 to 90 years (median 48.5 years). 60.7% were Chinese, 9.8% Malays, 6.6% Indians, 1.6% other races. 21.3 % were foreigners. 61% were new cases, 39% were relapse cases. All but 1 patient had pulmonary TB. 28% had diabetes mellitus, 5% were HIV-infected. Foreigners had significantly more far advanced disease with cavity as compared with residents (61.5% vs 14.6%, OR 9.3, 95% CI 1.9-47.6, $p < 0.001$). The patients were resistant to a median of 3 drugs. Median time to sputum culture conversion was 1.73 months. Treatment was continued for a median of 17 months after culture conversion. The most common adverse effect was gastro-

intestinal side effects (33%). 32 (52%) patients completed treatment, 6 died of TB, 9 died from other causes, 7 left the country, 7 defaulted treatment. One patient relapsed 2 years later and was re-treated successfully. Factors associated with successful treatment completion were age <60 years (OR 4.7, 95% CI 1.22-18.9, $p < 0.002$), weight > 55 kg (OR 3.5, 95% CI 1.08-14, $p < 0.03$), and resistance to <3 drugs (OR 4, 95% CI 1.18-14.2, $p < 0.02$).

Conclusion: Patients with MDR TB can be cured with appropriate treatment.

1102/MP

The M3 Muscarinic Receptor is Expressed in Human Limbal and Conjunctival Epithelial Cells

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Aim: Muscarinic cholinergic receptors are found on non-neural cells and they can be involved in regulating many cell functions. This study was to determine whether the acetylcholine muscarinic receptor subtype 3 (MR3) exists in human limbal and conjunctival epithelial cells.

Methods: Human limbal and conjunctival epithelial cells were isolated and grown in culture medium (SHEM for limbal epithelial cells in the presence of mitomycin C-treated 3T3 feeder cells, KGM for conjunctival cells). MR3 was detected using FITC immuno-fluorescence on the cultured cells (anti-MR3 from Research and Diagnostic Antibodies). Upon confluence, cells were homogenised and subjected to SDS-PAGE electrophoresis and western blot to detect MR3 protein expression.

Results: Staining for the MR3 receptor was detected on the membrane and in the cytoplasm of limbal and conjunctival epithelial cells. Western blot analysis revealed the presence of immunoreactive bands for MR3 muscarinic receptor in early passage limbal and conjunctival epithelial cells.

Conclusion: Muscarinic receptor subtype MR3 is present on cultured human limbal and conjunctival epithelial cells. This suggests the release of acetylcholine from parasympathetic nerves may play an important role in regulating the growth and differentiation of human ocular surface cells.

1103/MP

Proteomic Analysis of Human Tears: In Response to Ocular Surface Injury

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Aim: The objective of this study is to determine the qualitative and quantitative changes of tear protein in response to ocular surface injury.

Methods: Human tears were collected from the patients prior to ocular surface surgery and on day 1, 3 and 30 after surgery and were rapidly profiled using SELDI-TOF ProteinChip. Candidate proteins were subjected to tryptic digestion, and the resulting proteolytic peptide fragments were analysed by Q-TOF mass spectrometer. LC-ESI-MS was used to quantify the levels of human Alpha-defensins (HNP-1 and HNP-2) in human tears.

Results: With this approach, one of the obvious changes we found was that a group of human Alpha-defensins (HNP-1, HNP-2 and HNP-3) was significantly up-regulated after ocular surface surgery. Further confirmation of the identity of the Alpha-defensins in human tear fluids was made by LC purification, trypsin digestion and ESI-MS/MS analysis of their tryptic digests. The average concentrations of HNP-1 and HNP-2 in normal control tears were 0.36 ± 0.26 ug/ml ($n = 13$) and 0.28 ± 0.28 ug/ml ($n = 16$) respectively. After surgery the levels of HNP-1 and HNP-2 significantly increased to 6.52 ± 2.40 ug/ml ($P < 0.0000$) and 4.49 ± 1.68 ug/ml ($P < 0.0000$) at postoperative day 1 and 15.59 ± 6.28 ug/ml ($P < 0.0000$) and 7.16 ± 4.56 ug/ml ($P < 0.0000$) at postoperative day 3.

Conclusion: The marked increase in the level of HNP-1, HNP-2 and HNP-3 after ocular surface surgery suggests human alpha-defensins play an important role protecting the ocular surface from microbial attack and could modulate ocular surface wound healing processes.

1104/MP

UVB Irradiation Induces the Oxidative Stress Response and Cytokine Production in Human Conjunctival Cells

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Aim: To examine the response of cultured human conjunctival cells to UVB irradiation, the production of cytokine, the activation of cell signalling pathways and oxidative stress response.

Methods: Primary cultured human conjunctival cells at passage 2 to 3 were serum starved for 5 hrs and subsequently exposed to UVB at a dose of 20 mJ/cm². Culture medium and cells were harvested at different time intervals to assay for the activation of Nrf2, MAP kinases and production of IL-1a.

Results: Nrf2 protein level increased 10 minutes after UVB exposure. p38 MAP kinase was maximally stimulated 30 mins after UVB exposure, and attenuated after 1 hr. A similar time course of activation was also observed for c-Jun Kinase (JNK). p42/44 MAP kinase and Akt upregulation occurred at around 10 mins after the UVB irradiation. IL-1a in the medium increased from 0.3pg/ml in control cells to 20 pg/ml at 24 hrs after the UVB exposure.

Conclusion: The accumulation of Nrf2 suggested that the effect of UVB on human conjunctival cells may be mediated through oxidative stress. UVB exposure of human conjunctival cells leads to the activation of various MAP kinases including p38, p42/44 kinases as well as c-jun kinase. It also induced the accumulation of Nrf2. The activation of such kinases may be responsible for the production of inflammatory cytokines.

1105/NUR

Perceptions of Epilepsy Patients Towards Their Quality of Life

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Aim: To assess the quality of life of patients with epilepsy in Singapore.

Methods: 335 epilepsy patients seen at Outpatient Epilepsy Clinic between November 2001 and January 2003 were interviewed by an epilepsy nurse clinician using a structured questionnaire adapted from questionnaires used by regional epilepsy societies.

Results: 160 patients (47.8%) were male and 175 (52.2%) were female. The average seizure duration was 16.5 years (range 0.5 to 55 years). 192 (57.3%) patients have at least one but less than 12 seizures per year, 94 (28.1%) have at least 1 seizure per month and 42 (12.5%) have at least 1 seizure per week. 66.1% patients have generalised or secondary generalised seizures while 33.9% patients have only partial seizures. 21 (6.3%) patients were undergoing full time education, 119 (35.6%) were unemployed, 7 (2.1%) were attending sheltered workshop or training centre, 33 (9.9%) were working part-time and 155 (46.3%) were working full-time. 136 (42%) patients have no income at all and only 75 (23.1%) patients have income between S\$1001 and S\$2000. 155 patients (46.3%) cited work-related problems as the major factor impacted by epilepsy. Family problems (28.4%), self-esteem (26.3%) and being unable to live independently (25.7%) were also cited. Most patients expressed satisfaction with their drug treatment with most quoting little side effects significant enough to affect work performance or daily life.

Conclusion: People with epilepsy have significant quality of life impairment. Efforts to improve employability and relationship skills may help to enhance quality of life for people with epilepsy.

1106/NUR

A Retrospective Study Examining the Prevalence Wound Infection Rates and Explore its Determinants in the Polyclinic Setup

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Aim: To examine the prevalence of community acquired wound infection at NHG Polyclinics and explore its determinants.

Methods: A retrospective study comprising 1000 consecutive patients from Toa Payoh and Hougang Polyclinics attending for wound dressing procedures between January and September 2002. Patients with hospital-acquired infections and high-dose oral steroids were excluded. Using the standardised

NHGP wound chart, data such as demographics, solutions, co-morbidities were collected. Wounds were categorised as infected guided by CDC criteria. Results were analysed using SPSS.

Results: Infection prevalence rate was 1.7% (95% CI 1.1% - 2.8%), with no significant differences between gender ($p = 0.436$), ethnic groups ($p = 0.964$), diabetic status ($p = 0.146$) and the types of solutions used ($p = 0.318$). Interestingly, 15% of patients were prescribed chlorhexidine as the wound-cleansing agent. For cases with infection, the median of infection free days was 7, mean (SD) 8.1 (5.3), range 3 to 24 days. Older patients were more likely to have wound infection ($p = 0.031$) and diabetics with infected wound are more likely to be readmitted to hospital ($p < 0.001$, RR 71.4, 95% CI 41.7 to 125.0).

Conclusion: Our wound infection prevalence rate was 1.7%. There is a need to educate staff about the appropriate use of dressing solutions. Although no significant difference in infection rates was demonstrated with different solutions, including normal saline, which is the recommended cleaning agent, further studies are required. We propose to set up an infection registry aim at detecting patients at risk of wound infection to improve quality care.

I107/NUR

A Survey of COPD Patients' Knowledge of Their Disease and Treatment in a General Hospital in Singapore

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Aim: To investigate the level of patients' knowledge of the cause of their illness among hospitalised patients with chronic obstructive pulmonary disease (COPD) prior to the implementation of a hospital-wide clinical management pathway including nurse-provided education.

Methods: Consecutive patients admitted to general medical wards for acute exacerbation of COPD were interviewed by a nurse clinician on their knowledge of the cause of the illness, use of medication and oxygen therapy.

Results: 103 patients (91 male, mean age 72, mean FEV1 39.8 + 13.2 percent predicted) were included. Six patients had severe, 41 moderate and 56 mild exacerbations according to the Anthonisen severity scale. The median duration of disease from diagnosis was 3 years (range 1-20). 22 patients were active smokers while the rest were ex-smokers. 63 patients (61.2%) did not consider cigarette smoking to be a cause of their illness and among them, 14 were still smoking. All patients were using metered dose inhalers but only 37.5% of them could demonstrate faultless inhaler techniques. Four patients were using volumetric spacers and 3 of them could demonstrate proper use of spacer technique. Seventeen patients had home nebulizers but only 3 could demonstrate proper use of nebulizers. Eleven patients were on long-term oxygen therapy but only 6 reported using oxygen > 15 hours/day.

Conclusion: In this survey of patients with recurrent hospitalisation for COPD, most patients did not attribute their illness to cigarette smoking. Patients' knowledge and use of inhalers, home nebulizers and oxygen therapy were sub-optimal in most cases. These findings form the basis for provision of routine intensive patient education among patients hospitalised for COPD.

I108/NUR

A Comparison of Patient and Nurse Ratings of Pain Level in Postoperative Orthopaedic Patients.

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Aim: 1. To compare patient's self-rating of pain level with that of the registered nurse's assessment in postoperative orthopaedic patients. 2. To describe registered nurses' knowledge, perceptions and attitudes towards pain management in postoperative patients.

Methods: This is a descriptive study. It was conducted in 7 orthopaedic units in Tan Tock Seng Hospital. 141 adult patients listed for elective orthopaedic surgery from 1 October 2002 to 31 December 2002 were recruited for part one of the study. Using Visual Analogue Scale (VAS) pain rating scale and Wong-Baker Facial Coding System (FCS) patient's self-rating of pain and facial expression was compared with that of the registered nurse. In part two, 102 registered nurses working in the orthopaedic units participated in the study. A 50-item questionnaire survey comprising a 5-point scale was

designed to describe the registered nurses' approach to acute pain, pain management and administration of analgesia of postoperative orthopaedic patients.

Results: Wilcoxon-Signed Ranks Tests and reliability analysis was used in part one and descriptive statistics in part two of the study. The results revealed significant differences between the way patients and nurses measured their pain levels ($r = 0.0764$).

Conclusion: We hope this study could be used to reinforce the significant role played by nurses in the optimal management of postoperative patient's pain.

I109/POD

Incidence of Positive Direct Antiglobulin Test (DAT) and its Clinical Significance at an Acute Care Hospital, Singapore

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Aim: A retrospective study was done on all patients who gave a positive result for the direct antiglobulin test (DAT), its incidence and severity of haemolysis.

Methods: Pre-transfusion records of patients admitted between the period Year 2001 and 2002 were reviewed. The transfusion history and test results of the patients were then retrieved from the laboratory information system. The results, in particular, the haemoglobin, the concentration of bilirubin and lactate dehydrogenase (LDH) were collated and tabulated.

Results: 137 patients had a positive result for the DAT. 39% had their red blood cells coated with IgG and complement, 39% coated with IgG alone and the remaining 22% coated with complement alone. 47% had a haemoglobin level of less than or equal to 8.0 g/dL. 43% (26/60) of the patients tested for bilirubin had elevated levels. 63% (33/52) of the patients tested for LDH had elevated levels of more than 600 U/L. 82% gave a positive result for the pre-transfusion antibody screen. 9% had no clinically significant antibodies detected while another 9% had no pre-transfusion antibody screen performed, as transfusion had not been indicated for them. 55% of those who gave a positive result for the antibody screen were identified as having a non-specific autoantibody, 24% as having an autoantibody (with e and I specificity), 11% as having an alloantibody together with an autoantibody and the remaining 10% with just an alloantibody.

Conclusion: Positive DAT is not uncommon in clinical practice. Majority of the patients do not show signs of haemolysis and usually identified as having non-specific autoantibodies.

I110/POD

Pulmonary Rehabilitation for Chronic Lung Disease Other Than COPD

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Aim: The role of pulmonary rehabilitation (PR) in improving the functional status of patients with chronic obstructive pulmonary disease (COPD) is well established. However, the benefits of PR in patients with other chronic lung disease (CLD) have not been proven. We reviewed the outcomes of a pulmonary rehabilitation programme for patients with CLD other than COPD.

Methods: All patients underwent lung function and exercise testing before and after undergoing a 6-week, outpatient, hospital-based PR programme. A major component of the programme was supervised exercise training 3 sessions per week, lasting 60 minutes each, with the training intensity maintained at near-maximal targets.

Results: Seventeen patients (12 male, mean age 59) with the following conditions were included: bronchiectasis (9), obesity-hypoventilation syndrome (2), post-pleurodesis for recurrent pneumothorax (2), interstitial lung disease (1), rigid spine syndrome (1), fibrothorax (1), bronchiolitis obliterans (1). There was no significant change in lung function in all patients after pulmonary rehabilitation. Maximal oxygen uptake and work-rate improved significantly after PR by 242 mL.min⁻¹ ($p = 0.03$) and 17 W ($p = 0.006$) respectively. Six minute walk tests improved significantly by a mean

of 37.1 m ($p = 0.024$). Borg dyspnoea scores at maximum exercise decreased from 4.2 to 3.8.

Conclusion: Patients with CLD other than COPD can improve their exercise capacity by undergoing PR. Further studies are required to define selection criteria and optimise exercise prescription in this category of patients.

I111/PD

D-dimer: A Simple and Useful Test for Exclusion of Clinically Suspected Deep Vein Thrombosis

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Aim: Deep vein thrombosis (DVT) is a common disorder associated with significant morbidity and mortality. Symptoms are non-specific and radiological procedure based on compression doppler ultrasonography (CUS) is commonly used for the diagnosis of DVT. D-dimer, a cross-linked fibrin degradation product is elevated in DVT but also in other clinical situations common in hospitalised patients. D-dimer is more useful for exclusion of DVT due to the high sensitivity and negative predictive value of the test. We evaluated the use of Liatest D-dimer for exclusion of DVT.

Methods: Liatest D-dimer was performed on 77 plasma samples of in- and outpatients with clinically suspected DVT. CUS was used as the reference method to confirm the diagnosis of DVT. Accuracy indices (sensitivity, specificity, negative and positive predictive values) calculated using the Receiver Operating Curve were analysed.

Results: DVT was diagnosed in 25 of 77 patients by CUS. 55 of them have D-dimer level above the cut-off of 0.5 ug/mL (prevalence 71.4%). The sensitivity and negative predictive value of the test was high at 92.0% and 90.9% respectively whilst specificity and positive predictive value were low at 38.5% and 41.8%. There were 2 false negative results.

Conclusion: With low specificity but high sensitivity, Liatest D-dimer assay is a useful test for exclusion of clinically suspected DVT. It is probably best used for screening in the outpatient setting where DVT prevalence and risk for DVT of presenting patients are lower, improving its negative predictive value. This may reduce hospital admission and unnecessary radiological investigations.

I112/PD

Smart Doctors Collect Urine for Culture Before Starting Antibiotics

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Aim: To quantify the impact of administering antibiotics before urine collection on the value of urine culture.

Methods: 545 urine specimens submitted for routine urine culture from inpatients on the day of admission or 1 day after the day of admission were tested for the presence of antibiotics. All urine specimens received on Tuesdays, Wednesdays and Thursdays over a period of eight weeks were tested. 10 µl of urine was streaked onto Mueller Hinton agar plates that were lawned with *S.aureus* ATCC 25923 and *E.coli* ATCC 25922. A zone of inhibition with either organism was considered positive for the presence of antibiotics. The presence of antibiotics was correlated with the culture result.

Results: We detected antibiotics in 51% of urines tested. Of the urines that tested negative for antibiotics 23% had $\geq 10^5$ cfu/ml. Of the urines that tested positive for antibiotics only 5% had $\geq 10^5$ cfu/ml implying a loss of 78% of cultures with $\geq 10^5$ cfu/ml. Among urines positive for antibiotics 79% (220/279) had no significant bacterial growth. Among urines negative for antibiotics 50% (132/266) had no significant bacterial growth implying an increase of false negative cultures by about 58%.

Conclusion: Administering antibiotics before urine collection leads to the loss of 78% of cultures with $\geq 10^5$ cfu/ml. This loss leads to clinical confusion, unnecessary investigation, treatment and prolonged hospital stay. Urine samples for culture should be collected in the admitting clinics/emergency department before starting antibiotics and should not be postponed for later collection in the wards.

I113/PD

The Effect of Psychosis Patients and Families' Causal Beliefs on Duration of Untreated Psychosis

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Aim: Studies have examined the reasons why people with psychosis delay seeking psychiatric treatment. In this retrospective study on the Singaporean Chinese population, impact of causal beliefs about psychosis on the duration of untreated psychosis (DUP) is examined. It was expected that a dominant belief system, or a combination of these beliefs would best predict DUP. Indigenous Chinese beliefs were also expected to be the strongest predictors of long DUP. Socio-demographic factors were also considered.

Methods: Participants comprised patients and their families from the Early Psychosis Intervention Programme. Causal beliefs were assessed through the Opinions about Psychological Problems – Modified (OPP-M) questionnaire which constitutes beliefs derived from 3 causal models: indigenous Chinese model (dang-ki, feng-shui and Chinese medicine beliefs), Western psychological model (psychodynamic, behavioural, humanistic and cognitive beliefs), and the 'other' model (organic, socio-economic and naïve beliefs).

Results: Overall, findings were mixed. A linear combination of patients' cognitive and dang-ki beliefs and years of education jointly predicted DUP. Stronger endorsement of cognitive belief and less education were significantly associated with shorter DUP. Unexpectedly, stronger endorsement of indigenous Chinese beliefs were insignificantly associated with shorter DUP. Family beliefs in feng-shui and possibly, organic causes, predicted DUP. Stronger endorsement of these beliefs were associated with shorter DUP.

Conclusion: The unexpected finding of a negative trend between patients' endorsement of Chinese beliefs and DUP suggests the involvement of mediating factors in the relationship between causal beliefs and DUP. Future research should examine these factors and the impact of causal beliefs on outcome measures such as treatment compliance.

I114/PD

Neurocognition and Duration of Untreated Illness

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Aim: Studies have suggested that untreated psychosis can have a toxic effect on the brain. This study investigates the relationship between duration of untreated illness (DUI) and neurocognitive performance in patients with first-episode psychosis.

Methods: Patients included are aged between 15 to 40 with first-episode psychosis. DUI is defined as the period between onset of any psychiatric symptoms to initiation of treatment and assessed from structured interviews with patients and relatives. All patients were administered a neurocognitive battery. The National Adult Reading Test (NART) estimates pre-morbid cognitive functioning whereas the Raven's Progressive Matrices (RPM) estimates current cognitive functioning. The Continuous Performance Test (CPT) and Digit Span subtest from the Wechsler Adult Intelligence Scale (WAIS – III) are measures of attention while the Trail-making Test and the Wisconsin Card Sort Task (WCST) are measures of executive function.

Results: Forty one patients with mean age of 25.1 (± 5.7) years and mean DUI of 20.5 (± 27.0) months, median of 11.0 months, and range of 0 to 120 months, participated in the study. Fifteen patients (36.6%) were female. Spearman's partial correlation coefficients were used to examine the relationships between DUI and tests in the neurocognitive battery, controlling for years of education, age and gender. These did not achieve statistical significance.

Conclusion: The absence of significant correlations between DUI and neurocognitive functioning suggests that psychosis may not exert a toxic effect on brain functioning. However, further research using sophisticated brain imaging may allow greater exploration.

1115/PD

A Comparison Study between Vitek 1 and Vitek 2 Automated Systems in a Clinical Set-up

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Aim: The Vitek 1 automated system has been used in the National University Hospital for the past 3 years. The system has shortened reporting time, simplified and standardised workflow, and provided test information which, when used in conjunction with other systems, assist in completion of test results. Vitek 2 is a new version with increased automation. It comes with an Advanced Expert System for analyzing organism's profile and makes use of fluorescent technology for bacterial identification. The purpose of this study was 3-fold: to identify the problems that may be encountered during routine work, to determine additional tests required for complete identification of organisms and to work out the most appropriate workflow for our laboratory.

Methods: The trial study was separated into 2 parts. Part 1: A selection of organisms was used to challenge the system. Susceptibility testing was done on thirty-four multi-resistant strains and identification testing on over one hundred bacterial and yeast strains. Discrepancies encountered during identification and susceptibility testing were noted as major and minor errors according to the seriousness of the problem. Part II: One hundred isolates from routine cultures were tested in parallel by the Vitek 1 and Vitek 2 systems.

Results: Significant discrepancies were noted in the susceptibility results of amikacin when tested against *A. baumannii*. The 2 systems showed agreement when testing common clinical isolates.

Conclusion: Overall, the Vitek 2 system has proven to be not only rapid but is able to analyse intelligently, assisting laboratory workers in making more informed decisions.

1116/PD

The Effects of a Low Glycaemic Index cum High Fibre Diet on the Metabolic Control of Patients with Type 2 Diabetes Mellitus

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Aim: Medical nutrition therapy is essential in successful diabetes management. The aim is to investigate whether a low glycaemic index (GI) cum a high fibre diet could result in better glycaemic, lipid, and weight control in patients with Type 2 diabetes mellitus (DM).

Methods: Overweight (BMI >23 kg/m²) subjects (n = 26) with suboptimal glycaemic control (HbA1c 8-10%) recruited from the Alexandra Hospital Diabetes Centre were randomised using a 2² factorial design into 4 diet groups — (Grp 1) high GI + low fibre, (Grp 2) high GI + high fibre, (Grp 3) low GI + low fibre, (Grp 4) low GI + high fibre. They were given the respective dietary advice, asked to keep a 3-day food record and to monitor their blood glucose thrice weekly throughout the 3-month study period. Subjects are then followed up at 4th, 10th and 16th week to reinforce diet and to review various parameters.

Results: No significant differences in the baseline characteristics were found among groups. Using multiple comparisons, Grp 4 was observed to have a significant reduction in BMI (D4 = 3.9% vs. D1 = -0.4%; p = 0.015) and improvement in HbA1c (D4 = 16.9% vs. D2 = -4.5%, p = 0.017) when compared to Groups 1 and 2 respectively. Compliance with dietary food record appeared to correlate with improvement in HbA1c.

Conclusion: Low GI cum high fibre diet appears to help Type 2 DM subjects with better glycaemic and weight control, but not with lipids. Dietary food record may be useful for diabetes management.

1117/PD

Excess Amniotic Fluid Supernatant: A Novel Source of DNA for Prenatal Genetic Testing

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Aim: Amniotic fluid (AF) is the most common tissue used in prenatal diagnosis. AF supernatant is normally discarded after separation of cellular material for culture by low speed centrifugation. We sought to develop and validate a method of extracting DNA from leftover supernatant AF to extend its diagnostic potential and avoid wastage of fetal tissue.

Methods: 300 AF samples (13-23 weeks gestation) were studied. DNA was extracted from cellular material obtained after high speed centrifugation of AF supernatant and subjected to multiplex-PCR using 3 polymorphic chromosome 21 markers. Fragment separation and analysis of PCR products was carried out on a MegaBACE DNA Analyser (Amersham Biosciences, NJ, USA). Peak height fluorescent intensity ratios were used to predict allele copy numbers in normal and Down Syndrome (DS) samples.

Results: Detectable DNA at concentrations ranging from 27-895 ng/μl was obtained from all AF samples tested. A trend towards higher DNA yield (p <0.001, Spearman correlation coefficient = 0.69), but lower purity (p <0.001, Spearman correlation coefficient = -0.48) was observed with increasing gestational age. Only 2.33% (7/300) of samples showed amplification failure in 1 or more markers; failure was associated with a low (<50 ng/μl) DNA concentration (p <0.001, Fisher's exact test). PCR was invariably successful at a DNA concentration of ≥50 ng/μl. The peak height ratio of resultant PCR products allowed subsequent detection of DS in all abnormal cases.

Conclusion: AF supernatant is a viable, novel, alternative source of DNA which may be used for prenatal detection of trisomic disorders such as DS. This method may also be extended to molecular investigation of other genetic disorders.

1118/PD

Comparative Evaluation of Weil Felix Test with the Indx Custom Dip-S-Ticks (DS) for the Detection of Arthropod-borne Diseases

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Aim: Rickettsial diseases are widely distributed throughout the world and continue to be an important health problem. They are probably underdiagnosed. The Weil Felix test which is widely used has been shown to have poor sensitivity. The DS is a new rapid test using an enzyme immunoassay (EIA) dot technique for the detection of antibodies to *R. rickettsii*, *R. typhi*, *O. tsutsugamushi* (Karp strain), and *O. tsutsugamushi* (Kato and Gilliam strains). In this study, we compared the DS with the Weil Felix.

Methods: 280 serum samples were selected from patients tested with the Weil Felix. The sera were re-tested using the DS. The sensitivity and specificity of the Weil Felix test were calculated using the DS test as the "gold standard".

Results: Taking the DS as the "gold standard", at a cutoff titer of 1:160 (> 1:160 is considered antibody detected), the Weil Felix had a sensitivity of 27% and specificity of 99.5% for *R. typhi*. Positive and negative predictive values were 95.2% and 79.2% respectively. The number of positives cases for *R. rickettsia* and *O. tsutsugamushi* (Karp strain), and *O. tsutsugamushi* (Kato and Gilliam strains) were too low to calculate the sensitivity and specificity accurately.

Conclusion: Though costly, the greater sensitivity, shorter turnaround time and simplicity of the DS compared to the Weil Felix suggest that the DS is a satisfactory replacement test for the Weil Felix for routine testing for rickettsial infections.

I119/PD

Evaluation of the Clinical Impact Through a Focused Drug Therapy Review Programme in In-flight Patients with Renal ImpairmentSok Bee LIM¹, Gek Kee LIM¹, Ai Leng KHOO¹, Pary SIVARAMAN²¹Department of Pharmacy, National University Hospital, Singapore, ²Department of Medicine, National University Hospital, Singapore**Aim:** To evaluate the clinical impact of pharmacists' involvement in the drug therapy review of chronic renal failure (CRF) and end-stage renal disease (ESRD) patients.**Methods:** A detailed medication review was conducted for all CRF or ESRD patient admitted to the renal ward in NUH over a 2-month period. Prospective therapeutic monitoring together with concurrent feedback to physicians was carried out during daily ward round. In addition, recommendations, other than those to resolve an identified drug-related problem (DRP), that could potentially improve a patient's pharmacological management were also proposed. Each DRP and recommendation was assigned a significance rank based on a published scale by a renal physician. The scale comprises 6 levels of significance, ranging from 1 (adverse significance) to 6 (extreme significance).**Results:** Sixty cases were recruited into the study. Eighty-six DRPs (with acceptance rate of 93%) and 10 recommendations (with acceptance rate of 90%) were recorded. Transcription error made up 44% of the 86 DRPs while renal dosage adjustment accounted for approximately 10%. The main DRPs involved renal (27%), anti-infective (17%) and cardiovascular medications (16%). 70% of the recommendations were laboratory investigations. The significance ranking of the reported DRPs were 67% as level 4, 26% as level 3, 4% as level 5 and 4% as level 2. There was no DRP with a significance ranking of level 1 or 6.**Conclusion:** Pharmacists can play a significant role in the identification of potential or actual DRPs and through a concerted effort with renal physicians, optimize the pharmaceutical care of renal patients.

I120/PD

Stability of Spironolactone Suspension Using 1% and 3% Methylcellulose as the Suspending Agent

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Aim: Spironolactone is available commercially as tablets but not in suspension form. The problems with extemporaneously prepared syrup are settling of drug particles, which can lead to non-uniform drug dosing and short expiry. The objectives of this study were to reduce the caking problem of the current spironolactone suspension and to extend the expiry date of the current spironolactone suspension by using varying concentration of the suspension agent, methylcellulose.**Methods:** Spironolactone suspension was prepared with tablets suspended with methylcellulose (MC) 1% and 3%. 10 bottles each of 1% and 3% methylcellulose as the vehicle were prepared. Stability testing using HPLC was done at Day 0 and on Day 85. Suspendability and re-suspendability tests were also conducted to assess the caking problems of the syrup.**Results:** Results indicated no significant change over time (85 days) for the suspension with 1% methylcellulose with P value 0.152. However, there is a statistical significance for the preparation with 3% methylcellulose (P = 0.001) when it is stored for 85 days.**Conclusion:** Spironolactone suspension in 1% MC is stable for up to 12 weeks when stored at 4°C. The suspendability and re-suspendability results show no advantage of 3% MC over 1% MC in the reduction of caking of these suspension.

I121/PD

The Relationship Between Isokinetic Quadriceps Muscles Parameters and Countermovement Jump in Active Healthy Females: An Allometric Scaling ApproachYong Hao PUA¹, Yik Ying TEO², Michael Teik Hin KOH³¹Rehabilitation, Alexandra Hospital, Singapore, ²Defence Medical Research Institute, Defence Science and Technology Agency, Singapore, ³Physical Education and Sports Science, National Institute of Education, Singapore**Aim:** The utility of isokinetic quadriceps measurements in sports rehabilitation

is dependent on its magnitude of correlation with functional performance measurements. Previous attempts to correlate both measurements have, however, produced inconsistent results. Consequently, opinions differ regarding the isokinetic parameters employed during rehabilitation. Allometric scaling, to adjust for body mass differences, is used increasingly in exercise sciences, and is recently proposed to provide the strongest possible relationship with jump measurements. The purpose of our study is to use allometric modelling to examine the 1) isokinetic parameter that best correlates with countermovement jump (CMJ) and 2) strength-performance relationship.

Methods: Twelve non-elite females (age = 21.0 ± 2.0 years, body mass index = 20 ± 1.5 kgm⁻²) performed isokinetic quadriceps and CMJ testing. Allometric-scaled units were derived from a log-log transformation of body mass, and isokinetic peak torque and average power obtained reciprocally and non-reciprocally at 1.04 rad·s⁻¹ and 3.14 rad·s⁻¹. Coefficients of determination (r²) were calculated to determine the magnitude of relationships between isokinetic and CMJ measurements.**Results:** r² ranged from 0.06 to 0.13 and 0.29 to 0.37 for reciprocal and non-reciprocal isokinetic parameters, respectively. When non-reciprocal isokinetic parameters were allometrically corrected for body mass, 2.6–21.8% of the CMJ height variance was additionally accounted for. Specifically, isokinetic average power at 1.04rad·s⁻¹ had the highest correlation with CMJ (r² = 0.59).**Conclusion:** The ability to produce power is a significant criterion in CMJ. The use of isokinetic non-reciprocal average power as an indicator of muscle performance is based on biological and physical/Newtonian principles, and is supported empirically by our findings. Isokinetic parameters should be allometrically scaled to reveal correlations with CMJ that may otherwise remain obscure.

I122/PD

Error Estimates of the KT2000 ArthrometerYong Hao PUA¹, Peck Hoon ONG²¹Rehabilitation, Alexandra Hospital, Singapore, ²Rehabilitative Services, Alexandra Hospital, Singapore**Aim:** The KT2000 arthrometer is commonly used in the diagnosis of anterior cruciate ligament (ACL) deficiency and to document the state of recovery, both required datum involving test-retest statistics. Previous studies have calculated the standard error of measurement (SEM), but did not extrapolate the measurement error to analytical goals in the clinical setting. The purpose of our study is to examine the reliability of KT2000 measurements in clinical applications**Methods:** A single-group repeated measures design was used. Two testers performed measurements on 72 knees of 36 subjects (age = 22 ± 4 years) with suspected unilateral ACL insufficiency. Measurements were recorded at 131N. Relative reliability is expressed in terms of intra-class correlation coefficients (ICC formula [3,1]). Absolute reliability is expressed in terms of the smallest detectable difference (SDD) index.**Results:** The inter-tester ICCs were 0.86 and 0.68 for the involved and uninvolved side, respectively. The SDDs (95% confidence interval [CI]) were 3.75 mm and 2.67 mm for the involved and uninvolved side respectively. The overall inter-rater error estimate was 3.24 mm.**Conclusion:** Measurements from the involved side were more useful for discriminating amongst patients, whereas the magnitude of error is less for measurements from the uninvolved side. The SEM represents the error associated with a single measurement while the SDD provides a reference interval for a test-retest difference on a 95% CI basis; the latter may be a clinically more appropriate index. When considering that the overall inter-rater error exceeds the empirical threshold value of 3.0 mm for diagnostic purpose, we recommend that repeated measurements should be undertaken by the same examiner whenever possible.

I123/PD

Allometric Scaling of Isometric Knee Extensor Peak Torque in Male Subjects with Unilateral Knee InjuriesYong Hao PUA¹, Yik Ying TEO²¹Rehabilitation, Alexandra Hospital, Singapore, ²Defence Medical Research Institute, Defence Science and Technology Agency, Singapore**Aim:** Muscular strength (S) is associated with body mass (M) with $S = k \times M^b$, based on allometric modelling. Although controversy continues concerning the value of the exponential parameter, *b*, the qualitative difference

between S , defined as force, and torque has often been ignored. Because isometric knee extensor peak torque is frequently measured during rehabilitation, the purpose of our study was to use allometric scaling to examine the influence of body mass on torque measurements.

Methods: Using an isokinetic dynamometer, isometric knee extensor peak torque at 65° flexion of the uninvolved side was recorded in 116 males with unilateral knee injuries. To ensure greater homogeneity of body composition in the sample, an analysis of the coefficient of variation for torque measurements with increasing body mass index (BMI) yielded a threshold of minimal variability at 22.9 kgm⁻². Consequently, allometry was performed separately on torque measurements obtained from subjects with BMI of 22.9 kgm⁻² (49 males, age = 22.6 ± 4.1 y, M = 62.3 ± 6.2 kg, BMI = 20.8 ± 1.6 kgm⁻²) and BMI >22.9 kgm⁻² (67 males, age = 23.2 ± 2.8 y, M = 77.2 ± 9.9 kg, BMI = 25.8 ± 2.7 kgm⁻²).

Results: Allometric scaling exponents (95% confidence interval [CI]) were 0.93 (0.6-1.3) and 1.1 (0.71, 1.50) for the BMI of 22.9 kgm⁻² and BMI >22.9 kgm⁻² groups, respectively.

Conclusion: Both mass exponents were closer to 1 than 0.67, and 0.67 was excluded in the 95% CI in the BMI >22.9 kgm⁻² group, which supported the dimensionality theory that predicts $b = 0.67$ and 1 for force and torque measurements, respectively. Our findings suggest that ratio standards method ($b = 1$) may be used to adjust isometric knee extensor torque measurements for body mass differences to allow for inter-subject comparison.

I124/PD

Correlation of Knee Stability to Functional Outcomes after Anterior Cruciate Ligament Reconstruction: A Cross-sectional Study

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Aim: Traditionally, evaluation of outcomes after an anterior cruciate ligament (ACL) reconstruction has been limited to knee strength testing, clinical knee laxity test, knee range of motion and subjective reports. However, there is a recent trend towards the use of functional testing procedures, such as hop tests, that are time-efficient, economical and easy to administer. This study aims to investigate the relationship between knee laxity test, isokinetic knee strength, a self-administered Knee injury and Osteoarthritis Outcome Score (KOOS) questionnaire and 2 hop tests, single leg and crossover hop. The feasibility of using the 2 hop tests and KOOS questionnaire as alternative outcome measurements post-ACL reconstruction are also assessed.

Methods: 45 subjects were recruited for this cross sectional study. The KOOS questionnaire, KT2000 knee arthrometer, isokinetic knee strength and 2 hop tests were administered to them.

Results: Results showed that both hop tests were highly correlated ($r = 0.75$) to each other. They had moderate to good correlation ($r = 0.47$ - 0.62) to peak torque quadriceps muscles, fair correlation ($r = 0.26$ - 0.37) to peak torque hamstrings muscles and KOOS questionnaire, and little correlation ($r = 0.02$) to KT2000. KOOS questionnaire had fair correlation ($r = 0.25$ - 0.43) to both peak torque quadriceps and hamstrings muscles, and little correlation ($r = 0.19$) to KT2000.

Conclusion: These results indicate that hop tests may only reflect strength of quadriceps muscles. The relatively low correlation between the different outcome measures may indicate that neither of these measures can stand alone as an adequate assessment.

I125/PD

Application of Generalised Estimating Equations in Longitudinal Studies

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Aim: In a longitudinal study, the researcher follows a cohort of subjects over time, and performs repeated measurements at prescribed intervals. The measurements are correlated and, hence, violate the iid assumption upon which many likelihood statistical models are based. The aim of this paper is to demonstrate the appropriateness and usefulness of generalised estimating equations (GEEs) in analysing data obtained from longitudinal studies.

Methods: A Monte Carlo experiment was conducted to examine the properties of GEE models. To illustrate, 4 correlated measurements – the first as baseline and the rest as repeated data made at 3 different visits – were generated from a multivariate normal distribution with sample size fixed at 1000. The repeated data follow an autoregressive correlation structure with $\rho = 0.8$. Several GEE models with different correlation structures, namely, AR1, AR2, exchangeable and independent, were applied to analyse the data. All statistical tests were carried out at 5% level of significance. The data were analysed with Stata 7.0.

Results: The appropriate GEE models showed that conventional regression methods underestimate between-subject factors (such as, baseline measurements and treatment covariates) but overestimate within-subject factors (such as visits). If GEEs were not applied, one might arrive at incorrect decisions concerning the coefficients of the regression model.

Conclusion: Treating repeated observations obtained from longitudinal studies as independent is unrealistic and will certainly lead to poor estimates of the standard errors. As such, GEE models are advocated for analysing longitudinal data.

I126/PD

Expressed Emotion in Singapore: A Qualitative Enquiry

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Aim: The aim of this study was to investigate the concept of Expressed Emotion (EE) and the applicability of the Level of Expressed Emotion (LEE) scale in Singapore.

Methods: This was a qualitative study. Regarding EE, 10 patient-caregiver pairs were recruited from an ongoing study of patients experiencing their first episode of psychosis and interviewed using a semi-structured interview format. Regarding the LEE, small focus-group interviews were conducted with a cross-section of Singaporeans to gain their views on the concepts in the scale and the relevance of the items in this culture.

Results: For the first part, the data were analysed in light of attitudes found to discriminate between high and low EE families. A clear distinction between high and low EE groups was found. For the second part, the data from the focus groups supported the cross-cultural conceptual and operational equivalence of the scale. During discussion, several additional emic items were suggested by the participants.

Conclusion: There is support for the existence of EE in Singapore and the LEE was found, for the most part, to be applicable in Singapore, with the addition of several emic items.

I127/PD

Development of a Prostate Specific Antigen Transfected Murine Bladder Cancer Cell Line as a Means of Evaluating Gene Therapy for the Treatment of Bladder Cancer Using an Orthotopic Murine Model

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Aim: Our aim is to develop a simple, reliable and non-invasive method to monitor bladder tumour growth in a murine model during treatment. We will use this technique to evaluate the treatment effect of cytokine gene therapy on bladder cancer.

Methods: Murine bladder cancer cell line MB49 was permanently transfected with a plasmid vector pSecTag2/PSA so that it will produce PSA as a marker. After antibiotic selection, the resistant cells were cloned by limiting dilution. The clones were then screened for PSA production by sandwich ELISA assay. An orthotopic murine bladder cancer model was established by intravesical implantation of the modified MB49 cells. Then the serum and urine PSA levels were measured as indicators of tumour growth. The PSA level was also continuously measured following intravesical gene therapy using Granulocyte Macrophage Colony Stimulating factor (GM-CSF).

Results: The modified cells were shown to be tumourigenic and produced high level of PSA both *in vitro* and *in vivo*, detectable by ELISA. After intravesical implantation of the tumour, the PSA could be detected both in mouse urine

and serum from day 4 onwards. The level of PSA produced increased progressively and correlate with the tumour volume. The PSA level dropped following intravesical gene therapy using GM-CSF. Tumour regression was also confirmed by histology.

Conclusion: This study has provided a simple, non-invasive method to monitor orthotopic bladder tumour growth and the results confirmed that cytokine gene therapy is effective in the treatment of bladder cancer.

1128/PD

Distance and Velocity Requirements for Functional Community Ambulation in Singapore

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Aim: We document the distances and velocities that individuals must ambulate to function independently in the community.

Methods: Eighteen HDB blocks from 3 housing estates of different age categories (old, mature and new) were randomly selected. Distances between these blocks and the nearest amenities (such as, bus-stops, taxi stands/main roads, coffee shops, grocery shops, clinics, senior citizen centres and ATM machines) were measured. Distances across the roads in these estates and the time allowed by signals for safe crossing were also measured. From these data, the velocities needed to cross the roads safely were calculated.

Results: The results showed that the distances between the blocks and the nearest amenities were shortest in the old estates, followed by the mature estates, and the longest in the new estates. Individuals living in the old, mature and new estates will have to travel for an average distance of 254 m (range 67-834), 288 m (range 71-870) and 470 m (range 81-812), respectively, to the nearest amenities. The average velocities required to cross a road safely in the old, mature and new estates were 0.68 m/s, 0.81 m/s and 0.79 m/s, respectively.

Conclusion: Based on the results of this study, therapists will be able to set realistic community ambulatory goals for patients undergoing rehabilitation.

1129/SOGD

Risk Factors for Postoperative Renal Dysfunction after Deep Hypothermic Circulatory Arrest for Repair of Thoracic Aortic Aneurysm and Dissection

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Aim: The use of deep hypothermic circulatory arrest (DHCA) in cardiovascular surgery has been identified as a predictor of acute renal failure and contributes to significant morbidity and mortality. Aim: We aim to determine the incidence of and to elucidate the risk factors for renal dysfunction after DHCA for repair of thoracic aortic aneurysm and dissection.

Methods: From the cardiothoracic databases of National University Hospital and National Heart Centre, 59 patients were identified to have undergone repair of thoracic aortic aneurysm and dissection from January 1999 to April 2002. Chart review was performed to extract data pertaining to medical history, operative details and postoperative progress. Postoperative renal dysfunction was defined as a rise of serum creatinine $>177 \mu\text{mol/l}$ for patients with normal preoperative creatinine, doubling of creatinine from preoperative values for patients with pre-existing impaired renal function or requirement for postoperative renal dialysis.

Results: 36 (61%) of the 59 patients sustained postoperative renal dysfunction. 11 (30.6%) of these 36 patients required postoperative dialysis. 7 (63.6%) of these 11 patients died perioperatively. Significant risk factors for renal dysfunction were elderly age, longer bypass time, lower haematocrit and base excess during bypass, more bicarbonate administration and usage of blood salvage devices. There was a trend towards longer DHCA and aortic cross-clamp times, although this did not reach statistical significance.

Conclusion: Older age, longer bypass time, lower haematocrit and presence

of acidosis during bypass were identified as risk factors for renal dysfunction after DHCA for repair of thoracic aortic aneurysm and dissection.

1130/SOGD

Faster Resumption of Spontaneous Respiration after LMA Insertion Using Low-dose Fentanyl in Local Population

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Aim: Fentanyl is an adjuvant commonly used with propofol to facilitate insertion of the LMA. This is often followed by a variable period of apnoea that can sometimes be prolonged. Some patients may benefit from faster resumption of spontaneous breathing, including day surgery cases or procedures of short duration. The purpose of this study was to investigate if a clinically useful reduction in apnoea can be achieved using a lower dose of fentanyl, and how it would affect the conditions for LMA insertion.

Methods: 124 ASA I or II patients aged 16-65 years requiring minor surgery were included. They were randomised to receive either fentanyl 0.5 mcgkg^{-1} (F0.5) or fentanyl 1.0 mcgkg^{-1} (F1). This is followed by propofol 2.5 mgkg^{-1} . LMA insertion was attempted 90 seconds later. The time taken for patient to resume spontaneous respiration was noted. The conditions for insertion (determined by a 3-point scale on 5 variables) and changes in blood pressure, heart rate and pulse oximetry were recorded.

Results: Both groups were demographically similar. Apnoea was shortened in Group F0.5; at 30 seconds after insertion of LMA, 78% of patients had started breathing spontaneously compared to 41% of patients from Group F1 ($p < 0.001$). Conditions for insertion were not significantly different between both groups.

Conclusion: A lower dose of fentanyl can be used in our local population during LMA insertion without significantly affecting the conditions for insertion if faster resumption of spontaneous respiration is desired.

1131/SOGD

Excessive Hydrostatic Distension Reduces Vasoreactivity of Radial Artery Conduits

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Aim: Surgical preparation of coronary conduits may affect early and long-term patency through endothelial and smooth muscle injury. We investigated the effect of hydrostatic distension on in-vitro endothelial function and contractile properties of human radial artery (RA).

Methods: Human RAs were harvested and distended at physiological or supra-systemic pressure ($>300 \text{ mm Hg}$) for 2 minutes. Distal segments were retrieved and cut into 3-mm rings which were mounted and equilibrated in oxygenated Krebs's solution at 37°C . Contraction responses to potassium chloride (KCl), noradrenaline and serotonin, and relaxation responses to acetylcholine (ACh) and nitroprusside, were evaluated. Undistended rings were used as controls.

Results: Contraction to all 3 contractile agonists were significantly different between the groups, with supra-systemic pressure distension achieving the lowest percentage of maximum contraction (KCl $p < 0.001$; noradrenaline $p < 0.05$; serotonin $p < 0.05$). EC50 was also significantly reduced, indicating increased sensitivity to all 3 agonists. Only receptor-mediated contractility was significantly reduced in the physiologically distended group when compared to controls. Relaxation to ACh and nitroprusside was significantly reduced in the supra-systemic pressure distended group, with a tendency to vasospasm when exposed to a physiological concentration of ACh (10^{-6} M). EC50 to both ACh and nitroprusside were not different between the groups.

Conclusion: Excessive distension of RA leads to a significant reduction in vasoreactivity, which may be attributed to a disruption of the vascular endothelium and media with a propensity for graft spasm when exposed to ACh.

1132/SOGD

Risk Scoring Systems for Coronary Artery Bypass Graft (CABG): Do They Apply to Asian Patients?

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Aim: Risk scores need to be applied in comparing outcomes of coronary artery bypass graft (CABG). However, various scoring systems are based on different designs and patient populations. Commonly used risk stratification systems are derived from North American and European populations. They have not been evaluated for applicability to Asian populations. This study aims to address the issue.

Methods: Between 1 January 2000 and 31 December 2002, data of 1054 consecutive patients undergoing isolated primary CABG surgery in our institution was prospectively scored and collected by an independent observer. Mortality predictions were prepared using the Parsonnet, Euroscore and Northern New England systems. Postoperative 30-day mortality was registered. Score validity was assessed by the area under the receiver operating characteristic (ROC) curve. Odds ratios were calculated to investigate the predictive relevance of risk factors.

Results: The predicted mortality for our population was 6.91 + 7% by Parsonnet, 4.4 + 3% by Euroscore, and 1.7 + 1% by the Northern New England scoring system. Observed mortality at this centre was 2.8%. The area under the ROC curves were Parsonnet 0.8, Euroscore 0.87, and Northern New England 0.841. Most surgeons outperformed Parsonnet and Euroscore.

Conclusion: The risk scores derived from a predominantly Caucasian population are applicable to our patients. Euroscore had the highest predictive value in our total patient population.

1133/SOGD

Achievement of Technical Satisfaction after Proximal Aortic Anastomosis Using CorLink Aortic Anastomotic Device with Intraoperative Flowmeter Study in Isolated Coronary Artery Bypass Graft (CABG)

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Aim: We demonstrate equivalency of the CorLink aortic anastomotic (AAD) anastomoses compared to hand-sutured anastomoses in patients undergoing coronary artery bypass graft (CABG) with respect to 6 months patency at proximal anastomotic site.

Methods: Medi Stern flowmeter was used in all patients as standard method of assessing graft patency intraoperatively in our study. A total of 25 patients undergoing isolated CABG were randomised to using AAD (13 patients) and conventional hand suture technique (12 patients). Two patients assigned to AAD were converted to hand suture technique. A total of 16 AADs were used in 13 patients in the device group. All patients were reviewed at the first, third and sixth month after the operation. The patency of proximal anastomosis was evaluated using high speed computed tomography scan at follow-up 6 months later.

Results: The mean time of application of the device was 2 minutes and the mean flow rates using AAD and the hand suture technique were 24.68 ± 16.18 l/min and 30.50 ± 20.83 l/min, respectively. Pulsatility index in the flowmeter was 2.82 ± 1.61 for the hand suture technique and 5.65 ± 5.6 for the AAD group. There was no significance difference in the occlusion rate between the 2 techniques. In our study, the percentage of occlusion was 37.5% and 15.8% for AAD and the hand suture technique, respectively (p = 0.143). This was comparable with the overall result (p = 0.610) from combined groups (5 centres), which was 26.1% and 22.5% for AAD and hand suture technique, respectively.

Conclusion: Corlink AAD is safe, effective and efficient in creating proximal aorto-saphenous anastomosis besides the advantage of avoiding side clamping of the aorta.

1134/SOGD

Comparison of Tooth Slice and Immortalised Cell-Line for Cytotoxicity Testing

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Aim: Organ culture consists of dental cells organised *in vivo*, which is highly relevant to cytotoxicity testing of appropriate dental products. Immortalised cell-line cultures, on the other hand, are simple replicating systems without any specific metabolic potential that the target cells have *in vivo*. In this study, organ culture cytotoxicity testing was compared to that of immortalised cell-line to determine the sensitivity and reproducibility of both culture models.

Methods: For the organ culture, a 28-day old incisor, sliced into a thickness of 2 mm, was cultured with and without agarose culture gel and submerged in complex media. Direct contact test involved the restorative dental composite to come into contact with the exposed pulp-dentin complex. Indirect contact involved the composite contacting the agar barrier between the incisor slice. Differences in morphological intact cell numbers were assessed. For cell-line culture, L-929 (ISO-approved and highly recommended) was used. Direct test involved the monolayer cells to contact the composites, whereas the indirect test had an agar barrier. Zone of inhibitions was assessed. All results were analysed using Tukey one-way ANOVA (p<0.05).

Results: Direct contact organ cytotoxicity tests were more sensitive than indirect ones as more dental composites were toxic compared with controls. All test composites were non-toxic from L-929 direct contact test (p>0.05) and were significantly toxic from the indirect contact tests (p<0.001). Cytotoxicity rankings of the dental composites were similar for both culture models.

Conclusion: L-929 cytotoxicity tests are extremely sensitive, giving compatibility of the materials for 1 test and absolute toxicity for the other. Organ culture tests provided more explainable results; direct tests were more sensitive than indirect tests with the agar barrier, which reduced the response of toxic elements.

1135/SOGD

A Comparison of Hyperbaric Solutions of Levobupivacaine and Racemic Bupivacaine Administered Intrathecally with Fentanyl for Caesarean Delivery

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Aim: Levobupivacaine is the pure S(-) enantiomer of racemic bupivacaine with reduced cardiovascular and central nervous system toxicity. In this prospective, randomised and double-blinded study, we compare the clinical efficacy, characteristics and side effects of intrathecal levobupivacaine with that of racemic bupivacaine for elective caesarean delivery. Fentanyl was added to improve the quality and duration of anaesthesia.

Methods: 41 full-term singleton parturients were recruited. Patients received intrathecal injection of fentanyl 10 mcg, with 9 mg of either 0.5% hyperbaric levobupivacaine or 0.5% hyperbaric racemic bupivacaine. Assessments of sensory block to pin prick and motor block (using a modified Bromage scale) were performed in addition to routine monitoring. Evaluation of side effects and patient satisfaction scores were performed postoperatively.

Results: The onset of motor block in the levobupivacaine group was significantly slower (mean, 7.3 ± 2.6 vs. 4.9 ± 2.6 sec, P < 0.01), with a greater proportion of patients not achieving Bromage 3 motor block (24% vs. 0%, P < 0.01) compared to the racemic bupivacaine group. Furthermore, regression of motor block to T10 dermatome was significantly faster in the levobupivacaine group (mean, 89 ± 26 vs. 148 ± 26 min, P < 0.01). Other spinal block characteristics, incidence of side effects and patient satisfaction scores were similar in both groups.

Conclusion: Intrathecal levobupivacaine with fentanyl for elective caesarean section produced effective spinal anaesthesia, but with a shorter duration and

lesser degree of motor block compared to racemic bupivacaine. The faster recovery of motor function allows earlier ambulation, which will theoretically decrease the risk of deep vein thrombosis.

I136/SOGD

Comparison of Clinical with Pathological Nodal Status from Systematic Mediastinal Lymph Node Dissection in Surgery for cN0 Non-small Cell Lung Cancer

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Aim: We compared the accuracy of clinical nodal (cN) status N0 with that of pathological nodal (pN) status obtained from systematic mediastinal lymph node dissection (SMLD) in primary non-small cell lung cancer (NSCLC).

Methods: Data from 22 consecutive patients who underwent lung resection and SMLD, of at least 3 mediastinal node stations, from November 2001 to May 2003 were analysed retrospectively. Only patients with cN0 status on computed tomography (CT) scan referred for curative surgery were included in this study.

Results: The mean age of the patients was 66.6 ± 8.1 years and the male to female ratio was 17:5. The mean number of lymph node stations dissected was 5.8 ± 1.8 . Forty percent (9/22) had squamous cell carcinoma, 45% (10/22) had adenocarcinoma, 5% each had large cell carcinoma, bronchioalveolar carcinoma or a lympho-epithelial carcinoma. pN2 metastases were found in 27% (6/22) of patients. The sensitivity of cT was 70%, with a specificity of 50%. For cN, the sensitivity was only 7.1% with a specificity of 97.1%. The positive and negative predictive values of cN status were 50% and 71.1%, respectively. Curative resections were achieved in 59% (13/22) of patients.

Conclusion: The sensitivity of cN0 status, based on CT scan alone, is extremely poor when compared with pN status from SMLD. In our analysis, based on cN status alone, 27% of patients in pN2 status would have been understaged. We recommend that all patients with cN0 status should undergo SMLD, of at least 3 appropriate mediastinal node stations for proper staging.

I137/SOGD

Doppler Detection of Arterio-arterial Anastomosis Predicts Survival Outcome Independent of Quintero Stage in TTTS

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Aim: We seek to determine if the antenatal detection of arterio-arterial anastomoses (AAA) predicts survival independently of Quintero stage in twin-twin transfusion syndrome (TTTS).

Methods: One hundred and seven consecutive cases of TTTS were studied between 1995 and 2003. AAA and Quintero stage were determined at presentation and at each subsequent visit. The main outcome measures were rates of perinatal survival, double survival and any survival.

Results: Ninety-six pregnancies were analysed. The overall rates of perinatal survival, double survival and any survival were 60%, 44% and 76%, respectively. Survival was better when an AAA was detected at presentation than when it was not in terms of perinatal survival rates (78% vs 56%, $p = 0.02$) and double survival rates (72% vs 37%, $p = 0.007$). The differences in rates widened with increased AAA detection rates at treatment and before delivery. The outcome was poorer with increased Quintero stage at presentation in terms of perinatal survival rates (74%, 63%, 50% and 45%, $p = 0.001$) and double survival rates (66%, 50%, 33% and 0%, $p < 0.001$). Both AAA and stage were demonstrated to be independent predictors of perinatal survival rates and double survival rates by multiple logistic regression analysis. The presence of antenatally detected AAAs conferred better outcomes for Quintero stages I to III before the first invasive treatment in terms of perinatal survival rates and double survival rates.

Conclusion: Antenatal detection of AAA predicts better survival outcomes independent of Quintero stage. Its incorporation into a modified staging system improves prognostication.

I138/SOGD

Standardised MR Classification System for Reporting of Degenerate Lumbar Discs: Interobserver Variability and Implications

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Aim: A classification system has been proposed for the reporting of MR lumbar disc contour abnormality. We evaluate the system for interobserver variability and implications of using this system for routine MR reporting of lumbar spine studies.

Methods: 100 consecutive cases of MR lumbar spine studies were evaluated by 2 radiologists using the new classification system jointly proposed by the North American Spine Society, American Society of Neuroradiology and American Society of Skeletal Radiology. Disc contours were classified as: normal, symmetrical disc bulge, asymmetrical disc bulge, focal protrusion, broad-based protrusion and extrusion. Statistical analysis was performed for each category for percentage agreement.

Results: Interobserver agreement among all categories is 83%. Kappa value yielded 0.8, corresponding to substantial agreement.

Conclusion: Using the new proposed system, substantial agreement was achieved between observers, making the new classification a robust system. Some difficulties and pitfalls in using this new system include the effects of osteophytes on disc contour, incongruity of L5 vertebral body on S1 and the differentiation from the normal, but slightly bulging, L5 disc.

I139/SOGD

Extension of the Posterior Interosseous Reverse Flow Flap

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Aim: The posterior interosseous reverse flow (PIRF) flap is a well-established and robust option for the coverage of skin and soft tissue defects of the hand. It provides excellent tissue matching for the hand and does not require microsurgical expertise. It is commonly used over the region of the hand dorsum and first web. We have been able to extend the flap to cover defects more distally over the thumb and fingers, up to the level of the distal interphalangeal joint. We present our experience using the modified version of this flap.

Methods: Three cases of hand injuries affecting the thumb or fingers were reconstructed using an extended PIRF flap. Each case was discussed, emphasising the various reconstructive options and our rationale for using this flap. The technique used was discussed, particularly the need to include as many perforators as possible with a large skin paddle and de-epithelialisation of the tunnelled portion of the flap.

Results: In the 3 clinical cases presented, the flap was used successfully to cover defects in the thumb or fingers of the hand. Modification of the flap allows a further reach than the original flap design.

Conclusion: The PIRF flap is robust and versatile. Methods to extend the reach and reliability of the flap have been reported. The application of a breast reconstruction technique by taking a larger/longer flap than necessary to include more perforators, and de-epithelialising the tunnelled portion have allowed us to achieve extended reach up to the level of the distal interphalangeal joint of the fingers. This technique can also increase the reliability of the flap.

I140/SOGD

Management and Outcome of Adult Blunt Splenic Trauma

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Aim: The spleen is the most commonly injured organ in blunt abdominal trauma. Preservation is often advocated in view of the spleen's immunological importance. The aims of this study were to describe management and

outcome among adult patients with blunt splenic trauma seen at our hospital, and to determine the rate of splenic salvage.

Methods: A retrospective review of adult patients treated for blunt splenic trauma at our hospital between January 1994 and June 1997 was conducted.

Results: 34 patients with documented blunt splenic trauma were identified. Overall, 22 (65%) were definitively managed by splenectomy, 8 (24%) by splenorrhaphy and 3 (9%) by non-operative management. One had his splenic injury left alone at laparotomy as it was not actively bleeding. The mortality rate was 18%. The splenic salvage rate was 35%.

Conclusion: Splenectomy is the commonest method of management for adult blunt splenic trauma and could reflect the greater familiarity with this modality among our surgical staff. Splenic preservation is achieved in 35% of patients, mostly by splenorrhaphy. The use of a standardised management protocol may improve our salvage rate.

I141/SOGD

Soft Tissue Injury Patterns in Motorcycle Accidents

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Aim: A prospective study was conducted to describe the pattern of distribution and possible contributing factors of soft tissue injuries sustained by motorcyclists admitted to a hospital in Singapore. This information would provide insight into the likely cause and effect of soft tissue trauma in such accidents, as well as to provide a basis for work on improvement of existing safety measures.

Methods: Twenty-three inpatient motorcyclist casualties were studied over a period of 3 months. The circumstances of their accidents and the distribution and nature of their injuries were described. On follow-up, the duration of medical leave taken for their injuries was recorded.

Results: Injuries to the face (69.6%) and upper limbs (91.3%), in particular the dorsum of the hands (65.2%), were most commonly seen, the majority being superficial abrasions of varying surface area. While the distribution of injuries was largely random, there was a correlation between severity of injury with speed of travel and use of personal protective equipment. There was no clear relationship observed between the distribution of soft tissue injuries and bony or visceral injuries. Injuries resulted in patients being given, on average, 1 month's leave from work.

Conclusion: Despite existing safety measures, motorcyclists' faces and hands remain particularly vulnerable to soft tissue injuries. These injuries contribute to a significant part of annual medical leave.

I142/SOGD

Theophylline May Have a Role in the Management of Ureteric Colic

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Aim: We study the side effects and efficacy of orally administered theophylline in a double-blind, randomised phase II clinical trial in patients with ureteric colic.

Methods: Fifty-three patients with proven, uncomplicated single ureteric calculi 10mm or less in size were randomised to receive either theophylline or an identical placebo twice daily for a period of 8 weeks. 19 patients were on placebo and 34 patients were on theophylline. Each patient received a standard analgesia regime and a symptom diary during the 8-week period to document symptoms and side effects of therapy. Stone passage was documented with plain abdominal radiographs 4 and 8 weeks following therapy.

Results: Twelve patients on theophylline (n = 34) passed their calculi within 8 weeks, of which 66.7% of them did so within the first 4 weeks. Eight patients on placebo (n = 19) passed their calculi within 8 weeks, of whom 62.5% did so in the first 4 weeks. Both pain intensity and analgesic consumption were less in the theophylline arm. Side effects, such as vomiting,

palpitations and gastric discomfort, were minor and transient.

Conclusion: Theophylline may be a useful adjunct to standard analgesic medication in decreasing the intensity of ureteric colic and reducing analgesic use. This may reduce visits to the emergency room for pain relief.

I143/SOGD

Virus-mediated Small Interfering RNA Directed Against the Laminin-5 γ 2 Chain Reduces Secretion of Laminin-5, but Increases Tumour Cell Proliferation and Migration in Squamous Cell Carcinoma

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Aim: Laminins are heterotrimeric basement membrane glycoproteins. In squamous cell carcinoma (SCC), Ln-5 is overexpressed, especially at the invasive front. To understand the role of Ln-5 in SCC motility and invasion, we used small interfering RNAs (siRNAs) to inhibit the expression of Ln-5 in SCC cells.

Methods: UM-SCC-22B (22B), a highly invasive human SCC line, does not produce Ln-5. In contrast, JHU-022-SCC (022) is non-invasive, but secretes Ln-5. siRNA oligonucleotides directed against the Ln-5 γ 2 chain were cloned into a retroviral expression vector and transfected into amphotrophic packaging cells. Viruses expressing the siRNAs were used to infect 022 cells (022-si γ 2) and were selected by resistance to puromycin.

Results: Expression levels of the Ln-5 α 3 and β 3 subunits remained unchanged in both parental 022 and 022-si γ 2 cells. In contrast, expression of Ln-5 γ 2 chain was nearly undetectable in lysates and media conditioned by the 022-si γ 2 cells compared to parental cells. Furthermore, the levels of α 3 and β 3 chains were reduced in media of 022-si γ 2. 022-si γ 2 cells grew 2-fold faster and were 5-fold less resistant to trypsinisation compared to parental 022 cells. Finally, 022 cells migrate poorly on matrices whereas 022-si γ 2 cells migrated nearly as efficiently as 22B cells. The enhanced migration of 022-si γ 2 cells could be blocked by antibodies to Ln-5 and Ln-5 receptors.

Conclusion: The Ln-5 γ 2 chain regulates the secretion of the α 3 and β 3 subunits and is important in the secretion of the Ln-5 heterotrimer. Loss of γ 2 expression decreased cellular adhesion while increasing SCC proliferation and migration to levels similar to invasive SCC cells.

I144/SOGD

Total Knee Arthroplasty in the Severely Deformed Neuropathic Joint

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Aim: Severe progressive neuropathic arthropathy of the knee joint is uncommon. Surgical treatment has traditionally been arthrodesis. Recent reports with medium-term follow-up suggest that total knee arthroplasty (TKA) may be a viable option in these patients, avoiding fusion. We report early results of a series of 6 patients (12 knees) with severely deformed neuropathic knees for which TKA was performed.

Methods: We retrospectively analysed the records of patients with severely deformed neuropathic knee arthropathy who had TKA performed by the same surgeon. Cemented long-stem TKA prostheses with bone grafting and augmentation were used in all patients. Bilateral TKA, when required, was performed in a single operation. Patients were assessed at follow-up using the Hospital for Special Surgery Knee Disability Sheet for Total Knee Arthroplasty (HSS) and a visual analogue scale for pre-operative and post-operative pain, mobility and quality of life.

Results: The mean follow-up of the patients was 15 months (3-26 months). All patients were alive at follow-up. There were no perioperative complications. The mean HSS score at follow-up was 90 points. VAS scores for pain,

mobility and quality of life before and after the operation improved by means of 38, 75 and 43, respectively.

Conclusion: TKA is technically feasible in severely deformed neuropathic knees, with perioperative morbidity rates similar to routine TKA. The short term results of TKA in this series are encouraging, with good subjective and objective outcome scores at follow-up. TKA may be an acceptable alternative to arthrodesis in this group of patients.

I145/SOGD

Systemic Autonomic Function in Subjects with Primary Angle-closure Glaucoma

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Aim: Autonomic dysfunction is thought to be a contributory factor in primary angle closure (PAC), with autonomic neuropathy possibly involved in precipitating pupil block in anatomically predisposed eyes. This study aims to compare systemic autonomic function between subjects who have suffered a previous episode of acute angle closure (symptomatic PAC), those with asymptomatic chronic angle closure glaucoma (asymptomatic PAC), and age- and sex-matched controls.

Methods: Exclusion criteria were the use of salbutamol or ipratropium bromide, oral or topical beta-blockers, topical pilocarpine and those on systemic anticholinergic or antidepressant medications. Tests for systemic parasympathetic function included the heart-rate response to standing (ratio of 30:15), heart-rate variation during deep breathing, and the ratio of the heart rate at phases IV and II of the Valsalva manoeuvre (Valsalva ratio). For assessment of the sympathetic nervous system, blood pressure was recorded supine and then after 2 and 5 minutes of standing. A modified sweat test, the sympathetic skin response, was recorded on the palm and sole.

Results: A total of 30 subjects were examined: 8 symptomatic PACs, 8 asymptomatic PACs and 14 control subjects. The mean ages were similar and all, except 1 subject, were Chinese. There was no difference in the sex ratio between the groups. There was no significant difference ($p>0.05$) found between groups for the 30:15 ratio, heart rate variation during deep respiration and the Valsalva ratio. No significant orthostatic hypotension was detected in any subject. The occurrence of abnormal sympathetic skin response was slightly higher in the control group.

Conclusion: Our data suggests that in subjects with acute and chronic primary angle closure glaucoma, the autonomic nervous system is normal.

I146/SOGD

Allogenic Immunogenicity of Mesenchymal Stem Cell and Its Differentiated Osteogenic Lineage

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Aim: We evaluate the immunogenic reaction of allogeneic lymphocytes on mesenchymal stem cells (MSCs) and differentiated osteogenic lineage (DOL) from the same MSCs.

Methods: MSCs were purified from New Zealand white rabbits' iliac marrow. To verify MSCs, pluripotent differentiation to osteogenic lineage and chondrogenic lineage was examined. The osteogenic lineage differentiation was confirmed by positive Von Kossa staining, ALP and osteocalcin expression in ELISA, and chondrogenic lineage differentiation by positive toluidine staining and collagen-II expression in ELISA. Mononuclear cells were isolated from the rabbits' peripheral blood and spleens, then mixed with MSCs or DOL and incubated for 5 days. Proliferation of responding lymphocytes (RL) in the mixed culture was examined by CellTiter 96® non-radioactive cell proliferation assay with MTS. Cytotoxicity of stimulated RLs to MSCs and DOL was examined by CytoTox 96® non-radioactive cytotoxicity assay. MSCs and DOL from 3 different rabbit donors were cross-tested against allogeneic RLs. RLs and primary explanted osteoblasts (PEOs) from

the same donors were cross-tested against allogeneic RLs as positive controls. Autologous tests as negative controls. All experiments were performed a minimum of 3 separate times.

Results: Allogeneic RL proliferation and cytotoxicity against MSCs were significantly lower than positive controls ($p<0.01$, ANOVA) and comparable to autologous controls. Proliferation and cytotoxicity response of allogeneic RL to DOL: lower than allogeneic RL-RL ($p<0.05$) positive control, but insignificantly lower than PEO-RL ($p>0.05$) positive control and higher than autologous controls ($p>0.05$).

Conclusion: Rabbit MSCs have been observed to fail to elicit an immunogenic response from allogeneic lymphocytes. Rabbit DOL elicited little proliferation and cytotoxicity response from allogeneic lymphocytes, but needs to be investigated further in larger samples.

I147/SOGD

The Effect of Food Simulants on the Bond Strength of Orthodontic Brackets Using Glass Ionomer Cement

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Aim: We evaluate the effect of food simulants on the bond strength and failure modes of orthodontic brackets using glass ionomer cement (GIC) (Fuji Ortho LC®).

Methods: Orthodontic brackets were bonded onto 140 extracted premolars. The bonded specimens were then randomly distributed into 5 groups and conditioned in the following food-simulating liquids at 37°C: distilled water (control), 8% alcohol (aqueous food), 50% alcohol (alcoholic foods), pH4 citric acid (acidic foods) and corn oil (fatty food). The solutions were changed weekly over a period of 12 weeks. The specimens were then potted into acrylic moulds using a customised archwire-based fixture. The brackets were debonded with a shear-peel load using an Instron testing system at a crosshead speed of 0.5 mm/min. An image analysis system was used to determine the mode of failure, which was classified using the Adhesive Remnant Index (ARI). Bond strength data was analysed using 1-way ANOVA/Tukey's test and the Kruskal-Wallis test was used to determine differences in ARI data.

Results: Conditioning in corn oil significantly increased the bond strength of orthodontic brackets using GIC. No significant difference in bond strengths was observed among all other treatment groups. ARI data revealed cohesive failure for all groups.

Conclusion: Corn oil increased the bond strength of orthodontic brackets bonded with GIC. Alcohol and acidic foods do not influence the bond strength of brackets using GIC. The mode of failure was cohesive for all groups.

I148/SOGD

Transit-Time Flow Measurement is Essential to Coronary Artery Bypass Grafting

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Aim: Patent bypass grafts are fundamental to successful coronary artery bypass grafting (CABG). Intraoperative flow measurement through newly constructed grafts is a test of patency. We studied the use of transit-time flow measurement (TTFM) to determine its ability to detect technical errors in grafts; the mean flow norms for Asian patients; whether native coronary run-off can be used as a predictor of mean flow; and to compare arterial and vein grafts.

Methods: From January 2001 to September 2002, 116 patients underwent isolated primary CABG under a single surgeon. 67 underwent conventional CABG and 49 had off-pump CABG. There were 168 arterial grafts and 178 vein grafts. TTFM was carried out on all completed grafts. Graft patency was assessed using flow curves, mean flow and the Pulsatility Index (PI). The average of mean flows was calculated to determine mean flow norms. Arterial and vein grafts were compared by statistical analysis between variables of mean flow and PI. In a sample of 19 patients, the correlation between run-off

and mean flow was studied

Results: In 6 patients with 7 grafts, intraoperative graft assessment detected technical errors. These were corrected. Average mean flow was 35.66 ± 23.853 ml/min for LAD-LIMA grafts, with values ranging from 21.22 to 35.97 ml/min for the rest. There were no statistically significant differences in mean flow or PI between arterial and vein grafts. No clear relationship between mean flow and run-off could be found.

Conclusion: TTFM enables technical problems to be diagnosed accurately, allowing prompt revision of grafts. It should be mandatory in CABG to improve surgical outcomes.

I149/SOGD

Off-Pump Coronary Artery Bypass Grafting is the Preferred Choice for Patients Requiring Coronary Revascularisation

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Aim: Off-pump coronary artery bypass grafting (OPCABG) is gaining widespread acceptance as the preferred procedure for surgical myocardial revascularisation. However, no definite data exist as to whether it is better than conventional CABG. We wanted to investigate if OPCABG is indeed better than conventional CABG.

Methods: Between January 2000 and November 2002, 1020 patients underwent isolated coronary artery bypass in our institution. 167 patients underwent OPCABG. Patients were prospectively risk-stratified to Parsonnet, Euroscore and Northern New England models. Post-operative complications, ICU stay, hospital stay, types of grafts done, adoption rates amongst various surgeons were analysed.

Results: The incidence of off-pump procedures has shown a gradual increase over the last 2 years in this institution. A reduction in the numbers of post-operative complications, hospital ICU stay and mortality in the off-pump group was observed. However, most of the differences did not reach a level of statistical significance. A randomised trial is needed to prove a significant difference and benefit with the off-pump technique.

Conclusion: In conclusion, OPCABG is a viable alternative and possibly preferred to conventional CABG.

I150/SOGD

Pre-operative Eradication of Bacterial Carriage Reduces Post-operative Infections after Coronary Artery Bypass Grafting

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Aim: We investigate if the pre-operative elimination of nasal, axillary and inguinal carriage of important pathogens prior to coronary artery bypass grafting (CABG) would reduce post-operative wound infection.

Methods: 1155 consecutive patients undergoing isolated, elective CABG were included in this retrospective study. From 1 June 1995 to 30 July 1997, 312 patients (Group I) had nasal, axillary and groin swabs performed to assess bacterial load; however, bacterial colonisation was not treated. From 1 August 1997 to 30 October 2000, 843 patients (Group II) underwent pre-operative swabbing and eradication of bacterial carriage by administration of mupirocin. Eradication of bacterial carriage was confirmed by repeated cultures. Both groups underwent identical pre-operative preparation.

Results: There were 11 (0.95%) cases of sternal wound infections (SWI) between both groups of patients. In Group I, there were 6 cases (1.92%) of SWI; 3 (0.96%) patients had superficial sternal wound infections (SSWI) and 3 had deep sternal wound infections (DSWI). The incidence of SWI was significantly lower in Group II ($p < 0.05$). There were 5 (0.59%) cases of infection in this group. 2 (0.24%) were SSWI and 3 (0.35%) were DSWI.

There was a similar decrease in leg wound infections in Group II compared to Group I. There were 28 (3.3%) cases of leg wound infection versus 22 (7.1%) cases ($p < 0.01$), respectively.

Conclusion: Eradication of bacterial carriage with topical antibiotics prior to surgery reduces the incidence of postoperative wound infections among patients undergoing CABG. A large prospective, randomised, placebo-controlled study should be done to confirm this finding.

I151/SOGD

The Role of the p53 Tumour Suppressor Gene, bcl-2 and Bax-mediated Apoptosis in Gastric Cancer

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Aim: Apoptosis is a highly regulated form of programmed cell death in various tumours. The p53 tumour suppressor gene is believed to be involved in this process. Our aim was to investigate the alterations of p53 in gastric cancer and to correlate this with the expression of apoptosis-related antigens and apoptotic cell death.

Methods: Archival samples of gastric carcinomas from 232 patients were examined for overexpression of p53 by immunohistochemistry. The p53 mutations were studied by polymerase chain reaction-single strand conformation polymorphism (PCR-SSCP) analysis and sequencing. The overexpression of the bcl-2 and bax proteins was examined by immunohistochemistry. The TUNEL technique was used to determine the presence of apoptosis.

Results: There were 38.8% (using DO-7 anti-p53 antibody) and 34.1% (using 1801 anti-p53 antibody) p53 protein overexpression. Bcl-2 and bax expression was found in 30.6% and 57.3%, respectively. Apoptotic cells were found in 35%. p53 mutations were detected in 56 (24.1%) of 232 samples, in exon 5 (10.3%), exon 6 (1.3%), exon 7 (5.6%), and exon 8 (6.5%). No mutations were detected in exons 4 and 9. Polymorphism was found in codon 72 of exon 4 (CGC to CCC) in 23%.

Conclusion: The p53 gene is strongly implicated in the tumorigenesis of gastric cancer, possibly by regulating apoptosis through the expression of the apoptosis-associated genes bcl-2 and bax. Our findings have led to greater understanding of the role of p53 in gastric cancer and has important implication in prognostication and treatment using p53-mediated gene therapy.

I152/SOGD

The Role of Urodynamic Study in the Evaluation of Young Men Presenting with Lower Urinary Tract Symptoms

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Aim: We review the role of urodynamic study in the evaluation of young men who present with lower urinary tract symptoms (LUTS).

Methods: This was a retrospective study of 40 male patients presenting between September 1999 and July 2002, aged 55 years and below with no significant neurologic history, with persistent LUTS despite initial medical therapy. All patients underwent urodynamic study.

Results: The mean age of the patients was 39.4 years; 65% and 75% of them had obstructive and irritative symptoms, respectively. 47.5% of patients were found to have urodynamic abnormalities. The urodynamic findings were bladder outlet obstruction in 8 (20%) patients, detrusor overactivity in 3 (7.5%) patients, bladder outlet obstruction and detrusor overactivity in 1 (2.5%) patient, detrusor underactivity/acontractility in 4 (10%) patients and equivocal for obstruction in 3 (7.5%) patients. They were treated according to their symptoms and urodynamic findings. Patients with bladder outlet obstruction were treated with alpha-blocker therapy or transurethral surgery. Patients with detrusor overactivity were treated with anticholinergics, while those with detrusor underactivity/acontractility were treated with clean intermittent catheterisation or indwelling urinary catheter.

Conclusion: Young men presenting with LUTS may have similar symptoms but different pathologies. Urodynamic study has a definite role in the evaluation of this group of patients as it helps in the selection of definitive treatment.

I153/SOGD**A Selective Approach Increases the Clinical Benefit of Pre-operative Staging Laparoscopy and Laparoscopic Ultrasound for Gastric Cancer**Choon Hou HO¹, Melvin LOOK², Cheng Hock LOW²¹Department of General Surgery, Tan Tock Seng Hospital, Singapore, ²Department of Surgery, Tan Tock Seng Hospital, Singapore

Aim: Pre-operative laparoscopy has been found to be a highly accurate tool for staging gastric cancer. The use of laparoscopic ultrasound adds further information to this assessment. Nevertheless, the clinical impact of laparoscopic staging, based on an all-comers policy, is low as most patients do not benefit from this additional procedure. The aim of our study was to improve the clinical utility by a selective approach.

Methods: After conventional staging modalities, patients were selected for staging laparoscopy if they had a potentially curable tumour that is T3 or greater. Patients were excluded if they had a small tumour or if palliative resection was indicated. The procedure was done as day surgery whenever possible.

Results: Twenty patients with gastric adenocarcinoma satisfied our selection criteria and underwent staging laparoscopy. Laparoscopic ultrasound was used in 6 patients to obtain further information. Peritoneal metastasis was found in 10 patients. Nodal metastasis, malignant ascites and positive peritoneal lavage cytology were found in 3, 7 and 1 patients, respectively. Overall, 12 patients were found to have incurable disease and spared from unnecessary laparotomy. Two patients benefitted from palliative laparoscopic bypass done at the same sitting. There were no procedural-related complications, except for aspiration pneumonia in 1 patient.

Conclusion: Pre-operative staging laparoscopy and laparoscopic ultrasound are safe. A selective approach increases the clinical benefit of this procedure. The management of 60% of patients were altered based on this staging. Further advantage is gained if the expertise for palliative laparoscopic bypass is available.

I154/SOGD**Should Adenocarcinoma and Squamous Cell Carcinoma of the Oesophagus Be Studied Separately in Trials of Multimodality Therapy?**Khong Hee LIM¹, Wendy BROWN², Bryan BURMEISTER², Jennifer HARVEY², Ian MARTIN², David GOTLEY², Mark SMITHERS²¹Department of General Surgery, Tan Tock Seng Hospital, Singapore, ²Upper Gastrointestinal Surgical Unit, Department of Surgery, University of Queensland, Princess Alexandra Hospital, Australia

Aim: Multimodality therapy has been used to treat oesophageal cancer. We compared the treatment outcome between adenocarcinoma (AC) and squamous cell carcinoma (SCC) in terms of survival and recurrence.

Methods: A prospective database of patients with oesophageal cancer was collected from 1988-2001. 284 patients with AC and 191 patients with SCC were treated with curative intent. The options included resection alone, neoadjuvant chemotherapy with or without radiotherapy (cisplatin 80 mg/m², fluorouracil 800 mg/m² and 35 Gy) followed by resection, and definitive chemoradiotherapy (2 cycles of cisplatin 80mg/m² and fluorouracil 800 mg/m² and 60 Gy).

Results: The 2-year survival rates of patients with AC and SCC treated by resection were 43.6% and 35.9%, respectively (P = 0.352). Patients with SCC had a better 2-year survival rate (69.2%) than patients with AC (35.6%) receiving neoadjuvant therapy (P = 0.009). Patients with SCC treated by definitive CRT also had a better 2-year survival rate (42.4%) than those with AC (26.2%) (P = 0.024). Patients with AC treated with neoadjuvant therapy or definitive CRT had a higher recurrence rate than those with SCC. Distant recurrence was the major failure in both histologic groups.

Conclusion: The results of resection of SCC and AC of the oesophagus were comparable. However, when CRT is included in the treatment, either as pre-operative or definitive therapy, the outcome was significantly different. Although there may have been selection bias in the various treatment groups, the results suggest that future trials that involve CRT should consider the different histologic types separately.

I155/SOGD**DVT in an Asian Population**Ker Kan TAN¹, Woon Puay KOH², Alexandre K H CHAO¹Department of General Surgery, Tan Tock Seng Hospital, Singapore, ²Department of Community, Occupational and Family Medicine, National University Hospital, National University Singapore, Singapore

Aim: Deep vein thrombosis (DVT) is perceived to occur less frequently among Asians than Caucasians, although the reason for this has not been fully understood. This study examined the association of classical DVT risk factors and presentation among Asian patients with DVT.

Methods: We retrospectively reviewed 862 symptomatic patients referred to the vascular diagnostic laboratory for suspected DVT over a 30-month period. 271 patients diagnosed with DVT on ultrasound were matched for age, gender and ethnic group to negative controls to study the significance of risk factors and presenting symptoms or signs.

Results: Of the population screened, 74.7% were Chinese, 10.5% were Malay, 12.3% were Indian and other races constituted 2.5%. 277 (32.1%) patients tested positive for DVT on duplex ultrasound. In a multivariate analysis, independent risk factors for DVT included immobility (OR 2.61; 95% CI 1.63-4.15), malignancy (OR, 1.77; 95% CI, 1.01-3.10) and history of thrombophilia (OR, 9.95; 95% CI 1.26-78.87). The significant forms of DVT presentation were limb swelling (OR, 2.53; 95% CI, 1.41- 4.54) and a history of pulmonary embolism (OR, 11.45; 95% CI, 3.23-40.59). Fever >37.5°C was a negative predictive factor (OR, 0.42; 95% CI, 0.23-0.76).

Conclusion: The findings of this study show that the common risk factors of DVT, such as surgery and fractures, do not affect Asians as much as Caucasians. Thrombophilia and underlying malignancy are prominent risk factors among Asians, and a case of DVT in an Asian with no apparent cause should prompt the clinician to look for these predisposing factors.

I156/SOGD**Study of 201 Cases of Bladder Calculi: Combined Endoscopic Surgery for Bladder Calculi and Bladder Outlet Obstruction Will Not Cause Excessive Morbidity**

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Aim: Bladder calculi are frequently associated with bladder outlet obstruction from benign prostatic hyperplasia. Hence, patients often require both endoscopic lithotripsy and transurethral resection of the prostate (TURP). There are concerns that the morbidity of combining endoscopic lithotripsy and TURP is excessive. We aim to determine whether combining the 2 procedures leads to excessive morbidity.

Methods: This was a retrospective study on 201 consecutive operations for bladder calculi, comprising 97 cases of endoscopic lithotripsy and 104 cases of lithotripsy and TURP. 73 patients who underwent TURP during the same time period were selected as a control group.

Results: The addition of TURP significantly increased the complication rate (21.2% for the combined procedure compared to 8.2% for lithotripsy alone). However, the increased complication rate of lithotripsy and TURP was not significantly different from that of the control group who underwent TURP alone (21.2% vs 20.5%). An increased amount of prostatic resection was found to be a predisposing factor for complications from lithotripsy and TURP.

Conclusion: These findings support the practice of combined lithotripsy for bladder calculi and TURP at the same sitting, with the caveat that operating on patients with large prostates may lead to increased risk of complications.

I157/SOGD**An Expert System Using Artificial Intelligence Case-based Reasoning for the Prediction of Outcome in Acute Upper Gastrointestinal Bleeding**Melvin LOOK¹, Yah Yuen TAN¹, Appasamy VIJAYAN¹, Geok Hoon NG², San Nee FONG², Seng Joo THIO², Lean Suan ONG²¹Department of General Surgery, Tan Tock Seng Hospital, Singapore, ²Institute of Systems Science, National University of Singapore, Singapore

Aim: The accurate early prediction of outcome in acute upper gastrointestinal

bleeding is important for appropriate, cost-effective treatment. Conventional risk scoring by statistical models is inflexible, inaccurate and lack clinical intuition. Our aim was to evaluate a decision support tool that reasons and solves complex problems using Artificial Intelligence case-based reasoning. **Methods:** Data from patients' biodata, past history, co-morbidity, presentation, investigation, endoscopy, treatment and daily progress formed 86 fields representing a case. Useful fields were weighted and used to compute similarity scores by nearest neighbour matching. The predicted outcome is expressed as a probability of rebleeding. Actual patient data from 512 historical cases formed the database. Another 95 patients were used as test cases.

Results: Prediction was undertaken early in the course of admission (on the day of endoscopy). Out of 68 cases predicted to have low risk of rebleeding, there were 2 actual cases of minor rebleeding. Out of 13 predicted intermediate-risk cases, there was 1 actual case of minor rebleeding, 1 actual case of readmission from rebleeding and 1 actual mortality. Out of 14 predicted high-risk cases, there was 1 actual case of minor rebleeding, 1 actual case of readmission from rebleeding and 1 actual mortality. Validating the prediction by testing all 607 cases in the database against itself showed a similar degree of accuracy.

Conclusion: Outcome predictions were found to be useful in clinical decision-making. This accuracy will improve when the system "learns" as the database increases. This is a landmark study showing the novel and beneficial application of Artificial Intelligence in a medical domain.

I158/SOGD

Pure Laparoscopic Urologic Surgery: Review of Indications, Approaches and Complications

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Aim: We review our initial experience in pure laparoscopic urologic surgery in Tan Tock Seng Hospital.

Methods: Forty-eight consecutive cases of pure laparoscopic urologic surgery done from August 2001 to March 2003 were reviewed with respect to indications for surgery, age and sex of subjects, surgical approaches, length of procedure, length of hospital stay, complications, reasons for conversion to open surgery, final pathology and clinical outcome. One hand-assist laparoscopic nephroureterectomy was excluded from this review.

Results: There were 25 cancers, 6 non-malignant tumours and 17 benign conditions. Of all the cancers, 17 were radical nephrectomies, 4 were nephroureterectomies, 1 partial nephrectomy and 3 radical prostatectomies. Majority (36) of the cases were done via the transperitoneal approach. Six were retroperitoneal and 6 were pre-peritoneal in approach. While the majority were ablative in nature, there were reconstructive cases: like 3 prostatectomies, 1 pyeloplasty and 1 ureterolithotomy. There were 6 cases of groin hernia repair using the non-stapled anatomical polyester slit mesh. In ablative cancer surgery, specimens were usually extracted through a Pfannestiel incision. Reconstructive cases were done using intracorporeal suturing. Operative time ranged from 1 (diagnostic) to 9 (radical prostatectomy) hours. The average length of stay varied with pathology. Four cases (8%) were converted to open surgery. No major intraoperative complications and mortality were encountered in our early series.

Conclusion: Familiarity with various surgical approaches allows a wide spectrum of urologic pathology to be managed by pure laparoscopy. Our early experience indicates that the learning curve of pure laparoscopy can be mounted with acceptable complications and conversion rate.

I159/SOGD

Initial Experience of Adjuvant Chemoirradiation after D2 Gastrectomy for Gastric Cancer

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Aim: We determine the tolerability of adjuvant chemoirradiation after D2

gastrectomy.

Methods: the data of patients who received chemoradiotherapy following D2 gastrectomy were prospectively collected. The adjuvant treatment consisted of 425mg of fluorouracil per square metre of body surface area per day plus 20 mg of leucovorin per square metre per day, for 5 days, followed by 4500 cGy of radiation at 180 cGy per day, given 5 days per week for 5 weeks, with modified doses of fluorouracil and leucovorin on the first 4 and last 3 days of radiotherapy.

Results: The total number of patients was 37 with a median age of 62 years. 29 patients had undergone subtotal gastrectomy. 32% of patients developed mucositis and 78% had gastrointestinal side effects. 38% of patients experienced weight loss. 27% of patients were admitted during the chemoirradiation regime for neutropenic sepsis, gastrointestinal disturbances and deep vein thrombosis for 1 patient. A total of 29 patients completed the chemoirradiation regime.

Conclusion: 78% of patients completed the chemoirradiation regime, reflecting good tolerability even after D2 gastrectomy. None of the patients suffered major toxic side effects; most of the side effects were related to chemotherapy, of which gastrointestinal disturbances were the most common. Follow-up with longer duration is required to study the impact of adjuvant therapy on disease progression and survival.

I160/SOGD

The Virtual Reality Colonoscopy Simulator as a Skills Assessment Device

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Aim: Computer-based Virtual Reality (VR) medical simulation has emerged as a useful tool in teaching skills that require dexterity and eye-hand coordination. Numerous summary performance measures can also be recorded. This is useful, but the validity of VR simulators as a measure of what it purports to measure remains unproven. Our aim was to study the validity of the VR colonoscopy simulator as a skills assessment device by using its construct validity as a surrogate measure, that is, whether this test can distinguish those with the desired skills from those without.

Methods: Three groups of subjects (37 novices, 14 trainees and 9 experts) underwent 2 standardised tests and were scored on 5 objective parameters and a composite score that we devised.

Results: Performance scores increased with expertise for the composite score (P < 0.001), time score (P < 0.001) and depth of insertion score (P = 0.02), but not for mucosa visualisation score, red-out score or pain score (Spearman's rank correlation test). Amongst the novices, there was no difference in their performance on the test in relation to gender or time spent on other pursuits requiring psychomotor skills, such as arcade games, sports, playing musical instruments and handicrafts (Mann-Whitney U test).

Conclusion: The VR colonoscopy simulator is a good skills assessment device. The useful parameters to assess are the time score, depth of insertion score and composite score. It is also unlikely that the innate ability of a prospective trainee can be predicted by his aptitude for other related activities.

I161/SOGD

Renal Cell Carcinoma: A 10-year Review in a General Hospital

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Aim: A 10-year retrospective analysis of renal cancers diagnosed at Tan Tock Seng Hospital between 1993 and 2002 was undertaken.

Methods: A review of patients notes who had been diagnosed with renal cell carcinoma between January 1993 and December 2002 was performed. In particular, pathological staging and grade were analysed.

Results: 159 patients were reviewed. 22.6% were Stage I, 22% Stage II, 24.5% Stage III and 30.8% Stage IV at presentation. Mean age at diagnosis was 64.4 years and there was no downward trend in the mean age at diagnosis during the study period. 96 underwent either radical or partial nephrectomy, of which 17 were performed laparoscopically in the last 18 months. The most common renal cell carcinoma histologic subtypes were clear cell carcinoma (83.3%) and papillary renal cell carcinoma (6.3%). Fuhrman histological grade in 88 patients was compared with their respective T stage and showed

that poorly differentiated tumours are associated with higher T stage, whereas better differentiated tumours are associated with lower T stage, with strong statistical significance.

Conclusion: The clinical and pathological profile of our study population is comparable to other published series. The Fuhrman histological grade in renal cell carcinoma is significantly associated with the T stage.

I162/SOGD

Endovascular Stent Grafting of the Thoracic Aorta: The National Healthcare Group Experience

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Aim: We review the results of endovascular stent grafting procedures of the thoracic aorta in the National Healthcare Group.

Methods: A retrospective chart review of 17 patients over a 36-month period was performed.

Results: The mean age of our patients is 62.7 years (range 29 to 78 years). There were 13 male and 4 female patients. Six patients had chronic Type B dissections with expanding aneurysms, 1 had an acute Type B dissection with leak into the left hemithorax and 5 patients had leaking saccular aneurysms. One patient had a transection of the thoracic aorta after a fall from height and another had acute dissection after a road traffic accident. Twelve cases (70.1%) were done in the Angiography Suite. The mean operating time was 187 minutes (range 120 to 300). The average blood transfusion requirement was 1 pint (range 0 to 5). Three patients required intensive care. The median post-operative stay was 10 days (range 4 to 22 days). The 30-day mortality was 5.9% (1 patient with leaking thoracic aneurysm who developed CVA post-procedure). There were no paraplegia and no other major adverse cardiac events. The patient with the haemothorax from the leaking dissection had to be re-admitted for management of a persistent pleural collection. Follow-up ranged from 1-28 months. One patient required stenting of a late type I endoleak from migration (6.7% reintervention rate). Two patients succumbed from unrelated causes.

Conclusion: Endovascular stenting can be performed safely with low morbidity in terms of blood transfusion requirements, reduced ICU stay and minimal complications even in an emergency setting.

I163/SOGD

Groin Pain and Sports Hernia in Professional Footballers in Singapore

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Aim: Groin pain is a common sports-related problem, especially among professional footballers. Diagnosis is difficult as it can be due to various causes. We aim to define the extent of the problem among professional footballers in Singapore, the impact on their playing careers and related aetiology.

Methods: A prevalence study of 26 male professional footballers from a single premier division club in Singapore. The biodata, playing history, injury history and diagnosis were obtained by clinical review and physical examination.

Results: The median age was 22 years (range 19 to 31). The mean number of years spent in amateur and professional soccer were 5.3 and 5.2 years, respectively. 14 players (53.9%) had a history of groin pain. Of these, 6 (42.9%) had an active problem and 8 (57.1%) had recurrent groin pain. Playing performance was affected in most players, including enforced rest in 6 (42.9%) players. The average and maximum time out was 5 (1 to 14) weeks and 5.5 (1 to 20) weeks, respectively. The aetiology of groin pain was found to be sports hernia in 7 players (50%). Other causes were adductor strain and tears, acute groin strain and rectus femoris tear in 6 (42.9%), 2 (14.3%) and 1 (7.1%) player, respectively. 2 players had more than 1 problem.

Conclusion: Groin pain is common among professional footballers and has

a significant impact on performance. Sports hernia is a common cause. Awareness and accurate diagnosis are important so that proper treatment, including surgery, is given.

I164/SOGD

Single Finger Distal Amputation: Replant or Terminalise? Comparison of Costs and Functional Outcome

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Aim: Replantation of distal amputations provides the best functional and cosmetic reconstruction of the fingertip, but is technically challenging, resource- and cost-intensive. Terminalisation of the distal phalanx of a single digit is simpler and cheaper, with little loss of function, except in thumb amputations. This study compares the cost-effectiveness of single digit distal replantation and terminalisation.

Methods: All patients with single digit distal amputations, no other injuries or contraindications to replantation and were treated by replantation or terminalisation between 2001 and 2003 were included. Direct costs of treatment and rehabilitation and indirect costs from loss of productivity and compensation were compared. Patients' satisfaction with cosmesis and function was assessed. Function was assessed clinically, and with a Purdue pegboard time test to compare fine manipulation of the injured and uninjured hands. Patients were assessed when they were ready for work, a minimum of 3 months after surgery.

Results: 36 fingertips were replanted, 78% of which remained viable. 31 were terminalised. The direct costs of an uncomplicated replantation were 4.94 times that of an uncomplicated terminalisation. After including a prosthesis for terminalised fingers, this ratio dropped to 2.47. Duration of medical leave and light duties was 2.48 times greater for uncomplicated replantation. Compensation for disability was not significantly different. Replantation provides better fine manipulation and precision pinch, less hypersensitivity and cold intolerance, and more satisfying function and cosmesis.

Conclusion: Single digit distal replantation is costlier than terminalisation but is justified, providing superior function and cosmesis, with higher patient satisfaction.

I165/SOGD

Biological Spare Part Surgery

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Aim: Reconstruction after complex hand injuries remains a challenge to the reconstructive surgeon. This is because of the limitation of ideal donor tissues and donor morbidity. We need to balance satisfactory outcome with minimal donor morbidity. The problem arises when more than 1 digit needs to be reconstructed. We utilised biological tissues of compromised function from the same injured hand for reconstruction, which is known as "biological spare part surgery".

Methods: We present 2 cases in which we split a digital stump from the same hand into parts for multiple digit reconstructions. Our first patient sustained traumatic amputations of his left index, middle and ring fingers. We transferred the ring finger to the index and middle fingers by splitting it longitudinally into 2 parts, and anastomosing it as a syndactylised unit. Six months later, release of syndactyly was performed. Our second patient sustained traumatic amputations of bilateral index and middle fingers. Reconstruction was performed by segmentally dividing the right index finger, transferring the distal stump to the left index finger and the proximal part to the right middle finger.

Results: In both cases, we were successful in improving function as well as cosmesis to the hands. As the tissues used were taken from the same hand, donor morbidity was negligible.

Conclusion: This concept of "spare part" surgery, using 1 donor digit for 2 digital reconstructions, may resolve the problem of availability of donor

tissues while keeping donor morbidity to a minimum. These 2 cases represent a new milestone in reconstructive microsurgery.

I166/SOGD

Quantification of *Actinobacillus Actinomycetemcomitans* in Periodontal Health and Diseased

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Aim: *Actinobacillus actinomycetemcomitans* is associated with aggressive forms of periodontal disease. A great utility to study the aetiological and pathological aspect of this bacterial species in periodontal disease is the ability to make quantitative assessment of the bacteria at various disease stages. In comparison to conventional culture method, real-time PCR offers a faster, more sensitive and efficient alternative to quantitation of bacteria. We aim to study the feasibility of quantitating *A. actinomycetemcomitans* from subgingival plaque using real-time PCR and to compare the quantities of *A. actinomycetemcomitans* obtained from periodontally healthy and diseased subjects.

Methods: Subgingival plaque samples were obtained from 20 chronic periodontitis and 15 periodontally healthy subjects. The assay uses SYBR Green to continuously monitor product formation. Optimum parameters of primer sequences, concentrations of primers and/or templates and PCR conditions were experimentally determined. A standard curve was generated using DNA template corresponding to known numbers of bacteria. Plaque samples were assayed and compared with the standard curve to determine the quantity of bacteria cells present.

Results: A linear quantitative detection range was obtained with a detection limit of 10 cells. Eleven healthy subjects (73%) and 17 diseased patients (85%) tested positive for *A. actinomycetemcomitans*. The amount of *A. actinomycetemcomitans* in plaque samples ranged from 102 to 106 in both periodontally healthy and diseased, with modes of 103.

Conclusion: We showed that quantitation of *A. actinomycetemcomitans* from plaque samples using real-time PCR was possible. The amount of bacteria did not vary significantly between periodontally healthy and diseased subjects in ethnic Chinese. This study was supported by grants R-182-000-044-213 and R-222-000-012-112 from the National Medical Research Council and the National University of Singapore, respectively.

I167/SOGD

Management of Ruptured and Unruptured Symptomatic Posterior Inferior Cerebellar Artery Aneurysms

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Aim: Distal posterior inferior cerebellar artery (PICA) aneurysms are very rare. We analysed our series of eight consecutive patients to evaluate their management and outcome, with emphasis on parent artery sacrifice without revascularisation.

Methods: Eight consecutive ruptured and unruptured distal PICA aneurysm patients from January 1998 to December 2002 were reviewed retrospectively.

Results: The mean age was 49.1 ± 7.4 years. Two were unruptured aneurysms and 6 presented with acute subarachnoid haemorrhage. Four presented with WFNS Grade 5 with the other 4 grade 1 and 2. All the patients with ruptured aneurysms were subjected to cerebral angiograms on the day of admission. All surgeries were performed immediately after angiogram through the far lateral approach. Six were fusiform aneurysms while 2 were saccular aneurysms. The saccular aneurysms were clipped, 3 fusiform aneurysms were trapped and 2 proximal clippings done. Three patients with proximal aneurysms had their parent artery sacrificed. Six out of seven operated patients needed CSF shunting for hydrocephalus. All check angiogram during follow-up did not show recurrence of aneurysm. None developed the PICA syndrome or showed infarction on brain scans. All good grade patients recovered without neurological deficits. The only major morbidity was from shunt infection.

Conclusion: Our experience showed that early surgery for ruptured PICA aneurysm carries good prognosis and low morbidity. The need for revascularisation procedures in proximally located PICA aneurysms is contrary to conventional wisdom, but only a larger series would likely demonstrate the factors in predicting whether the parent vessel could indeed be sacrificed safely without neurological sequelae.

I168/SOGD

Expression of Poly-ADP Ribose Polymerase and its Link with Apoptosis-related Cell Death in Human Traumatic Brain Injury

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Aim: Inhibition of PARP has been shown to be neuroprotective in animal models of cerebral ischaemia. However, PARP activation has yet to be addressed in humans. We investigated the cellular pattern of PARP expression during human head injury and its relation to apoptosis-related cell death, and attempted to correlate it with clinical parameters.

Methods: Patients with mass lesions and refractory intracranial hypertension who underwent emergency craniotomy and evacuation were recruited into the study. Paraformaldehyde-fixed specimens of peri-contusional tissue obtained from 16 head-injured patients were subjected to PARP immunohistochemistry. The numbers of positively-stained cells ($\times 20$ magnification field) were counted manually. The clinical parameters analysed were admission GCS, time interval between injury and surgery, initial ICP and ICP values at 6, 12 and 24 hours after surgery. Statistical analysis was carried out using SPSS.

Results: In each of the 8 specimens that were found suitable for analysis, activated Caspase-3 immunoreactivity was present in all samples. PARP immunoreactivity was present exclusively in the nucleus of some neurons, whilst other neurons showed both nuclear and cytoplasmic localisation. Nuclear staining of PARP significantly correlated with a short time interval to surgery (< 4 hours), but not with admission GCS, initial ICP or subsequent ICP values.

Conclusion: Cytoplasmic localisation of PARP may reflect PARP cleavage and, thus, ongoing apoptosis. As cytoplasmic PARP expression predominates at early time intervals (4 hours or less), this would suggest that apoptotic mechanisms of cell death are active in an early time frame following head injury.

I169/SOGD

Management of Aneurysmal Subarachnoid Haemorrhage in Elderly Patients

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Aim: The management of subarachnoid haemorrhage (SAH) from ruptured cerebral aneurysms consumes considerable acute management and rehabilitation resources. We undertook a retrospective study of the elderly patients to identify factors contributing to mortality and poor outcome.

Methods: A retrospective review of elderly aneurysmal SAH patients (65 years old) presented to the National Neuroscience Institute from December 1998 to January 2001 was done. The outcome was categorised with the Glasgow Outcome Scale (GOS) at 6 months post-ictus.

Results: There were 48 patients with a mean age of 74.15 ± 5.99 years. The male to female ratio was 1:15. One patient without the GCS on admission was excluded from the analysis. The patients with WFNS grade 1, 2, 4 and 5 were 40.4%, 10.6%, 34% and 14.9%, respectively. Forty-five percent presented with Fisher grades 3 and 4. Hydrocephalus was present in 64.6% of patients on admission and 45.8% had hyponatraemia. The mortality at 6 months was 17%. 38.3% of patients had poor outcome (GOS 2 and 3) and 44.7% had GOS 4 and 5 at 6 months. Fisher grade on admission was the only significant factor affecting the GOS at 6 months ($p = 0.002$).

Conclusion: The majority of the elderly patients with aneurysmal SAH were either dead or had poor outcome at 6 months post-ictus. The only predictor of outcome was the Fisher grade on admission. A larger series is needed to enable an outcome prediction model to be formulated to better utilise our limited resources.

I170/SOGD

Cervical Corpectomy for Cervical Spondylotic myelopathy and Ossification of the Posterior Longitudinal Ligament: Results of the First 100 Cases

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Aim: Cervical spondylotic myelopathy (CSM) with ossification of the posterior longitudinal ligament (OPLL) is a common and challenging cause of myelopathy in Oriental populations. The treatment approaches are varied and include anterior or posterior decompressive surgeries. We study the results of the first 100 cases treated at our institute by anterior cervical corpectomy and fusion with iliac crest graft (ACCF).

Methods: The first 100 patients were reviewed. The clinical notes, operative recordings, post-surgical evaluations and imaging studies were all carefully analysed. The results were compared to those achieved by other techniques reported in the literature.

Results: 97 patients improved their neurological function after surgery. 1 patient did not improve and 2 died from unrelated medical problems. The complication rate was minimal and decreased as familiarity was gained with the procedure. Compared to other reported techniques, this is the most successful technique for the treatment of CSM and OPLL.

Conclusion: ACCF is the treatment of choice for CSM and OPLL.

I171/SOGD

Paediatric Tracheostomy: The KK Women's and Children's Hospital ExperienceDennis Yu Kim CHUA¹, Henry Kun Kiang TAN²¹Medical student, National University of Singapore, Singapore, ²Department of Otolaryngology, KK Women's and Children's Hospital, Singapore

Aim: We analyse paediatric tracheostomies in KK Women's and Children's Hospital from 1997 to 2003.

Methods: A retrospective review of all case notes for infants and children who underwent tracheostomy in Kandang Kerbau Women's and Children's Hospital from 1997 to 2003 was performed.

Results: There were a total of 23 patients; their age ranged from 16 days to 14 years. Paediatric tracheostomies were mainly performed for congenital disorders resulting in upper airway obstruction. Fifteen of 23 tracheostomies were done within the first year of life. Five of the 23 patients underwent semi-urgent tracheostomies, while the rest were elective cases. Thirty-five percent of the patients had early complications whilst 70% had late post-operative complications. Chest infection was the commonest early and late post-operative complications. There were 9 attempts at decanulation and 8 were successful. Three (13%) patients who underwent tracheostomy died from causes probably not related to tracheostomy.

Conclusion: Paediatric tracheostomies were mainly done for congenital lesions. Most tracheostomies were done within the first year of life. The complication rate is high and 3 of our patients eventually died. The deaths of these patients, however, could be due to multiple co-morbidities.

I172/SOGD

Can Low-dose Oral Solution Misoprostol be Used as a Uterotonic Agent to Prevent Postpartum Haemorrhage?Yap Seng CHONG¹, Selina CHUA¹, Liang SHEN², Sabaratnam ARULKUMARAN³¹Department of Obstetrics and Gynaecology, National University of Singapore, Singapore, ²Clinical Trials and Epidemiology Research Unit, Singapore, ³Department of Obstetrics and Gynaecology, St George's Hospital Medical School, London, United Kingdom

Aim: In an earlier study, we found that misoprostol 400 mg, given as an oral solution, produced the fastest and greatest uterotonic effect compared to other routes of administration, but resulted in high rates of side effects. We hypothesised that a lower dose of oral solution misoprostol would give a better side effect profile without significant loss of uterotonic effect.

Methods: 30 women were given either misoprostol 200 or 400 mg as an oral solution, or intramuscular syntometrine 1mL after spontaneous vaginal delivery. Pre- and post-treatment uterine activities were measured with

intrauterine pressure catheters.

Results: Uterine activity produced by oral solution misoprostol 200 mg was not significantly different from that of oral solution misoprostol 400 mg ($P = 0.758$) or intramuscular syntometrine 1 mL ($P = 0.623$), with the maximum probable differences between treatment groups not statistically or clinically significant. Onset of action was also not significantly different among the 3 groups. Shivering and pyrexia occurred less frequently (20% versus 50%, $P = 0.35$; and 10% versus 90%, $P = 0.005$, respectively) and the maximum body temperatures recorded were significantly lower ($P < 0.001$), with 200 mg compared to 400 mg oral solution misoprostol.

Conclusion: The differences between the uterotonic effect produced by oral solution misoprostol 200 µg and 400 µg, and between oral solution misoprostol 200 µg and intramuscular syntometrine 1 mL, were small while the difference in side effects produced was significant. We suggest that a strategy to consider for the safe routine use of misoprostol to prevent postpartum haemorrhage would be to give low doses of misoprostol by oral solution, rather than higher doses by other routes.

I173/SOGD

Does the Route of Administration of Misoprostol Make a Difference for the Routine Prevention of Postpartum Haemorrhage? The Uterotonic Effect and Side Effects of Misoprostol Given by Different Routes after Vaginal DeliveryYap Seng CHONG¹, Selina CHUA¹, Liang SHEN², Sabaratnam ARULKUMARAN³¹Department of Obstetrics and Gynaecology, National University of Singapore, Singapore, ²Clinical Trials and Epidemiology Research Unit, Singapore, ³Department of Obstetrics and Gynaecology, St George's Hospital Medical School, London, United Kingdom

Aim: Despite the findings of recent studies that parenteral oxytocics are preferable to oral tablet misoprostol for the management of third-stage labour, interest in misoprostol remains because of its ease of use and storage and its low cost. There has, however, been little agreement on the optimum dose and route of administration of misoprostol for this purpose. We studied misoprostol 400 mg administered by different routes after vaginal delivery in order to identify the ideal route for its administration in terms of onset of action, uterotonic effect and side effects.

Methods: 50 women were given misoprostol 400 mg, either by oral solution, oral tablet, rectal or vaginal route, or intramuscular syntometrine 1 mL after vaginal delivery. Pre- and post-treatment uterine activities were measured with intrauterine pressure catheters.

Results: Uterine activity produced by oral solution misoprostol 400mg was significantly higher than that of oral tablet, rectal and vaginal misoprostol ($P = 0.045$, $P = 0.004$, $P = 0.002$, respectively). Onset of action after oral solution misoprostol was faster than by the oral tablet ($P = 0.01$), rectal ($P < 0.0005$) and vaginal ($P < 0.0005$) routes. Shivering and pyrexia were most common with oral solution misoprostol (50% and 90%, respectively). The maximum body temperature recorded was also significantly higher ($P = 0.001$) with oral solution misoprostol.

Conclusion: Different routes of administering misoprostol greatly influence the effects achieved. Oral solution misoprostol produces the fastest and strongest uterotonic effect but, unfortunately, with the most side effects. This study highlights the need to re-examine carefully the route and dose of misoprostol used for the purpose of preventing postpartum haemorrhage.

I174/SOGD

Dengue in Pregnancy: A Singaporean Perspective

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Aim: Dengue remains a serious public health problem in Singapore with frequent outbreaks among adults. It is associated with adverse fetal outcomes and maternal morbidity. This has not previously been well described in Singapore. This study evaluates the consequences of such an infection during pregnancy.

Methods: A retrospective review of patients with dengue fever managed in our hospital in the last 4 years was performed. Diagnosis was confirmed using

the ELISA test (Focus Technologies, Cypress CA). Their own obstetricians monitored the patients, with ID physician input in 3 cases.

Results: Six women with dengue were identified in this period. They were aged 31 to 36 years and developed fever between 7 to 33 weeks of gestation, with 2 patients in each trimester. All patients developed fever; 3 (50%) reported abdominal pain or discomfort, 2 (33%) reporting a rash and 1 reported headache and photophobia. They were hospitalised for an average of 3.8 ± 2.04 days. On repeated blood tests, they had a platelet nadir of 171.6 ± 38.53 . None of them required platelet transfusion. There was 1 fetal death in-utero and 5 normal vaginal deliveries with healthy infants. There were no cases of premature birth or abruptio placentae. There were no signs of vertical transmission.

Conclusion: While pregnant women with dengue are at risk of adverse fetal outcomes, careful monitoring can be associated with favourable results.

I175/SOGD

Prospective Clinical Audit of Morbidity and Mortality in Gynaecological Surgery and Obstetric Deliveries Over a 4-month Period in a University Teaching Hospital

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Aim: Prospective clinical audit of morbidity and mortality in gynaecological surgery and obstetric deliveries over a 4-month period in a university teaching hospital.

Methods: A prospective study in complications, morbidity and mortality of 410 consecutive patients who underwent gynaecological surgery or delivered a baby between 2 February 2003 and 30 May 2003 was performed. Procedures were divided into gynaecology and obstetrics. The multitude of gynaecological procedures were subdivided into minor, laparoscopic and major surgeries. Obstetric procedures were divided between vaginal and caesarean deliveries. The complications were analysed.

Results: In 410 procedures, the overall complication rate was 10.97% (44/410). Gynaecological surgery complications: overall complication rate was 15.49%. Complication rate of laparoscopy was 5.88% (1 injury to bladder), minor operation was 5.26% (1 haemorrhage, 1 atrial fibrillation) and major operation was 21.83%, with 2 deaths following complicated debulking cancer surgery. Most common was paralytic ileus (5.74%) followed by small bowel injury (3.44%). Average stay of a laparoscopic operation was 2.18 days. Obstetric complications: overall complication rate was 7.54%. Most common was postpartum haemorrhage (3.77%). Complication rate of caesarean section was 11.94% and vaginal delivery was 6.06%. Average length of admission for vaginal delivery was 2.51 days and for caesarean section, 3.65 days.

Conclusion: Complications in this institution are less common than international standards (10.97% vs. 11.6% to 14.8%). The caesarean section complication rate is higher than NVD and the length of stay longer. The study will ensure an optimal standard in procedures and allow the hospital to fully utilise resources by understanding the length of stay in various operations and the amount of OT and delivery suite usage.

I176/SOGD

Epidemiology of Charles Bonnet Syndrome in an Asian Tertiary Ophthalmic Centre

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Aim: To describe the epidemiology of Charles Bonnet syndrome (CBS) among patients in an Asian tertiary ophthalmic centre and to describe the characteristics of the hallucinations experienced.

Methods: 1000 randomly selected patients aged 50 years and above were surveyed at The Eye Institute at Tan Tock Seng Hospital. Patients who reported formed visual hallucinations were evaluated in greater detail and were asked to describe the characteristics of their hallucinations and their

reactions to it.

Results: The mean age of the patients was 67.9 years (range, 50 to 104 years). There were 457 males and 543 females. The most common ocular pathology in these patients were cataract (59.1%), diabetic retinopathy (14.3%), glaucoma (9.2%) and age-related macular degeneration (4.2%). Their visual acuity (VA) ranged from 6/6 to no light perception. Two men and 2 women described formed visual hallucinations characteristic of CBS. Their mean age was 76.3 years (range, 65 to 90 years). Two of them had cataracts, 1 had glaucoma and 1 had both cataracts and glaucoma. The VA in the patients' worse-seeing eye was 6/12, 6/18, 6/30 and hand movements. The hallucinations experienced varied and included people, animals and inanimate objects. Three of the 4 patients had discussed their symptoms with family members and had attributed the hallucinations to poor eyesight.

Conclusion: This is the first report on the epidemiology of CBS in Asian patients. The prevalence of CBS in Asian ophthalmic patients is slightly lower than in previous reports in Caucasian patients.

I177/SOGD

Visual Experience During Cataract Surgery: A Survey on the Knowledge of Singapore Optometry Students

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Aim: Recent studies have shown that many patients undergoing cataract surgery using regional or topical anaesthesia experience a variety of visual sensations with their operated eye intraoperatively, with up to 15.4% of patients finding their visual experience frightening. Since optometrists are an important source of information for patients considering cataract surgery, this study aims to determine the knowledge of Singapore optometry students on this subject.

Methods: A survey using a standardised, self-administered questionnaire on possible visual sensations experienced by patients during cataract surgery was conducted on all optometry students in Singapore.

Results: The response rate amongst the 125 students was 87.8%. The mean age of the respondents was 19.6 years (range 18 to 24 years). 37% and 38.9% believed that patients may experience no light perception under topical and regional anaesthesia, respectively, while 68.5% and 74.1%, respectively, felt that patients were likely to have light perception. More than half believed that patients might experience other visual sensations intraoperatively. 70.4% and 67.6% of students believed that patients undergoing cataract surgery under regional and topical anaesthesia, respectively, may be frightened by their visual experience, while 88% and 86.1% felt that preoperative counselling might help to alleviate the fear.

Conclusion: The majority of Singapore optometry students were aware that patients might experience various visual sensations during cataract surgery. In addition, a high percentage felt that patients may experience fear from their visual experience and would benefit from preoperative counselling.

I178/SOGD

Epidemiology of Pterygium Among Residents on a Tropical Island in Indonesia

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Aim: To describe the epidemiology of pterygium among residents of a tropical island in Indonesia and to examine the roles of age and gender as determinants of bilaterality and severity of the disease.

Methods: An eye examination was performed as part of a voluntary health screening programme for residents of Pulau Jaloh, an island in the Riau

Archipelago, Indonesia.

Results: Of an estimated 550 inhabitants, 477 (86.7%) responded to the screening and were examined. Their mean age was 22.8 years (range, 0 to 90 years, SD 18.1). The overall prevalence rate of pterygium was 17%. 71.6% of subjects with pterygium had bilateral disease, most of them in the third decade of life. 22.7% of males and 12.4% of females had the disorder, the gender difference being statistically significant. Adjusted for age, the risk of the disease was 3.1-fold higher among the males. Subjects with pterygium were significantly older; their mean age was 42.9 years compared to 16.7 years among those without disease. The prevalence rates in males increased very rapidly with age from age 20 years to reach a plateau of 63.6% at age 35 and remained stable thereafter. In the females, the rates also increased with age, albeit at a slower rate, from age 20 years to reach a plateau of 46.7% at age 55 and remained stable thereafter.

Conclusion: There is a high prevalence rate of pterygium among the study subjects, with the rates increasing rapidly with age.

I179/SOGD

The Effect of Brimonidine Tartrate Ophthalmic Solution 0.2% (Alphagan®) on Pupil Size in Normal Individuals Under Different Luminance Conditions

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Aim: We evaluate the effect of brimonidine tartrate ophthalmic solution 0.2% (Alphagan®) on pupil size in normal individuals. Three different luminance conditions were used in order to assess the potential use of brimonidine in postoperative refractive patients who experience night time visual complaints related to large pupil size.

Methods: Pupil size was measured in 16 eyes of 16 participants with the Colvard Pupillometer (Oasis Medical, Glendora, CA, USA) under 3 different luminance conditions. One drop of Brimonidine 0.2% was administered to each patient. Pupil size was then measured using the same technique at 30 minutes, 4 hours and 6 hours after drop administration.

Results: Under scotopic conditions, 100% of the pupils showed significant miosis at 30 minutes ($P < 0.05$). The effect continued in all subjects for 4 hours. At 6 hours, a miotic effect was still present in 81.3%. However, under photopic luminance, all 16 eyes showed no significant effect on pupil size ($P > 0.05$). The pupil size of 5 eyes (31.2%) was not affected at 30 minutes, 4 hours or 6 hours. At 6 hours, 15 eyes (93.8%) had returned to their pre-instillation size.

Conclusion: Brimonidine 0.2% was shown to have a significant effect in decreasing pupil size under scotopic conditions. It can contribute to the reduction of night vision complaints, such as halos, starbursts, glare and monocular diplopia, as noted in postoperative refractive patients.

I180/SOGD

UCVA Intacs™ versus LASIK in Myopia Between -1.0D and -4.5D

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Aim: We compare the uncorrected visual acuity (UCVA) outcome of patients having Laser in-situ keratomileusis (LASIK) versus intrastromal corneal ring segments (ICRS) at day 1, day 7, month 1, month 3 and month 6 postoperative interval.

Methods: Forty eyes of 40 patients were compared; 20 eyes of 10 patients with Intacs™ and 20 eyes of 10 patients having LASIK. Patients' visual acuity was measured at day 1, day 7, month 1, month 3 and month 6; UCVA was reported and compared. Eyes were eliminated that did not have complete follow-up or were treated for monovision. Intacs™ that were removed or exchanged were eliminated, as well as any LASIK eye that had a complication that could affect best visual acuity.

Results: At the 20/40 and 20/20 or better UCVA level both Intacs™ and LASIK eyes had similar outcome. However, at 6 months, more than half of Intacs™ patients (65%) achieved 20/16 or better vision compared to only 5% of LASIK patients.

Conclusion: Both Intacs and LASIK are effective and safe for myopic patients between -1.0D and -4.5D. In this study, Intacs™ showed superior UCVA outcome at the 20/16 or better level at 6 months, while only 5% of LASIK patients achieved the same level. Intacs™ are superior with their ability to give better than 20/20 outcomes.

I181/SOGD

The Role of Myocutaneous Advancement Flap in the Prevention of Canthal Dystopia

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Aim: We describe a technique of lower eyelid reconstruction involving cheek and temporal myocutaneous flap dissection that minimises post-operative lateral ectropion and canthal dystopia.

Methods: The surgery involves the creation of a vertical temporal myocutaneous advancement flap (with attachments to the arcus marginalis) and lateral canthal resuspension. The medially advanced flap enabled the lower eyelid defects to be closed in layers without tension.

Results: Seven patients had lower eyelid defects corrected using this technique and attained stable lateral canthal angles with no lateral ectropion. The mean age of the patients was 74.1 years (range 49-87 years). There were 3 males and 4 females. Patients were followed up for a mean duration of 12.1 months (range 3-28 months). Reconstructions were performed after Mohs' excision of lower eyelid basal cell carcinoma (6 patients) and squamous cell carcinoma (1 patient). The lateral canthal skin incisions healed well, except in 1 patient with a slightly prominent scar. One patient had a lower eyelid wound dehiscence due to a long delay in eyelid reconstruction; the rest of the patients had uneventful postoperative healing without eyelid notching.

Conclusion: The myocutaneous advancement flap, with its periosteal fixation and vertical-temporal wound orientation, enables good support of the lateral eyelid and discourages lateral canthal dystopia.

I182/SOGD

Hydroxyapatite Orbital Implants: Indications, Changes in Surgical Techniques, Outcome and Complications

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Aim: We discuss the different indications for hydroxyapatite orbital implants, describe some modifications in surgical technique. we document the outcome and complications in a large series and compare the results with other published series.

Methods: Analysis of non-comparative series of 51 patients who had hydroxyapatite orbital implant operation in 1999 at Moorfields Eye Hospital and in 2000 at Cairo University Hospitals for different aetiologies. Data including history, examination, intraoperative findings, postoperative follow-up and complications were analysed.

Results: The mean age of the patients was 27 years (range 8-64). 45% of patients were males and 55% were females. The commonest indication for eye removal was trauma in 25 patients (49%). Orbital implant was done with evisceration in 15 patients (29%). Functional improvement was reported in 42 patients (82%). Postoperative infection was noted in 3 cases (6%) and exposure in 2 cases (4%).

Conclusion: Hydroxyapatite orbital implant is an effective way of treating orbital volume deficiency. It should be performed with some surgical modifications. Infection after orbital implant is the main cause of other postoperative complications.

I183/SOGD**Intacs™ (Intrastromal Corneal Ring Segments) Reversibility after Explant**Ahmed M EL-MOATASSEM*Ophthalmology, McDonald Eye Associates, Egypt*

Aim: McDonald Eye Associates, Fayetteville, Arkansas, USA is part of the KeraVision multicentre phase III study.

Methods: Data from 6 eyes, from which Intacs™ were removed, were evaluated with regard to segment size, loss or change of best corrected visual acuity (BCVA), any change in uncorrected visual acuity (UCVA), manifest refraction spherical equivalent (MRSE) and keratometric readings.

Results: Three eyes were explanted after 3 months, while the other rest were explanted at 6, 9 and 12 months, respectively. All patients were followed up for 6 months after the explant. They returned to their preoperative refraction level and had the same UCVA, MRSE and BCVA. The mean keratometric reading showed some flattening effect, indicating that the corneal curvature takes a longer time than refraction. However, this did not affect the visual end result or refraction outcome.

Conclusion: Intacs™ were easily and safely removed and the eyes returned to their preoperative refractive status within 6 months.

I184/SOGD**Monovision Outcomes with Laser in situ Keratomileusis (LASIK)**Seo Wei LEO¹, Hung Ming LEE¹, Siew Pang CHAN²*¹Department of Ophthalmology, Tan Tock Seng Hospital, Singapore, ²Division of Research and Evaluation, Health Promotion Board, Singapore*

Aim: We evaluate monovision outcomes after laser in-situ keratomileusis (LASIK) and identify factors affecting patient satisfaction with monovision LASIK.

Methods: A retrospective study of patients' demographic data, refractive outcomes, visual performance, satisfaction at various distances and under different lighting conditions was performed. Linear regression models were used to analyse factors related to satisfaction and to ascertain how post-operative visual acuities and spherical equivalents were associated with satisfaction (Stata 7.0).

Results: The mean satisfaction among 74 patients was 87.9%. The mean postoperative far and near vision spherical equivalents were -0.22D and -1.49D, respectively. Patients citing "inconvenience of spectacles/contact lens" as a reason for LASIK had significantly higher level of satisfaction. Satisfaction was not significantly associated with age, gender, occupation, religion, preoperative trial of monovision and visual acuity. Although a higher satisfaction level was recorded for patients with better postoperative unaided vision for distance, the result was not statistically significant. Similar observations were made in patients with good postoperative unaided near vision. All 17 patients with crossed monovision were satisfied.

Conclusion: Monovision is a viable option for presbyopes who want LASIK. Crossed monovision can result in satisfactory visual outcomes.

I185/SOGD**Paediatric Keratoplasty in Egypt: Indications, Visual Outcome and Complications in a Multicentre Study**Yassir ABOU-RAYYAH*Ophthalmology, Institute of Ophthalmology, University College London, UK*

Aim: We study the causes of potentially curable corneal blindness in children undergoing keratoplasty in Egypt and evaluate the visual outcome and complications of paediatric keratoplasty in Egypt.

Methods: A retrospective, non-comparative series of 78 children who presented to 3 centres within Cairo University Hospitals with corneal opacities of different aetiologies over a 2-year period (July 1995 to June 1997) was analysed. Case notes were reviewed for clinical and operative details and postoperative follow-up. Data were analysed using EPI INFO version 6.0.

Results: Penetrating keratoplasty was undertaken between 3 and 16 years of age. The main indication (diagnostic reason) for paediatric keratoplasty in the sample was scarring of the cornea due to post-microbial keratitis. This accounted for 51.3% of all keratoplasties. The next most common condition was trachomatous corneal scarring, which was responsible for 29.5% of the

cases. The preoperative visual acuity in the operated eye was very poor at hand movement or even worse in 68% of cases, and no better than 1/60 in the remaining children. The postoperative visual acuity in the operated eye at 6 months after surgery was 3/60 or better in 72.8% of cases. The main postoperative complication was graft rejection in 23.1% of children.

Conclusion: Paediatric keratoplasty is an effective method for treating corneal blindness in children in Egypt. More efforts should be directed at prevention of infective keratitis among children in Egypt.

I186/SOGD**LASIK for Unilateral High Myopia in Children**Ahmed MEL-MOATASSEM¹, Hassan EL-SAMMA², Ahmed Abdel-Basset SALLAM²*¹Ophthalmology, Ain-Shams University, Cairo, Egypt, ²Ain-Shams University Hospital, Cairo, Egypt*

Aim: We evaluate the safety, efficacy and predictability of using LASIK as a refractive surgical tool in children with unilateral high myopia, for whom conventional methods have failed.

Methods: Six eyes of 6 patients (3 boys and 3 girls) with high myopia and anisometropia (>3.5D) had the LASIK procedure to correct their vision. Best corrected visual acuity was measured before the procedure and at 2 months and 6 months post-procedure.

Results: All patients had at least 6 months of follow-up. The mean preoperative spherical equivalent refraction with cycloplegia was -8D (range -6.25D to -9D); it decreased to a mean postoperative spherical equivalent of -1.0D (range -2D to +0.5D) at 6 months. The preoperative visual acuity was <20/200 in all cases; the best corrected visual acuity ranged from 20/40 to 20/200. Half of our patients improved by at least 5 Snellen lines while the rest showed no improvement. None of the operated eyes lost any lines of its best corrected visual acuity. No patients gained any improvement in their stereopsis acuity.

Conclusion: LASIK can be performed safely and effectively in children who are compliant enough to undergo the procedure with topical anaesthesia. Refractive surgery does not improve vision in densely amblyopic eyes, but may give modest improvement in mildly amblyopic eyes. No significant complications were encountered other than a myopic shift over time.

I187/SOGD**Low-cost Intravitreal Ganciclovir Maintenance Injection for Cytomegalovirus Retinitis: Efficacy of an Intermediate Dose Regimen**Stephen Charn Beng TEOH, Ronaldo JARIN, Tock Han LIM*Department of Ophthalmology, The Eye Institute, Tan Tock Seng Hospital, Singapore*

Aim: We have previously reported the time to progression for cytomegalovirus (CMV) retinitis on weekly high-dose and low-dose intravitreal ganciclovir. This study measures time to progression for an intermediate-dose (1 mg/0.02 mL) regimen.

Methods: 34 eyes of 24 HAART-naïve patients with CMV retinitis received weekly 1 mg intravitreal ganciclovir. Progression was observed using photographic documentation.

Results: The mean time to progression was 608 days (95% CI 448, 768). The mean follow-up was 208 days. 3 eyes developed rhegmatogenous detachments, but none had endophthalmitis. Cost estimate was S\$750/eye/year (7.5% of sustained-release implant).

Conclusion: Weekly intermediate-dose ganciclovir is an efficacious option for patients who cannot afford implants.

I188/SOGD**A Comparative Study of Efficacy of Mesenchymal Stem Cells from Bone Marrow, Periosteum and Fat Transfers in the Treatment of Partial Growth Arrest**Yee Hong TEO¹, Li LI², James Hoi Po HUI¹, Eng Hin LEE¹*¹Department of Orthopaedic Surgery, National University Hospital, Singapore, ²Faculty of Medicine, National University of Singapore, Singapore*

Aim: We evaluate the efficacy of mesenchymal stem cells (MSCs) from bone marrow, periosteum, and fat in the treatment of partial growth arrest. In-vitro lineage differentiation was investigated and a rabbit model was created.

Methods: MSCs from bone marrow, periosteum and adipose were harvested and cultured. Various biological factors were used to induce chondrogenic and osteogenic differentiation. Calcium, alkaline phosphate activity and collagen II content were examined and compared. Medial half, proximal physis of tibiae in 6-week-old NZW rabbits were excised in our model. Cultured MSCs with fibrin glue (carrier) were transferred into the growth-plate defect following excision of bony bridge in established growth arrest. Contralateral tibiae received fibrin glue only as controls. 3 experimental groups of rabbits were established based on MSC source and were sacrificed at 8 and 16 weeks postoperatively. Clinical, radiological and histological analysis were performed.

Results: All MSCs demonstrated potential chondrogenic and osteogenic lineage differentiation ability. The proliferative rates were similar at days 4, 7 and 11. MSCs derived from the bone marrow and periosteum appeared more homogeneous than those from fat. All the tibiae treated with MSCs from the bone marrow and periosteum showed significant correction of varus deformity at 16 weeks. However, the varus angulation remained at 5.8° in the fat group. The limb difference with contralateral limb (control) in each animal was 0.65 ± 0.33 cm (bone marrow), 0.68 ± 0.24 cm (periosteum) and 1.22 ± 0.43 cm (adipose).

Conclusion: Bone marrow and periosteum MSCs better correct physeal arrest in rabbit. Hence, the source of MSC does influence treatment success.

I189/SOGD

Establishing an Osteoporosis Model for Tissue Engineering Application

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Aim: Osteoporosis and fragility fractures are projected to increase worldwide. With the myriads of tissue engineering techniques available, we believe bone regeneration via integration of mesenchymal stem cells (MSCs) into host cells is not impossible. We embark on a search for an osteoporosis model for our research.

Methods: 6-month-old female NZW rabbits were ovariectomised to induce osteoporosis. Both control (n = 6) and ovariectomised (n = 24) rabbits were fed normal diet and allowed to roam freely. We measured bone mass density (BMD), performed biomechanical testing (indentation test), histomorphometry (analysing 2-dimensional trabecular bone structures with an image analyser) and radiological analysis. Harvesting of MSCs was done by aspirating iliac crest of our rabbit; the yield was improved by mechanical stimulation and repeated puncture.

Results: BMD for ovariectomised rabbits decreased 3.5 standard deviation (318 ± 7 mg/cm³) versus increase in control. Less bone density, broader trabecular space and looser micro-architecture were seen on radiographs of the experimental animal. Histomorphometry revealed lower bone to total volume ratio of $22 \pm 9\%$ in ovariectomised rabbits versus $51 \pm 12\%$ in controls, lower trabecular thickness of $123 \pm 15\mu\text{m}$ vs $156 \pm 31\mu\text{m}$ (controls), lower nodes/free ends ratio of 0.53 ± 0.09 vs 0.98 ± 0.17 (controls). Ovariectomised rabbits achieved peak bone density 3 months after surgery before undergoing constant bone loss.

Conclusion: In our series, we have shown that NZW rabbit can be an effective osteoporosis model; the sizable bone mass with the presence of harvesian canals will most certainly supercede rodents as a model in such studies. Coupled with successful isolation and culture of MSCs from our rabbits, we are optimistic of conducting osteoporosis research at a cellular level with our model.

I190/SOGD

Unicompartmental Knee Arthroplasty: A Short-term Follow-Up

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Aim: Unicompartmental knee arthroplasty (UKA) was first introduced in the early 1970s, but its use is controversial from the start. Early initial results suggested that this new technique did not produce good enough results to

become a viable alternative to total knee arthroplasty. However, current studies have shown that in properly selected patients and with improved techniques, UKA could produce reliable favourable 8- to 10-year outcomes. UKA has also been shown to yield a higher initial success rate and had fewer complications. This has fuelled the resurgence in interest in the USA, Europe and Asia in the last 7 years.

Methods: We retrospectively analysed the records of patients who had UKA performed. All were operated on by the same surgeon. These patients were assessed pre- and post-operatively using the Hospital for Special Surgery Knee Disability Sheet for Knee Arthroplasty (HSS). Emphasis in data analysis was placed on pain, mobility and restoration of function.

Results: Ten patients (10 knees) were included in the study. The mean follow-up was 14 months (range 8 to 20 months). There were no perioperative complications and all were alive at follow-up. The preoperative mean HSS score was 54 and the postoperative score was 90. Range of motion improved from a mean of 70 to 110 degrees.

Conclusion: UKA has been shown to have distinct advantages. The incisions are smaller and patients have a shorter recuperation period. Bone stock and patellofemoral articulation are preserved. Results of UKA in this series are encouraging. These factors make UKA an attractive surgical option in patients with osteoarthritis.

I191/SOGD

Flap Coverage in Severe Open Injuries of the Lower Limb

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Aim: The aim of this study was to review the results of flap coverage in severe open Gustilo IIIB and IIIC.

Methods: Between 1999 and 2003, 37 lower limbs in 36 patients who sustained such injuries were treated at our institution. A total of 38 flaps were done. The cases were reviewed retrospectively.

Results: There were 32 IIIB and 2 IIIC fractures and 2 crush amputations of the forefoot. Twenty-eight patients were males. The mean age of the patients at the time of injury was 38 years (range 14 to 75 years). There were 27 injuries to the tibia, 3 to the ankle and 6 to the foot. The soft tissue defects ranged from 4 to 45 cm² in size. The time interval from injury to flap surgery ranged from 3 to 43 days (mean, 18.9 days). Twenty-eight were free flaps (12 gracilis, 10 latissimus dorsi and 6 rectus) and 10 were pedicled flaps (7 soleal, 2 gastrocnemius and 1 first metatarsal web). There was 1 failure involving free latissimus dorsi flap and 1 gracilis flap had partial necrosis. Of the 27 cases involving the tibia, 4 (14.8%) were nonunions. Preoperative wound cultures were positive in 36 samples taken from 24 patients, of which 25% were MRSA, 22.2% Ps aeruginosa and 13.8% Acinetobacter baumannii. Postoperatively, there were 3 cases of deep soft tissue infection.

Conclusion: Early flap coverage before colonisation of bacteria, appropriate antibiotic cover and early bone grafting are advocated.

I192/SOGD

Biliary Atresia and Liver Transplantation: The Singapore Experience

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Aim: Biliary atresia (BA) is a congenital malformation which, if untreated, leads to hepatic failure and death within 2 years of birth. It is the commonest indication for liver transplantation in children worldwide. The aim of the present study is to review the results of liver transplantation in children with BA at Singapore's national Liver Transplant Programme, which was set up at National University Hospital in 1996.

Methods: A retrospective review of paediatric patients with BA who underwent liver transplantation between 1996 and 2002 was conducted.

Results: During this period, a total of 33 children underwent liver transplantation. Of these, 25 had BA. Of these 25 children, 23 had undergone a prior Kasai's hepatic portoenterostomy. The waiting time for transplantation ranged from 5 days to 16 months, the median period being 2.6 months. A total of 27 transplant procedures were carried out in this group of 25 patients, with 2 patients requiring retransplants. The median age at transplantation was 1.7

years (range 1.1-14.2 years). 11 cadaveric and 16 living-related donor grafts were used. 20 (80%) patients remain alive, with follow-up periods ranging from 6 months to 7 years. Common post-operative complications included intra-abdominal abscess formation, bile leakage and portal vein thrombosis.

Conclusion: Our centre's experience with liver transplantation for children with BA has been encouraging. With the increase in cadaveric grafts expected due to changes in organ donation legislation, it is envisaged that more children suffering from BA will benefit from this procedure.

I193/SOGD

Management of Ventral Hernia Following Giant Exomphalos with External Pressure Compression Using Helmet Device

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Aim: Neonates with exomphalos major present a great challenge to paediatric surgeons. The abdominal cavity is small and underdeveloped. Primary surgical reduction of the herniated contents in such a case could result in compression of the liver, inferior vena cava, hepatic veins and decreased renal and pulmonary function. Hence, the initial management is conservative. The authors present a technique of controlled external compression using a specially constructed device.

Methods: Our patient is a full-term baby boy who was born with exomphalos major consisting of intestinal loops, with the liver protruding through a defect measuring 10 x 8 x 7 cm. No other major anomalies were detected. Controlled external compression using a specially constructed device was applied. Care was taken to avoid intra-abdominal hypertension by using the manometer readings and corroborated with observations of respiration, peripheral perfusion and urine output. The child was on full oral feeds and did not require any ventilatory support. Within 9 months, the treatment resulted in reduction of the exomphalos into a ventral hernia that was surgically repaired.

Results: The child did not demonstrate any ill effects of raised intra-abdominal pressure. Recovery was uneventful.

Conclusion: Application of controlled external pressure using a specially constructed device is an alternative method of conservative treatment when primary surgery is not possible. This device is safe, non-invasive, effective and can be constructed easily. The pressure applied is measured readily by directly reading the manometer attached to the cuff. However, the amniotic sac needs to be intact and the base of the sac must be large enough to allow uncomplicated reduction.

I194/SOGD

Quality Indices in a Cervicovaginal Cytology Service: Pre- and Post-Laboratory Accreditation

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Aim: Quality assurance practices contribute to the effectiveness of the cervical smear. Having been accredited by the College of American Pathologists (CAP) in 2000, we seek to identify changes in the quality indices of our cervicovaginal cytology service preceding and following accreditation.

Methods: Cervicovaginal cytology quality indices for 2001 (post-accreditation) were compared with those of 1997 (pre-accreditation). Performances in the CAP's interlaboratory comparison programme in cervicovaginal cytology (PAP) for the years 2000 to 2002 were analysed.

Results: A comparison between 1997 and 2001 shows a slightly higher inadequacy rate (1.3% versus 0.7%) in 2001, maintenance of a low ASCUS/SIL ratio (0.76 versus 0.82), a higher overall positive predictive value of a positive cytology (87% versus 79%) in 2001, fewer changes of the original cytological diagnoses in 2001 following review of significant cyto-histological discrepancies (2 versus 5 cases) and a higher subsequent positive yield of squamous intraepithelial lesions following ASCUS diagnoses in 2001 (41% versus 19%). The average discrepancy rate of the cytotechnologists and the laboratory consensus opinion in the PAP programme also showed improvement over the period 2000-2002 (2%, 1% and 0% [cytotechnologists] against 7%, 0% and 0% [consensus opinion], respectively).

Conclusion: An increased awareness of quality-related issues and participation in intradepartmental consultation and diagnostic seminars, all part of the accreditation process, have very likely contributed to the positive trends identified in the cytology service. Future challenges include increases in

workload, with the anticipated launch of Singapore's national cervical screening programme and adaptation to emerging cervical screening technologies.

I195/SOGD

Indocyanine Green Test: How Many Samples are Needed?

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Aim: The indocyanine green (ICG) test is used to evaluate hepatic function in patients undergoing hepatic resection. The procedure in our institution involves the collection of 6 timed blood samples (pretest, 0, 5, 10, 15 and 20 min). We examined how the procedure could be simplified while maintaining reliability of results.

Methods: The original laboratory records (serum absorbances) of all ICG tests performed between April 2002 and March 2003 were reanalysed using different mathematical models (1-point, 2-point and 4-point linear regression) and compared with the reported R15 (retention at 15 mins' post injection). The estimated retentions at time 0 was compared with the theoretical 100% to estimate overall errors in timing.

Results: 22 ICG tests were performed, of which 2 were invalid due to unlabelling/mislabelling of specimens. All mathematical models gave comparable answers. However, sample timing was out by ± 5 mins. Collecting a single specimen at 15 mins rather than a series runs the risk of an error in R15 of $\pm 12\%$. Reliability of results could be maintained with a reduction in samples from 6 to 4, recording of actual time of sampling rather than attempting to collect at specified times, and adjustment of the graph to give a 0-min retention of 100%.

Conclusion: Collection of blood samples for the ICG test can be simplified into 4 samples (pretest, 5-10 mins, 10-15 mins, 15-20 mins) with no loss of result quality. This is of benefit to both the patient and the clinician performing the test.

I196/SOGD

Repair of Calvarial Defects with Customised Tissue-Engineered Bone Grafts. Part I: Evaluation of Osteogenesis in a 3D Culture System

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Aim: We evaluate the morphology and osteogenic differentiation of bone marrow-derived mesenchymal progenitor cells and calvarial osteoblasts in a 2D and 3D culture environment.

Methods: NZ white rabbits were used to isolate osteoblasts from calvarial bone chips and bone marrow stromal cells from iliac crest bone marrow aspirates. Multi-lineage differentiation potential was evaluated in a 2D culture setting. Following amplification, the cells were seeded within a fibrin matrix into a 3D polycaprolactone (PCL) scaffold system.

Results: The constructs were cultured for up to 3 weeks in vitro and assayed for cell attachment and proliferation using phase contrast light, confocal laser, scanning electron microscopy and MTS cell metabolic assay. Osteogenic differentiation was analysed by determining the expression of ALP and osteocalcin. The bone marrow-derived progenitor cells demonstrated the potential to be induced to the osteogenic, adipogenic and chondrogenic pathways. In a 3D environment, cell-seeded PCL scaffolds evaluated by confocal laser microscopy revealed continuous cell proliferation and homogeneous cell distribution within the PCL scaffolds. Upon osteogenic induction, MPCs (12 U/l) produce significantly higher ($p < 0.05$) ALP activity than osteoblasts (2U/l); however, no significant differences were found in the osteocalcin expression.

Conclusion: This study showed that the combination of a mechanically stable synthetic framework (PCL scaffolds) and a biomimetic hydrogel (fibrin glue) provides a potential matrix for bone tissue engineering applications. Comparison of osteogenic differentiation between the 2 mesenchymal cell

sources revealed a similar pattern.

1197/SOGD

Shape and Contour Assessment of Asymmetric Human Mandibles Through 3D CT Image Analysis and Visualisation

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Aim: The aim of this project is to utilise 3D surface shape and contour assessment algorithms to develop a 3D analysis that will determine asymmetry of human mandibles.

Methods: Patients presenting with severe mandibular asymmetry which require surgical correction underwent computed tomography (CT) scanning at the National University Hospital as part of their treatment plan. CT data was obtained and analysed. The method involves image segmentation of the 3D CT image of the mandible from the craniofacial skeleton by double image thresholding. An algorithm is developed for the semi-automated detection of mandibular landmarks and subsequent establishment of the mandibular midline. Visualisation and 3D quantification of asymmetry are subsequently based on surface and contour matching algorithms and volumetric comparison between the left and right sides of the mandible.

Results: Our analysis enable us to identify the severity and origin of asymmetry. The area of aberrant or deficient growth is localised either in the ramal, condylar or body of the mandible or a combination. Our results confirm the clinical finding and, most importantly, allow surgeons to determine the directional vectors involved during distraction osteogenesis or the surgical target region during correction of the asymmetry. This information cannot be obtained from 2-dimensional cephalometric data or unprocessed CT data.

Conclusion: This 3D method of morphometric analysis permits clinicians to identify the anatomic location and to quantify the extent of anatomic asymmetry in the human mandible. It increases the accuracy and specificity of surgical planning for the correction of severe mandibular asymmetry and minimizes a second surgical intervention.

1198/SOGD

Delivery of Vascular Endothelial Growth Factor in Bone Regeneration: A Comparison of Vicryl and Polycaprolactone

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Aim: We compare the effectiveness of polyglactin 910 meshes (Vicryl, Ethicon, Somerville, NJ, USA) and custom made poly-caprolactone (PCL) as a scaffold for the delivery of vascular endothelial growth factor (VEGF) bone regeneration.

Methods: 36 adult New Zealand white rabbits (3.5- 4.0kg) with 72 parietal skull defects (10 mm in diameter) were used. 24 defects were grafted with scaffold (Vicryl or PCL) impregnated with rhVEGF (Calbiochem) and fibrin sealant (Tisseel®, Immuno AG) (Group 1). 24 defects were grafted with scaffold and fibrin (Group 2), and 16 defects grafted with scaffold alone (Group 3). 8 defects were left empty. An equal number of rabbits were sacrificed at 1 week and 2 weeks post-surgery and the tissue specimen harvested for histomorphometry analysis. The amount of new bone formed was quantified using the Olympus MicroImage software.

Results: At 2 weeks, significantly more bone was formed in defects grafted with Vicryl compared to PCL as a scaffold, in the presence of VEGF and fibrin (Group 1), fibrin only (Group 2) or used alone (Group 3).

Conclusion: Vicryl may be more effective than PCL in the delivery of VEGF for local application at bone defects in the short term, as observed in the rabbit model. Vicryl and VEGF may potentially be used as an effective tool to promote human bone repair.

1199/SOGD

Regeneration of Bone with Vascular Endothelial Growth Factor and Vicryl Mesh Scaffold

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Aim: We examine the osteogenicity of vascular endothelial growth factor

(VEGF) *in vivo* using fibrin sealant (Tisseel®, Immuno AG) as a carrier and polyglactin 910 mesh (Vicryl; Ethicon, Somerville, NJ, USA) as a scaffold.

Methods: 32 adult New Zealand white rabbits (3.5- 4.0kg) with 40 parietal skull defects (10 mm diameter) were used. 12 defects were grafted with Vicryl impregnated with rhVEGF (Calbiochem) and fibrin (Group 1). 12 defects grafted with Vicryl and fibrin only (Group 2) and 8 defects grafted with Vicryl alone (Group 3) formed the active controls. 8 defects that were left empty (Group 4) formed the passive controls. Equal number of rabbits were sacrificed at 1 week and 2 weeks post-surgery and the tissue specimen harvested for histological analysis. The amount of new bone formed was analysed using the Olympus MicroImage software.

Results: Defects grafted with Vicryl impregnated with fibrin and rhVEGF (Group 1) harvested at 2 weeks showed significantly more new bone formed compared to all control groups. Significantly more bone was formed at 2 weeks compared to 1 week in Group 1. Complete osteoid bone bridging across the defect was seen in Group 1 at 2 weeks, while all other groups showed only a little amount of new bone formed adjacent to defect margins

Conclusion: The responses to exogenous VEGF observed in the rabbit model indicated that VEGF, delivered with fibrin and Vicryl, applied locally at the site of bone defects did increase bone formation *in vivo*. This may potentially be an effective therapy to promote human bone repair.

1200/SOGD

Effects of pH on Surface Roughness of Glass Ionomer Restorative Materials

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Aim: The increased consumption of dietary acids has been linked to tooth surface loss, which may also affect dental restorations. This study aimed to determine the effect of pH on the surface roughness of commonly used glass ionomer restorative materials.

Methods: The materials evaluated were 2 highly viscous glass ionomer cements (Fuji IX and Ketac Molar). A compomer (Dyract AP) was used for comparison. Forty-two specimens (3 x 3 x 2 mm) were made for each material. The specimens were divided into 6 groups and conditioned in the following solutions at 37°C for 1 week: citric acid (pH 2, 3, 4, 5 and 6) and distilled water (pH 7). After conditioning, the surface roughness (Ra, µm) of each specimen was measured using a surface profilometer (SurfTest, Mitutoyo Corp., Tokyo, Japan). Data was analysed using 1-way ANOVA and Scheffe's test at a significance level of 0.05.

Results: The effects of pH on the surface roughness of glass ionomer restoratives were material-dependent. Ra values ranged from 0.04 µm to 0.15 µm and 0.04 µm to 4.4 µm for pH 7 and pH 2, respectively. The surface roughness of all materials evaluated was significantly affected by acids of low pH, with the glass ionomer materials being significantly rougher than the compomer at all pH levels.

Conclusion: The large increase in surface roughness of the highly viscous glass ionomer cements after exposure to acids may render them more susceptible to clinical failure.

1201/SOGD

Expression and Function of Chondroitin Sulfate on Palatal Wound Healing

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Aim: This study investigates the expression and function of chondroitin sulfate (CS) on palatal wound healing.

Methods: The expression of CS was observed by immuno-histochemistry technique in an *in vivo* wound healing model, which was made on the palatal mucosa of adult female New Zealand white (NZW) rabbits. The function of CS was investigated using the palatal fibroblast culture. Cells were treated with: 30 mM chlorate; 30 mM chlorate with 100 ng/ml CS or normal culture

medium. Cell adhesion and proliferation were quantified by MTS assay. Cell migration was observed in an *in vitro* wound healing model. One-way ANOVA was used for cell adhesion and proliferation.

Results: The expression of CS was increased in the wound repair region at the early healing stage and decreased to normal level 30 days after the operation. The chlorate-treated group of palatal fibroblasts exhibited fewer adherent cells at 4, 6, 8 and 10 hours ($p < 0.05$). Fibroblast proliferation was consistently slower in the chlorate-treated group at days 3 and 7 ($p < 0.05$). In the *in vitro* wound healing model to examine fibroblast migration, the wounded edges in the normal medium closed completely at 18 hours, and that of the chlorate-treated group were closed after 24 hours. The addition of CS can partially recover the inhibition effect of chlorate ($p < 0.05$).

Conclusion: CS was involved in palatal mucosa wound healing. *In vitro*, the addition of CS can partially recover the inhibition of chlorate on rabbit palatal fibroblast adhesion, proliferation and migration.

I202/SOGD

Development of a Robot for Skull-Base Surgery

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Aim: The NeuroBot system was developed to aid neuro- and otolaryngology surgeons achieve quick and precise drilling of the skull-base automatically. We aim to provide surgeons with a surgical planning station and a surgical navigation device by integrating these modules, which work interdependently, into the robotic system.

Methods: NeuroBot is made up of 4 distinct, but interdependent, modules. Fiducial markers are mounted on the skull. This patient marker system is subsequently registered and tracking of the patient and robot is done intra-operatively by the registration and tracking cum navigation system (NeuroRAT). The surgical planning workstation (NeuroVision) is used to combine computed tomography and magnetic resonance images, presenting the information in 3D to the surgeon. The surgeon pre-operatively defines the areas to be avoided and the system automatically generates the required path. The path is verified before instructions are sent to a base robot (NeuroBase), carrying a manipulator (NeuroPod). The NeuroPod is fitted with a surgical drill and a force sensor to monitor the drill sequence. The entire procedure is monitored by the surgeon through live video feedback and robot and patient tracking provided by NeuroRAT.

Results: Preliminary in-vitro tests have shown that NeuRobot could significantly reduce the amount of time spent on SBS with improved accuracy and safety.

Conclusion: This system greatly aids the surgeon in a complex surgery, such as SBS. Various modules of the system could be extended to adopt surgeon training and other surgical procedures requiring accurate and precise intervention.

I203/SOGD

Effects of Prophylaxis Regimens on Surface Roughness of Glass Ionomer Restorative Materials

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Aim: The aim of this study was to determine the effects of different prophylaxis regimens on the surface roughness of conventional (Fuji II Cap [FC], GC), resin-modified (Fuji II LC [FL], GC) and highly viscous (Fuji IX GP Fast [FN], GC) glass ionomer cements.

Methods: Five commonly employed prophylaxis regimens were selected for the study. They included brush with pumice-water slurry [PB], rubber cup with pumice-water slurry [PC], rubber cup with prophylaxis paste [PP], rubber cup with prophylaxis gel [PG] and air polishing [PJ]. Untreated specimens were used as controls. Eight specimens of each material were made for various treatment groups. For all groups, specimens were polished with 1200 grit grinding paper using a lapping device prior to treatment. Specimens

in the PJ group were subjected to 12 seconds of air-powder polishing. Groups involving the use of rotating devices were subjected to 12 seconds of treatment at a speed of 2000 rpm. Mean Ra [μm] was measured using surface profilometry. Data were subjected to ANOVA/Scheffe's tests at a significance level of 0.05.

Results: The range of Ra values for the different materials were as follows: FC - 0.30 to 1.70 μm ; FL - 0.40 to 2.51 μm ; and FN - 0.44 to 1.79 μm . For all materials, treatment with PJ resulted in significantly rougher surfaces when compared to the control group. For FC and FN, there is a significant increase in roughness after treatment with PB and PP, respectively.

Conclusion: Glass ionomer restoratives may require repolishing after treatment with some prophylaxis regimens.

I204/SOGD

Ability of Composite Core Materials to Mask the Colour of Prefabricated Posts under All-Ceramic Crowns

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Aim: The aim of this study was to evaluate the ability of composite core materials to mask underlying post when the recommended thickness of all-ceramic crowns was used.

Methods: Empress II disks ($n = 5$) of 1.2 mm thickness (shade A2) and 3 prefabricated posts (Aestheti-Post [A], C-post [C] and Parapost [P]) were selected for this study. Five composite disks of each material (Bis-core Natural® [BN], Bis-core Opaque® [BO], Corerestore2 White® [CW], Corerestore2 Universal® [CU], Core-Flo® [BCF] and Ti-Core Natural® [TC]) of 3 thicknesses (0.5, 0.75 and 1.0 mm) were fabricated. The composite disks were placed between the post and the ceramic disks and colour measurement was performed for all possible combinations using a spectrophotometer (Minolta, Japan). The combinations of ceramic and composite disks without posts served as control. CIE L a*b* were measured and Delta E values were calculated. The data were statistically analysed using one-way ANOVA with Tukey post-hoc test at a significance level of 0.05.

Results: The combination of 1.2-mm Empress II and 1 mm of all composite disks was able to mask the colour of all 3 types of post (Delta E < 2). When reduced to 0.75 mm, only BN, BO and CW showed Delta E values < 2 for all the posts tested. Most of the 0.5-mm disks were unable to mask the underlying colour.

Conclusion: The colour of the restorations was least affected by the colour of the post studied when a 1-mm thick composite core was placed under 1.2 mm of ceramic. BO showed the best masking ability with the lowest Delta E values, whereas BCF exhibited the highest Delta E values.

I205/SOGD

Surface Texture of Resin-Modified Glass Ionomer Cements: Effects of Finishing/Polishing Systems and Time

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Aim: We compare the effect of immediate/delayed finishing of resin-modified glass ionomer cements (RMGICs) on the surface roughness (Ra) of such restorations in the vertical (RaV) and horizontal (RaH) directions based on a tooth model.

Methods: Class V preparations were made on buccal and lingual/palatal surfaces of 64 freshly extracted teeth and restored with Fuji II LC and Photac-Fil Quick. Immediately after light polymerisation, gross finishing was performed with 8-fluted tungsten carbide burs. The teeth were then randomly divided into 4 groups of 16 teeth. Half of the teeth in each group were finished immediately, while the remaining half were finished after a week's storage in distilled water at 37°C. The following finishing/polishing systems were employed: Robot Carbides (RC); SuperSnap (SS); OneGloss (OG) and CompoSite Polishers (CS). The mean RaV and RaH (μm ; $n = 8$) were measured

using a profilometer.

Results: Data were subjected to ANOVA/Scheffe's tests and independent samples t-test at $p = 0.05$. In the immediate finishing groups, the mean RaV ranged from 0.59-1.31 and 0.83-1.52, while mean RaH ranged from 0.80-1.43 for Fuji II LC and Photac-Fil, respectively.

Conclusion: Choice of finishing systems is more critical in immediate finishing, with SS being preferred and CS as a viable alternative.

I206/SOGD

Non-destructive Characterisation of Dental Biocomposites Using Electronic Speckle Pattern

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Aim: The current international standard for determining the modulus of dental biocomposites involves the destruction of beam-shaped specimens. The aim of this study was to develop a non-destructive test for characterising the modulus of dental biocomposites.

Methods: Five visible-light-cured composites (Filtek A110 [AO], Z100 [ZO], Filtek Z250 [ZT], F2000 [FT] and Filtek Flow [FF]); 3M-ESPE were selected for this study. An electronic speckle pattern interferometry (ESPI) apparatus involving cantilever beam specimens (28 x 8 x 2 mm) was developed to determine modulus. Out-of-plane displacement upon force application was measured using 2 focus region lengths (22 mm [EI1] and 11 mm [EI2]) and the modulus ($n = 7$) was subsequently computed based on cantilever beam equations. Data was compared to those obtained from 3-point-bend flexural testing ($n = 7$) based on ISO4049:2000 specifications. Specimens were stored in distilled water at 37°C for 1 week prior to evaluation of all tests. Results were analysed using ANOVA/Scheffe's post-hoc tests ($p < 0.05$) and Pearson's correlation ($p < 0.01$).

Results: The modulus ranged from 5.53 GPa to 13.99 GPa, 5.78 GPa to 14.24 GPa and 4.26 GPa to 11.3 GPa for EI1, EI2 and ISO, respectively. For all 3 tests, the modulus of ZO and FT was significantly greater than ZT, which in turn was significantly greater than AO and FF. Correlation of EI1 and EI2 to ISO was significant, positive and very strong ($r = 0.94$ for EI1 and EI2).

Conclusion: ESPI may be a viable method of characterising the modulus of dental biocomposites. As it is a non-destructive test, time-dependent effects of composites can be determined using the same specimens, leading to substantial time and material savings.

I207/SOGD

Effects of Prophylaxis Regimens on Surface Roughness of Composite Restorative Materials

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Aim: The aim of this study was to determine the effects of different prophylaxis regimens on the surface roughness of microfill (Filtek A110 [AO]), flowable (Filtek Flowable [FF]) and polyacid-modified (F2000 [FT]) composites.

Methods: Five commonly employed prophylaxis regimens were selected for the study. They included (a) brush with pumice-water slurry [PB]; (b) rubber cup with pumice-water slurry [PC]; (c) rubber cup with prophylaxis paste [PP]; (c) rubber cup with prophylaxis gel [PG], and (d) air polishing [PJ]. Untreated specimens were used as the control group. Eight specimens of each material were made for the various treatment groups. For all groups, specimens were polished with 1200 grit grinding paper using a lapping device prior to treatment. Specimens in the PJ group were subjected to 12 seconds of air-powder polishing. Groups involving the use of rotating devices were subjected to 12 seconds of treatment at a speed of 2000 rpm. Surface roughness (Ra) was determined using profilometry and data was subjected to ANOVA/Scheffe's tests ($p < 0.05$).

Results: The range of Ra values for the different materials were as follows: AO - 0.09 to 2.17 mm, FF - 0.13 to 1.68 mm and FT - 0.42 to 1.25 mm. For

all materials, treatment with PJ resulted in significantly rougher surfaces compared to controls. Both AO and FF were also significantly roughened after treatment with PB. FT was significantly roughened after treatment with all prophylaxis regimens.

Conclusion: Composite resin restoratives may require re-polishing after treatment with some prophylaxis regimens.

I208/SOGD

Comparative Hardness and Modulus of Direct Tooth-coloured Restorative Materials

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Aim: The objective of this study was to compare the hardness and elastic modulus of the continuum of direct tooth-coloured restoratives.

Methods: Six restorative materials representing the continuum were selected for this study. They included an ormocer (Admira [AM], Voco), a giomer (Beautifil [BF], Shofu), a compomer (Dyract Extra [DE], Dentsply), a minifill composite (Esthet-X [EX], Dentsply), resin-modified (Fuji II LC [FL], GC) and highly viscous (Fuji IX [FN], GC) glass ionomer cements. Seven specimens were made for each material and stored in distilled water at 37°C for 1 month. Hardness and modulus of the materials were determined using depth-sensing micro-indentation testing. Multiple comparisons of the materials were performed using ANOVA/Scheffe's post-hoc test ($p < 0.05$). The correlation between modulus and hardness was determined using Pearson's correlation ($p < 0.01$).

Results: Mean hardness ranged from 46.44 to 72.65 HV, while mean modulus ranged from 7.86 to 12.77 GPa. The following significant differences were observed: Hardness – BF > DE, AM, FL and EX > FL; Modulus – FN > EX, DE, AM and FL, BF > AM. Correlation of micro-indentation modulus and hardness was significant and positive ($r = 0.55$).

Conclusion: Contrary to popular belief, the hardness and modulus of glass ionomer-based/containing restorative materials may be comparable or even superior to minifill and ormocer composites.

I209/SOGD

Effects of Thermal Fatigue on Mechanical Properties of Tooth-coloured Restorative Materials

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Aim: The objective of this study was to determine the effects of thermal fatigue on the modulus and hardness of direct tooth-coloured restoratives.

Methods: Five materials representing the continuum of tooth-coloured restorative materials were selected for this study. They included an ormocer (Admira [AM], Voco), a giomer (Beautifil [BF], Shofu), a compomer (Dyract Extra [DE], Dentsply), a composite (Esthet-X [EX], Dentsply), resin-modified (Fuji II LC [FL], GC) and highly viscous (Fuji IX [FN], GC) glass ionomer cements. Fourteen specimens were made for each material. The specimens were divided into 2 groups. Group A was stored in distilled water at 37°C for 1 month and Group B was thermocycled for 5000 cycles and stored for an identical time period. Hardness and modulus of the materials were determined using depth-sensing microindentation testing. Results were analysed using independent samples T-test ($p < 0.05$) and Pearson's correlation ($p < 0.01$).

Results: Hardness ranged from 46.44 to 72.65 and 49.11 to 78.97 HV, while modulus ranged from 7.86 to 12.78 and 8.12 to 13.13 GPa for Groups A and B, respectively. With the exception of BF, no significant change in hardness and modulus was observed for all materials. A significant increase in hardness was observed for BF specimens that were thermocycled. Correlation of modulus and hardness was significant and positive ($r = 0.56$).

Conclusion: Thermal fatigue does not change the mechanical properties of most direct tooth-coloured restorative materials. In view of this, the need for thermal cycling during biomechanical characterisation of these materials is questionable.

I210/SOGD**Long-Term Effect of Traditional and Alternative Intracoronary Bleaching Agents on Microhardness of Human Dentine**Hui Kheng CHNG¹, Adrian U Jin YAP¹, Hoe Boon ONG²¹Department of Restorative Dentistry, National University Hospital, Singapore, ²Department of Preventive Dentistry, National University Hospital, Singapore**Aim:** The purpose of this study was to determine the long-term effect of various bleaching agents on the microhardness of human dentine.**Methods:** Thirty-six human premolars were root canal-treated and randomly divided into 6 groups. Bleaching agents were sealed in pulp chambers as follows: group 1 (control) – water, group 2 – cotton pellet soaked with 30% hydrogen peroxide solution, group 3 – sodium perborate mixed with distilled water, group 4 – sodium perborate mixed with 30% hydrogen peroxide solution, group 5 – 35% carbamide peroxide gel and group 6 – 35% hydrogen peroxide gel. After 7 days, the teeth were sectioned and microhardness testing was carried out on inner and outer dentine. After storage for 3 months in distilled water at 37°C, microhardness testing was repeated.**Results:** There was significant reduction in dentine microhardness in groups 2, 5 and 6 immediately post-bleaching. There was significant further reduction in dentine microhardness in groups 1, 2, 3, 5 and 6 after 3 months of storage in water.**Conclusion:** Any decrease in microhardness of dentine post-bleaching was irreversible. Long-term storage in water results in further reduction in microhardness of dentine. Intracoronary bleaching with high concentration hydrogen peroxide should be avoided in cases with extensive loss of tooth structure, as the decrease in dentine microhardness associated with its use may predispose such teeth to fracture in function.**I211/SOGD****Effects of Food-simulating Liquids on Shear – Punch Strength of Dental Composite Restoratives**Sew Meng CHUNG¹, Mun Kit LEE², Adrian U Jin YAP¹, Chwee Teck LIM¹¹Department of Restorative Dentistry, National University of Singapore, Singapore, ²Division of Bioengineering, Faculty of Engineering, National University of Singapore, Singapore**Aim:** This study investigated the effect of food-simulating liquids on the shear punch strength of 2 composites (Tetric Ceram [TC], Vivadent and Esthet X [EX], Dentsply), a conventional (Compoglass [CG], Vivadent) composite and a posterior polyacid-modified (Dyract Posterior [DP], Dentsply) composite.**Methods:** Thirty-two specimens (10 mm in diameter and 1.6 mm thick) of each material were prepared. They were randomly divided into 4 groups of eight and conditioned for 1 week as follows: - Group 1 (control): air at 37°C; Group 2: distilled water at 37°C; Group 3: 75% ethanol-water solution at 37°C; and Group 4: heptane at 37°C. After conditioning, the specimens were restrained and subjected to shear punch strength testing using a 3.2-mm diameter punch at a crosshead speed of 0.5 mm/min. The shear punch strength of the specimens was computed and the data were subjected to ANOVA/Scheffe's tests at significance level of 0.05.**Results:** The effect of food-simulating liquids on shear strength was found to be material-dependent. All materials, with the exception of EX, were significantly weakened by ethanol solution. For DP, a significant increase in strength was observed after conditioning in water. EX was significantly stronger than TC and DY after conditioning in air, water and ethanol solution. The shear punch strength of EX and CG was significantly higher than DY after conditioning in heptane.**Conclusion:** The effect of food-simulating liquids on the shear strength of resin-based filling materials was product-dependent. Composites based on BisEMA may be more resistant to degradation by alcohol.**I212/SOGD****Comparison of the Physical Properties of MTA and Portland Cement**

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Aim: This study examined and compared the solubility, pH, and setting time

of ProRoot MTA (tooth-coloured formula) (WMTA), ProRoot MTA (original formula) (OMTA), White Portland (WP) and Ordinary Portland (OP) cements.

Methods: The pH of the cements as they set was measured with a temperature-compensated pH meter. Materials were tested for solubility by first immersing in distilled water for 24 hours, discarding the specimen and then evaporating the water and weighing the residue to calculate the solubility as a percentage of the original weight. The setting times were determined using Gillmore needles. All tests were conducted in accordance with ISO6876.**Results:** The solubility of the set cements was 1.28% wt for WMTA, 0.9721% wt for OMTA, 1.05% wt for WP and 1.06% wt for OP. The materials had average pH values of 12.78 for WMTA, 12.74 for OMTA, 13.07 for WP and 13.02 for OP. The setting time was 2 hr 20 min for WMTA, 2 hr 55 min for OMTA, 2 hr 15 min for WP and 2 hr 50 min for OP.**Conclusion:** The physical properties of all 4 cements tested were very similar. Further in-vitro and in-vivo tests should be conducted to determine the suitability of Portland cement for use as a cheaper alternative to MTA as a root-end filling material.**I213/SOGD****Clinical Application of Prognostic Factors for Patients with Organic Causes of Erectile Dysfunction on Sildenafil Citrate**

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Aim: There are still no clinical predictive factors to determine the response rate of erectile dysfunction patients (ED) to sildenafil citrate. The aims of this study were to evaluate and stratify the risk factors as well as to determine the prognostic factors in clinical practice to predict the response rate in order to improve the cost effectiveness and avoid side effects.**Methods:** This is an open label prospective study that includes patients who will be seen at the andrology clinic in 2 years' time. The patients were evaluated and investigated for possible underlying causes. ED severity was assessed by IIEF 5 with its duration and the degree and rigidity of erection. Psychogenic causes were excluded with a minimal follow-up of 6 months. They were all given 100 mg sildenafil citrate and were reassessed at the end of 6 months. Logistic regression with univariate and multivariate was used as the method of statistical analysis.**Results:** A total of 232 patients were in the cohort. The overall response rate was 43%; the best was seen in veno-occlusive cause and the worst in neurogenic cause. Age, smoking, diabetes mellitus, hypertension, hypercholesterolemia, pre-treatment IIEF, interval to achieve erection and duration of erection were significant factors in univariate analysis, but only age and smoking with IIEF were significant in multivariate analysis. With a combination of these factors, a table was centred to determine the response rate in clinical practice. This will assist physicians in selecting patients with a favourable response and to avoid unnecessary wastage of time and costs and to avoid side effect.**Conclusion:** Possible factors could be determined and used clinically to predict the response rate to sildenafil citrate.**I214/SOGD****The Use of Stretch Expanded Polytetrafluoroethylene as a Microvascular Graft in a Low-Flow Situation**Thien Chong WONG¹, Jane LIM², Thiam Chye LIM²¹Department of Surgery, National University Hospital, Singapore, ²Division of Plastic and Reconstructive Surgery, Department of Surgery, National University Hospital, National Medical Research Council, Singapore**Aim:** Microvascular reconstruction is often limited by the availability and length of the pedicle. The harvesting of autologous vein grafts adds morbidity and may not provide a good match. Expanded polytetrafluoroethylene (ePTFE) grafts have been used routinely in macrovascular surgery. However, there is only limited and somewhat inconclusive data on the performance of small-diameter PTFE grafts for pedicle lengthening in free flaps in a low-flow situation. In this study, we evaluated the efficacy of 3 mm-diameter stretch ePTFE grafts to lengthen the venous pedicle of a free flap.**Methods:** Five male New Zealand white rabbits were operated on under sterile conditions. Using an operating microscope, an epigastric flap was

raised and the pedicle was exposed and dissected to its origin from the superficial femoral vessels. A 2-cm segment of the vein was replaced with a stretch ePTFE graft. Anastomoses were performed using 9-0 nylon sutures. At 4 weeks postoperatively, the flaps were raised again with the pedicles re-explored. The graft was then removed and examined histologically.

Results: All the grafts demonstrated immediate patency and all the flaps were vital at 4 weeks postoperatively. When re-explored, the grafts appeared to be patent and covered by connective tissue. Light microscopy showed a thin fibrin layer covering the internal surface of the graft.

Conclusion: From this study, we conclude that 3 mm-diameter stretch ePTFE grafts can be used successfully as an alternative to bridging autologous vein grafts in the lengthening of free flap pedicles. However, longer grafts must be used to simulate clinical situations.

I215/SOGD

Repair of Calvarial Defects with Customised Tissue-Engineered Bone Grafts. Part II: Evaluation of Cellular Efficiency and Efficacy In Vivo

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Aim: We evaluate engineered cell-polymer constructs using calvarial osteoblasts and mesenchymal progenitor cells for reconstructing complex cranial defects.

Methods: 30 New Zealand white rabbits had bilateral parietal defects created. Based on computed tomography (CT) scans, customised polycaprolactone (PCL) scaffolds with precisely controlled microarchitecture were fabricated using rapid prototyping. Bone marrow-derived progenitor cells and osteoblasts were isolated and expanded in culture. Osteoblasts (Group I) and osteoprogenitor cells (Group II) were seeded with fibrin-glue suspension into 40 scaffolds. After incubating for 3 days, the scaffold-cell constructs and unseeded PCL scaffolds (control group) were implanted into 15-mm calvarial defects. Reconstruction was performed at 3 months.

Results: Osseous tissue integration within the implant and functionally stable restoration of the calvarium. Islands of early bone formation observed in X-rays and histological sections. Implants showed a high cellular-ECM ratio and dense vascular network. Mechanical testing: reconstructed area revealed partial integration with the surrounding cortico-cancellous bone. Amount of calcification measured using CT indicated cell-seeded constructs and measured about 60% more than unrepared/unseeded scaffolds. Mechanical investigations: stiffness reached 52 ± 29 MPa and 44 ± 16 MPa for MPC- and osteoblast-seeded scaffolds, respectively. Yield strength (push-out tests): 180 ± 36 N for normal calvarial bone, 90 ± 1 N (unrepared) and 106 ± 10 N (unseeded) constructs, which is about 60% of normal bone strength. MPC- and osteoblast-seeded scaffolds had yield strength of 149 ± 15 N and 164 ± 42 N, respectively, about 85-90% of normal bone.

Conclusion: This study demonstrated that biodegradable polymeric implants may be used to deliver osteogenic cells and enhance bone formation. Rapid prototyping technology produces scaffolds with controlled external geometry and microarchitecture, and offers new possibilities in the functional and aesthetic reconstruction of craniofacial defects.

I216/SOGD

Percussion, Diuresis and Inversion Therapy can Assist Passage of Lower Pole Renal Calculi after ESWL

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Aim: We compare the clearance rates of lower pole renal stones between

extracorporeal shock wave lithotripsy (ESWL) treatment alone and that of a combination of ESWL and mechanical percussion, diuresis and inversion (PDI) therapy on fragments after ESWL treatment.

Methods: 68 patients who underwent ESWL treatment for lower pole renal stones of total diameter ≤ 2 cm were prospectively randomised into 2 groups. The first group comprised 32 patients who received only ESWL treatment and the second group, 36 patients who had a median of 4 (range 1 to 12) sessions of PDI therapy about 1 to 2 weeks after each ESWL session. PDI therapy was performed with patients in a prone Trendelenberg position on a 45-degree angled couch, with at least 500 mL of oral fluids administered 30 minutes before therapy and continuous 10-minute manual mechanical percussion applied over the flank. Stone clearance was documented with plain abdominal radiographs at 1 month and 3 months following initial ESWL therapy.

Results: Patients from both groups were comparable in terms of mean age, total stone diameter, infundibular neck diameter, infundibular length, calyceal height and infundibular angles. All patients had a maximum of 3 ESWL treatments. Radiological complete stone clearance after 3 months for the ESWL alone group was 40.6% and that of the combination ESWL with PDI therapy group was 69.4%. This difference was statistically significant.

Conclusion: PDI therapy is useful in assisting passage of lower pole renal stone fragments after ESWL treatment.

I217/SOGD

Mandibular Fractures: Characteristics of Fractures and Results of Osteosyntheses with Titanium Implants Compared with Resorbable Implants in a Tertiary Hospital

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Aim: We attempt to establish the commonest aetiology for and sites of mandibular fractures and to compare the outcome of osteosyntheses with titanium to that with resorbable implants.

Methods: A retrospective analysis of 45 mandibular fractures with surgical interventions in our division from April 2000 to May 2003 was undertaken. There were 38 males and 7 females, 21 with open and 24 with closed fractures. All had open reductions and internal fixations of their fractures, except for 3 who had intermaxillary fixations. 4 of the 42 patients had osteosyntheses with resorbable implants; the rest had titanium implants.

Results: The commonest aetiology was road traffic accidents (55.6%) followed by falls (17.8%), industrial accidents (13.3%), assaults (8.9%) and sports-related accidents (4.4%). The commonest sites of fractures amongst a total of 74 fractures were parasymphiseal/symphiseal (36.4%) followed by angle (23%), condyle (18.9%), body (16.2%) and ramus of mandible (5.4%). The commonest complication encountered was chin paraesthesia/numbness, seen in 4 patients. 2 patients with open fractures developed osteomyelitis which required implant removal. All patients achieved fair to good occlusion after surgery, except for 2 patients who needed subsequent surgeries for malocclusion. No complications were encountered in the 4 patients with resorbable implants.

Conclusion: The commonest aetiology for mandibular fractures was road traffic accident and the commonest site of fracture was the symphyseal/parasymphiseal region. The use of resorbable implants did not result in a higher complication rate in this limited study.

I218/SOGD

Postoperative Pain Control after Laparoscopic Totally Extraperitoneal Groin Hernia Repair: A Comparison Between Continuous Bupivacaine Infusion versus Bolus Infusion

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Aim: Postoperative pain control after laparoscopic totally extraperitoneal/groin hernia repair (TEP) has elicited interest in recent years. It was thought that the enclosed extraperitoneal space after TEP would act as a reservoir for a bolus dose of bupivacaine. However, there have been mixed results with regard to postoperative pain control. We investigate a novel technique of continuous bupivacaine infusion using a catheter system and compare its efficacy with the bolus system.

Methods: 24 patients with groin hernia repair using TEP were randomised into 2 groups. At the end of the operation, group 1 received a bolus infusion of 40 cc of 0.25% bupivacaine in the extraperitoneal space, while group 2 had a catheter delivery system that delivered 0.5% bupivacaine at the rate of 2 cc per hour over 48 hours inserted into the same space. Pain scores were recorded at 6 hours and 24 hours postoperatively.

Results: The average pain score on the visual analogue scale at 6 hours for the bolus group was 34.5, with a minimum of 20 and a maximum of 40. The comparable values in the infusion group were 19.25, 0 and 30 ($t_{0.05} = 4.01$). The 24-hour record showed a still poorer pain control in the bolus group with values of bolus: Avg = 59, max = 90, min = 19; Infusion: Avg = 14.58, max = 20, min = 0 ($t_{0.05} = 3.03$) ($t > t_{0.05}$ in both). The patients with the infusion technique can also be sent home on the first postoperative day with earlier resumption of duties.

Conclusion: The infusion technique is superior to the bolus technique for postoperative pain control after laparoscopic TEP groin hernia repair.

I219/SOGD

Is There Any Benefit in Adding Breast Ultrasound to Standard Screening Mammogram for Breast Cancer?

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Aim: Ultrasound of the breasts is not part of the standard breast cancer screening protocol. This study examines if the addition of ultrasound to mammogram gives any useful added information that can affect patient management.

Methods: All patients with T1 and T2 tumours investigated in this hospital in 2001 and 2002 were included. 55 patients who had either mammogram or ultrasound, but not both, were excluded.

Results: n = 252. Age range: 24-88 years. Median age: 51 years. The majority were Chinese (86.5%). 70 (27.8%) patients had additional information on ultrasound. 19 (7.6%) patients had a second breast cancer found, of which 5 (2%) had multicentric and 14 (5.6%) had multifocal breast cancers. Mammogram and ultrasound correlated in 16 of these 19 cases, but in 3 cases (1.2%), the second tumour was detected only from the ultrasound. 17 (6.7%) patients had their breast lumps upgraded from benign to malignant based on additional ultrasound findings. 109 (43.3%) patients had no additional information on ultrasound. 40 (15.9%) patients had their tumours downgraded on ultrasound, but their management was still based on the standard mammogram.

Conclusion: Ultrasound added useful information in over a quarter of patients. Detection of second tumours by ultrasound, but not mammogram (1.2%), may affect these patients' surgical management in terms of breast conservation. Patients whose lumps were upgraded to malignant based on ultrasound may have had frozen section and margin control instead of excision biopsy during initial surgery. Thus, in a small proportion of patients, the addition of ultrasound can alter treatment.

I220/SOGD

The Interaction Between Cyclo-oxygenase and Inducible Nitric Oxide Synthase in Colon Cancer

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Aim: Cyclo-oxygenase (COX) and inducible nitric oxide synthase (iNOS) are 2 of the important inducible genes involved in inflammation and cancer. In this study, the interaction between these 2 genes in colon cancer cell lines was studied.

Methods: Three colon cancer cell lines (HCA7, HT29 and HCT116) with different COX-2 expression levels and activities were used to study the effect of S-nitroso-glutathione (GSNO), a NO donor. 7kb promoter sequence upstream of COX-2 gene was amplified and different COX-2 promoter plasmid constructs were used to evaluate which pathway NO affects to increase COX-2 expression. Cytokines' mixture can induce both COX-2 and iNOS expression. Different COX-2 or iNOS inhibitors were used to investigate if there were mutual regulatory effects between these 2 genes in colon cancer cell lines.

Results: GSNO increased PGE2 production and induced COX-1 and COX-

2 protein expression in all 3 cell lines in a dose- and time-dependent manner. Higher dosages of GSNO also inhibited cell growth and induced apoptosis, but this inhibitory effect is unrelated with the COX expression/activities of the cell lines because inhibition of COX did not further improve the inhibitory effect of GSNO on cell growth. Transient transfection analysis showed that GSNO did not increase the promoter activity of the 5' flanking region of the human COX-2 gene, which includes the NF κ B, IL-6 and CAMP response elements.

Conclusion: The inhibitory effect of NO on colon cancer cell lines is independent of their COX expression and activity. NO can stimulate COX protein expression and activity.

I221/SOGD

Implementation of Clinical Pathway Decreases Length of Stay and Hospital Charges for Patients Undergoing Breast Reconstruction

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Aim: Clinical pathways are designed to streamline patient care delivery and maximise efficiency while minimising cost. We evaluated the effect on cost and length of stay with the implementation of clinical care pathway for breast reconstruction patients. The average hospital stay for breast reconstruction pathway patients is 7 days.

Methods: Clinical pathway with the aim of improving quality of patient care was developed by a multidisciplinary team and implemented. The breast reconstruction pathway was implemented in November 2002 to standardise patient care. Data on length of stay and costs were collected for all patients undergoing breast reconstruction 1 year before and 1 year after pathway implementation. A total of 27 patients were included in the study. Total hospital charges and average length of stay were compared between 15 pilot patients not placed on the clinical pathway programme and 12 patients treated in the programme.

Results: The mean length of stay decreased from 6.9 days to 6.2 days for patients on pathway versus pilot patients. Mean hospital charges also decreased significantly, from S\$15,390 to S\$11,479 per patient ($P = 0.021$). Postoperative complications and rehospitalisation did not differ between the 2 groups.

Conclusion: With the implementation of the clinical pathway, average hospital charges and length of stay were reduced. The clinical pathway is considered a good tool in health care cost management. Additional research is needed to further assess the impact of clinical pathways on these patients.

I222/SOGD

Breast Reconstruction with the DIEP Flap: Our Experience of 45 Flaps

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Aim: The deep inferior epigastric perforator (DIEP) flap is now widely used as the first choice for autologous breast reconstruction. It was first described by Koshima and Soeda in 1989 and has replaced the transverse rectus abdominis muscle (TRAM) flap as the flap of choice in many centers. We evaluate the results of breast reconstruction with the DIEP flap in our patients.

Methods: A prospective study was undertaken using a standard database. Biographic data on the patients was recorded in each case with the operative details and postoperative course. Results were evaluated objectively and subjectively.

Results: 45 breast reconstructions were performed in 41 patients over a period of 3.5 years from July 1999 to October 2002. 4 patients had bilateral reconstructions while the rest had unilateral reconstructions. 32 patients had immediate reconstructions and 8 had delayed reconstructions. Well-known risk factors for free flap breast reconstructions were present: 7% were smokers, and 30% had abdominal scarring. There were 3 flap failures, with 6 partial flap failures. We achieved good results in 81% of our patients in terms of symmetry, projection and ptosis.

Conclusion: The DIEP flap, in our experience, is a reliable and safe technique for autologous breast reconstruction. It offers the patient the same advantages as the TRAM flap, with the additional benefit of preserving the rectus muscle. Donor morbidity and postoperative pain are reduced, leading to quicker recovery and reduced hospital stay. The more complex nature of this procedure is balanced by the gratifying results.

1223/SOGD

Breast Reconstruction: Local Experience

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Aim: Post-mastectomy breast reconstruction is performed more frequently due to improved patient awareness and availability of reconstructive options. This study compares the outcomes of the various methods used in our local experience.

Methods: Biographic data was recorded in each case with the operative details and post-operative course. Results were evaluated objectively and subjectively.

Results: Over the past 4 years, a total of 65 cases were performed using different methods. Autologous breast reconstruction was performed using the deep inferior epigastric perforator (DIEP) flap, transverse rectus abdominis muscle (TRAM) flap and latissimus dorsi flaps. The DIEP flap was popularised by Blondeel, Allen and Treece for breast reconstruction. It utilises the skin fat island of the TRAM flap without sacrificing the rectus muscle. We used the DIEP flap in 45, TRAM flap in 9, latissimus dorsi flap in 2 and breast implants in 9 of the cases. The failure rate was 6% for the DIEP flap group and 100% success for the groups who underwent TRAM and latissimus dorsi flap reconstructions. The DIEP flap group experienced less post-operative pain, quicker recovery and shorter hospital stay compared to the TRAM flap group. Generally, our patients were happy with the outcomes of reconstruction. The long-term results for the patients who underwent autologous reconstruction were better than the group with implants.

Conclusion: In our experience, the DIEP flap is a reliable and safe technique, with less donor morbidity. Nevertheless, with the many options available, the choice for breast reconstruction should be tailored to the individual.

1224/SOGD

Arteriovenous Fistula Using Transposed Basilic Vein

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Aim: When the cephalic vein is not available for a fistula at the wrist or elbow, the basilic vein is almost always of good size and quality, although too deep within the arm. If it is dissected and transposed into a new subcutaneous tunnel, it may be a useful fistula. In the UK, published results with this procedure are limited. We report our initial experience of basilic vein transposition over the last 3 years.

Methods: A retrospective review was performed of 11 patients who had basilic vein transposition. There were 4 males and 7 females, with a mean age of 53 (range 36-77) years. All patients underwent duplex scanning of the basilic vein. Nine patients had regional and 2 had general anaesthesia.

Results: There were no perioperative deaths. All 11 fistulae were technically successful, but 1 fistula needed thrombectomy. Nine of the 11 subsequently matured. One patient died before maturation. One fistula failed after 2 months. Of the 9 patent fistulae, 2 patients received renal transplantation. Two patients on dialysis died with functioning fistulae at 3 and 17 months. Four patients are having adequate dialysis at 6, 10, 10 and 19 months post-operatively. The remaining fistula is functioning, but has not yet been used for dialysis. Complications include superficial wound infection in 3 patients, 1 steal syndrome and 1 subclavian venous thrombosis.

Conclusion: Basilic vein transposition can be performed with acceptable patency and relatively few complications. It can prevent the need for synthetic grafts for formation of arteriovenous fistulae.

1225/SOGD

A Comparative Study of Ambulatory Circular Stapled Haemorrhoidectomy under Local Anaesthesia versus Circular Stapled Haemorrhoidectomy under Regional Anaesthesia

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Aim: The usage of circular stapled haemorrhoidectomy (CSH) has increased dramatically in recent years. Hitherto, it has been performed using regional or general anaesthesia. This study assesses the feasibility of performing CSH under local anaesthesia on an ambulatory basis and its acceptance by patients.

Methods: 60 patients with symptomatic 2nd or 3rd degree haemorrhoids were randomised into 2 groups. Group A had CSH under regional anaesthesia and were discharged on the following day. Group B had CSH under local anaesthesia and were discharged on the same admission day. Visual Analogue Pain Score was administered to both groups. In addition, Group B patients were asked questions regarding their satisfaction with the procedure.

Results: No significant differences in pain score and analgesic requirement were found between both groups of patients. All patients in Group B, except for 1, reported that they were satisfied to highly satisfied with their procedure.

Conclusion: CSH can be performed safely under local anaesthesia in an ambulatory care setting. The potential cost savings that may accrue would offset the cost of the stapler.

1226/SOGD

Congruence of Endoscopic and Histological Diagnosis of Gastritis

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Aim: Endoscopy is often used as an endpoint in the diagnosis of gastritis in spite of evidence showing a poor correlation between clinical diagnosis and histological congruence, both in terms of presence and type. We sought to achieve a consensus regarding the accuracy of endoscopic diagnosis and guidelines on the need for biopsy in all patients presenting for diagnostic upper gastrointestinal endoscopy.

Methods: We analysed retrospectively the OGD findings in 121 patients. The findings on endoscopy were based on the Sydney Classification with general intradepartmental consensus. Biopsies were obtained in all cases irrespective of findings. The findings were recorded as erythema, red spots, nodularity and atrophy, in addition to a specific "yes" or "no" answer for gastritis as a finding.

Results: Pain accounted for an overwhelming majority of symptoms (n = 84) followed by dyspepsia (n = 22) and bleeding (n = 16). Gastritis was noted on endoscopy in 63.6% (n = 77) of cases, while 36.4% (n = 44) of cases had normal findings. Of the 77 cases, 60 (77.9%) had histological confirmation, while only 9 (20.5%) of the other 44 had histological congruence. In generalised cases (pangastritis, n = 29), 69% (n = 20) matched histologically. An abnormal finding on endoscopy is about 77.9% sensitive, while a normal finding is only about 20.45% specific.

Conclusion: In the presence of obvious findings endoscopically, the correlation is likely to be very high, while negative findings are likely to be extremely fallacious. Biopsies must be taken in all clinically suspected cases.

1227/SOGD

The Missing Cleavage: A Report of a Case of Synmastia

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Aim: We report a rare case of synmastia in an 18-year-old female. The authors propose an original technique for correction of synmastia with loss of the intermammary sulcus. The technique consists of defatting a presternal "gutter" using liposuction and fixation of the skin by sutures transfixing the sternum and tied over a pad.

Methods: An 18-year-old Indian woman was referred to our clinic for correction of synmastia with loss of intermammary sulcus. Ultrasound and mammographic examination showed that the breasts were connected by fatty tissue. There was no other medical or family history of note. Physical

examination revealed the absence of an intermammary sulcus. An operation involving liposuction of the presternal area was proposed.

Results: There has only been 1 previous reported case of symmastia in the literature. In view of the Asian predilection for keloids, especially in the sternal region, any incision in this area should be avoided. Taking into consideration her age and the possibility of childrearing and breastfeeding, any options that disrupt the ductular or glandular tissue in either breast should be avoided. Several options have been considered in order to dissect the entire thoracic cutaneo-glandular tissue in the presternal region. Options may include transaxillary or transareolar endoscopic approach, bilateral perioareolar incisions with subcutaneous dissection, inframammary, subxiphoid or suprasternal approaches or a combination of the above.

Conclusion: We report a rare case of symmastia for which liposuction is proposed for the creation of an intermammary sulcus.

1228/SOGD

Factors Affecting Rate of Breast Conservation Surgery for Early Breast Cancer: An Observational Study in an Institution Between 2000 and 2002

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Aim: Breast conservation surgery (BCS) with post-operative radiotherapy is a well-established treatment for early breast cancer patients. This study attempts to find the factors affecting BCS in a local acute care hospital.

Methods: All stage I and II cases operated between 2000 and 2002, excluding T3N0 cases, were included in this study. Data was obtained from the breast cancer database and patients' casenotes.

Results: 389 cases were eligible for analysis. The mean age was 53.9 years (range 24 to 90 years). The racial distribution was similar to that in the local population. There was no difference in patient demographics seeing breast and non-breast subspecialists. In 25.7%, there was no documentation in the patient's casenotes that the BCS option was discussed (24% in breast surgeons and 30.6% in other surgeons, $p = 0.314$). Indications for mastectomy were more likely to be documented by breast surgeons (45%) than by other surgeons (30.6%) ($p = 0.052$). Univariate analysis showed that patients who had T1 tumours were operated on in 2002 and those operated on by breast subspecialists were more likely to have BCS. Multivariate analysis, after excluding patients with strong indications for mastectomy, showed that the year of operation and surgeon type remained independent predictors of BCS.

Conclusion: BCS in this institution is largely influenced by the surgeon's subspecialty training and tumour size. Other factors, including patient choice do not appear to influence BCS rates. The surgeon plays a crucial role in increasing the BCS rate in the treatment of early breast cancer.

1229/SOGD

Assessment of Biocompatibility of a Microporous Polyurethane Synthetic Analogue (NeuroPatch) in Reconstruction of Orbital Fractures

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Aim: Various synthetic analogues are available for use in reconstruction of the orbital wall after traumatic injury. They are used to cover defects in the orbital wall and to overlay reduced fracture sites to prevent soft tissue entrapment during healing. Consideration needs to be given to their ability to provide a solid support lattice during healing and to maintain post-reduction and fixation orbital volume (functional biocompatibility). One also need to consider the risk of developing host reaction with resulting inflammation and extrusion (constitutional biocompatibility). This study specifically examines the biocompatibility of NeuroPatch, a microporous polyurethane material.

Methods: Rates of persistent post-operative diplopia, enophthalmos, implant infection and extrusion are examined in a retrospective review of 105 patients who underwent orbital fracture reconstruction using NeuroPatch between October 1997 and December 2002. Patients were followed up for at least 1 month and the average duration of follow-up was 6.62 months. The complication rates were compared with that of various synthetic analogues in

other case series.

Results: The overall complication rate was 5.7%, with a 1.9% rate of persistent diplopia that did not resolve with conservative measures, 2.85% infection rate and 0.95% implant extrusion rate.

Conclusion: NeuroPatch compares favourably with other synthetic analogues in terms of diplopia and enophthalmos rate, but has slightly higher extrusion and infection rates. Taking study size and fracture subtype differences with other series into consideration, NeuroPatch remains a viable tool in orbital fracture reconstruction with good biocompatibility.

1230/SOGD

Patients' Expectation and Experience of Visual Sensations During Cataract Surgery Under Topical Anaesthesia

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Aim: To investigate what patients expect to see and the visual sensations they experience during cataract surgery under topical anaesthesia. We also sought to determine if patients find their intraoperative visual experience frightening and the factors that are associated with this.

Methods: One hundred and 1 patients (47 males and 54 females) who underwent phacoemulsification and intraocular lens implantation under topical anaesthesia were interviewed preoperatively on what they expected to see with their operated eye during surgery, and postoperatively on the visual sensations they actually experienced.

Results: Preoperatively, 39 (38.6%) patients expected some light perception during surgery, 38 (37.6%) patients expected no light perception and 24 (23.8%) did not know what to expect. Many patients who expected light perception also expected to experience a variety of visual sensations. Postoperatively, all patients reported that they saw at least some light intraoperatively and some saw a variety of visual sensations. Twenty (19.8%) patients found their visual experience frightening. Patients who were anxious, saw movement intraoperatively or did not experience a sudden increase in clarity intraoperatively were statistically more likely to be frightened.

Conclusion: A majority of patients either expected that they would not perceive light throughout their cataract surgery under topical anaesthesia or were unsure of what to expect. All patients experienced at least some light perception, and many perceived a variety of visual sensations. These were frightening to nearly 1 out of 5 patients.

1231/SOGD

Patients' Expectation and Experience of Visual Sensations during Cataract Surgery under Regional Anaesthesia

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Aim: To investigate and compare patients' expectation and experience of intraoperative visual sensations during cataract surgery under retrobulbar anaesthesia, and to determine whether they found their intraoperative visual experiences frightening and the factors influencing this.

Methods: One hundred and fifty-two consecutive patients undergoing routine phacoemulsification or extracapsular cataract extraction (ECCE), with posterior chamber intraocular lens implantation under retrobulbar anaesthesia, were interviewed peri-operatively regarding their expected and actual visual sensations in the operated eye during surgery.

Results: Seventy-two men (47.4%) and 80 women (52.6%) participated in the study. One hundred and 2 patients (67.1%) underwent phacoemulsification and 50 patients (32.9%) had ECCE. Forty-nine patients (32.2%) expected to be able to see at least some light during surgery. Thirty-two (21.1%) felt that they might be frightened by the intra-operative experience. Postoperatively, 127 patients (83.6%) saw at least some light. Many of those who saw some light also experienced a variety of visual sensations. Twenty-five patients (16.4%) reported no perception of light with the operated eye during the

entire surgery. Forty-five (29.6%) had transient no light perception. Thirteen patients (8.6%) were frightened by what they saw intraoperatively. Patients who had a longer operation ($P = 0.006$, multivariate analysis) were statistically more likely to find their visual experience frightening.

Conclusion: Many patients undergoing cataract surgery under retrobulbar anaesthesia experienced a variety of visual sensations even though most did not expect to see anything preoperatively. These sensations were frightening to some patients.

I232/SOGD

Compliance: Just How Important is This in the Use of Intranasal Steroids for Allergic Rhinitis

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Aim: Intranasal corticosteroids are recommended first-line therapy in adults with moderate/severe persistent allergic rhinitis (PAR). Discrepancies observed between treatment efficacy demonstrated in clinical trials and actual clinical practice could be a reflection of patient compliance. This study aims to evaluate the impact of patient compliance on the efficacy of treatment.

Methods: Sixty-three adult patients with moderate-to-severe PAR, and treated in an otolaryngology outpatient clinic with intranasal triamcinolone acetonate were randomly selected. Compliance was determined both by direct questioning and measurement of weight of medication consumed (WMC) after 4 weeks of therapy. Pre- and post-treatment nasal symptom scores were obtained.

Results: Less than 50% compliance was reported by 1 patient (1.6%) but detected in 7 patients (11%) by WMC measurement. Patients with lower WMC compliance were more likely to over report compliance on questioning. There was a significant ($p < 0.001$) improvement in the total symptom score before (7.45 ± 1.99) and after (3.59 ± 2.72) treatment in patients with at least 50% of WMC, but not when the WMC is $< 50\%$ (8.43 ± 1.72 vs 6.29 ± 2.43 , $p = 0.114$). The positive predictive values for each symptom relief (with $> 50\%$ compliance) were: itch = 70%, sneeze = 65%, running nose = 78% and blocked nose = 67%. The probability of therapy failure was inversely related to compliance by WMC.

Conclusion: Compliance has an impact on treatment efficacy. Patient history becomes increasingly unreliable as actual compliance falls. With the large discrepancy between reported and actual compliance, it is important to establish actual compliance when evaluating patients who failed to respond to therapy.

I233/SOGD

A Population Study of Nocturia in Singapore

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Aim: We estimate the prevalence of nocturia in Singaporean adults and assess its associations with sociodemographic and health factors.

Methods: In 1999, a door-to-door interview questionnaire survey was conducted amongst a randomly selected sample of 3000 individuals (response rate of 78.2%). Using questions from the International Prostate Symptoms Score (IPSS), nocturia and its associated problems were evaluated. Concurrently, sociodemographic and health parameters were recorded.

Results: The data of 1134 women (aged 20 to 95) and 1139 men (aged 20 to 92) were analysed. The overall prevalence of nocturia (1 or more voids/night, according to the International Continence Society definition) was 55.5%, with increasing numbers in the higher age groups ($p < 0.01$). Women had nocturia significantly ($p = 0.015$) more often than men (58% vs. 53%). It was positively associated with poor health, with the highest odds ratio for diabetes mellitus (OR = 2.0, CI = 1.3-3.1), renal disease (OR = 6.4, CI = 2.3-18.2) and strokes (OR = 3.1, CI = 1.1-9.2). Patients with previous major abdominal and pelvic surgery were also more likely to have nocturia ($p = 0.003$). In both men

and women, the median IPSS score in patients with nocturia was significantly higher than that in patients without nocturia ($p < 0.001$). 83% of respondents who woke up at least once did not consider it a problem at all, with 21% of them complaining of sleep and rest disturbances ($p < 0.001$).

Conclusion: Nocturia is a common symptom amongst Singaporean adults, especially in the elderly. It has strong associations with poor health and other lower urinary tract symptoms. In addition, nocturia is significantly linked to sleep disturbances.

I234/SOGD

The Safety Profile of Transrectal Ultrasound-guided Biopsy of the Prostate at a University Hospital

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Aim: Transrectal ultrasound-guided needle biopsy of the prostate is the procedure of choice for diagnosing prostate cancer. With current ongoing studies to evaluate screening programs for prostate cancer, this procedure will become increasingly widespread. We report on the experience and complications of this procedure at the National University Hospital.

Methods: Thirty-eight consecutive transrectal ultrasound guided needle prostate biopsies carried out in 2002 were audited retrospectively. The indications of biopsies, pre-operative preparation, ultrasound and biopsy results and complications were studied.

Results: The patients had a mean age of 67.5 (range 50-85) years. All but 2 of the biopsies were 10 core biopsies. The indications were elevated PSA leveling [22 (58%) patients], abnormal digital rectal examination [4 (10%) patients] or both [12 (32%) patients]. The median PSA level was 10 ng/ml (range 0.7-282.2). All patients complied with the pre-operative course of prophylactic ciprofloxacin and ducolax suppository. The mean prostate volume was 45.9 mls (range 14 to 121). A total of 10 (26.3%) prostate cancers were detected. There were no intraoperative complications, but post-operatively there were 2 (5.2%) episodes of mild haematuria, 2 (5.2%) episodes of fevers and 1 (2.6%) episode of urinary retention. None required hospital admission and all complications resolved with conservative treatment. There was no association of complications with prostate cancer or with lower urinary symptoms (19 patients) and high post-micturition volume (> 100 ml) (7 patients).

Conclusion: Transrectal ultrasound-guided needle biopsy of the prostate has an adequate safety profile for its widespread application in a population screening programme.

I235/SOGD

RPE65 Gene in India: A Phenotype Genotype Correlation in Retinal Degenerative Diseases

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Aim: We evaluate the clinical profile and correlate the RPE65 genotype of patients with retinal degenerative disorders.

Methods: Forty-six patients with Leber's congenital amaurosis (LCA) and early onset retinitis pigmentosa (RP) underwent detailed ophthalmic examination and electroretinography. They were subjected to pedigree analysis and mutation screening for the RPE 65 gene.

Results: Thirty-three (72%) patients were diagnosed with LCA and 13 (28%) had early onset RP. Thirty-five (76%) patients had onset of symptoms within 1 year after birth. Diffuse retinal pigment epithelial mottling was the most common fundus finding in LCA (16 patients, 48%), while typical bone spicule pigmentation, arteriolar attenuation and optic disc pallor were most common in RP (7 patients, 53%). Thirty (65%) patients had a history of consanguinity and first cousin unions constitute the majority (93%). Autosomal recessive inheritance was noted in 34 (73%) patients. Fifteen (32%) patients had nucleotide variations. One patient with RP had a homozygous mutation in exon 9 (N321K), while another patient with LCA had a heterozygous

mutation. Unusually, in 13 (28%) patients a silent mutation in exon 10 (E352E) was found.

Conclusion: There was no significant difference in the clinical presentation in patients with or without mutations in the RPE65 gene. Hyperopic refractive error and autosomal recessive inheritance were significantly associated with LCA ($p < 0.05$). RPE65 mutations reported in 16% of LCA and 2% of RP patients in the USA are not the common genetic cause of retinal degenerative diseases in India.

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Clinical Profile, Risk Factors, Management, Microbiologic and Molecular Biologic Study of Endogenous Endophthalmitis in India

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Aim: To study the clinical, laboratory and management profile of endogenous endophthalmitis in India and correlate it with the risk factors.

Methods: A 5-year retrospective analysis of 70 patients (83 eyes) with a clinical diagnosis of endogenous endophthalmitis was done.

Results: Bilateral involvement was noted in 13 (18%) patients. Systemic predisposing conditions were noted in 44 (63%) patients. A history of intravenous infusions prior to presentation was the most common risk factor (25%). Majority of the eyes (36 eyes, 43%) had a diffuse involvement of both anterior and posterior segments. Cultures were positive in 51 (61%) eyes. Vitreous and aqueous were culture-positive in 55% and 18% of eyes, respectively. Bacterial and fungal infection was noted in 23 eyes each, while 5 eyes had mixed infection. The most frequent bacterial and fungal isolates were staphylococcus (34%) and candida (52%) respectively. Eye salvage was achieved in 76 (91%) eyes. Fundus view at the initial presentation had a better final visual outcome ($p = 0.003$, Pearson Chi Square test).

Conclusion: Fungal and bacterial endogenous endophthalmitis is equally common in culture-positive cases. Vitreous is a better sample for isolating the causative organism. Infusion of possibly contaminated intravenous fluids is the most significant predisposing factor noted for fungal endogenous infection in healthy individuals. Fundus view at initial presentation predicts a fair visual outcome. Despite a poor visual prognosis, eye salvage is possible in most cases.