Poster Presentation Abstracts – Day Two

I/II – Day One/Day Two; xxx – Poster Board Number; AH – Allied Health/Health Sciences/Paramedical Disciplines; CPIP – Clinical Practice Improvement Programme; MPC – Medicine/Paediatrics (Clinical based); MPL – Medicine/Paediatrics (Laboratory based); NUR – Nursing; SC – Surgery/Obstetrics & Gynaecology/Dentistry/Ophthalmology (Clinical based); SL – Surgery/Obstetrics & Gynaecology/Dentistry/Ophthalmology (Laboratory based)

Layout of Posters: See Programme Guidebook pages 21-28

II001/AH

Mobile Crisis Service: A Pilot Project of the Institute of Mental Health

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Aim: Recent trends in mental healthcare worldwide show an emergence of community crisis intervention services. Such services are seen to support the development of alternatives to hospitalisation in the provision of acute psychiatric care. In Singapore, the Institute of Mental Health has recently launched a Mobile Crisis Service to augment the existing community services. Broadly, the service aims to reduce the impact of mental health emergencies through immediate response to crises at the community level.

Methods: There are 2 components to the service: a crisis hotline offering an available source of support for mental patients in crisis immediately, and a mobile crisis team (MCT) that does on-site crisis interventions aiming to de-escalate situational crises in order to prevent unnecessary visits to the hospital's emergency department.

Results: From January to May 2004, there was a total of 856 phonecalls to the hotline, with 86 home visits by the MCT. About half of the calls were for phone counselling. The majority of cases attended to by the MCT were for relapsed and/or violent patients. 27 cases were resolved on-site while 41 needed admission. Of these, 8 were arrested and brought in by the police.

Conclusion: Timely intervention by professionals during mental health emergencies can help prevent the escalation of crises to disasters. Also, by offering a ready source of support and practical assistance, it is hoped that caregiving burden can be alleviated.

II002/AH

Neural Cell Adhesion Molecule Mediated Neurite Outgrowth in Relation with Members of Protein Kinase C

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Aim: It is well known that the neural cell adhesion molecule (NCAM) is involved in cell migration, neuronal differentiation, neurite outgrowth and synaptic plasticity. However, the precise effect of various members of NCAM on neurite outgrowth is still not clearly defined. This study is aimed to find out the relation of NCAM 140 and NCAM 180 in TPA induced morphological changes in neuroblastoma cell lines.

Methods: We have got 3 different cell lines, where the NCAM 140 and NCAM 180 levels of protein expression are different. These cell lines were treated with TPA for 2 to 4 days, and cell morphology and different protein expressions were studied. Neuronal differentiation was assessed by microscopic observation and protein expression which were determined by western blotting, immunoprecipitation and immunohistochemical staining.

Results: Neurite outgrowth in SH-SY5Y (human neuroblastoma cell line) cells treated with 16nM TPA showed longer, hard processes with growth cone, whereas T18 cells (where NCAM 180 is mainly expressed) had soft neurites with lots of small branching. Transfection of NCAM 140 to T18 cells convert neurite behaviour into SH-SY5Y cell like with harder and longer growth cone morphology. We also found out co-localisation of NCAM140 with PKC members in different cell lines by immunoprecipitation, immunohistochemistry and western blot techniques.

Conclusion: Our findings suggest that neural cell adhesion molecules associate with certain members of protein kinase C prominently on growth cone formation.

II003/AH

Use of Antilipemic Drugs in National Healthcare Group (NHG) Singapore

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Aim: To assess the use and cost of antilipemics in NHG.

Methods: Dispensing data for antilipemics for AH, NHGP, NUH and TTSH from January to September 2003 was extracted and analysed using WHO ATC/DDD methodology (version 2004).

Results: Statins accounted for 90% (88%-92%) whereas fibrates accounted for 10% (8%-12%) of total DDDs. Lovastatin and simvastatin predominated the antilipemics use (83% of total DDDs). Although the usage of atorvastatin and pravastatin was less than 7% of total DDDs, they accounted for almost 50% of the total cost for antilipemics. The total usage and cost of antilipemics were highest in NHGP. Atorvastatin and pravastatin were used more commonly in NUH and TTSH (22% and 17% respectively) and resulted in higher (2-3 times) average daily cost as compared to AH & NHGP (2% for both institutions). The analysis also revealed that NUH and NHGP have a higher average daily cost of bile acid sequestrants and nicotinic acid derivatives respectively, due to the use of more expensive agents in these groups of drugs.

Conclusion: Generally the utilisation profile of antilipemics was similar across the 4 institutions. Statins were the leading antilipemics followed by fibrates. Some institutions used more expensive antilipemics compared to the others. This has significant cost implication to patients as well as institutions, and warrants closer analysis of patterns of antilipemics' usage to identify the reasons and outcomes for the use of these agents and to identify measures that may be taken to rationalise the prescription of these agents.

II004/AH

Mapping Census of Population 2000 (Singapore) for Health Planning

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Aim: Healthcare utilisation is very much driven by demographics of the population of an area or region served. The Singapore Census is an essential resource for understanding the characteristics of the population and households. The NHG has developed an environment that combines the Census data and the geographic information system to aid its provision of healthcare services.

Methods: Data from the Census of Population 2000 by Ministry of Trade & Industry, Singapore was transformed spatially using the GIS. The distribution of demographic parameters (age, gender, ethnic group, housing type and income) was displayed geographically using the 55 DGP zones.

Results: Distribution of population: 58% of the total population was from 10 DGP zones; top 5 zones being Bedok, Tampines, Jurong West, Hougang and Woodlands. Age: Overall, the elderly population (65+ years) comprise 7.3% of the resident population. Highest proportion of elderly patients is from Outram, Kallang and Bukit Merah. Housing type: Overall, 85% of dwelling units were HDB apartments, private apartments being 6% and landed properties 7.5%. Smaller HDB flats (1-3 rooms) were more concentrated in Outram, Queenstown and Bukit Merah. Income: For resident working persons (15+ years), 27% earned less than $1500/mth. The areas with highest percentage earning <$1500/mth were Outram, Kallang, Rochor, Bukit Merah and the Downtown Core.

Conclusion: The spatial display of such demographic information geographically allows visualisation of areas of differing healthcare needs and is useful for national planning of appropriate allocation of resources and siting of new services where a gap is identified.

II005/AH

Biomedical Technology in Progress with Responsibility: An Ethical Legal Social Review of Human Stem Cell Research, Therapeutic and Reproductive Cloning in Singapore

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Aim: The cloning of human embryos for therapeutic research carries controversial ethical issues. This paper discusses human stem cell research, with a focus on clinical research compensation related injuries. An analytical and critical discussion is also undertaken on the earlier "Regulation of Biomedical Research Bill" and the current "The Human Cloning and other

Prohibited Practices Act 2004".

Methods: We reviewed the major literature on our subject and carried out a comparative study of the major countries' viewpoints, as well as discussed the recommendations by the Singapore Bioethics Advisory Committee (BAC), interjected with our arguments, current opinions and suggestions.

Results: Our study revealed diverse opinions on the ethical acceptability of human stem cell research among various countries. In Singapore, the BAC examines and makes recommendations on scientific, ethical, legal and social issues arising from biomedical research and development. The BAC's fundamental approach is to balance 2 ethical commitments – to advance human life by curing diseases and to protect human life. To formulate its recommendations, it relies on the twin guiding principles that the results of biotechnology must be 'just' and 'sustainable'.

Conclusion: Human stem cell research should be regulated and monitored in accordance with the relevant ethical considerations. There should be an international convention on bioethics and human stem cell research so that a consensus can be reached internationally with minimum standards and safeguards to be placed at national levels.

II006/AH

Singapore Children Emotional Distress Scale: Examination of Psychometric Properties and Identification of Clinical Cut-offs

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Aim: Recognising the lack of a brief parent-rated tool for screening children's emotional distress locally, Parker and colleagues (2001) developed a Singapore Children Emotional Distress Scale (SCEDS). Its psychometric properties (factor structure, construct validity, discriminant functions), function as a brief measure, and appropriate cut-offs were examined with a clinical sample in the present study.

Methods: Participants were 143 parents whose children were attending the Child Guidance Clinic. Of these children, 21 had stress-emotional disorders, 55 had disruptive behaviours, 40 were normal variants, and 27 had other diagnoses. The SCEDS and the Child Behavioural Checklist (CBCL, Achenbach & Edelbrock, 1983) were administered.

Results: A 2-factor structure was found for the SCEDS. Its internalising factor was found to correlate higher with the CBCL internalising factor compared to its correlation with the CBCL externalising factor, while its externalising factor correlated higher with the CBCL externalising factor compared to its correlation with the CBCL internalising factor, supporting its construct validity. Both the SCEDS internalising and externalising factors were found to discriminate between children with stress-emotional disorders, disruptive behaviours and children who were normal variants appropriately, supporting its discriminant functions. Compared to the CBCL internalising factor, the SCEDS internalising factor was found to be a stronger predictor of clinicians' diagnoses of stress-emotional disorders. Suggested cut-offs for the SCEDS internalising and externalising factors were 3 and 1 respectively.

Conclusion: The SCEDS internalising factor might function as a potential screening tool for children's emotional problems in Singapore.

II007/AH

The Impact of Neurocognition and Premorbid Adjustment on Psychosis in Singapore

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Aim: This study aims to examine the relationships between premorbid functioning and neurocognitive deficits in first-episode psychosis.

Methods: Patients with first-episode psychosis were assessed with validated clinical instruments, including a neurocognitive battery and measure of premorbid functioning. The Wisconsin Card Sort Test (WCST) and the Trail-Making Test (TMT) assessed executive functioning. The Continuous Performance Test (CPT-II) and Digit Span (WAIS-III) measured attention. The National Adult Reading Test (NART) and Ravens Progressive Matrices (RPM) were used to assess IQ functioning.

Results: Thirty Singaporean patients (mean age of 24.4 years, SD = 5.7) of whom 21 (61.8%) were males participated in the study. The average duration of untreated psychosis (DUP) reported was 21.7 months (SD = 32.3), median DUP was 11 months. Statistically significant associations were found between premorbid functioning scores and scores of CPT ($r = 0.427$, $P = 0.03$), TMT ($r = -0.458$, $P = 0.016$) and WCST ($r = -0.444$, $P = 0.029$). Multiple regression analyses further supported the findings.

Conclusion: Results support the neurodevelopmental hypothesis of schizophrenia, postulating that early insult to the brain may lead to neuro-cognitive deficits and poor premorbid functioning.

II008/AH

Effectiveness of Very Low Calorie Diet (VLCD) in Weight Reduction for Super Obese Patient Prior to Laparoscopic Gastric Banding

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Aim: 1) To reduce the weight of a super obese in-patient with BMI 90 prior to Laparoscopic Gastric Banding thereby reducing mortality risk; 2) to improve co-morbidities i.e. OSA with Type 2 respiratory failure and osteoarthritis; 3) to improve overall quality of life.

Methods: The patient was prescribed VLCD (*Optifast) for 12 weeks prior to laparoscopic gastric banding. The risks involved with taking VLCD were informed and consent was taken. Laboratory investigations included blood glucose, renal panel, uric acid, liver function tests, ECG, urine ketones and blood gases. Diet: Patient was educated on the use of VLCD. 3 packets of Optifast were given daily in accordance to meal times (providing 456 kcal, 51.9 g protein, 6.9 g fats). Lunch and dinner included 100 g vegetables with no dressings or sauces. Patient was encouraged to take 2 to 3 L of water daily. No other food was allowed. Progress: Patient was photographed weekly over the 11 weeks and weighed daily to monitor the rate of weight reduction. Relevant laboratory investigations were repeated according to protocol.

Results: After 11 weeks of VLCD treatment, the patient lost 50.3 kg. Improvement in blood gases and patient mobility were noted. Oxygen could be weaned off.

Conclusion: The Very Low Calorie Diet was an effective method of weight reduction for this super obese patient. Motivation and close monitoring by doctors and dieticians were mandatory during treatment. Patient's co-morbidities and overall quality of life improved after having lost 50.3 kg.

II009/AH

Nutritionally-variant *Escherichia coli* from Blood Culture

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Aim: *Escherichia coli* (*E. coli*) belong to the family Enterobacteriaceae, members of which are biochemically active and grow readily on ordinary media. In this hospital 11.2% of total isolates from blood culture between January and April 2004 were *E. coli*. An isolate of Gram-negative bacilli, which grew reluctantly on ordinary media, was obtained from the anaerobic blood culture of a septic 70-year-old patient. After overnight incubation at 35ºC supplemented with 5% CO_2, this isolate produced pinpoint ß-haemolytic colonies, with enhanced growth in anaerobic atmosphere. Direct Gram stain from the blood culture bottle and of the colonies showed Gram-negative bacilli. There was no growth on direct antimicrobial susceptibility tests done on Mueller-Hinton (MH) Agar and the direct conventional biochemical identification tests were non-reactive except for lysine decarboxylation test, which was positive. Oxidase test was negative. No conclusive identification was obtained using various commercial identification kits. Initial suspicion was that this isolate is fastidious in its requirements for growth and that it

belongs to the HACEK group of organisms.

Methods: This isolate was inoculated in nutrient broth and incubated for 4 hours at 35ºC supplemented with 5% CO_2 to initiate its growth. A fresh set of biochemical identification and antimicrobial susceptibility tests was done using the broth in which growth had been initiated in a capnophilic atmosphere.

Results: The biochemical identification tests yielded a conclusive identification. Growth on MH Agar was satisfactory and antimicrobial susceptibility test results interpretable.

Conclusion: The isolate was identified as a microaerophilic, extended spectrum ß-lactamase producing *E. coli*.

II010/AH
Incidence of Acute Transfusion Reactions, Untoward and "Near Miss" Events During Transfusion in an Acute Care Hospital

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Aim: A retrospective study was done to classify all acute transfusion reactions, untoward and "near miss" events during transfusion in an acute care hospital.

Methods: Acute transfusion reactions, untoward and "near miss" events reported between year 2001 and 2003 were consolidated. Acute transfusion reactions were categorised based on the standards of the American Association of Blood Banks criteria.

Results: 229 acute transfusion reactions were reported for 67 819 units of blood and blood components transfused. 50% (115/229) of the reactions were allergic reactions, 30% (69/229) were Febrile Non-Haemolytic Transfusion Reactions (FNHTR), 18% (41/229) were non-specific reactions which cannot be classified as FNHTR as patients had a rise in temperature of less than 1°C, and 2% (4/229) were anaphylactic reaction. Twenty-seven "near miss" and 2 untoward events (blood administration to wrong patient) were reported. Of the 27 "near-miss" events, 67% (18/27) of the events were due to errors during specimen collections, 11% (3/27) were due to incorrect blood component issued owing to incorrect product collection form from the ward and 4% (1/27) were due to incorrect methods of blood product transportation. Blood bank errors including clerical error in results entry and transcription, and issuances of incorrect blood components were responsible for 11% (3/27) and 7% (2/27), respectively.

Conclusion: There was no acute haemolytic transfusion reaction, transfusion associated sepsis or transfusion related acute lung injury reported. Near misses occurring during transfusion process continued to be a significant problem. These were mainly due to human errors. Strict adherence to the Standard Operating Procedure is mandatory to avoid these errors.

II011/AH
Cytospin Evaluation in Urine Cytology: Are Two Slides Better than One?

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Aim: Preparation of duplicate slides for urine cytology analysis is a common practice. In this study, we assess the feasibility of using a more economic single cytospin preparation.

Methods: Duplicate cytospin preparations of 120 urine samples received over a 6-month period in 2003 were reviewed. The 240 slides were randomised and assessed blind by 2 independent observers. Parameters evaluated included smear quality (cellularity/cell distribution), satisfactory rate, sensitivity and specificity. For each sample pair, the less informative of the 2 samples was used for comparison. Histology reports for 26 cases were available.

Results: Thirty-one cases showed discrepancies in diagnosis: 14 unsatisfactory single slides yielded diagnostic material in the respective duplicate slides, 16 negative single samples revealed malignant or atypical diagnoses in the second slide and 1 atypical case showed malignant cells in the second sample. The sensitivity, positive predictive values (PPV) and negative predictive values (NPV) of dual cytospin preparations were 94.7%, 94.7% and 83.3% respectively, superior to the corresponding single slide preparation (66.7%, 92.3% and 45.5% respectively). The specificity was similar with both methods (83.3%).

Conclusion: Using dual cytospin slide preparations significantly improves specimen adequacy, sensitivity, PPV and NPV of urine cytology samples. These advantages more than offset the slightly reduced cost saved in single slide preparation.

II012/AH
Different Approaches to Improve Smoking Cessation Attempts Among Smokers

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Aim: Smoking continues to be a preventable cause of death with smokers deluded to the harmful effects of tobacco, due to the physical and psychological pleasures derived. The process of quitting begins when the precontemplating smoker (not interested to quit) becomes a contemplator of quitting. The low quit rate in Singapore is chiefly due to smokers seeking advice only when they become contemplators. Therefore, our team seeks to improve smoking cessation attempts by encouraging more precontemplators to quit. This is done through implementing group counselling and piloting inpatient smoking cessation counselling (in 3 wards), in addition to our existing outpatient counselling work.

Methods: Group counselling was conducted in institutions that recruited our services, whilst patients noted to be smokers on admission to AH were given inpatient counselling. Smokers who refused counselling were excluded from data collection. Smoking cessation counselling involved obtaining the smoking history, assessing the level of addiction, providing advice and medication (where appropriate). Smokers were followed up for at least 2 months.

Results: Seventy-seven smokers were counselled over 12 months (46 group and inpatient, 31 outpatient cases). The number of smokers counselled was 1.5 times greater than the previous year (28 outpatient cases). The number of smokers who attempted to stop smoking was 4 times greater, with 29 cases (38%) from outpatient, group and inpatient counselling compared with 6 cases (7.8%) from outpatient counselling alone (based on the previous year).

Conclusion: Group and inpatient smoking cessation counselling are effective approaches to improve smoking cessation attempts.

II013/AH
Reducing Medication Administration Documentation Errors and Discharge Prescriptions Transcribing Errors in the In-patient Setting – A Multi-disciplinary Approach

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Aim: Nurses administer medications to in-patients and document the activity by signing the relevant columns of the in-patient medication record (IMR). Doctors ink out discharge prescriptions based on medications ordered in the IMR. Medication administration documentation errors by nurses can lead to miscommunication and inappropriate medication regimen being delivered. Transcription errors from the IMR to discharge prescriptions can likewise lead to wrong medication regimen being dispensed to patients upon discharge. The aims of the study are to reduce medication administration documentation errors and discharge prescription transcribing errors to improve patient safety.

Methods: A new IMR was designed based on a survey and suggestions of all staff (medical, nursing and pharmacy) involved in the use of the IMR. The new IMR was put on trial in 3 wards of mixed disciplines and gender.

Results: Regular, daily audits of the IMR and data from pharmacist-physician interventions over ambiguous discharge prescriptions that did not match with the IMR showed a mean of 4.2 documentation errors and 3.2 ambiguous discharge prescriptions per ward monthly. During the trial, staff was briefed on the use of the IMR and audit data collected one week after commencement. Both kinds of errors were reduced to nil in the trial wards.

Conclusion: A multi-disciplinary involvement in the revamp of the IMR is associated with a reduction in the 2 kinds of medication errors. Further audits and review of processes are required to verify its potential.

II014/AH

Physiotherapy Management of Kartegener's Syndrome – A Case Report

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Aim: Kartegener's syndrome is an autosomal recessive hereditary condition, of unknown aetiology, comprising of a triad of transposition of the viscera, abnormal frontal sinuses producing sinusitis, bronchiectasis and immotility of the cilia leading to dyspnoea, productive cough and recurrent pneumonia. The usual aim of physiotherapy was to improve mucociliary clearance.

Methods: We present a patient with Kartegener's syndrome, with heart on the right side. He had repeated chest infections with increasing dyspnoea and exercise intolerance. The patient, a 57-year-old man (body mass index 18.6) on long-term oxygen therapy (2 L/min), was admitted to the hospital for assessment of rehabilitation potential. On admission, peak oxygen consumption (VO_2) was 751 mL/min (41% predicted) on symptom-limited ergometry testing. Six-minute walk distance (6MWD) was 138 m. Chronic Respiratory Questionnaire (CRQ) and Medical Outcomes Trust Short-Form (SF)-36 were administered.

Results: The patient underwent aerobic exercise training (cycling and treadmill walking), extremities strengthening and general thoracic wall flexibility exercises. He completed 18 sessions in the 2 weeks' hospitalisation. His peak VO_2 was 831 mL/min (46% predicted; +10% improvement) and 6MWD 160 m (+16%). His CRQ score improved from 55 to 73 (+33%) and SF-36 from 119 to 205 (+72%). Improvement in CRQ was recorded in all 4 dimensions. Improvement in SF-36 was primarily in physical functioning, general health, vitality and mental health domains.

Conclusion: In conclusion, this case report highlights the role of physiotherapy in improving exercise tolerance in a patient with Kartegener's syndrome, rather than focussing on mucociliary clearance.

II015/AH

Quality Correlates with 6-Minute Walk Distance in Patients Undergoing Pulmonary Rehabilitation

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Aim: The aim of this study was to correlate aspects of quality of life with functional performance in patients undergoing pulmonary rehabilitation.

Methods: Fifty-five patients of mean age 63.2 years (SD 11.5) with chronic respiratory diseases (chronic obstructive pulmonary disease, 56%; bronchiectasis, 9%; asthma, 9%; primary emphysema, 6%; others, 20%) participated in 18 sessions of pulmonary rehabilitation over 6 weeks. The programme included aerobic exercise training and upper/lower extremity strengthening. Chronic Respiratory Questionnaire (CRQ) and 6-minute walk distance (6MWD) testing were administered before and after the 6-week rehabilitation programme.

Results: Both CRQ total scores and 6MWD were significantly correlated (start of the programme, r = 0.40, P = 0.004; end of the programme, r = 0.62, P <0.001).

Conclusion: Both dyspnoea scores predicted almost 31% of the variance in 6MWD. With post-rehabilitation dyspnoea score accounting improvement in functional performance seeming to correlate with overall improvement in quality of life, dyspnoea appears to be the most important predictor of functional performance.

II016/AH

The Assertive Community Treatment Programme in the Institute of Mental Health, Singapore

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Aim: The Assertive Community Treatment (ACT) Programme, launched on 1 Nov 03, provides community-based psychosocial rehabilitation for people with disabling severe mental illness, with the aim of improving their social and occupational functioning. Through this poster, we hope to increase the awareness about this programme, and to report the demographic profile of our patients.

Methods: Forty-one patients, with severe mental illness and a significant period of hospitalisation in the preceding year, were selected from 52 referrals received from IMH psychiatrists over a 7-month period from 1 Nov 03 to 30 May 04. For each patient, the ACT team (comprising a psychiatrist, medical officer, medical social work, occupational therapist and 4 community psychiatric nurses) has planned an individualised psychosocial rehabilitation programme, which covers areas such as training in activities of daily living and psycho-education. We report the profile of our patients below.

Results: Most patients are in the age group 40-50 (34.1%) with a mean age of 42. Majority of them (87.8 %) are Chinese. The number of male and female patients are roughly equal. Except for 2 patients with schizoaffective disorder and bipolar disorder, the other patients have schizophrenia. The average number of hospitalisation-days in the preceding year is 85 (range, 12-365), and their duration of illness ranges from 1 to 43 years.

Conclusion: The ACT Programme is the first local home-based psychosocial rehabilitation programme. The patients' outcome will be analysed after the first year, including the rates of recidivism and re-hospitalisation-days compared to the previous year.

II017/AH

Validity of 'Standard' Dose-prescription Parameters for Palliative Spinal-irradiation – An Evaluation on Asian Patients

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Aim: Spinal-metastasis presents often with debilitating backache and even neurological complications. As treatment usually involves palliative spinal-irradiation, 'standard' radiotherapy-prescription parameters should be validated for application on Asian patients.

Methods: Fifty radiotherapy-prescriptions for 46 patients treated at a single institution were reviewed with assessment of irradiated spinal-volumes and construction of dose-volume histograms (DVH) using CT-planning. Spinal depths from posterior skin to posterior spinal-canal (Point A), anterior spinal-canal (Point B) and anterior vertebral border (Point C) were recorded at 8 levels: thoracic (T2,5,8,11), lumbar (L1,3,5) and sacral (S2).

Results: A direct posterior-anterior (PA) portal with 6 MV photons was used for all but one treatment (10 MV). Average dose, fractions and reference depth were 19.7 Gy (8-30 Gy, SD 5.7), 5.5 (1-10 fractions, SD 2.5) and 5.1 cm (4.6-7 cm, SD 0.4) respectively. There was marked variation in spinal-depth at different levels. The average and maximum for point C were 8.7 cm (L1) and 10 cm (L5) respectively, 0.9 to 1.9 cm less than findings in a Canadian-based study. There was no difference in the average spinal-depths between males and females. However, lumbar-spinal depth at point C is deeper by 0.6 to 0.9 cm in males at L1 (P = 0.01), L3 (P = 0.03) and L5 (P = 0.06), contradicting findings of the Canadian-based study. The mean-volume of irradiated-spine was 442 cc encompassing 6 vertebrae on average. Volume per vertebra-body (VVB) for T-spine was 49 cc in contrast with 110 cc for L-spine (P <0.001). Despite this, radiation dose-range of 68.5% to 117.7% within irradiated spine remained consistent between levels averaging 97.7% of the prescribed dose.

Conclusion: Three-dimensional CT-planning is useful in correlating spinal-anatomy with radiation dose-distribution for validation and optimisation of radiotherapy techniques.

II018/AH

Investigating Gender Differences in Following Severe Traumatic Brain Injury

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Aim: The objective of this study was to investigate if there are possible gender

differences in relation to outcome following closed severe Traumatic Brain Injury (TBI) in a predominantly Asian population.

Methods: A retrospective study was conducted using our prospectively maintained severe TBI database. Four hundred and eighty patients with severe head injury admitted into our neurosurgical intensive care were studied. All patients were managed according to the "Guidelines to the management of severe traumatic brain injury". A dichotomised Glasgow Outcome Score was used to measure the outcome of patients 6 months post injury.

Results: There were 100 females and 380 males. The median age of female patients was significantly higher than male patients. There was a slight but not significantly higher overall case fatality rate and proportion of patients who made a poor recovery (at 6 months post injury) in females. Crude and adjusted odds ratios revealed that only increasing age, presence of pupil abnormality and a lower GCS score were significantly predictive of death and poor outcome.

Conclusion: Both odd ratios indicate that mortality and poor outcome did not differ significantly between men and women.

II019/AH

PKC-b Expression is Highly Associated with Patient Survival in Diffuse Large B-Cell Lymphoma and Glioblastoma: Use of Public Microarray Datasets and its Implication in Clinical Drug Development for Enzastaurin HCL®

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Aim: PKC-b is an isoform of protein kinase C, a family of serine-threonine kinases involved in a wide range of signal transduction pathways such as cell proliferation, cell differentiation and apoptosis. PKC-b has been shown to be one of the most prominently over-expressed genes in fatal/refractory DLBCL patients. Its role in tumour development and angiogenesis makes it a potential therapeutic target in cancer. Enzastaurin HCL is a potent and selective inhibitor of PKC-b. The compound exhibited antiangiogenic activity in a preclinical animal model and is well tolerated in toxicology studies.

Methods: In this study we analysed public gene expression profiling data on different types of cancer to investigate if PKC-b gene expression is correlated with patient survival.

Results: Our analysis has demonstrated that high PKC-b expression has a strong correlation with poor patient outcome in DLBCL, confirming the observations published in previous publications on these datasets. We have also linked PKC-b expression with clinical prognostic markers like the International Prognostic Index for DLBCL. A similar demonstration of a correlation between PKC-b expression and poor survival was observed in glioblastomas. Similar analysis of MCL and other solid tumours like non-small cell lung cancer did not yield similar associations between PKC-b and survival.

Conclusion: The analysis of public gene expression data and its correlation with patient survival suggests that inhibiting PKC-b in patients with DLBCL and glioblastomas may provide a clinical benefit.

II020/CPIP

Improvement of Turnaround Time for Mammography

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Aim: In November 2002, we aimed to reduce the turnaround time (TAT) for a diagnostic mammographic examination to within 1 hour for at least 90% of patients by 6 months. A preliminary survey showed that 67.1% of patients spent more than an hour within our department. We wanted to minimise waiting time for these highly anxious women.

Methods: The team used CPIP methodology. A flowchart for mammography, a cause-and-effect analysis of the long waiting time and a pareto chart were constructed. Main problems included wrong arrival time of patient (26%), long billing time (25%), many interruptions during the procedure (16%), film viewing area too far from mammography room (12%) and many extra views (11%). Interventions included reminders to patients to come on time, streamline billing and payment, relocation of film viewing area, closer supervision and CME activities for junior staff and diversion of phone enquires. We went through several PDSA cycles.

Results: The project was interrupted in March 2003 due to the SARS outbreak. By June 2003, the target of 90% was achieved. Periodic surveys showed an improvement maintained at above 90%. A run chart of the results is displayed in the mammography and film viewing rooms to remind, encourage and motivate the staff. The mean TAT was reduced from 61.9 minutes to 51 minutes. This savings of 10.9 minutes per patient translates into an additional 2 cases per day and additional revenue for the hospital.

Conclusion: Improvement of services for the benefit of our patients is possible with the active participation of stakeholders.

II021/CPIP

Reduction of Peripheral IV Phlebitis in a Surgical Unit

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Aim: The use of peripheral intravenous device (PIVD) is an integral part of patient care. Insertion of a PIVD predisposes the patient to numerous local and systemic hazards, of which phlebitis is one. In May 2002, the point prevalence phlebitis rate of a surgical unit (comprising 3 wards) in TTSH was 26.3%. A CPIP was undertaken in December 2002 to reduce the phlebitis rate by 50% in 3 months.

Methods: A multidisciplinary team was formed to reduce the phlebitis rate. A literature review was done to explore the causes of phlebitis. This was followed by team brainstorming, healthcare workers multi-voting and an audit to identify the leading causes of phlebitis in the unit under study. Interventions targetted the frequent causes identified, namely the speed of administration of medication, flushing of PIVD after medication administration, IV bolus against recommendations and incorrect dilution of drugs. An antibiotics information chart and a list of drugs not for bolus administration were compiled and all categories of staff were educated on the findings of the audit, as well as the above recommendations.

Results: The point prevalence phlebitis rates were 14.6% in January 2003 (a reduction by nearly 50%) and nil in January 2004.

Conclusion: Staff awareness is important in the reduction of phlebitis. Resources on correct drug preparation and administration should be made readily available for reference. It is also important to conduct regular in-service education to reinforce recommendations and correct practices.

II022/CPIP

To Reduce the Inpatient Fall Rate

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Aim: The inpatients' fall rate was increasing in the year 2002. Thus, a clinical project improvement team was formed in October 2002 to reduce the fall rate.

Methods: The team analysed and collated data. The root causes were patients climbing out of bed, losing balance and falling due to their medical condition. The team utilised 3 Plan, Do Study, Act (PDSA) cycles and piloted various solutions before hospital-wide implementation. The Fall Risk Assessment, Fall Prevention Action Plan and Fall Prevention Protocol were revised. Patients who had undergone surgery, invasive procedure or treatment, had been transferred from another department or had a significant change in condition were reassessed for the risk profile. Green wrist tags and highlighted "FALL PREVENTION" tags placed on the information panel were introduced for easy identification of high-risk patients. Bed pan and urinal rounds at periods of high fall rate of noon, 2200 hours, 0200 hours and 0600 hours and hourly nursing rounds were introduced. Carers or relatives were encouraged to accompany the patients. Nurses were instructed to ensure that all fall prevention interventions were observed before taking over care of patients during shift change. Three road shows and 8 fall prevention workshops were conducted to increase awareness and compliance among nurses. A fall prevention committee was formed and auditors were nominated to conduct monthly cross ward audit for compliance. The strategy for spreading includes

training for new staff.

Results: The fall rate decreased by 15%.

Conclusion: Increased vigilance, bed pan and urinal rounds and accurate identification of high-risk patients will help to reduce inpatients' fall rate.

II023/CPIP
Reducing Blood Specimen Rejection by Laboratory

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Aim: TTSH laboratory rejects an average of more than 900 specimens per month, 2/3 of these are not rectifiable (e.g. specimen clotted) while the other 1/3 is rectifiable (e.g. wrong request form). This translates to at least 21 patients having to suffer a second venepuncture unnecessarily, not to mention the extra work for clerks, nurses, doctors and laboratory staff. TTSH's specimen rejection rate ranges from 0.26% (clinic with high volume) to 2.67% (ward with high volume) with a mean of 1.43%. The international standard for Haematology is 0.45% rejection out of 7.8 million specimens and for Biochemistry 0.35% rejection out of 10.7 million specimens. The team aimed to reduce laboratory rejection rate of level 8 blood specimens to less than 1% within 6 months.

Methods: We implemented the following interventions: 1) distributed a Tube Guide and Chart with details on handling of tubes and specimens for common and specialty specific tests to all clinical areas; 2) conducted customised training for level 8 doctors, phlebotomists, nurses and clerks.

Results: The specimen rejection rate of level 8 improved from 2.1% (July 2003) to 1.4% (December 2003), then to 1.2% (March 2004). The consumables and staff time saved translated into a tangible cost savings of $3924 per year for level 8. The intangible saving of patient's "precious" blood, minimising specimen re-draw and avoiding delay in results are also equally important.

Conclusion: Regular training and an easy to use tube guide and chart can result in cost savings and improved patient satisfaction. In addition, wider availability of phlebotomists will further improve specimen rejection rate. This approach can be easily spread to all locations.

II024/CPIP
Improvement of INR Target Process Capability for Warfarinised Patients in the RAI Department

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Aim: The INR target process capability (TPC) of our department was running at an average of 58% over the 1-year period of 2002. The aim of this project is to improve the INR TPC for warfarinised patients in our department to 90% in 6 months.

Methods: Using the Clinical Process Improvement Programme (CPIP) methodology, a committee consisting of 2 nurse clinicians, a doctor, a pharmacist, a counter staff and a patient brainstormed the causes for poor INR TPC amongst our patients. The 3 top reasons were (1) poor knowledge of patients, (2) inadequate feedback about patient's understanding and (3) excessive tampering of warfarin dosage. 2 process changes were initiated: (1) patient education was done using standard materials, guided by a checklist, with re-enforcement of knowledge using a pre/post education assessment; (2) doctors were asked to titrate INR using a standard protocol. The project was implementation in the whole department from August 2003 to January 2004.

Results: The INR TPC of patients 12 months before implementation of the process changes was averaging at 58%. After the implementation, the average TPC was 83% over a 5-month period. There was no hospitalisation of patients due to under or over-anticoagulation during the implementation of the new processes.

Conclusion: Significant improvement was achieved for the INR TPC of warfarinised patients in our department using the CPIP methodology. Continuous measurement of INR TPC is currently undertaken and new PDSA cycles are being looked into to improve other areas that affect the INR TPC.

II025/MPC
A New Pressure Half Constant to Estimate Prosthetic Mitral Valve Area

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Aim: The pressure halftime (PHT) method is widely used to estimate mitral valve area (MVA) in patients with mitral stenosis. However, it is believed to be inaccurate in patients with prosthetic mitral valve. We wish to identify a new constant that will accurately estimate the prosthetic MVA using the PHT method.

Methods: We measured the MVA using PHT in 55 patients with a bileaflet prosthetic mitral valve. This was compared with MVA obtained using continuity equation (MVA-CE). The first 20 patients served as the derivation cohort. A new PHT constant was obtained using the formula (MVA-CE) x (PHT). The accuracy of the new PHT constant was then validated in a second cohort of 35 studies. Bland-Altman plots were used to compare the difference in means of the 2 tests.

Results: A new PHT constant of 190 was derived from the first 20 patients. Using the new constant in the subsequent 35 studies, we found a good agreement between MVA-PHT and MVA-CE across a wide range of mean MVAs, with near equal distribution above and below zero and most values (97%) falling within 2 Standard Deviations (SD) of the difference in mean MVA.

Conclusion: MVA when estimated using the new PHT constant of 190 is in good agreement with MVA estimated by CE. This new PHT constant should be used to estimate the MVA of a bileaflet mitral prosthesis.

II026/MPC
The Difference in Length of Stay in Isolation among Suspect TB Patients Admitted to TTSH and CDC2 after Introduction of Weekend AFB Smears

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Aim: To study the difference in length of stay (LOS) in isolation for suspect TB patients admitted to TTSH and CDC 2, before and after 17 January 2004, when weekend AFB smears were introduced.

Methods: Isolated patients admitted from November 2003 to March 2004 were included. We used the multivariate linear regression model to study the difference in length of stay in isolation (LOSI) between those admitted before and after 17 January 2004. LOSI was transformed and analysed on the natural logarithmic scale. Data was analysed in Stata (v7.0).

Results: 343 admissions were analysed. The mean LOSI was 5.0 (± 5.0) days, with a median of 4 days (IQR: 3-6 days). Mean age was 62.4 ± 20.0 years, with most of them, 231 (67.5%) being male. Eighty-six (25%) were admitted on a weekend. The overall group of patients have no significant difference in LOSI before and after 17 January 2004 but suspect TB patients admitted on weekends after 17 January stayed on average 1 day less.

Conclusion: TB suspect patients admitted to TTSH and CDC2 wards on weekends after 17 January 2004 stayed on average 1 day less than those admitted before the date in spite of the fact that there was no overall change in length of stay amongst cases admitted to isolation rooms over the period.

II027/MPC
Role of Nuclear Imaging in Sports Medicine

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Aim: Nuclear imaging using single-photon-emission tomography (SPECT) and 3-phase bone scan is a well-established, highly effective diagnostic tool. Although many conditions can be diagnosed with a good history and physical examination, specialised imaging techniques may be needed to confirm or exclude a serious disorder. The diagnosis of stress-related musculoskeletal disorders still constitute the most popular application of radio-nuclide imaging in sports medicine. These conditions include stress fractures, avulsion fractures, periostitis ("shin splint"), myositis ossificans, rhabdomyolysis, bony contusion and avascular necrosis.

Methods: It involved a retrospective study of related cases performed in the

Nuclear Medicine Laboratory, Department of Diagnostic Imaging, NUH.

Results: We present a poster review of common sports-related musculoskeletal disorders that were diagnosed on Nuclear Medicine scans.

Conclusion: Bone scintigraphy is a highly sensitive, widely available and relatively inexpensive method for diagnosing many stress-related skeletal injuries. The greatest strength of the radio-nuclide scan relates to its ability to provide early physiologic information about the involved organ system and to evaluate multiple areas in a single, relatively rapid examination. Improved imaging techniques such as SPECT and 3-phase scanning, together with the recognition of scintigraphic patterns, have improved scintigraphy's diagnostic specificity for many sports-related injuries.

II028/MPC
Multidetector CT Pulmonary Angiography in Clinically Suspected Pulmonary Embolism

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Aim: To describe our experience with multi-detector CT pulmonary angiography in patients suspected of having pulmonary embolism (PE).

Methods: Retrospective analysis of data of patients who underwent CT pulmonary angiography (CTPA) for clinically suspected pulmonary embolism was done. The study included unselected patients who underwent CTPA during a 36-month period. A total of 524 patients underwent CTPA. The follow up period was taken till the last date of visit to the hospital by the patient at the time of data collection or death. The follow up period ranged from 1 to 903 days (mean 197.3 days). D-Dimer, Doppler tests and ventilation-perfusion scans were done in 334, 155 and 13 patients, respectively.

Results: CTPA was positive for PE in 107 patients and negative in 416 patients. There was one false negative scan. In one patient, the study was indeterminate. A total of 146 patients received anticoagulation treatment. Among these, 5 patients were treated with anticoagulation due to high clinical suspicion. At the end of the follow up period, there were 121 deaths (10 due to PE). Among the negative CTPA patients, there was no PE or PE related mortality during follow up. The overall sensitivity and specificity of CTPA in detection of PE was 99.07% and 98.6%, respectively. Alternate diagnosis could be demonstrated in nearly 80% of patients with negative CTPA.

Conclusion: Multi-detector CTPA has good sensitivity and specificity for diagnosis of PE. In majority of patients who do not have PE, it demonstrates alternate findings for final diagnosis.

II029/MPC
High Resolution Computed Tomography of the Lung Detection of Air Trapping Due to Small Airways Disease Using Ultrafast Dynamic Scans During Forced Expiration

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Aim: The use of high resolution computed tomography (HRCT) in the diagnosis of small airways disease has been well documented. Inspiratory and expiratory HRCT of the lungs can identify affected airways that are conducting to areas of air trapping. In patients with mild disease, lung function tests may be negative or equivocal. In these instances, HRCT of the lungs, with additional dynamic ultrafast scans during forced expiration can be of use to identify subtle areas of air trapping.

Methods: We reviewed HRCT studies done at our institution over a period of 6 months. Those scans with additional dynamic expiratory scans were reviewed to identify areas of air trapping. Correlation of the HRCT findings with clinical diagnosis and lung function tests was made.

Results: In patients who underwent additional dynamic expiratory scans during HRCT study, the finding of air trapping was useful in the diagnosis of small airways disease, especially where lung function tests were normal or equivocal. The additional scans were helpful in identifying air trapping, compared with simple post-expiratory HRCT.

Conclusion: Air trapping as an indicator of small airways disease can be identified and quantified using HRCT. Ultrafast dynamic expiratory HRCT can be a useful adjunct in identifying subtle air trapping in patients with small airways disease.

II030/MPC
Gender Differences in Hippocampal Volume in Patients with Psychosis

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Aim: To examine the hippocampal volume in minimally treated patients with first-episode psychosis as compared to normal controls and to look at the correlation between the hippocampal volume and clinical data.

Methods: From contiguous 1.5-mm coronal magnetic resonance images, the hippocampal formation was divided into posterior and anterior segments, and the anterior hippocampal formation was separated from the amygdala. Volumes of bilateral, posterior and anterior hippocampal formation were computed in 27 patients and 16 healthy controls matched for age, gender and handedness.

Results: Compared to controls, patients had statistically significant smaller mean right hippocampal and right anterior hippocampal volumes. There was a significant gender-by-diagnosis-by hemisphere interaction for hippocampal volume. Hippocampal volume on the right was significantly smaller in female patients than in female controls. Male patients and male controls demonstrated no significant difference in hippocampal volume. There was no significant correlation between hippocampal volume and duration of untreated psychosis as well as psychopathology as measured by the Positive and Negative Scale for Schizophrenia (PANSS).

Conclusion: These findings suggest that there may be a unique interaction between gender and the disease processes that lead to reductions in hippocampal volume in patients with schizophrenia.

II031/MPC
Management of Acute Pulmonary Oedema with High Dose Intravenous Glyceryl Trinitrate

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Aim: A starting dose of intravenous (IV) glyceryl trinitrate (GTN) at 10 to 20 µg/min is recommended for management of acute fluid overload, i.e. acute pulmonary oedema (APO). This study describes the use of high dose (>20 µg/min) IV GTN in APO management in the Emergency Department (ED).

Methods: The ED computer system was searched from September 2003 to April 2004 for patients with APO. Eleven patients received high dose IV GTN and a retrospective chart review was done for them.

Results: There were 5 men and 6 women, with a mean age of 69.7 years. The mean systolic blood pressure (SBP) on arrival was 204.9 mmHg, heart rate was 107.7/min, SaO2 was 94.2%. The mean dose of frusemide was 123.7 mg and morphine was 3.5 mg, with 3 patients not given morphine. The mean starting dose of IV GTN was 21.4 µg/min, with 7 patients given an initial 1 mg bolus. The mean SBP on leaving ED was 151.8 mmHg. The mean length of stay in ED was 1.45 hours. Two patients required intubation in ED and 1 patient was intubated subsequently in CCU. Seven were admitted to the general ward and 4 to CCU. Except for one patient diagnosed to have pneumonia, ED diagnoses of APO matched discharge diagnoses in the other patients: one was due to a renal cause while the rest had cardiac causes. All patients were discharged alive with mean length of stay of 5.1 days.

Conclusion: High starting dose of IV GTN appeared safe and efficacious in APO management.

II032/MPC
Elderly in an Emergency Department

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Aim: The study aims to examine the use of emergency service by the elderly in an emergency department (ED) in Singapore and its outcomes.

Methods: Patients aged 65 years and above who attended the emergency department at National University Hospital from 18 February 2002 to 31 March 2002 were retrospectively studied. Data was collected from NUH EMD and HIDS records.

Results: The elderly (aged 65 years and above) represented 1270 (15.6%) out of the total 8216 ED attendances for all adults (aged 16 years and above) from 18 February 2002 to 31 March 2002. The mean age was 75.3 years old with ages ranging from 65 to 107 years. 35% of them arrived via ambulance; 1169 (92%) were emergencies with non-traumatic causes forming the majority (85%). 72.3% of the patients were admitted.

Conclusion: Though the elderly formed only 15% of the total ED attendances, it constituted 34.7% of total ED admissions. Understanding the use of emergency services by the elderly and its outcome is important as the elderly population has their own distinct physical, physiological and social needs. As the elderly population increases, the information will aid us in the evaluation and disposition of the elderly.

II033/MPC
The ED Heartache

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Aim: The emergency management of patients with suspected ACS has been the subject of numerous studies. An ideal, safe, yet efficient approach for managing chest pain patients presenting to the emergency department has yet to be found. The aim of this study was to describe the current state of management of chest pain patients at a tertiary teaching hospital.

Methods: Retrospective audit: Patient admission and diagnosis data were retrieved from the hospital medical information services (MIS) over a period of 6 months from January 2003 to June 2003. Chest pain patients were identified from ICD codes and their dispositions reviewed.

Results: Of 1427 chest pain patients identified during the study period, 13% were diagnosed to have acute myocardial infarction (AMI) at the ED and the other 87% diagnosed to have angina or chest pain. 56% of the patients were admitted, while 40% were discharged. The remainder were either transferred or discharged against advice. Of patients admitted to the wards, 39% were discharged with a diagnosis of "chest pain", and 21% had non cardiac diagnoses. Another 12% were found to have AMI after admission. 26% patients had a length of stay of 1 day, and another 26% stayed 2 days.

Conclusion: This study has identified some areas for improvement and forms a historical database for future studies in the continuing search for a safe yet efficient approach to the management of patients with chest pain.

II034/MPC
Are Homicide Offenders Psychiatrically Different from Offenders of Other Violent Crimes?

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Aim: The association between mental illness and violent offenders is an important issue. Several studies have found an increased prevalence of psychiatric illness among offenders. This study seeks to update the psychiatric community on individuals charged with murder or voluntarily causing hurt (VCH) from 1997 to 2001, the last major psychiatric homicide study here being in 1985.

Methods: Fifty-three homicide offenders and 80 controls had psychiatric diagnosis(es). Demographic data, diagnoses, offence and victim profiles were compared, with analyses done using SPSS.

Results: Demographically, the 2 groups were similar. A positive history of violence was significantly less likely in homicide offenders, as was schizophrenia. Alcohol and substance abuse or dependence and depression were reported with greater frequency in the homicide group. Of those with psychotic disorders, persecutory delusions were found more often with the homicide offender group. The use of dual methods of sharp trauma and blunt trauma was employed significantly more by the homicide offenders.

Conclusion: While not totally preventable, reduction of the rate of homicide in the country may be achievable via the reduction of controllable factors found to be linked to the aetiology of murder. In this study, use of alcohol and other illicit substances is frequently found to be in association with homicide. In Singapore, campaigns to dissuade alcohol abuse have not been as prominent as other health prevention programmes, such as those on smoking cessation. The authorities are urged to strongly consider implementing such programmes.

II035/MPC
Migration Psychosis and Homicide in Singapore

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Aim: Studies have found increased incidence of psychotic and mood disorders in migrant populations. Further, a higher percentage of immigrants has been found in schizophrenic murderers compared with crime-free schizophrenics. This study aims to determine if "migration psychosis" is valid in Singapore homicides. International literature also addresses under-utilisation of psychiatric services by some migrant populations.

Methods: Foreigner and local homicide offenders from 1997 to 2001 were compared using SPSS with regard to demographic data, psychiatric diagnoses, offence and victim profiles.

Results: Thirty homicide offenders were foreigners. The proportion of foreigner homicide offenders was significantly higher than the proportion of foreigners in the population. Foreigners who commit homicide also appear to suffer from the more serious psychiatric illnesses of mood and psychotic disorders compared with the locals, but yet are less likely to be known to have had a history of violence or a past forensic history. The foreigner homicide offenders were more likely to be new to psychiatric services compared with the local offenders and thus here, be presenting to a psychiatrist only after they have killed another person.

Conclusion: Foreigners appear to be at higher risk of developing a serious mental illness, not being treated for it and then committing an act as tragic as murder. A simple programme for educating employers and newly recruited foreign workers may curb such happenings. Basic orientation to the spectrum of healthcare resources available, including psychiatric services, would alleviate some of the stresses of being in a strange land.

II036/MPC
Epidemiology of Patients with Sepsis Admitted to a Medical Intensive Care Unit in Singapore Over 3 Months

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Aim: Critically ill patients with sepsis are known to have high mortality rates. However, there is no published data on the epidemiology of these patients presenting to the Medical Intensive Care Unit (MICU) in Singapore.

Methods: This prospective, observational study investigates the clinical presentation and outcome of patients with sepsis who were admitted to the MICU of a local university-affiliated hospital over 3 months (March to May 2004).

Results: Over the period of study, there were 133 new cases admitted to the MICU, of which 41 (30.8%) were patients with sepsis. Nine of them were female (22%). The mean age ± SD was 61.2 ± 14.5 years (median: 63; range: 30-82). Only 4 patients were admitted directly from the Emergency Department. The most common primary source of infection was from the lungs (82.9%). Three patients were admitted with hospital acquired infections. The mean APACHE II score was 30.6 ± 7.5 (median 30; range 17 to 48). The average ICU length of stay was 8.6 ± 7.7 days (median 6; range 1 to 32) and the ICU mortality rate was 41.5%.

Conclusion: The ICU mortality rate of our study population was 41.5%. This is within the range of other published epidemiological studies of critically ill patients with sepsis in the ICU.

II037/MPC
Outcomes of Patients Referred to a Specialised Falls and Balance Clinic

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Aim: To determine the outcomes of patients referred to a specialised Falls and Balance Clinic and factors affecting these outcomes.

Methods: Retrospective chart review of 193 patients (mean age ± standard deviation: 78.1 years ± 7.6 years) referred to a specialised Falls and Balance Clinic over a 1-year period. Demographic data and clinical parameters were systematically extracted for analysis.

Results: Seventy-one patients (36.8%) remained in the Falls and Balance Clinic programme for a minimum of 6 months. Seventy-eight patients (40.4%) were discharged from the clinic prior to completing the 6 months programme. Forty patients (20.7%) defaulted follow-up and 4 patients (2.1%) died during the 6-month follow-up period. Of the group of patients who remained in the programme for 6 months, 70.0% reported that they had benefited from the interventions in terms of increased confidence in mobility. 47.2% and 64.0% of patients had improvement in the timed 'Up and Go' test and Berg Balance Scale score respectively. On multivariate analysis, compliance to physical therapy was significantly associated with subjective improvement (P = 0.021).

Conclusion: The findings indicate that the majority of patients who adhered to a specialised Falls and Balance Clinic programme do benefit in terms of increased confidence in mobility. The beneficial effect of the programme is dependent on compliance to physical therapy. This highlights the need to educate patients and their carers on the importance of adhering to a falls prevention programme.

II038/MPC
The Use of a Behavioural Pain Rating Scale in Nursing Home Residents with Cognitive Impairment

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Aim: To assess the construct validity and the diagnostic accuracy of the Pain Assessment in Advance Dementia (PAINAD) scale in assessing pain.

Methods: Design: Case control design. Participants: Ninety-nine nursing home residents with moderately severe cognitive impairment. Measurements: Residents were asked to recall their average pain over 1 week. Nurses scored the PAINAD scale, a behavioural pain scale, by recalling the type of pain behaviours the resident exhibited in that same week. Residents were also assessed with the Cornell's scale of depression in dementia (CSDD) and the Abbreviated Mental Test (AMT) score.

Results: There was a significant correlation between the PAINAD score with the SRPS (spearman's rho [sr] = 0.363) and with the CSDD score (sr = 0.350), but not with the AMT score. Patients with and without significant depressive behaviours (CSDD score of 8 or more) had statistically different PAINAD scores but not SRPS. There was no statistical difference in PAINAD scores and SRPS among patients with decreasing AMT scores. For residents without depression, the following scores had a modest relationship with the SRPS (0 = no pain; 1-2 = mild pain; 3 and above = moderate pain and above) (sr = 0.526). For residents with depression, the following scores had a low relationship (0-1 = no pain, 2-3 = mild pain; 4 and above = moderate pain and above) (sr = 0.332).

Conclusion: The PAINAD has a modest relationship with the SRPS in nursing home residents without depression, but a low relationship in residents with depression.

II039/MPC
Caregiving in Dementia

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Aim: Caregiving in dementia is a demanding task and the quality of life of the patient is affected much by the quality of care he receives. As such, understanding the caregiver is important as his knowledge, beliefs and attitudes towards dementia and caregiving would impact the quality of care he provides.

Methods: Using a standard questionnaire, we studied caregivers with respect to their approach towards certain problems in caregiving, their perception of how dementia has affected the relationship between the patient and themselves and administered the Short Zarit Burden Interview to assess caregiver burden.

Results: Out of more than 50 respondents in this ongoing study, more than 50% showed high burden scores and a similar proportion had difficulty finding meaning or deriving pleasure in caregiving. Caregivers also expressed difficulty in empathising with the patient and some even felt that the patient often behaved in a difficult way and irritated their caregivers on purpose.

Conclusion: The results suggest the need to help caregivers better understand the person with dementia. Person centered approaches to caregiving should be emphasised and finally, we need to help caregivers find meaning in caregiving and this could translate to lower caregiver burden.

II040/MPC
Concern for Family Members is a Strong Motivator for Genetic Testing in Patients at Risk for Hereditary Cancer Syndromes

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Aim: Cancer genetics clinics that evaluate patients for hereditary cancer syndromes are now part of routine oncology services. We prospectively studied the acceptance rate of genetic testing in high-risk cancer patients as there is limited data on this for adult-onset diseases in Asia.

Methods: High-risk cancer patients with at least 10% probability of carrying a genetic mutation for hereditary cancer syndrome were surveyed immediately after genetic counselling.

Results: Thirty-nine high-risk cancer patients, age ranging from 26 to 72 (median 37), participated, of which 85% and 15% were suspected to have hereditary breast or hereditary colorectal cancer, respectively. 79% were Chinese and 21% Malay; 92% were female, 77% were married, and 72% had children. 65% indicated interest to undergo genetic testing, 15% were uncertain and 20% declined. The major motivator was to gain information to help family members (50%), while the major reasons against were worries that testing would cause stress/anxiety/depression (13%), concerns about employability or insurability (13%), and perception that testing cannot prevent another cancer or recurrence (10%). Seventeen of the 26 patients (65%) who indicated initial interest in testing were actually tested. 3/26 decided against testing, and 6/26 needed more time to consider. 2/6 patients who initially said "no" to testing were subsequently tested.

Conclusion: Interest and actual uptake in genetic testing for hereditary cancer syndromes among Singaporean high-risk cancer patients is high, and the major motivator is to gain information to help family members.

II041/MPC
Clearance of Anticancer Drug Docetaxel is Strongly Inhibited by the Antifungal Agent Ketoconazole, Which is a CYP3A Inhibitor

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Aim: We previously reported CYP3A phenotyping with midazolam predicted interindividual variations in docetaxel pharmacokinetics (PK) [J Clin Oncol 2002:20:3683]. This study investigated if CYP3A inhibition by ketoconazole could reduce interindividual variability in docetaxel clearance, thereby allowing safe dosage standardisation, and whether CYP3A phenotyping could predict this inhibition.

Methods: A dose escalation study was conducted using docetaxel infusion q3w in combination with per oral ketoconazole 2 days before and after docetaxel. The pharmacokinetics of docetaxel and IV midazolam 1 mg in each dosage group were studied using non-compartmental analysis.

Results: Twenty-seven patients with tumours refractory to standard chemotherapy were enrolled at docetaxel doses of 10 (2 patients), 20 (6 patients), 25 (7 patients), 30 (6 patients) mg/m^2 and 50 mg (6 patients) standard dose; 2 were unevaluable. Ketoconazole did not reduce docetaxel clearance variability across and within dose levels. Docetaxel clearance was 5.88 ± 2.69, 9.83 ± 4.64, 8.07 ± 2.78 and 8.21 ± 2.86 L/h/m^2 at doses of 20, 25, 30 mg/m^2 and 50 mg respectively. Mean midazolam clearance was 4.69 ± 2.1 L/h, 5.3-fold slower with ketoconazole, compared to our previous data. Mean docetaxel clearance was 2-fold slower, 7.73 ± 3.66 L/h/m^2. Midazolam clearance (r = 0.29, P = 0.18) did not correlate with docetaxel clearance.

Conclusion: Ketoconazole strongly inhibits midazolam and docetaxel

clearances by unequal extent and does not reduce variability for docetaxel. This has strong implications for drug interactions and possible application in cost savings for docetaxel treatment.

II042/MPC
A Comparison of Tuberculin Skin Testing Using 1 TU RT 23 PPD Versus 2 TU RT 23 PPD in Healthy TB Contacts

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Aim: In Singapore, historically 1 unit RT 23 PPD (equivalent to 2.5 TU) has been employed for tuberculin skin test (TST). In the US and several other countries, 5 TU is used (equivalent to 2 unit RT 23 PPD). This makes it difficult to compare the rates of TST positivity with other countries. We did a prospective randomised study to assess the difference in TST reading for 1 versus 2 units RT 23 PPD.

Methods: Healthy contacts of TB patients who came for routine TST were consecutively enrolled after informed consent. 2 TSTs were performed simultaneously in each subject using 1 and 2 units RT 23 PPD (Serum Statens Institute, SSI). Each dose was randomly assigned in a blinded manner to the right or left forearm and read at 48-72 hours by experienced nurses who were blinded to the assignment.

Results: A total of 79 subjects (71 of whom had a history of past BCG vaccination) were enrolled. The overall mean for reaction size for 1 TU was 7.15 mm and for 2 TU 8.13 mm. The overall mean difference was 1.96 mm, and this difference was significant (P <0.001).

Conclusion: The mean difference of 1.96 mm should be considered when comparing rates of TST positivity between countries that use different doses of tuberculin. This difference may have less impact in countries with high rates of BCG coverage and smear positive cases.

II043/MPC
Predictors of Lower Limb Amputations in Patients with Diabetes Mellitus

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Aim: To identify the predictors of amputation in patients with diabetes mellitus.

Methods: A retrospective study was planned on 140 patients with diabetes mellitus (DM) who underwent lower limb amputations in a general hospital in Singapore, between 2001 and 2003. We report results of the first 19 patients. Case records with procedure coding for amputations were retrieved for the predictors of lower limb amputations. Parameters analysed were HBA1C, lipid status and blood pressure on admission. Duration of DM, precipitating factors for the lower limb ulcers, location of the ulcers and outcome following amputations were also recorded.

Results: Ten were males and 9 females. Thirteen patients (68%) underwent "Below Knee Amputation" and 9 had Ray's amputation (32%). All patients had infection of lower limb as the precipitating factor for amputation. Six had ulcers in the toes, 7 had ulcers in metatarsal region and 4 in the heel. Hypertension and hyperlipidemia were the most common risk factors, involving 63%. Pre-existent atherosclerotic disease was also an important predictor. Poor glycemic control was seen in 63%. Nine patients had Ankle/Brachial index <0.9 (47%). Eleven out of 12 (92%) patients had neuropathy as evidenced by sensory deficit and/or absent ankle jerk. Nine patients were either smokers or ex-smokers. Outcome of the amputations was that 10 patients were ambulant while 3 became bedbound, 4 became wheelchairbound while 1 patient died.

Conclusion: Hypertension, hyperlipidaemia, peripheral artery disease and neuropathy were significant predictors of amputation in a diabetic cohort.

II044/MPC
Outcome from Molecular Adsorbents Recirculating System (MARS™) Liver Dialysis Following Drug-induced Liver Failure

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Aim: Fulminant liver failure from drug ingestion is associated with a high mortality, and the introduction of liver transplantation has improved the mortality significantly if done in a timely fashion. Recently, MARS™ liver dialysis has been introduced as a support for liver failure with varying results. We review our experience with drug-induced liver failure and the impact of MARS™ liver dialysis on the outcome, in a setting where cadaveric liver transplantation is rarely available.

Methods: A total of 13 patients were treated, and 40 sessions of MARS™ liver dialysis were conducted in the intensive care unit. The majority of cases were due to herbal medicine toxicity.

Results: Total bilirubin and conjugated bilirubin were significantly reduced, with no change in unconjugated or delta bilirubin. All patients satisfied the criteria for urgent liver transplantation with an average MELD score of 35. Only one patient received a liver transplantation from a live donor (right lobe). Overall mortality was 85%. Median time to death from the start of MARS™ was 8 days.

Conclusion: MARS™ liver dialysis in a setting without timely liver transplantation is associated with a poor outcome. It does, however, provide a window of time for consideration of living donors in the setting of limited cadaveric donors.

II045/MPC
Tilt Table and Autonomic Testing: Review of Indications for Referrals and Results

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Aim: Tilt table and autonomic testing can be a useful supplementary test for differentiating the cause of loss of consciousness, orthostatic symptoms and some non-specific symptoms. We set out to establish the indications for referrals to our tertiary care tilt table and autonomic testing and the rate of corresponding abnormal results.

Methods: Retrospective review of all indications and results of patients referred for tilt table (blood pressure responses) and autonomic testing (heart rate variability) in the year 2002 at the Department of Medicine, Neurology Diagnostic Laboratory, National University Hospital, Singapore.

Results: Eighty-nine patients were tested (51 females, average age 49; range 17-86 yrs). The 4 major causes for referral and the corresponding number of abnormal results respectively were non-specific giddiness (n = 42; 20); single episode of loss of consciousness (n = 33; 10); recurrent loss of consciousness (n = 6; 4); orthostatic hypotension (n = 5; 4).

Conclusion: The most common indication for referral for tilt table and autonomic testing was for non-specific giddiness followed by a single episode of loss of consciousness. Referrals for recurrent loss of consciousness and orthostatic hypotension though much less common showed very high rates of abnormal test results. In our setting, screening tests seem useful in helping to establish or exclude a blood pressure regulatory or autonomic cause of symptoms.

II046/MPC
Blood Pressure Control in Patients with Chronic Renal Failure

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Aim: The JNC-VII recommends target blood pressure of <130/80 mmHg for patients with diabetes and chronic renal failure (CRF). Recent studies suggest that blood pressure control in patients with CRF was still suboptimal even in clinics that have specialised in the treatment of hypertension.

Methods: We conducted a retrospective analysis of blood pressure control in patients with CRF who were followed at Tan Tock Seng Hospital between January 2004 and May 2004. Patients were included in the analysis if they had serum creatinine between 110 and 400 umol/L and they had been followed up in our outpatient renal clinics for at least 3 months. A total of 190 patients (age 22-87, mean 67) were included in this analysis. 61% of the patients were diabetic. Blood pressure measurement during office visit, the most recent serum creatinine, and current antihypertensive agents were retrieved from the patient's medical records.

Results: 31.6% and 46.3% of the patients were able to achieve target systolic blood pressure (SBP) of <130 mmHg and diastolic blood pressure (DBP) of

<80 mmHg, respectively. On average, patients took 2.48 antihypertensive drugs. The most common prescribed antihypertensive drug was ACE-inhibitor and angiotensin receptor blocker (69.5%), followed by diuretics (64.2%), beta blocker (53.2%), and calcium channel blocker (36.8%).

Conclusion: In patients with CRF, achieving target SBP is more difficult than achieving target DBP. Less than half of the patients with CRF were able to achieve target blood pressure of <130/80 mmHg.

II047/MPC
Use of Angiotensin Converting Enzyme Inhibitors (ACE-I)/ Angiotensin Receptor Blockers (ARB) in Patients with Diabetic Nephropathy and/or Proteinuria

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Aim: Studies have shown beneficial effects of ACE-I/ARB in retarding the progression of DM nephropathy, as well as in the reduction of proteinuria.

Methods: We conducted a retrospective analysis of patients who were followed up at the outpatient renal clinics of Tan Tock Seng Hospital between January and May 2004. Patients were included if they had diabetes with a serum creatinine of between 100 and 400 umol/L, and/or if there was proteinuria (secondary to diabetes or otherwise) of more than 300 mg/day with a serum creatinine of less than 400 umol/L. The patients must have been followed up for at least 3 months. The current medications were retrieved from the patients' medical records.

Results: Of the 115 diabetic patients who had a serum creatinine of 100 to 400 umol/L, 69.6% were prescribed an ACE-I or ARB, 4.3% were prescribed both ACE-I and ARB. Of the 174 proteinuric patients who had a serum creatinine of less than 400 umol/L, 78.2% were prescribed an ACE-I or ARB and 5.2% were prescribed both ACE-I and ARB. Reasons for not prescribing ACE-I/ARB were mainly hyperkalaemia, significant worsening of creatinine after initiation of ACE-I/ARB or pre-end stage renal disease.

Conclusion: Most of the patients with diabetic nephropathy and/or proteinuria in our renal clinics were prescribed an ACE-I or ARB, as these medications have been shown to be beneficial in retarding the progression of diabetic nephropathy, as well as for its anti-proteinuric effects.

II048/MPC
The Prevalence of Malnutrition in Inpatients in the National University Hospital

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Aim: Malnutrition adversely affects patients' outcomes, including hospital stay. It is also potentially reversible. This study aimed to determine the prevalence of malnutrition in a population of patients admitted to hospital.

Methods: All patients admitted to a single ward in August 2003 (totalling 85) were studied. Mean age (± SD): 55.9 ± 17.6 years; height (± SD): 1.58 ± 0.09 metres; weight (± SD): 60.5 ± 12.8 kg. 35% were males. 51.8% were Chinese, 28.2% Malays and 17.6% Indian. 53% were diabetics and 43% had end-stage renal failure (ESRF). The patients' diagnosis and co-morbidities were noted. The following indices of nutrition were: body mass index (BMI) calculated using the formula: dry weight (kg)/height x height (m^2). BMI >25: overweight and well-nourished. A revised Subjective Global Assessment (SGA) 7-point scale was used: SGA of 1-2 is severely malnourished; SGA of 3-5 is moderately malnourished; SGA ≥6 is well nourished. Fifty-five patients had their SGA and BMI assessed.

Results: Using the BMI, 5 patients (5.9%) were underweight and malnourished, and with SGA, 26 patients (47.3%) were malnourished. When compared with age, gender, ethnic group, diabetes and ESRF, only diabetes and ESRF were positively associated with a higher likelihood of malnutrition.

Conclusion: This study reveals that malnutrition is a major problem in inpatients. Malnutrition seems to be more frequently associated with diabetes as well as ESRF. BMI seems to be a less sensitive indicator of malnutrition.

II049/MPC
White Coat Hypertension in the Elderly

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Aim: The benefit of treating hypertension in the elderly has been well established. However, treating one with the white coat response can be detrimental, especially in this group already at risk for falls. This retrospective study was conducted to determine the prevalence of white coat response in elderly subjects and to emphasise the importance of correct diagnosis to reduce overtreatment.

Methods: Twenty-four hour ambulatory blood pressure (ABP) records of elderly patients 65 years old and above, performed from 2001 to 2003 in the general medicine clinic, were reviewed. The clinical records were retrieved, identifying the clinical blood pressure reading, the underlying clinical history and antihypertensive regimen used when the test was requested.

Results: Of the 286 24h ABP records reviewed, 45 elderly patients were identified, of which only 39 clinical records were available. The mean age of the group was 72, with 49% male and 87% Chinese. 87% had underlying hypertension, with 44% demonstrating white coat response. In the remaining who were not previously diagnosed with hypertension, 60% proved to have white coat hypertension. Within the white coat responders, the mean clinic BP was 177/85 mmHg (± 18/16), the mean ABP 129/65 mmHg (± 7/9) and the mean difference 50 mm Hg (± 19).

Conclusion: The elderly patient commonly exhibits a white coat response even with an underlying history of hypertension. Decision to start or escalate antihypertensive medication should be made with caution. Use of 24h ABP monitoring and a "start low, go slow" strategy should be considered in clinical management.

II050/MPC
Review of Patients with Carbon Monoxide Poisoning Admitted to Tan Tock Seng Hospital

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Aim: Carbon monoxide poisoning (COP) is one of the leading causes of death from poisoning worldwide. There is no published study of COP in Singapore so far.

Methods: All COP cases admitted to Tan Tock Seng Hospital over 5 years from 1999 to 2003 were retrospectively reviewed. The diagnosis was based on a history of exposure to smoke and elevated levels of carboxyhaemoglobin (COHb). The causes, demographic data, clinical presentations, management and complications were analysed.

Results: There were 12 patients with COP. Their average age was 38.9 (± 11.8) years, with male to female ratio of 3:1. Accidental COP (58.3%) was commoner than intentional (41.7%). The commonest cause of accidental COP was smoke inhalation from a faulty vehicle. Gas stove was the most preferred source for intentional poisoning. Presenting features were headache (83.3%), confusion (83.3%), coma (12.7%) and agitation (8.3%). The mean COHb level on admission was 35.9% (± 13.55). All the patients had their COHb levels normalised within 24 hours of admission. All were treated with 100% oxygen. Two (16.7%) required intubation and another was treated with hyperbaric oxygen. Acute complications were globus pallidus infarction (16.6%), adult respiratory distress syndrome (8.3%) and myocardial ischaemia (8.3%). Most of the patients (91.7%) were discharged well from the hospital. One patient developed early parkinsonism after a follow up of 2 years. There was no death.

Conclusion: COP is relatively uncommon in Singapore. It has a low rate of short- and long-term complications.

II051/MPC
Waist Circumference – A Significant Predictor of Metabolic Syndrome in Obesity

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Aim: The study is aimed at retrospectively analysing the predictors of metabolic syndrome (MS) in a non-diabetic obese cohort in an Asian population.

Methods: Retrospective analysis of biochemical and clinical parameters was conducted on 401 consecutive personnel of an organisation referred to the

weight management clinic of a general hospital in Singapore. All subjects were male. Clinical parameters analysed were age, BMI, waist circumference (WC), blood pressure and waist-hip ratio (WHR). Biochemical parameters measured after overnight fast included lipids and glucose. Metabolic syndrome was defined according to National Cholesterol Education Program Adult Treatment Panel (NCEP ATP III) guidelines. Statistical analyses were performed by χ^2 and logistic regression with significant *P* value <0.05 using SPSS 12.0.

Results: According to ATP III criteria, 10% of the study population had MS. Logistic regression analysis showed that WC (OR 1.093; 1.028-1.162) and age (OR 1.084; 1.034-1.133) were the best predictors of MS while BMI and WHR were not significant predictors. An increase in 1 unit in WC resulted in 9.3% increased risk of MS (95% CI, 2.8-16.2) and increase in 1 year of age resulted in increased risk of 7.2% (95% CI, 3.4-11.1%).

Conclusion: WC is a better predictor of MS compared to BMI and WHR. Increasing degree of WC and higher age are associated with higher risk of MS in obesity.

II052/MPC

Linitis Plastica: A Case Series, Review and the Role of Endoscopic Ultrasound

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Aim: Linitis plastica is an aggressive infiltrating tumour consisting of high-grade tumour cells accompanied by a marked desmoplastic reaction that results in a rigid stomach resembling a leather bottle. Typical barium and conventional endoscopic finding are present in less than half the cases. We describe the use of endoscopic ultrasound (EUS) to augment the diagnostic accuracy of this often-missed malignancy.

Methods: We report 5 cases of linitis plastica from August 2002 to April 2004 where the use of EUS aided greatly in the management of the patient.

Results: All 5 patients had endoscopic finding suspicious but not diagnostic of linitis plastica, and gastric biopsy was only positive in 1 case. All 5 patients had typical sonographic finding of linitis plastica, helping us to arrive at the correct diagnosis. One patient had MALToma of the stomach and the use of EUS was helpful in monitoring the progress of the tumour and planning subsequent management.

Conclusion: Endoscopic ultrasound appears to be a useful adjunct in the diagnosis of linitis plastica.

II053/MPC

Serum Albumin is Positively Associated with Better Quality of Life in Patients with Metastatic Solid Organ Cancer

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Aim: Serum albumin is a marker of nutrition that is associated with increased morbidity and mortality among the elderly and terminally ill. The relationship between serum albumin and quality of life (QOL) has not been studied among patients with metastatic solid-organ cancer.

Methods: We performed a prospective cross-sectional cohort study among patients with metastatic solid-organ cancer admitted to The Cancer Institute, Singapore, from February to April 2004. QOL was assessed using the European Organisation for Research and Treatment of Cancer QLQ-C30 questionnaire. Serum albumin measured on admission were compared with the function scales (physical, emotional, cognitive, social, role and global health), symptom scales (fatigue, pain, nausea/vomiting), and 6 single items assessing symptoms and the financial impact of the disease.

Results: Eighty-seven patients recruited were of mean age 60 years (range 29-90) who had a primary gastrointestinal tract (stomach and colon) (37%), lung (24%) and breast (13%) cancers. The mean serum albumin was 33 mmol/dL (range 16-50). The physical and role function scales were significantly lower in patients with low albumin. Physical role and cognitive function scales, and improving dyspnoea and fatigue were significantly associated with a rise in serum albumin. Hypoalbuminaemia (<40 mmol/dL) was found to be more common in older patients and did not differ according to the primary site of malignancy.

Conclusion: Serum albumin is positively associated with better quality of life among patients with advanced cancer who may benefit from early nutritional intervention.

II054/MPC

Incidence of Pneumothorax in Critically Ill Patients with Severe Acute Respiratory Syndrome (SARS)

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Aim: During the SARS outbreak in Singapore in 2003, Tan Tock Seng Hospital (TTSH) was designated as the national SARS hospital. 96.6% (199/206) of all probable SARS patients in Singapore were treated in our hospital. In this study, we analyse the incidence of pneumothorax in our SARS patients and whether its presence had any impact on morbidity and mortality.

Methods: Observational cohort study involving retrospective analysis of demographic, laboratory and radiological data. The patients were recruited from 1 March 2003 to 13 July 2003, when the last SARS patient was discharged from TTSH.

Results: 23% (46/206) of the probable SARS patients required ICU care. Pneumothorax was observed in 17.3% (8/46) of these ICU patients. Of these 8 patients with pneumothorax, 7 (87.5%) were on ventilatory support and 1 had spontaneous pneumothorax. The length of mechanical ventilation was significantly prolonged in patients who developed pneumothorax (median of 25 days compared to 15 days in those without pneumothorax). Mortality was 87.5% in patients who developed pneumothorax, compared to 12.5 % in those without pneumothorax. Incidence of other complications in these SARS ICU patients were secondary pneumonia (52.2%), septicaemia (34.9%), deep vein thrombosis (23.9%) and acute renal failure (19.6%).

Conclusion: Pneumothorax was the fifth commonest complication in our SARS ICU patients. Patients with pneumothorax had significantly increased days of mechanical ventilation and mortality.

II055/MPC

Serum Bilirubin is the Only Independent Variable Affecting Mortality on Liver Transplant Waiting List

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Aim: The MELD score has been shown to be the best predictor of short-term mortality on the liver transplant waiting list in the USA. We wanted to identify the factors affecting mortality on the liver transplant waiting list in Singapore, including the MELD score.

Methods: All patients who were listed on the liver transplant waiting list in Singapore from January 1997 to December 2003 were analysed. MELD was calculated according to the United Network for Organ Sharing formula. Univariate analysis was performed to identify factors affecting mortality on the waiting list and multivariate analysis by logistic regression. Categorical and continuous variables were compared with Chi square and Mann-Whitney U tests.

Results: There were 48 patients in the study. We found that on univariate analysis, bilirubin, INR, MELD score and Child's score significantly influenced mortality on the waiting list. However, on multivariate analysis, bilirubin was the only independent prognostic indicator of mortality on the waiting list (LR = 1.97 [95% CI: 1.08-3.61]). INR was found to be significantly correlated to bilirubin with Pearson's correlation R = 0.63; *P* <0.001.

Conclusion: Bilirubin is the only independent factor affecting mortality on the liver transplant waiting list.

II056/MPC

Validity and Reliability of the PDQ-39 and the PDQ-8 in English-speaking Parkinson's Disease Patients in Singapore

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Aim: The purpose of the study was to assess the validity and reliability of the Parkinson's Disease Health Related Quality of Life (HRQoL) Questionnaire (PDQ-39, UK English version, 39-point questionnaire) as well as its briefer version (the PDQ-8, 8-point questionnaire) among patients with Parkinson's Disease (PD) in Singapore.

Methods: Eighty-eight patients recruited from movement disorder clinics or patient support groups completed the PDQ-39 and EQ-5D, a generic HRQoL questionnaire (consisting of a classifier for 5 health dimensions and visual analogue scale) previously validated for use in Singapore.

Results: PDQ-39 items showed good convergent and discriminant validity. Construct validation against the EQ-5D showed strong correlation between these scales as hypothesised (Spearman's rho: 0.53 to 0.71, $P < 0.001$).

Conclusion: We conclude that the PDQ-39 and PDQ-8 are valid and reliable disease-specific HRQoL instruments for PD in Singapore.

II057/MPC

Appendectomy in Childhood Immunosuppression: In for a Rough Ride?

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Aim: To identify clinical features which suggest poor prognosis in appendectomies performed in children with immunosuppressed states.

Methods: A retrospective review of demographic data, clinical presentation, radiological and laboratory investigations, operative and histological findings and postoperative outcome was conducted on consecutive immunosuppressed children who underwent appendectomy between January 2002 and February 2004.

Results: Ten consecutive patients with various forms of immunosuppression, median age 9.5 years, who underwent appendectomy for suspected appendicitis were reviewed. The underlying primary diseases were acute lymphoblastic leukaemia in 5, acute myeloid leukaemia in 2, aplastic anaemia in 2 and rhabdoid tumour of brain in 1. Except those with aplastic anaemia, all were receiving chemotherapy. Eight patients had neutropenia. The median duration of symptoms prior to diagnosis was 4 days (range, 1-7 days), with similar duration of intravenous antibiotics prior to surgery. All had CT scans (8 positive for appendicitis) done. Five had additional radiological findings of enterocolitis. Intraoperatively, there were 4 perforated appendicitis, 5 acute appendicitis and 1 normal appendix, confirmed on histology. There were 4 mortalities; all were neutropenic. Three of the 4 patients who were septicaemic preoperatively died in the immediate postoperative period. All had stormy postoperative courses with multiorgan failure as end-point. The fourth death was unrelated to surgery.

Conclusion: Diagnosis of appendicitis is a challenge in this group of patients due to equivocal early clinical and radiological signs, differential diagnosis of neutropenic colitis and prior antibiotic therapy. Aggressive surgical management is suggested once appendicitis is diagnosed. Neutropenia and preoperative septicaemia are possible indicators of poor prognosis.

II058/MPC

Osteosarcoma in a Paediatric and Young Adult Population in Singapore National University Hospital Experience

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Aim: More than 80% of children with osteosarcoma (OS) in the world relapse and 35% to 40% die within the first 2 years after diagnosis. There is limited information on survival regarding these tumours in the region of Southeast Asia. We thus attempted to investigate the incidence, the treatment modalities used and the outcome of OS in Singapore.

Methods: A comprehensive list of patients with OS treated at the Children's Medical Institute of the National University Hospital, Singapore between January 1997 and June 2004 was generated. During the study interval, patients received neoadjuvant chemotherapy followed by definitive surgery, consisting of either limb-salvage or amputation and adjuvant chemotherapy. Chemotherapy included combination of cisplatin and doxorubicin as per the European Osteosarcoma InterGroup (EOI).

Results: Of the 17 patients with OS, 7 patients presented with metastatic OS (lungs, n = 5; others, n = 2). The median age of diagnosis of OS was 11.6 years (range, 6.4-14.9). Median survival after diagnosis of OS was 1.4 years (range, 0.1-9.3). The approximate 2- and 5-year overall survival rates were 40% and 29%, respectively. At last follow-up, median 1.4 years, 7 of the 17 patients (40%) were dead of disease and 5 (29 %) patients were alive with no evidence of disease. All except the 2 alive were treated on the EOI regimen.

Conclusion: Survival from OS in Singapore is poor compared to the rest of the world. The rarity and complexity of OS makes it crucial for patients diagnosed with this tumour to seek a specialised multi-disciplinary team approach. Further improvements in the chemotherapy regimen employed are necessitated.

II059/MPC

Rapid Diagnosis of Urinary Tract Infections in the Elderly

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Aim: Urinary tract infections (UTIs) in elderly patients are exceedingly common and account for substantial morbidity and economic costs. These infections can occur in the community or may be acquired in nursing homes and hospitals. UTIs may also lead to complications. Therefore, early detection with appropriate intervention can potentially reduce the morbidity and mortality associated with urinary tract infection.

Methods: At Tan Tock Seng Hospital, urine cultures constitute 24% of total cultures sent to the laboratory. Common aetiological agents encountered in these samples are *Escherichia coli*, *Klebsiella* species, yeast and *Enterococcus* species. These organisms make up 72% of total urine isolates. Conventionally, the turnaround time for positive urine cultures is 2 days. Since 2002, the turnaround time has been reduced to 1 day, using the morphology and rapid tests for the identification of the majority of isolates.

Results: Some of the tests used for the identification of lactose-fermenting Gram-negative bacilli include spot indole, rapid MUG, motility, ornithine and lysine decarboxylases, pyrrolidonyl peptidase and oxidative-fermentative glucose utilisation. Antibiotic susceptibility tests are set up in the morning and read after 6 hours of incubaton. Most positive results could be sent out 1 day after receipt of specimen.

Conclusion: Providing results after 1 day allows the clinician to initiate specific therapy earlier, alleviating the patients' symptoms and probably reducing complications. Patients may also be switched to suitable oral options allowing earlier discharge, thus contributing to decreasing healthcare costs in this group of patients.

II060/MPC

The Problem with the Classification of Auras in Temporal Lobe Epilepsy

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Aim: One main feature of temporal lobe epilepsy (TLE) is the reports of auras by patients. An aura is the brief subjective experience that frequently precedes the onset of clinical seizures. Taylor and Lochery (1987) opined that the more complex an aura is, for example déjà vu aura, the more it could be subjected to systematic simplification, especially by the recording clinician. Past studies have shown that auras have been classified according to some a

priori invented rule of thumb as constructed by clinicians or researchers. This study attempted to verify if the objective expectations of clinicians and researchers, as represented in aura classifications, matched patients' subjective reports of auras.

Methods: The pre-surgical aura descriptions of 114 patients with TLE were recorded and categorised in an aura classification, the Aura Tree, which was constructed by a team of experts belonging to the Raymond-Way Neuropsychiatry Unit, National Hospital for Neurology and Neurosurgery, and has been shown to have face validity. It classified auras into 2 big categories, Experiential and Physical, which are further divided into sub-categories. The aura data was coded into 'yes' or 'no' responses and categorised according to the Aura Tree classification.

Results: Factor analysis could not be performed as poor correlations between aura sensations meant that distinct groups of auras could not be statistically derived.

Conclusion: It was suggested that the expectations of clinicians and researchers might not match the subjective experiences of patients.

II061/MPC

The Relationship Between Auras and Psychopathology Following Temporal Lobectomy

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Aim: The impact of temporal lobectomy on the relationship between auras and psychopathology in temporal lobe epilepsy patients has not been well explored. Most studies have been cross-sectional in their examination. The aim of this study was to investigate the short-term as well as long-term effects on this relationship.

Methods: 137 patients participated in Time 1 (1 year follow-up), whereas 61 (44.5%) of these participated in Time 2 (3 years after Time 1). Pre-surgical and short-term follow-up information was collected via patients' case-notes. A questionnaire was constructed to collect long-term follow-up information, as based on patients' subjective experiences in the preceding year. Psychopathology was defined by mood and anxiety disorders.

Results: Chi-squared tests of independence and Fisher's Exact test were used to examine distributions of aura sensations, various combinations of auras, and no aura groups, against mood and anxiety disorders. Short-term outcome was analysed by comparing pre-surgical and Time 1 data, whereas long-term outcome was analysed by comparing pre-surgical and Time 2 data. Results revealed that the chance of patients with pre-surgical aura(s) experiencing mood and anxiety disorders at Time 1 and Time 2 was not significantly different from the chance of patients without pre-surgical aura(s).

Conclusion: This study observed trends that not only were different from past studies, but were difficult to analyse and interpret. It may suggest that the number of auras experienced may not be associated with the experiencing of psychopathology. The results could be attributed to a number of methodological concerns.

II062/MPC

Impact of a Quality Improvement Program on Radiation Oncologist Performance: Evaluation of the Cancer Institute (TCI) Model Integrating Continuing Medical Education, Clinical Quality Assurance and International Revalidation Activities

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Aim: Clinical quality improvement (QI) may result from quality assurance (QA), continuing medical education (CME) or revalidation/recertification activities. Our aim was to evaluate whether the refined TCI-Singapore QI model integrating CME, QA and international revalidation activities resulted in improved radiation oncologist (RO) practice.

Methods: The QI program incorporated QA (random case audit, simulation audit, reminders), CME (protocols, audit feedback/discussion, directed/ad hoc tutorials) and revalidation (the random audit targeted RANZCR revalidation-audit criteria). Program evaluation compared audit scores (behaviour and performance) and adherence to TCI protocols between the first 6 months (T1: June-November 2003) and second 6 months (T2: December 2003-May 2004) of the integrated program.

Results: 167 and 136 charts were evaluated during T1 and T2. Physician behaviour significantly improved between time-periods (from 10.0 to 10.7 out of 11, $P < 0.0001$), as did performance (6.7 to 6.9 out of 7, $P = 0.07$). Of 303 patients, 68% were eligible for protocols. Significantly more eligible patients were treated according to protocols at T2 compared to T1 (85% vs 68%, $P = 0.005$). The QI program resulted in 53 actions generated, including CME talks targeting deficient knowledge (14 actions), protocol alterations (8), systematic changes to RO practice (13), QA checks (8), and remediating deficient management of individual patients audited (10, representing 3.3% of all patients).

Conclusion: The TCI QI model incorporating CME, QA and revalidation effectively improved RO behaviour and performance, as well as departmental protocol adherence. Additional benefits included identifying CME topics, systematic changes in RO practice and altering management of 3.3% of patients audited.

II063/MPC

Patient Choice of Radiotherapy Fractionation Schedule in the Palliation of Non-Small Cell Lung Cancer: Design and Validation of a Decision Board

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Aim: Randomised studies of palliative radiation for NSCLC show relative advantages and disadvantages of short versus long fractionation schedules. Our aim was to develop a visual aid to accommodate patient choice in the palliative treatment of NSCLC.

Methods: A decision board was developed based on the British MRC study of 17 Gy/2 fractions versus 39 Gy/13 fractions, with advantages and disadvantages of each schedule displayed using proportions, graphs and confidence levels. A prototype was designed after evaluating decision board literature, then discussed with radiation oncologists, nursing staff and patients. Revisions were made to obtain an acceptable final version. The final version was piloted in 15 patients to ensure validity.

Results: Of 15 patients enrolled in the pilot, median age was 65, 93% were males, 73% were Chinese. 47% of patients spoke English, and none had ECOG ≥3. 60% of patients had chest pain or shortness of breath as the main presenting symptom. 47% of patients chose the shorter fractionation for reasons of convenience (100%) and cost of treatment (34%). 53% of patients chose 39Gy/13 fractions, for reasons of better local control (50%), survival advantage (37%), less psychological distress (38%) and better physical activity (25%). All reasons for fractionation choice were consistent with decision-board information, confirming validity. All patients were satisfied with involvement in decision-making.

Conclusion: We have validated a decision board assisting patient choice of radiotherapy fractionation schedules in the palliation of NSCLC. A phase II study evaluating patient preferences using the instrument is underway.

II064/MPC

Physical, Cognitive-Behavioural and Educational Group Interventions in Fibromyalgia: Preliminary Results of a 12-week Pilot Programme

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Aim: To document preliminary results of a 12-week group program in fibromyalgia patients.

Methods: An interdisciplinary team consisting of physician, physical therapists, occupational therapists, nurses, dieticians and psychologists conducted the 8-session, 3-hourly program over 12 weeks. Interventions

include education, stretching and aerobic exercises, proper body mechanics, stress and pain management and dietary advice.

Results: Four patients participated in the program. Six-minute walk test distance improved from a mean of 345.2 ± 57.3 metres to 422.8 ± 60.6 metres post program. Knowledge of good dietary practice improved (9.0 ± 1.4 vs. 14.3 ± 1.5). Beck depression scale (17.2 ± 8.3 to 14.5 ± 17.9) and number of moderate to severe tender points (14.3 ± 1.4 to 17.1 ± 4.8) did not improve significantly. There was no difference in BPI pain scores (4.4 ± 1.8 vs. 4.1 ± 1.9 post) or SF36 scores (physical scores pre- and post-programme: 32.8 ± 8.7 and 34.1 ± 10.0; mental scores: 51.2 ± 12.5 and 46.8 ± 13.2 respectively). Fibromyalgia Impact Questionnaire VAS scores for pain, sleep, morning stiffness, anxiety and depression did not improve (33.2 ± 16.5 and 34.5 ± 10.8 respectively).

Conclusion: Physical, cognitive-behavioural and educational group programme for fibromyalgia patients improved 6-minute walk test scores. There was no significant change in pain perception and quality of life. A larger study is required to confirm these results.

II065/MPC
Effectiveness of a Dedicated Non-invasive Ventilation Unit in a General Hospital

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Aim: Non-invasive ventilation (NIV) is a recognised modality in the management of patients with acute respiratory failure (ARF). It can be performed in the general ward setting. We evaluated the outcomes of episodes of ARF treated by NIV in a dedicated intermediate care unit, located in the general medicine ward.

Methods: We conducted a retrospective review of the data of patients who were admitted into the NIVU (Non-invasive Ventilation Unit) from November 2001 to April 2003. General ward nurses, with no previous ICU experience, received training to staff NIVU and were supported by respiratory therapists. A total of 121 episodes (mean age 71.4 years, M:F 2.6:1) of ARF were submitted to NIV in NIVU. We analysed pH and pCO_2 prior to NIV and 2 hours NIV, and also the success rate of NIV, which was defined as resolution of ARF without need for endotracheal intubation or leading to death.

Results: Commonest causes of ARF were decompensated COPD (67.5%), obesity-hypoventilation syndrome (6.7%), bronchiectasis (5.8%) and pneumonia (9.2%). Rate of NIV success was 82.9%. Overall, mean pH and $PaCO_2$ of all cases improved 2 hours after initiation of NIV [7.27 versus 7.32 (P <0.001) and 77.6 mmHg versus 68.5 mmHg (P <0.001) respectively]. Mean duration of NIV was 4.7 + 6.1 days. One patient was intubated (twice) but died eventually. Nineteen patients died, majority of whom had end stage COPD and no further intervention was planned.

Conclusion: NIV is effective and feasible in treatment of ARF in a dedicated intermediate care unit.

II066/MPC
Clinical and Radiologic Features of Patients with Mycobacterium Avium Lung Disease

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Aim: Non-tuberculous mycobacteria (NTM) lung disease is an emerging infection with little published clinical data. *Mycobacterium avium* complex (MAC) is relatively common in settings with AIDS. However, MAC lung disease is a rare entity and tends to occur among patients. This study assesses the clinical and radiologic features in an area with a high incidence of TB which may confound its diagnosis.

Methods: All cases with accessible records on follow up at 2 clinics with an interest in NTM lung diseases were reviewed. Cases with lung disease due to *M. avium* complex were analysed. Data regarding demography, clinical and radiologic presentation were analysed.

Results: Fourteen patients were studied (age 63.7 ± 11.9 years, 7 males and 7 females). Cough was the main presenting symptom in 11 patients while hemoptysis was in 4. Two subjects were diabetic. Only 4 were smokers and 3 consumed alcohol. None had HIV. A history of previous TB was noted in 8 subjects, of which 3 had positive cultures recorded. Multiple cultures were obtained from these patients (3.6 ± 1.9, min. 1, max. 8). Chest x-rays at presentation showed bilateral involvement in 8 subjects. In all 14 cases, upper lobe involvement was noted. HRCT was done for 10 subjects. Most had multi-lobar scarring or disease with only 1 subject having unilobar disease (3.6 ± 1.4 lobes). Treatment was initiated in 11 patients.

Conclusion: MAC lung disease has a similar presentation as pulmonary TB. Lung involvement tends to be extensive and the condition also does not appear to be related to any immune suppression. Clinical differentiation between the 2 illnesses is thus made difficult.

II067/MPC
Osteoporosis is an Unfamiliar Illness Among Elderly Singaporean Patients with Fragility Fractures

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Aim: The HSDP programme for osteoporosis treatment aimed to treat patients who have prior history of fragility fractures to prevent recurrent fractures. This paper examined the reasons why patients refused to join the programme.

Methods: A total of 410 patients were screened using the DRG for hip or spine fractures (2001 to 2002). Face to face or telephonic interviews were conducted and questions on patient's current mobility status, their understanding of osteoporosis and its treatment, and their reasons for not participating in the programme were assessed.

Results: Out of the 410 patients screened (49 spinal fractures and 362 hip fractures), 62 patients had passed away when the screening was done. Only 16% were told that they had osteoporosis after their fragility fracture and only 8% were on anti-resorptive treatment. Of the 221 patients who fulfilled the entry criteria, only 18 were keen to join the programme. Older age (OR 0.93, CI 0.88 to 0.99) and lack of awareness of diagnosis of osteoporosis (OR 0.06, CI 0.02 to 0.22) were associated with lower odds of joining the programme. The common reasons for rejecting the programme were that "osteoporosis was not important", "medication was too expensive" and "no one to bring to doctor".

Conclusion: Majority of patients who already had either spine or hip fragility fractures did not know that they had osteoporosis. Up to one-third of the patients refused treatment because they thought that the treatment of osteoporosis was not important.

II068/MPC
Comparison of Clinical Features of Patients with High Titre Anti Nuclear Antibodies (ANA) in Singapore and Sydney

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Aim: Patients with Connective Tissue Diseases (CTD) of Asian origin appear to have more severe end-organ damage than Caucasian patients. To investigate this, patients of a rheumatologist, who had been entered in his Sydney CTD patient database, were compared to his CTD patients seen at the Singapore General Hospital. The referral pattern was similar in the 2 populations.

Methods: Only patients with a high ANA reading were included in the data analysis. The patients' age, gender, racial origin, diagnosis, use of prednisolone, immunosuppressive therapy and organ involvement were collected prospectively by a clinician. Diagnosis satisfied the relevant ACR criteria for a specific CTD.

Results: The mean age and gender of the 2 populations were similar. Only 10 patients in Sydney satisfied the clinical diagnosis of SLE (25.6%) compared with 20 Singaporean patients (57.1%) (P = 0.005). The use of prednisolone was higher in Singapore (P <0.0001). Musculoskeletal features were significantly more common in the Sydney population with 76.9% of patients, compared to only 20% of Singaporean patients. The number of patients on DMARDs was similar, with mainly hydroxychloroquine (21 patients) in Sydney, while 12 Singaporean patients were on strong immunosuppressives like azathioprine and cyclophosphamide.

Conclusion: The differences in CTD manifestations between the Caucasian races and the Asian populations have not previously been so clearly identified. These differences account for the drug use and complications of disease. This needs to be considered in allocation of funds for treatment, research and patient education.

II069/MPC
Erythrocyte Sedimentation Rate Reflects Disease Activity but is not Associated with Damage Accrual in Systemic Lupus Erythematosus

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Aim: An elevated erythrocyte sedimentation rate (ESR) is common in active systemic lupus erythematosus (SLE) and is used to monitor disease course, even though its value is not yet clear. We sought to investigate if ESR was associated with disease activity, damage accrual and quality of life in our SLE patient cohort.

Methods: SLE patients (fulfilling ACR criteria) were consecutively enrolled into a prospective study cohort. Demographic, clinical and laboratory data, SLEDAI and SLAM disease activity indices, the SLICC damage index, quality of life index (SF-36) and the Rheumatology Attitudes Index (RAI) were collected. ESR was divided into 4 categories: <25 (normal), 25-50 (mild), 51-75 (moderate) and >75 (severe).

Results: The cohort mainly consisted of Chinese (78.9%) females (90.9%). At recruitment, the median SLEDAI score was 2 (range, 0-39) median SLAM score 2 (range, 0-28), median SLICC of 1 (range: 0-8) and elevated ESRs were found in 36% of patients. Significant difference between ESR categories were found for disease activity indices but not SLICC or quality of life using Kruskal-Wallis test with Bonferroni's correction.

Conclusion: ESR is commonly raised in SLE, but anti-dsDNA antibody levels do not appear to directly influence ESR. Higher ESRs are associated with more active disease but not with damage accrual or worse quality of life, except maybe in the physical aspects.

II070/MPC
SLAM and SLEDAI are Valid Disease Activity Measures in Oriental Lupus Patients with SLEDAI Being More Sensitive to Change

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Aim: SLAM and SLEDAI, systemic lupus erythematosus (SLE) disease activity assessment instruments, have been developed mainly from studies of Caucasian patients. We sought to compare SLAM and SLEDAI against the physician global assessment of disease activity (PGA) in our cohort of Oriental lupus patients.

Methods: A prospective SLE cohort consists of 460 SLE patients (fulfilling ACR classification criteria for SLE) who were enrolled between May 2002 and December 2003. Assessments were made at fixed intervals with demographic, clinical and laboratory information collected using a standard protocol, disease activity assessed using both SLEDAI and SLAM. PGA was scored using a visual analogue scale (VAS) of 100 mm. The cut-off to differentiate clearly active versus mild/non-active disease was 7 points for SLAM, 4 points for SLEDAI and 30 mm for the PGA.

Results: The cohort comprised mainly Chinese (78.9%) females (90.9%), mean age 41 ± 13 years, median disease duration 7.1 years (range, 0-36). Significant correlations were found in SLEDAI-SLAM, PGA-SLEDAI and PGA-SLAM (rho: 0.48, 0.33 and 0.50 respectively, P <0.0001 for all) with SLAM having stronger correlation with the PGA. Standardised response means (SRM) and effect size for SLEDAI, SLAM and PGA were used to evaluate their sensitivity to change between 2 consecutive visits and all were shown to have very good sensitivity (0.80).

Conclusion: Using PGA as the gold standard, SLEDAI and SLAM were found to be valid disease activity measures in Oriental patients.

II071/MPC
Outcomes of Chronic Hepatitis B Infection in 23 Oriental Patients Receiving Immunosuppressive Therapy for Rheumatic Disease

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Aim: To describe outcomes of chronic hepatitis B (HBV) infection following immunosuppressive therapy in 23 consecutive oriental patients with rheumatic disease.

Methods: Retrospective case series.

Results: There were 7 (30.4%) males and 16 (69.6%) females, predominantly Chinese (91.3%), with mean age 48.8 ± 15.2 years. Mean duration of rheumatic disease was 9.4 ± 12.4 years, with rheumatoid arthritis (56.5%), systemic vasculitis (17.4%) and systemic lupus erythematosus (8.7%) being the commonest. Chronic HBV infection, mean duration 6.3 ± 7.6 years, was diagnosed during pre-methotrexate screening (43.5%), asymptomatic transaminitis (21.7%), systemic vasculitis (17.4%), and primary care screening (17.4%). At baseline, all patients had normal ALT, 25.0% positive hepatitis B e antigen (HBeAg) and 68.4% positive anti-HBe antibody. Following immunosuppressive therapy, ALT remained normal in 8 patients. Fifteen (65.2%) developed ALT elevation, which was >2x normal in 9 patients. These patients received prednisolone (2); prednisolone with azathioprine (2), cyclophosphamide (2), hydroxychloroquine (2), sulphasalazine (3) or hydroxychloroquine/sulphsalazine (2); or hydroxychloroquine (2) or sulphasalazine (1) respectively over 10.9 ± 14.6 years. ALT normalised spontaneously in 9 patients without hepatic decompensation or change in therapy. 4 (26.7%) patients, of whom 3 had HBeAg-negative viremia and 1 cirrhosis diagnosed histologically, received lamivudine over 18.8 ± 10.1 months. There were 2 HBV-unrelated deaths from pyogenic infection. None developed hepatocellular carcinoma.

Conclusion: Elevated ALT occurred in 65.2% of rheumatological patients with chronic HBV infection following immunosuppressive therapy, although only 26.7% required lamivudine. There was no HBV-related mortality.

II072/MPC
Lupus Myocarditis Presentation and Outcome

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Aim: Symptomatic myocarditis in SLE is uncommon. Our aim is to study the clinical characteristics, management and outcome of SLE patients with acute lupus myocarditis.

Methods: Retrospective review of 11 SLE patients with a history of acute myocarditis between 1993 and 2001.

Results: All 11 patients were female, the majority being Chinese (46%). Mean age at diagnosis of SLE was 27 ± 10 years. Acute myocarditis was the first presentation of SLE in 8 patients (73%). The most common symptoms and signs were dyspnea (91%), fever (55%), orthopnea (45%), basal crackles (73%), tachycardia (55%), raised jugular venous pressure (55%) and gallop rhythm (45%). Median SLEDAI during acute myocarditis was 16. Laboratory investigations showed raised ds-DNA (100%), low C3 (73%), low albumin (64%), lymphopenia (64%), raised creatinine (36%) and raised creatinine kinase (27%). CXR abnormalities were cardiomegaly (100%), pulmonary congestion (73%) and pleural effusion (73%). Non specific ST/T changes on ECG were common (91%). Echocardiographic changes were WMA (81%), low LVEF (81%), pericardial effusion (73%) and pulmonary hypertension (64%). All patients received high dose of oral corticosteroids, IV methylprednisolone 45% and IV cyclophosphamide 64%. There were 2 deaths (18%) but no recurrence of myocarditis on follow-up for a median duration of 4 years. All survivors had improvement of cardiac function. The majority of the 9 survivors (67%) did not suffer any permanent damage (SLICC score of 0).

Conclusion: Majority of our patients had myocarditis at initial presentation of SLE. Early treatment with high dose corticosteroids and IV cyclophosphamide resulted in good outcome.

II073/MPC

A Comparison Between Foreign Workers from the Indian Subcontinent and Ethnic Indians Living in Singapore: Looking at How a Difference in Lifestyle Affects Obesity, Blood Pressure and Serum Lipids

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Aim: 111,000 migrant workers of ethnic Indian origin work in Singpaore, mainly in blue-collar jobs with an average monthly wage of S$900. In contrast, the average income of resident ethnic Indians is about S$4,500. The disparity in disposable income between the 2 groups is associated with a marked difference in lifestyle. Two community surveys focusing on body mass index (BMI), mean arterial blood pressure (MAP), and total cholesterol (TC) were done, comparing these 2 populations. The objective of this study is to compare basic anthropomorphic and metabolic data between migrant workers and residents of ethnic Indian origin. This will enable us to determine if the disparity in lifestyle is enough to cause a significant difference in the measured parameters.

Methods: The data from the 2 groups is evaluated with a 2-tailed *t*-test with unequal variances, giving *P* values and hence confidence limits for the respective data sets.

Results: Unpaired t-test results of migrant workers vs. residents are as follows: BMI difference -1.55, *P* value 0.0028 (95% CI - 2.56 to -0.54), MAP difference +2.25, *P* value 0.0400 (95% CI 0.11 to 4.59), TC difference -0.65, *P* value <0.0001 (95% CI -0.86 to -0.44).

Conclusion: The difference in lifestyle between migrant workers and residents of ethnic Indian origin in Singapore results in a significantly lower BMI and TC, but higher MAP in the migrant workers.

II074/MPC

Measuring Improvement in Stroke Management in NHG Institutions

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Aim: The National Healthcare Group (NHG) carried out audits on stroke management in 2002 and 2003 to drive quality improvement and evaluation of stroke care in its 4 institutions.

Methods: A random sample of 105 cases from each institution was drawn from patients discharged in 2002 with a primary diagnosis of stroke (ICD 430-436). Medical records were reviewed to assess the various clinical domains. Data was analysed using SPSS, and a probability of <0.05 considered statistically significant.

Results: Of the 420 cases selected, a total of 373 cases (88.8%) were audited. The 2003 sample was similar and comparable with that of 2002, and representative of the stroke population in NHG. Brain scanning within 24 hours of admission was carried out in 85.8% of cases (75.6% in 2002) (*P* = 0.001). Blood glucose testing on admission was achieved in 97.3% of the cases. ECG within 24 hours of admission was achieved in 92.8% of cases. Both swallowing assessment and use of care paths were comparable with that of 2002, being 67.6% and 64.7% respectively. Discharge planning was documented in 97.7% of stroke patients who were ADL-dependent. Anti-platelet therapy was instituted in 88.5% of patients with ischaemic stroke (74.1% in 2002) (*P* <0.0001). Communication of prognosis was documented in 83.4% of cases; and that of risk education to patients and relatives was 46.6% (22.4% in 2002) (*P* <0.0001).

Conclusion: The 2003 audit has shown significant improvements in stroke care. There were however, areas of lapses that need to be addressed.

II075/MPC

The Impact of a Multi-dimensional Health Promotion Programme for Older Persons on Physical Fitness and Performance Measures

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Aim: We examined the impact of a multi-dimensional health promotion programme, Health for Older Persons (HOP), on the physical fitness and performance measures of older participants. HOP was designed using Rowe and Kahn's model for successful aging.

Methods: In a quasi-experimental study, 117 community-dwelling, ambulant, nondisabled participants >50 years old were recruited. The main outcome measures were weight, body mass index (BMI), bioelectrical impedance for body fat composition, gait velocity, sit-to-stand time and grip strength. Physical fitness and performance were measured at 0, 6 and 12 months. Repeated measurement analysis was performed for the outcomes. The difference among baseline, 6 and 12 months was examined adjusting for basic demographic, health and social contact factors.

Results: The mean age of participants was 62.9 ± 8.0 years. The response rate was 70.1% at 6 months (n = 82) and 64.1% at 12 months (n = 75). There was a significant decrease in weight, BMI and bioelectrical impedance between baseline and 12 months. There was an increase in gait velocity; 0.15 m/s (95% CI 0.08 to 0.22, *P* <0.001) at 6 months and an increase of 0.20 m/s (95% CI 0.14 to 0.27, *P* <0.0001) at 12 months from baseline. A decrease in sit to stand time of 0.20s (95% CI –0.08 to –0.31, *P* = 0.0014) and 0.36s (95% CI –0.11 to –0.61, *P* = 0.0070) respectively. There was no change in grip strength.

Conclusion: A multi-dimensional approach to health promotion in older adults, modelled after the concept of successful aging, conferred benefit to participants in terms of improvement in their physical fitness and performance.

II076/MPC

Preventing Readmissions of Stable Heart Failure Patients by Effective Management at Primary Care Through Second Tier Specialised Clinics

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Aim: To demonstrate that readmissions can be prevented in stable heart failure patients by effective management of heart failure through second tier specialised clinics in a primary care setting, using disease management pathways and managed by a healthcare team led by a family physician.

Methods: A project was designed and implemented whereby stable heart failure patients were discharged to the NHG polyclinics for follow up. These patients are then seen in the polyclinics' second tier clinic, which is run by a multidisciplinary team. The project is funded by MOH's HSDP.

Results: Between February 2004 and April 2004, 23 patients were discharged for follow up in 6 NHG Polyclinics. The majority of patients were males (91.3%), Chinese (78.3%), and were aged between 50 to 79 years (82.6%). Five patients had diabetes mellitus (21.7%), 21 had hypertension (91.3%) and 14 had lipid disorders (60.9%). 80% of the patients had HbA1c of less than 10%, while 52.1% had blood pressures of less than 140/90 mmHg. The large majority (91%) of them belonged to the NYHA Class I. Almost all (95.7%) of the patients were on both beta-blockers and ACEI/ARB, which are the current recommended heart failure medications.

Conclusion: This is the first study undertaken in which stabilised patients with heart failure are seamlessly discharged for follow up in second tier specialised clinics in a primary care setting. The majority of the patients have co-morbid conditions as well.

II077/MPC

Spirometry in Primary Healthcare: A Utilisation Survey

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Aim: Although spirometry is useful for the diagnosis and management of patients with airflow abnormalities such as bronchial asthma (BA) and chronic obstructive pulmonary disease (COPD), primary care physicians

rarely use spirometry in routine practice. We reviewed the utilisation and standards of spirometry since the implementation of this diagnostic service in the National Healthcare Group (NHG) polyclinics.

Methods: Newly trained technicians, who underwent regular training sessions, performed the tests using standard portable spirometers. The utilisation rates and quality of the test results over a 6-month period (November 2003 to April 2004) were reviewed. Decision on the acceptability and interpretation of the tests were made according to established standards for performance and interpretation of spirometry.

Results: A total of 1637 tests were performed. 21% of the tests were performed for COPD management, 29.4% for asthma management, 37.8% for diagnosis of asthma and 11.8% for diagnosis of COPD in symptomatic smokers. 31.3% of the tests showed obstructive abnormality, 13.6% suggested a restrictive pattern, 27.6% were normal, and 27.5% were unacceptable for interpretation. The indication and the results of spirometry were differentially correlated (P <0.001). The percentage of unacceptable tests per month has been gradually decreasing from 37.9% in the first month to 18.6% in the final month.

Conclusion: Provision of spirometry in primary healthcare has led to substantial utilisation with defined indications. The majority of tests performed were of acceptable standard and diagnostic value, and the quality of test results improved with technicians' experience and training.

II078/MPC

Early Detection and Intervention of Chronic Obstructive Pulmonary Disease in Smokers in Primary Healthcare

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Aim: With the availability of spirometry service in primary healthcare, early detection and intervention of chronic obstructive pulmonary disease (COPD) in smokers to prevent further deterioration of their lung function are now possible in the community.

Methods: Patients who were more than 40 years old, with a history of smoking but no prior history of COPD or bronchial asthma and presenting with chronic cough and/or breathlessness, were sent for spirometry in the 9 National Healthcare Group Polyclinics from November 2003 to April 2004. These patients had their lung function test results interpreted by their doctors and were managed according to Global Initiative for Chronic Obstructive Lung Disease (GOLD) guidelines.

Results: A total of 192 patients had spirometry for diagnosis of COPD. The mean age was 57.4 (± 14.4) years and 86.5% were males. 22.9% of the tests showed obstructive abnormality, 15.1% suggested a restrictive pattern, 35.4% were normal and 26.6% were unacceptable for interpretation. Amongst those with COPD, 34.1% were mild, 50.0% were moderate, 13.6% were severe and 2.3% were very severe.

Conclusion: The availability of spirometry in primary healthcare has made the early detection of COPD possible. This will facilitate early and important intervention, which will have maximal influence on the patients, such as smoking cessation and appropriate treatment, to prevent further disease progression and complications in these patients.

II079/MPC

Smokers with Acute Upper Respiratory Tract Infection (URTI): A Study of Their Symptoms and Outcomes

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Aim: Comparison of symptoms and outcomes between smokers and non-smokers who attend for URTI.

Methods: In a prospective study, 595 consecutive patients who attended for URTI were subjected to a questionnaire covering possible symptoms related to URTI. Patients were followed up till resolution of their symptoms. Outcomes captured were antibiotics prescribed, sick leave given, total number of days sick, facial congestion, ear pain and number of cigarettes smoked.

Results: Smokers reported 0.60 times (CI 0.4, 0.9) less itch in the throat than non-smokers. They were also 2.3 times (CI 1.5, 3.6) more likely to report weakness. However, there were no significant differences in the reporting of cough, runny nose, sore throat, fever or shortness of breath. There was no significant difference in the antibiotics prescribed between groups, the total number of days sick nor the incidence of facial and ear pain. Sick leave was found to be given 3.7 times (CI 2.4, 5.7) more in smokers. 70% (83) of current smokers reported a decrease in the number of cigarettes smoked during the episode of URTI, while 4.2% (5) stopped smoking altogether.

Conclusion: Smokers experienced less localised but more constitutional symptoms. Smoking status did not confer an increase risk of prolonged symptoms or complications. However, many smokers do actually cut down the number of sticks smoked during a URTI. This makes it a golden opportunity for the doctor to promote smoking cessation to these patients during the consultation for URTI.

II080/MPC

Polymorphisms of the Insertion ACE Gene and M235T AGT Gene and Essential Hypertension

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Aim: Renin-angiotensin system gene polymorphisms are explored as genetic determinants of essential hypertension. This study investigates whether polymorphisms of the insertion/deletion ACE gene and the M235T AGT gene account for prevalence of hypertension.

Methods: Rapid fragment length polymorphism (RFLP) and restriction analysis determined the frequencies of gene polymorphisms in 637 hypertensive patients and 720 samples from normotensive local blood donors in Saxony, Germany.

Results: No differences were observed in ACE allele and genotype frequency distribution between 2 groups with respect to gender and age. ACE isoforms were of identical frequency within both groups, while AGT TT homozygotes were more frequent in controls (4.6% vs 2.7%, P = 0.08). In females, this finding became significant (P = 0.035), but not in males. AGT TT genotype was associated with a 48% decrease in the odds of having hypertension (OR-TT vs MM: 0.52; 95% CI: 0.28 to 0.96, P = 0.034), and the odds decreased more significantly in women (OR: 0.28; 95% CI: 0.1 to 0.78, P = 0.01).

Conclusion: This study does not support that the ACE I/D polymorphism contributes to essential hypertension. In contrast to published data, the M235T TT genotype of AGT gene was detected to confer significantly decreased odds for the development of hypertension in this particular population.

II081/MPC

Development of a Computational Platform to Evaluate Effect of Bone Adaptation on Fracture Susceptibility

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Aim: Osteoporosis is a worldwide public healthcare problem. The number of hip fractures due to osteoporosis exceeded 1300 in Singapore in 1998. Many variants of bone adaptation methods have been proposed; however, a common problem confronting these methods is that the bone density or strain energy remains inconsistent at the nodes and element boundaries, which leads to computing errors and affects numerical stability. Here, a computational platform was developed to evaluate the effect of bone functional adaptation on bone fracture susceptibility.

Methods: A bone-volume based non-continuum formulation is presented to evaluate the effect of bone adaptation on bone properties. The new formulation shifts traditional state variables of adaptation from density to volume, introduces the connectivity matrix and is computationally less demanding. It starts from a uniform distribution of material and progresses toward the adapted structure. The bone fracture susceptibility is then estimated through the effective stress range.

Results: With the hypothetically uniform distribution, bone fracture susceptibility under daily activities is typically greater than 95%, but as the adaptive process goes on, the effective stress range gradually decreases, and

the fracture susceptibility drops below 5% in the final stage, indicating well-adapted trabecular structure.

Conclusion: The bone-volume based non-continuum formulation is a novel method for modelling the bone adaptation process that eliminates the problems commonly encountered before and is computationally less demanding. Linking it to clinical data may allow it to predict fracture risk.

II082/MPC
How Much do Diabetics Know About Diabetes Mellitus and its Complications?

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Aim: Two Singapore studies reported that 99% of diabetics had received some diabetes mellitus (DM) education and the public is generally well informed about DM. Our Phase 1 study indicated that the knowledge level possessed by diabetics and non-diabetics (NDM) was comparable and that a knowledge-practice disparity exists amongst diabetics. The authors aimed to determine the DM knowledge level possessed by diabetics and NDM by visiting 2 NHG polyclinics located in HDB heartlands and the knowledge-practice gap amongst diabetics in this group.

Methods: A face-to-face survey using a questionnaire was conducted. Respondents answered 43 questions, divided into 5 sections: general knowledge, risk factors, symptoms and complications, treatment and management, and monitoring. One point was awarded for each correct response, and 0 for incorrect and unsure responses.

Results: 509 subjects were interviewed. Mean score obtained (maximum: 43) by diabetics and NDM were 32.0 and 29.9, respectively. Mean score obtained by diabetics and NDM for each section respectively: 4.2 and 3.8 upon 8 (General Knowledge); 3.8 and 3.9 upon 6 (Risk Factors); 9.9 and 9.0 upon 12 (Symptoms and Complications); 10.8 and 10.1 upon 13 (Treatment and Management); 3.2 and 3.2 upon 4 (Monitoring).

Conclusion: Unlike the phase 1 study, polyclinic diabetics scored higher than NDM in diabetes knowledge. Less than a third of diabetics practised home blood glucose monitoring. The knowledge-practice gap was smaller as suggested by the high percentage of diabetics practicing 80% of DM self-care items, indicating that diabetes education resulted in better informed diabetics and changed practices.

II083/MPC
Tuberculosis Post Liver Transplantation

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Aim: Tuberculosis (TB) is a rare complication after organ transplantation but is sometimes fatal. We report a case of pulmonary TB post-liver transplantation and discuss its presentation and management.

Methods: From 1990 till May 2004, 100 liver transplants had been performed at the NUH Liver Transplantation Programme, of which 1 patient developed pulmonary TB post-transplantation.

Results: A 60-year-old Indonesian male, with no past or contact history of TB, underwent orthotopic liver transplantation for chronic hepatitis C-related decompensated cirrhosis and hepatocellular carcinoma. Pre-transplant chest X-ray and CT scan of thorax were completely normal. Three-and-a-half months post-transplant, the patient presented with fever, acute confusion and rapidly progressive right upper lobe pneumonia. Pulmonary TB was diagnosed on positive sputum smear for acid-fast-bacilli and TB culture. Initial anti-TB treatment consisted of 6 months of isoniazid, ethambutol, ofloxacin and rifampicin. Rifampicin was substituted with streptomycin 4 weeks later due to drug-induced cholestasis. Immunosuppression regime was adjusted: prednisolone tapered from 9 mg daily to 0 over a 6-month period, while cyclosporine increased from 125 mg b.d. to 175 mg b.d. No acute rejection was observed. Patient was last reviewed 28 months post TB-treatment and remained well.

Conclusion: Pulmonary TB could present atypically as rapidly progressive pneumonia in organ transplant recipients, and should be suspected even without past or contact history of TB, or radiological evidence of prior pulmonary TB on pre-transplant chest X-ray, especially in patients from endemic areas. High level of suspicion, prompt anti-TB treatment, awareness of drug-induced liver toxicity, and close follow-up are essential in management.

II084/MPC
States of Severely Altered Consciousness Clinical Characteristics Medical Complications and Functional Outcome After Acute Rehabilitation

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Aim: To document injury variables, medical complications and functional outcome in patients presenting in states of severely altered consciousness (SSAC).

Methods: A retrospective case series of 30 consecutive patients in persistent vegetative states (PVS) or minimally responsive states (MCS) rehabilitated in an inpatient brain injury rehabilitation unit. Functional outcome measures included admission and discharge Disability Rating Scale (DRS), Ranchos Los Amigos Scale (RLAS) and Modified Barthel Index (MBI).

Results: Altogether, there were 17 (57%) males and 13 (43%) females (mean age 31.8 years, SD 16.3 years, range 15-74 years). Twenty-one (70%) had traumatic brain injury. Seventeen (57%) patients were in PVS and the rest were in MCS on admissison to rehabilitation (RLAS levels II and III). Mean acute and rehabilitation length of stays (LOS) were 90.1 (SD 50.3) and 106.3 (SD 39.1) days respectively. Tracheostomised patients had a longer acute LOS (P = 0.03). Twelve patients progressed to a state of awareness and a greater spread of higher RLAS categories on discharge was seen. Urinary tract infection (UTI) in 16 was the commonest medical complication. All patients demonstrated positive gains in DRS scores upon discharge from rehabilitation. The MBI was generally insensitive to functional change post-rehabilitation, although paired analyses were significant. The majority of patients (80%) were discharged home.

Conclusion: The extent of initial disability predicted a worse functional outcome in this cohort. While the majority showed cognitive improvement after inpatient rehabilitation, profound disability persisted.

II085/MPC
Psychological Morbidity and Stigma of Severe Acute Respiratory Syndrome (SARS) among Healthcare Workers in Singapore

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Aim: This study was aimed at exploring the psychological morbidity and perception of stigma among healthcare workers following a suspected SARS outbreak at the Institute of Mental Health, Singapore.

Methods: The staff of the Institute were assessed using 3 self-report questionnaires; the GHQ-28 which assessed psychological distress, the Impact of Events Revised Scale, which assessed the symptomatic status with respect to the 3 domains of Post Traumatic Stress Disorder, and the perception of stigma as experienced by the subjects was assessed with a questionnaire adopted from the HIV Stigma Scale. The relevant sociodemographic data was collected using a structured questionnaire.

Results: A total of 443 members (32.6%) of the staff responded to the survey, of which 170 (38.4%) were males and 273 (61.7%) were females. Using a threshold of 5/6 on the GHQ-28, 98 respondents (22.1%) were classified as a "GHQ-case".

Conclusion: We found a high prevalence of psychiatric morbidity among our healthcare workers. Female healthcare workers were significantly more likely to be a case (P = 0.01) as compared to male healthcare workers. Doctors scored higher on GHQ sub-scales while nurses scored higher on the stigma subscales. Only 21 members (4.7%) of the staff received psychological counselling through a confidential help line that was set up for all the hospital staff. Steps must be taken to protect healthcare workers against the more covert psychological effects of global epidemics.

II086/MPL

EWS-WT1 Fusion Transcript in the Peritoneal Effusion of a Patient with Desmoplastic Small Round Cell Tumour

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Aim: Desmoplastic small round cell tumour (DSRCT) is a highly aggressive tumour that often occurs as multiple masses in the abdomen involving the regional lymph nodes and the lining of the abdomen and pelvis. This rare undifferentiated neoplasm predominantly affects males, usually in their second decade of life. Patients with DSRCT have a poor prognosis, even if therapy is instituted promptly, and an overall survival rate of <20%. We present a case of DSRCT in a 17-year-old male with disseminated peritoneal disease and peritoneal effusion in January 2003. The cytology sample showed a malignant small round cell tumor with the classical cytological features of DSRCT, and immunohistochemistry performed on the prepared cell block exhibited an antibody expression profile in keeping with DSRCT.

Methods: DSRCT is associated with a characteristic translocation between chromosome 11 and 22 involving the EWS and WT1 genes, and identification of this fusion gene is used in the diagnosis of this tumour. An RT-PCR designed to detect the chimeric gene was carried out on the aspirated ascitic fluid.

Results: The result showed presence of the t(11;22) (p13;q11 or q12) translocation. The transcript of the reciprocal translocation was later confirmed by direct sequencing.

Conclusion: This case study demonstrates the usefulness of employing molecular techniques to complement cytology and/or cytogenetics assessment in resolving and confirming certain difficult diagnostic conundrums presented by undifferentiated neoplasms.

II087/MPL

Nasopharyngeal Carcinoma Cell Lines: Sensitivity To TRAIL-induced Cell Death

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Aim: Nasopharyngeal cancer (NPC) is endemic in the Chinese population. Tumour necrosis factor (TNF)-related apoptosis-inducing ligand (TRAIL) is a promising candidate for cancer therapy as it is primarily active against a variety of cancer cells with little effect on normal cells. FaDu, an NPC cell line, was previously found to have a homozygous deletion of the death receptor DR4, and resistant to the cytotoxic effects of TRAIL. In this study, we evaluated the cytotoxicity of TRAIL in several NPC cell lines, including CNE1, HK-1, FaDu and HONE1.

Methods: Cells were treated for 8 to 48 hours with varying doses of TRAIL in the presence and absence of cycloheximide (35 µM). Cell viability was assessed using the WST colorimetric assay. Human fibroblast cell lines (GM01386 and GM07492) and HepG2 were used as negative and positive controls respectively.

Results: After 8 hours of exposure to 1 ng/µL TRAIL in the presence of cycloheximide, about 70% cell kill was achieved in HepG2 (+ve control) but none in the fibroblast cell lines (-ve controls). CNE1 and FaDu were the most resistant (~30% cell kill), with HK-1 exhibiting intermediate cell kill (~50%). HONE1 was the most susceptible to the cytotoxic effect of TRAIL (~80% cell kill).

Conclusion: Our study has demonstrated that there are varying degrees of sensitivity towards TRAIL amongst the different NPC cell lines. The mechanisms underlying the different responses to TRAIL amongst these NPC cell lines are being examined. TRAIL may prove to be a helpful adjunct in current anti-cancer therapeutic regimens for NPC, which involves conventional chemotherapy and radiotherapy, and fraught with toxic side effects.

II088/MPL

Invasive Group B Streptococcal Infections in Non-pregnant Adults

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Aim: Beta-haemolytic streptococci with Lancefield's group B antigen (*Streptococcus agalactiae*) are known colonisers of the female genital tract (and the adult gut) leading to colonisation of infants with consequent risk of serious neonatal disease characterised by sepsis and meningitis. Over the last decade however, the spectrum of disease produced by this organism has been changing worldwide, with disease manifestations in non-pregnant adults. In the majority of reported cases, predisposing conditions were identified and these included trauma, immunocompromised state and diabetes.

Methods: A retrospective study was carried out over a 6-month period starting January 2004 to review the spectrum of disease caused by *S. agalactiae* in this 400-bed general hospital (which does not have maternal or neonatal specialties). The laboratory records of all patients with *S. agalactiae* isolated from clinical samples were reviewed.

Results: A total of 15 cases were identified. All isolates were susceptible to penicillin. The spectrum of disease included urosepsis, abscesses (including 2 cases of thyroid abscess), tenosynovitis and bacteraemia. Risk factors included diabetes, geriatric age group, chronic renal disease and underlying malignancy.

Conclusion: It has been postulated that certain capsular serotypes and clonotypes account for the majority of disease in non-pregnant adults. Further work needs to be done in this field to ascertain if this is true in this community as well. A prospective study will also help determine if there is any temporal increase in *S. agalactiae* infections in non-pregnant adults in this hospital.

II089/MPL

The Role of Two Polymorphisms in the Endothelial Nitric Oxide Synthase Gene in Nephropathy Among Singaporean Chinese Patients with Type 2 Diabetes Mellitus

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Aim: Several allelic variations of the endothelial nitric oxide synthase (eNOS) gene have been evaluated for possible links to cardiovascular disease, renal disease and diabetes mellitus. We studied the role of 2 polymorphisms in the promoter region of the eNOS gene, the T-786C polymorphism and the T-1468A polymorphism, in conferring susceptibility to nephropathy among Singaporean Chinese with type 2 diabetes mellitus (T2DM).

Methods: We compared 2 groups of Chinese patients with T2DM: cases had proteinuria >0.5 g/day or urine albumin/creatinine ratio of >0.5 mg/mg or persistently elevated serum creatinine while controls had T2DM for at least 10 years with consistently normal serum creatinine and urine albumin/creatinine ratio of <0.05 mg/mg. Genotyping was carried out using standard polymerase chain reaction, restriction fragment length polymorphism and electrophoretic resolution.

Results: Fifty cases and 50 controls were genotyped for the T-786C polymorphism, while 46 cases and 48 controls were genotyped for the T-1468A polymorphism. Genotype distribution for both cases and controls conformed to Hardy-Weinburg equilibrium for both polymorphisms studied. For the T-786C polymorphism, the frequency of the C allele was 12% for both cases and controls. For the T-1468A polymorphism, the frequency of the A allele was 9.9% in cases and 8.3% in controls ($\chi^2 = 0.01$, $P = 0.9203$).

Conclusion: We conclude that the 2 polymorphisms studied are not likely to be related to diabetic nephropathy.

II090/MPL

Identification and Characterisation of Deleted in Esophageal Cancer 1 in CD4+ T Cells in Children with Minimal Change Nephrotic Syndrome

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Aim: It has been suggested that minimal change nephrotic syndrome (MCNS) results from a primary immune disturbance with a Th2 cytokine bias. We have demonstrated that interleukin-13 (IL-13) gene expression was upregulated in T cells in MCNS children in relapse. However, its upstream or downstream molecular events are still unclear. This study further investigated the differentially expressed genes in T cells of MCNS, with their functions being characterised.

Methods: CD4+ T cells were purified from peripheral blood mononuclear cells (PBMC). Total RNA was subjected to differential display RT-PCR (DDRT-PCR). Differentially expressed PCR products were then cloned and sequenced. The upregulated gene was verified by Northern blotting and RT-PCR, and subsequently transfected into Jurkat cells, followed by proliferation and apoptosis assays.

Results: In addition to IL-13, the deleted in esophageal cancer 1 (DEC1) gene was shown to be significantly upregulated in CD4+ but not CD8+ T cells during relapses of MCNS. When transfected into Jurkat cells, DEC1 inhibited cell proliferation by 47.2 ± 4.3%. Active caspase-3 staining showed that apoptosis may be responsible at least in part.

Conclusion: DEC1, a potent tumour suppressor gene, was identified in CD4+ T cells of MCNS and its expression was significantly upregulated in relapse. As it inhibits cell proliferation and induces apoptosis, it may be important in mediating the functions of T cells in MCNS. Further study is warranted to address its potential relationship to IL-13 during nephrotic relapses.

II091/MPL
Tissue Microarray Analysis of Mammary Phyllodes Tumour

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Aim: Background: Mammary phyllodes tumours (PT) are fibroepithelial neoplasms of the breast. Histologically, PT are characterised as benign, borderline and malignant. The aim of this study was to analyse the expression profiles of a panel of markers in the PT tissue microarray of our study population by immunohistochemistry.

Methods: Seventy-six cases of PT diagnosed from 1991 to 2000 were reviewed, and the area reflecting the characteristics of full sections was selected for tissue microarray construction. Immunostaining for estrogen receptor (ER), progesterone receptor (PR), c-Kit, HER-2/neu, APC and p53 were performed on TMA sections.

Results: ER expression in stroma and epithelium was noted in 1.4% and 71.4% cases, respectively. Similarly, PR expression was 0% and 61%. The concordance of TMA results of ER and PR with the full sections is at moderate level (average kappa value, 0.475). Of the available cases, stromal expression of p53 was found in 67 (93%) cases and epithelial expression of p53 in 56 (91.8%) cases. Twenty-six cases (36%) showed APC expression in stroma and epithelium, respectively. Only 1 case was found to be weakly stained for HER-2/neu in stroma and 32 (44%) cases were positively stained in epithelium. c-Kit expression was observed in 22 (30%) cases whereas only 3 cases showed positivity in stroma. In correlation with histological criteria, only p53 stromal expression showed a significant difference between benign and malignant lesions: 18/41 (44%) benign tumours had p53 expression, whereas 10/10 (100%) malignant tumours revealed p53 expression ($P = 0$).

Conclusion: p53 stromal expression can be a useful marker in predicting malignancy in PT.

II092/MPL
Ocular Melanocytoma: Infrequent but Important Eye Lesion of 2 Cases

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Aim: We reported 2 cases of incidental ocular melanocytoma in 2 young patients. Melanocytomas are well-differentiated neoplasms and must be distinguished from other pigmented lesions of the eye like malignant melanoma, adenoma and adenocarcinomas of the pigmented ciliary epithelium by histopathological criteria.

Methods: Both patients had their affected eyes enucleated and a black tumour was noted in the uvea and choroid. Sections were stained with haematoxylin and eosin. Immunohistochemical stains with S-100, HMB-45 and Ki-67 were used to determine the exact nature of the tumour.

Results: Microscopically, the tumour is well-circumscribed and showed a combination of spindle and epithelioid melanocytes loaded with melanin pigment and obscuring most of the cytoplasmic and nuclear details. The cells showed minimal nuclear atypia and there were no mitoses or necrosis. The tumour cells were positive for HMB-45 and S-100 and Ki-67 was negative. A diagnosis of melanocytoma was rendered.

Conclusion: Melanocytomas can involve the optic disc, choroid, iris and uvea. These lesions are asymptomatic and seldom encountered. It is important for the pathologist to recognise this lesion and not misinterpret it as malignant melanoma. Features indicating the benign nature of this tumour such as minimal nuclear atypia, rare to absent mitoses, low proliferation index and absence of necrosis and invasion should be carefully assessed to arrive at an accurate diagnosis. Since so few of these tumours have been studied, long-term follow-up is needed to accurately assess the biological behaviour of ocular melanocytomas.

II093/MPL
The Performance of a RT-PCR Compared with a Rapid Serological Assay for Acute Dengue Fever in a Diagnostic Laboratory

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Aim: The laboratory diagnosis of dengue has relied on serology although many different RT-PCR protocols have been reported. Due to limited use, the value of RT-PCR in the clinical laboratory has not been fully evaluated. During the outbreak of severe acute respiratory syndrome (SARS) in Singapore last year, we rapidly set up RT-PCR as a tool to differentiate dengue from SARS among the patients that presented to Tan Tock Seng Hospital, the hospital designated to manage and quarantine SARS cases. The objective of this study was to compare the performance of the RT-PCR with a rapid serological assay for the diagnosis of dengue.

Methods: We studied a total of 343 and 439 results for RT-PCR and serology respectively. These were analysed by the day of illness. The clinical discharge diagnosis was the gold standard.

Results: RT-PCR was 100% specific. Its sensitivity declined from 100% in the first 2 days of illness to 76% on day 6 and 52% on day 7 of illness. The serological assay showed a rising sensitivity from 38% on day 6, through 59% on day 7 to reach 80% by day 8.

Conclusion: Our experience indicates that RT-PCR for dengue is a very sensitive and specific tool for the diagnosis of dengue, particularly in the first 5 days from the onset of symptoms, and it can be easily set up in a clinical laboratory. Serology is more useful than PCR after the sixth day of illness.

II094/MPL
Cyclooxygenase and Angiogenesis in Hepatocellular Carcinoma

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Aim: Several cancers are associated with chronic inflammation, and among these is hepatocellular carcinoma (HCC) arising on the background of hepatitis B and C, and cirrhosis. Studies suggest that cyclooxygenases (Cox), which catalyse the conversion of arachidonic acid to prostaglandins are linked to carcinogenesis, particularly the inducible Cox-2. Cox-2 is expressed

highly in well-differentiated HCCs and in low amounts in advanced HCCs. The aim of this study is to investigate the relation between Cox-2 expression and angiogenesis in hepatocellular carcinoma.

Methods: Seventy proven cases of hepatocellular carcinomas from the National University Hospital, Singapore were retrieved and reviewed. Immmunohistochemical stains for Cox-2 and CD31 were done. Three pathologists independently graded the Cox-2 expression (product of intensity and range of cells expressing Cox-2). Then, the sections stained with CD31 were evaluated for angiogenesis.

Results: The *P* value of the mean vessel density of Cox-2 negative cases as compared to Cox-2 positive between well-differentiated, moderately differentiated and poorly differentiated HCCs are 0.61, 0.25 and 0.89, respectively. It shows that there is no significant relationship between microvessel density (angiogenesis) and Cox-2 expression on all levels of histologic differentiation of HCCs.

Conclusion: Cox-2 may have no direct influence on angiogenesis in HCCs but may affect other steps of carcinogenesis. Also, studies into other related inflammatory mediators, such as tumour-associated macrophages, as well as expression of other inflammatory chemicals such as tumour necrosis factor (TNF) and interleukins (IL) and their relation to tumour vascularity may reveal the intricate association of inflammation and carcinogenesis.

II095/MPL

Role of Cell Block Immunocytochemistry in the Diagnosis of Lymphomas

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Aim: Traditionally, lymphomas are diagnosed on histoarchitecture, cytomorphology and immunophenotyping. Under the current WHO classification, there is no single gold standard for their diagnosis. Our interest was to examine the extent to which immunocytochemistry on cell blocks of fine needle aspirates (FNAs) could provide diagnostic information.

Methods: We selected 15 cases from the last 2 years with FNAs and subsequent biopsies that were either differentially or finally diagnosed as lymphoma, examining disparities between the FNA and final histological diagnoses, and investigating the extent to which cell block immunocytochemistry could narrow these disparities.

Results: In 12 out of 15 cases, diagnostic information not previously anticipated could be gleaned from their FNA cell blocks by immunocytochemical analysis. In 2 cases, there were insufficient cells for immunostaining, and in one case the cell block had been exhausted.

Conclusion: In the light of this study, we suggest that cell block immunocytochemistry could provide useful diagnostic information in cases of suspected lymphoma where formal excision biopsy might be risky or contraindicated, provided the cell yield is adequate.

II096/MPL

Use of Tissue Microarray (TMA) Technology in Immunohistochemistry: Quality Control and Evaluation of New Antibodies

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Aim: Tissue microarray technology (TMA) is a recent development that facilitates rapid tissue analysis by in situ hybridisation and immunohistochemical techniques. Multiple cores of tissue as small as 0.6 mm and as large as 2 mm in diameter are incorporated into a paraffin block. About 200 tissue sections at 4-mm thickness can be cut from each microarray block.

Methods: Positive control tissues are selected based on the common immunoassays performed in our laboratory. Suitable paraffin blocks containing selected tissues are identified and retrieved from our archives. One or more immunostains are performed using standard tissue sections to ensure the quality of antigenic preservation. Tissue cores of 1-mm diameter are prepared into a TMA block using the Beecher microarrayer. We cut standard 4-mm sections and mount them at one edge of the slide, adjacent to the test material.

Results: For evaluation of new antibodies, we initially use a limited array comprising a variety of tissues including tonsil, colon, thyroid, liver (HBV+), breast, lung, cerebellar, prostate, testis, placenta, stomach, spleen, adrenal, as well as cancers of the bladder, liver and breast. Depending on the type of tissue showing expression, a more extensive array containing many more examples of the appropriate tissue type is used for optimisation.

Conclusion: We describe a useful method of providing positive control tissue for evaluating staining efficacy in routine immunohistochemistry as well as deciding optimal staining protocols for new immunoassays.

II097/MPL

Detection of c-erb B2 Amplification in Breast Carcinoma: Comparison Between Immunohistochemistry and Chromogen In situ Hybridisation

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Aim: Amplification of the c-erbB2/Her-2 gene or overexpression of its encoded protein is associated with worse prognosis in breast cancers, particularly in node positive cases. Herceptin (trastuzumab), a humanised anti-Her-2 monoclonal antibody directed against the Her-2 protein, has been approved for the treatment of metastatic breast cancer. The demonstration of Her-2 amplification has become an increasingly important prognostic and predictive investigation in breast cancer.

Methods: Thirty cases of breast carcinoma were studied using chromogenic in situ hybridisation (CISH) detection of the c-erb B2 oncogene using published methods. Briefly, a Her-2 specific probe is labelled with digoxygenin, and allowed to hybridise to tissue sections. This is followed by sequential incubations with antidigoxygenin fluorescein, antifluorescein peroxidase and diaminobenzidine. The results are compared with those of immunohistochemistry against the Her-2 protein.

Results: Twenty-six of 30 cases (87%) show complete concordance between immunohistochemistry and CISH. Of the 4 remaining cases, 3 were scored as negative (0 to 1+) by immunostaining but low-level amplification (<10 signals) was noted by CISH. The reverse occurred in one case, in which immunostaining for Her-2 was graded as positive (2+) but CISH clearly showed absence of Her-2 amplification.

Conclusion: There is good concordance between immunohistochemistry and CISH for Her-2 but interpretation of CISH signals is easier and more objective, compared to the semi-quantitative assessment of immunostaining. There is a false-negative rate of 10% and a false-positive rate of 3% for predicting Her-2 amplification when using immunohistochemistry.

II098/MPL

Diffuse Large B-cell Lymphoma with a Late to Post Centre Phenotype: A Study Using Immunohistochemistry and Tissue Microarray (TMA)

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Aim: To study if there is a subset of diffuse large B-cell lymphoma with a late to post-germinal centre cell phenotype that may be determined by immunohistochemistry.

Methods: Thirty cases of diffuse large B-cell lymphoma were selected and the histology was reviewed. We constructed 3 tissue microarray blocks using both the 0.6-mm and 1-mm tissue punches. Immunohistochemistry was performed using CD3, CD20, CD10, bcl6, PAX5, CD138 and MUM-1.

Results: By tissue microarray, 3 cases were not sufficiently representative in the microarray block. The remaining 27 cases featured sufficient tissue cores for immunohistochemical staining. There is a large proportion of highly proliferative tumours with a proliferative fraction of 60% or more (in 19/27 cases). There is a population of diffuse large B-cell lymphoma that expresses MUM1 (7/27), which is a marker of late to post-germinal centre phenotype. However, all but 2 of these cases also co-express Bcl-6, a marker of germinal centre phenotype. What is particularly interesting is that none of these cases co-express CD10, another marker of germinal centre cells, regardless of Bcl-6 expression.

Conclusion: These early findings indicate that there is a subset of DLBCL, which appears to express a late germinal centre to post-germinal cell phenotype. It appears that CD10 rather than Bcl-6 might be a better marker of germinal centre phenotype, since the latter is also co-expressed in cases that express MUM-1.

II099/MPL

Cardioprotective Effect of Des-Aspartate-Angiotensin-I (DAA-I) on Cytokine Gene Expression Profile in Myocardial Infarction

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Aim: To investigate the effect of DAA-I on expression profile of inflammatory cytokine genes in rodent model of myocardial infarction.

Methods: Myocardial infarction models were created in female Wistar rats by coronary artery ligation. They were randomised to receive intravenously, a daily dose of 1.2 µg/kg (body weight) of DAA-I (n = 60) or saline solution (n = 60) for up to 14 days after infarction. Echocardiography was done to assess the heart function. The animals were harvested at 1, 3, 7, 14 and 30 days after infarction (n = 12 at each time point). Infarct size was measured by tetrazolium chloride staining. Immunohistochemical staining was done to assess the extent of immune cell infiltration and expression of inflammatory cytokines at the infarct zone. Multiplex PCR was used to study the differential gene expression of IL-6, IL-1β, TGF-β, TNF-α and GM-CSF between experimental and control groups.

Results: Significant reduction in infarct size started after day-14 of DAA-I treatment (32.2%, P <0.05). Left ventricular ejection fraction improved significantly after day-3 of treatment. Extensive infiltration of immune cells observed in saline-treated group was reduced in DAA-treated group. IL-6, TNF-α, TGF-β and GM-CSF expression were significantly down-regulated in the infarct, peri-infarct and contralateral zones of the left ventricle in DAA-I-treated group as compared to saline-treated group. Reduction of IL-6, TGF-β and GM-CSF expression started on day-1 after treatment while TNF-α expression only reduced after day 3 of treatment.

Conclusion: DAA-I reduces infarct expansion through suppression of inflammatory cytokines and immune cells infiltration into the infarct region.

II100/MPL

Oxidative Stress in Diabetes Mellitus: cGMP Levels in Human Umbilical Cord Arteries Incubated in Normal and High Glucose Ambient Concentrations

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Aim: Vascular complications in diabetes mellitus result from increased free radical activity in the presence of high ambient glucose concentration. Such activity has been hypothesised to impair the nitric oxide pathway resulting in endothelial dysfunction. Vascular relaxation mediated by nitric oxide is effected and amplified by its second messenger, cyclic guanosine monophosphate (cGMP).

Methods: Human umbilical cord arteries were incubated in normal and high glucose conditions and stimulated with nitric oxide. cGMP levels were extracted and measured using radioimmunoassay.

Results: A trend for lower cGMP levels was observed in arteries incubated in high glucose concentration verses lower glucose concentration. Mean difference 0.639 pmol/g (P = 0.28).

Conclusion: Although this test did not achieve significance due to its small size, the results supported the hypothesis that the nitric oxide pathway is impaired in the presence of high glucose concentration.

II101/NUR

Nurses' Knowledge on Pain Management

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Aim: Pain management of a patient is one of the critical responsibilities of a nurse. Despite the availability of the effective analgesics and new technologies in drug administration, studies continue to demonstrate a suboptimal pain management in the hospital. The aim of this study is to determine the pain management knowledge of registered nurses in Alexandra Hospital.

Methods: Data was collected using validated self administered questionnaires to 237 registered nurses in Alexandra Hospital. Questionnaires used were Nurses' Knowledge and Attitude Survey by Dr BR Ferrel.

Results: 198 questionnaires were returned. The inpatient nurses' knowledge on pain management was found to be significantly higher (P = 0.005). Intensive care unit nurses achieved higher scores. There was no significant difference seen in scores of nurses with longer nursing experiences.

Conclusion: The results indicate that suboptimal knowledge of pain management exists in Alexandra Hospital registered nurses.

II102/NUR

Quality of Life (QOL) in Young Adults with Diabetes

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Aim: Diabetes mellitus is a condition which requires continuous adjustment to lifestyle practices to achieve optimal glycaemic control. Therefore, it can become a burden and interfere with the patient's lifestyle. The purpose of this study was to describe the perception of young adults with diabetes. With an understanding of their perception, the healthcare team can tailor treatment to improve self care management.

Methods: This study was conducted in a diabetes centre in one of the restructured hospitals. A convenience sample of 25 young adults aged between 18 and 35 years was taken. The subjects were literate in English and had either type 1 or 2 diabetes of 5 years duration or less. A Diabetes Control and Complications Trial (DCCT) Diabetes Quality of Life (DQOL) questionnaire was used as the research instrument. DCCT DQOL questionnaire consists of 4 primary scales of domain: satisfaction, impact, social/vocational worry and diabetes-related worry.

Results: Our study shows a mean satisfaction level of 67.5% of maximum possible satisfaction score in relation to their treatment and lifestyle. A mean impact of illness score of 41.4% of the maximum possible was noted. The level of social/vocational worries was 45.3% of the maximum possible and diabetes-related worries score was 47.4%. The overall degree of worry affecting the quality of life in our study population was not high.

Conclusion: In conclusion, the study has shown that diabetes and its management does not appear to interfere significantly with the quality of life of young adult patients.

II103/NUR

Preliminary Experience from a Group-based Diabetes Empowerment Programme

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Aim: Diabetes self-care education is important in diabetes management. Traditional one-to-one education is effective but is resource-intensive. Therefore, we explored the effectiveness of group-based education in a multi-ethnic population to empower the individual; hence the name of Diabetes Empowerment Programme or DEP.

Methods: We studied the clinical and metabolic profile of 28 subjects with diabetes at baseline and 6 months after DEP. Among them, 57% were male. 60.7% were Chinese, 28.6% were Malay and 10.7% were Indians. Approximately 90% of them had Type 2. Their mean age was 44 ± 12 years and duration of disease was 10 ± 7 years.

Results: A significant reduction of mean HbA1c from 9.8 ± 2.7% to 8.2 ± 1.8% was seen over a period of 6 months (P <0.001) after completion of the DEP. There was no significant change in blood pressure. However, there was a slight increase in mean weight from 73.0 ± 15.4 kg to 74.7 ± 17.0 kg (P <0.05).

Conclusion: It is shown in this study that our 4-week group-based diabetes empowerment programme has a sustained benefit in glycaemic control over a 6-month period. Nonetheless, further studies using a randomised control design with a larger sample size should be considered to examine the effectiveness of group-based education programmes in our population.

II104/NUR

Registered Nurses' Behaviors on Extended Role in Performing Advanced Skills

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Aim: The role of nurses is evolving towards greater expansion. Training of nurses on the advanced skills to expand their role has been conducted extensively for the past 1 and a half years. However, the impact of the training in changing the behaviour of the registered nurses in performing intravenous cannulation and administering medicines intravenously is inconclusive. This study also aims to explore the barriers that prevent the nurses from undertaking their new role.

Methods: This research is a cross-sectional quantitative survey questionnaire involving registered nurses in the general wards. The study was preceded with a focus group interview of nurses and was piloted to ensure content validity.

Results: A total of 347 (81%) nurses responded. Findings revealed that most nurses are aware of expanded role and benefits. Findings also revealed that most nurses are practising advanced skills. 98% of the respondents agreed that it was important to have sufficient and relevant support to enable them to practise. Areas of concern are litigation issues, devaluing the essential value of "basic" nursing care, perpetuating a "hand maiden" role, reducing nurses' time in providing other nursing activities and increased responsibilities. Interestingly, findings also revealed that there is no reduction in contact time with patients.

Conclusion: Nurses seemed to be performing the advanced roles and are aware of the benefits to patients and themselves when they undertake the expanded role. However, there are still concerns and barriers reported which need to be resolved.

II105/NUR

Survey on Pulmonary Tuberculosis (PTB) Treatment Defaulters

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Aim: 1) To identify patients' reasons for defaulting treatment; and 2) to study the demographic and social background of defaulters.

Methods: The survey was carried out by Tuberculosis Care Unit (TBCU) nurses who visited the homes of infectious PTB treatment defaulters, defined as patients who missed Directly Observed Therapy (DOT) at the polyclinic or their scheduled appointments at TBCU, to recall them for treatment. The reasons for defaulting were obtained from patients or relatives during the home visits. The social and demographic data of the defaulters were compared with that of PTB cases notified from 2001 to 2003 to the STEP registry.

Results: Ninety-nine defaulters' homes were visited between April 2002 to December 2003, of which contact was established with 59 defaulters or their family member(s). The main reasons for defaulting treatment were financial (39%) (of these, 70% were unemployed, and 70% were of non-Chinese ethnicity) and time constraints (28.8%) (of these, 88.2% were employed, half of whom held manual jobs). 63% of the defaulters lived in 3- to 4-room flats, and only 66% lived with their family. Non-Chinese were 3 times more likely to default, P <0.001. Age and gender were not factors predictive for defaulting.

Conclusion: Financial difficulty was the commonest reason for defaulting DOT and clinic appointments. 69.6% who defaulted due to financial reasons were unemployed. Non-Chinese persons were 3 times more likely to default PTB treatment.

II106/NUR

Reducing Length of Stay of Patients Admitted with Pneumonia-Poster Presentation

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Aim: Pneumonia pathway was implemented in November 2001. The team found that the average length of stay escalated from 7 to 10 days for the third quarter of 2003 and was higher compared to other institutions of 5-day length of stay. A multi-disciplinary clinical project team was formed with the target to reduce length of stay (LOS) to not more than 5 days in 50% of patients admitted with pneumonia without complications (DRG 171 & 172).

Methods: Data collected showed 5 key causes of long LOS. The following interventions were implemented: a) all new house officers were briefed on protocol and documentation; b) admitting doctors were allowed to order basic investigations only; c) pharmacists assisted in reminding doctors to oralise antibiotics as the patient's condition improved and fever subsided; d) ward nurses and case managers followed ward rounds, monitored and gently reinforced doctors to adhere to pathway.

Results: With the above interventions, 50% to 80% of patients achieved LOS of 5 days and below.

Conclusion: LOS was reduced from 10 days to 5 days and below. We have demonstrated that the involvement of a multi-disciplinary team approach using clinical pathway can reduce LOS without increasing patient morbidity.

II107/NUR

Better Late Than Never? A Report on Patients Attending a Multidisciplinary Osteoporosis Clinic

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Aim: Osteoporosis is both a disease and a risk factor for fracture, with debilitating consequences. As our population ages, an estimated 17% of our elderly population is expected to have osteoporosis by 2030. Previous studies have demonstrated that osteoporosis is an under-recognised and under-treated problem. An osteoporosis clinic was started at Alexandra Hospital with the aim of using a multidisciplinary approach to effectively assess and treat osteoporosis.

Methods: We encouraged the referral of patients at risk of or suffering from osteoporosis to the clinic. We present the clinical profile of the patients (n = 75) attending the osteoporosis clinic from November 2002 to September 2003.

Results: Patients attending the clinic were predominantly women (92%) and consisted of 90% Chinese, 6% Malay and 4% Indian/other races. The median age of attendees was 68 years. The median T-score was –2.55 at the spine and –2.70 at the hip. Majority of the patients (69.2%) had at least 1 fracture. The most common fracture site was the spine (63%), followed by the hip (22%), other peripheral sites (11%) and both the hip and the spine (4%).

Conclusion: A large proportion of the patients attending the osteoporosis clinic had advanced osteoporosis with previous fractures. Greater awareness of the disease and earlier detection and treatment of osteoporosis should be advocated.

II108/NUR

Effectiveness of Nurse Clinician Case Manager and Telemedicine in the Management of Patients with Persistently Uncontrolled Diabetes Mellitus

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Aim: To determine the effectiveness of outpatient telemedicine based, diabetes nurse clinician supervised therapeutic education in subjects with persistently uncontrolled diabetes.

Methods: A total of 20 subjects with persistently uncontrolled diabetes (HbA1c >8.5% for at least a year) were recruited from 2 tertiary diabetes centres. A diabetes nurse clinician was assigned as case manager to provide systematic and structured diabetes education via telemedicine (electronic mail) over a 6-month period. Interpretation and advice on self blood glucose

monitoring data was also communicated via email. Outcome measures include HbA1c and body weight at baseline, third month and sixth month. Repeat measurement technique is used to evaluate the time effect on the endpoints.

Results: There were 10 Chinese, 6 Indians and 4 Malays. The median age was 38 years (range, 19 to 52); median year of diagnosis was 8 years (range, 0.5 to 31). We found significant changes in weight and HbA1c by time (P = 0.0105 and P <0.0001 respectively). Mean weight increased by time, while mean HbA1c decreases. Compared with baseline, the mean increase of weight at the first and the second follow-up visits were 0.84 kg (95% CI -0.16 to 1.83, P = 0.096) and 1.75 (95% CI 0.54 to 2.96, P = 0.007) respectively. Compared with baseline, the mean decrease of HbA1c at the first and the second follow-up visits were 1.26 (95% CI 0.81 to 1.71) and 1.19 (95% CI 0.69 to 1.70), respectively.

Conclusion: Telemedicine based therapeutic diabetes education may be effective in improving glycaemic control among subjects with persistently uncontrolled diabetes.

II109/NUR
A Simple Approach to Improve Indwelling Urinary Catheter Care

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Aim: There is a scientific basis that suggests a reduction in nosocomial infection rates could be achieved by optimising processes in the delivery of care to patients. The purpose of this project was to improve the insertion and day-to-day care of Indwelling Urinary Catheters (IDC).

Methods: The clinical quality improvement tool, Plan-Do-Study-Act Cycle was used. A pilot project was conducted in the Medical and Surgical wards. Tools were designed to measure the care associated with IDC insertion and maintenance. A denominator of device days and a numerator of catheter associated urinary tract infections (CAUTI), along with the CDC classification for symptomatic and asymptomatic CAUTI, were used.

Results: The results, obtained prospectively over 6 months, were analysed. After the introduction of the project, the CAUTI incidence rates for both wards decreased. Overall, the compliance rates to insertion and maintenance of IDCs improved. The majority of insertion non-compliance was associated with the aseptic hand-wash prior to IDC insertion and use of the sterile drape. During the maintenance phase, most non-compliance was associated with hand-hygiene before and after procedures and not wearing gloves when handling IDCs. Continuous feedback was given to staff and results were discussed with the Infection Control Committee. The measures implemented included reinforcement and on-site education. In addition, a training programme focusing on IDC insertion has commenced.

Conclusion: The project has improved the care associated with IDCs. The success of this project-based approach will be used to improve other processes involved in nosocomial infections.

II110/SC
Evaluation of Ease of Intubation with Glidescope or Macintosh Laryngoscope by Experienced Operators in Simulated Easy and Difficult Airways

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Aim: The new video-equipped laryngoscope, Glidescope® (GS), is developed for difficult airway management. We compared this device with the Macintosh laryngoscope (ML) in intubation of simulated grade 1 and 3 larynx by experienced anaesthetists.

Methods: In this double crossover study, 20 anaesthetists were randomised to use either the GS or ML first, and then randomised to intubate grade 1 or 3 larynx first. They were allowed 3 attempts to intubate in a maximum time of 360 sec in each of the 4 scenarios on the Human Patient Simulator.

Results: In the grade 1 scenario, success and ease of intubations were similar with both devices. Time taken was shorter with ML (mean 12.7 sec, SD 5.9 sec vs 19.0 sec, SD 9.7 sec, P = 0.006). Most of the anaesthetists chose ML (17/20) with 3 undecided. In the grade 3 scenario, there were more successful intubations with GS (20/20 vs 18/20, P = 0.5). Time taken was shorter for GS (mean 23.5 sec, SD 12.7 sec vs 70.5 sec, SD 101.2 sec, P = 0.001). The anaesthetists graded intubation easier with the GS (median easy vs intermediate, P = 0.025). More would choose the GS for the grade 3 scenario (12/20 vs 6/20).

Conclusion: In simulated grade 1 larynx, there was no advantage with GS, and intubating time was longer. In simulated grade 3 larynx, success rate and intubation time were better with the GS. We suggest further study of the GS in real patients.

II111/SC
Combined MIBI/US is the Modality of Choice: A Prospective Study Comparing MIBI, Ultrasound and Combined MIBI/US of the Neck in Hyperparathyroidism

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Aim: Ultrasound (US) and technetium-99m sestamibi scintigraphy (MIBI) are frequently used to detect abnormal parathyroid glands prior to surgical decision-making in hyperparathyroidism. This prospective study compares the efficacy of US, MIBI and combined MIBI/US in the detection of parathyroid adenoma or hyperplasia.

Methods: Twenty-nine patients with a mean age of 57 years were prospectively evaluated. Clinically, 15 patients were suspected of primary hyperparathyroidism, 7 of secondary hyperparathyroidism and 7 had recurrent disease. There were 113 parathyroid sites which were evaluated by MIBI, 94 sites by US and 94 sites by combined MIBI/US.

Results: The overall sensitivity, specificity, positive predictive value (PPV) and negative predictive value (NPV) of MIBI were 56.4%, 97.3%, 91.7% and 80.9%. For US, they were 50%, 96.9%, 88.2% and 80.5%. For combined MIBI/US, they were 63.3%, 96.9%, 90.5% and 84.9%. For primary hyperparathyroidism, the sensitivity rates of MIBI, US and combined MIBI/US were 78.6% and 63.6% and 90.9%. NPV was 93.6%, 90.7% and 97.5%, respectively. For secondary hyperparathyroidism, the sensitivity rates of MIBI, US and combined MIBI/US were 44.0%, 42.1% and 47.4%. NPV was 66.7%, 67.6% and 69.7%, respectively.

Conclusion: Combined MIBI/US imaging is better in detecting and in excluding parathyroid abnormality than either MIBI or US alone. In addition, although sensitivity, specificity, PPV and NPV are decreased in secondary hyperparathyroidism, combined MIBI/US continues to be better in detecting and in excluding disease than either MIBI or US alone.

II112/SC
MRI of Hip Pain: Prevalence and Mimickers of Radiographically Occult Hip Fractures

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Aim: Hip fracture, defined as fracture of the femoral neck region, is commonly diagnosed on radiographs. When it is minimally displaced or impacted, magnetic resonance imaging (MRI) is utilised to confirm the diagnosis. This study evaluates the prevalence of radiographically occult hip fractures and illustrates MRI appearance of some mimickers.

Methods: Fifty-five studies were performed in 54 patients (18 males, 36 females, mean age 55 years, range 13-94 years) with hip pain. MRIs were evaluated for the presence and location of bone or soft tissue injury.

Results: 25% (14/55) studies showed an acute fracture. Of these, 8 had a hip fracture and 6 had fractures in the ischium, pubis and/or sacrum. 15% (8/55) had other bone disease but not a fracture (5 avascular necrosis, 1 acute myeloid leukaemia, 1 lymphoma, 1 osteoarthritis). 16% (9/55) studies had muscle strain or grade 1 muscle tear without a fracture. 15% (8/55) had unrelated soft tissue disease (1 trochanteric bursitis, 1 pyomyositis, 3 paralabral cyst, 1 transient osteoporosis of the hip, 1 injection site oedema in the gluteal muscles, 1 non-specific hip effusion). 31% (17/55) studies had no

cause identified for hip pain.

Conclusion: Not everyone with hip pain has a hip fracture. Apart from diagnosing subtle fractures, MRI is also useful to demonstrate other bone or soft tissue conditions which cause hip pain. Because of the location of this wide range of mimickers, an imaging protocol which extends from pubic symphysis to sacrum is recommended.

II113/SC

Stereotactic Vacuum Breast Core Biopsy Using an Upright Mammographic Unit

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Aim: Vacuum-assisted core breast biopsy under stereotactic mammographic guidance is mostly performed in the prone position on a dedicated unit. However, the availability of add-on attachments allows the procedure to be done with lower cost and on pre-existing mammographic units. A review of our experience in TTSH with this method was performed.

Methods: From August 2001 to March 2004, there were 197 vacuum-assisted core biopsy procedures performed on 188 patients, using an 11G Mammotome biopsy device. The age of the study population ranged from 30 to 82 years. All technical details and complications were recorded. A follow-up phone interview was also conducted the next working day.

Results: The technical considerations with an upright mammographic unit for biopsy include a higher chance patient movement and limited infero-superior access. Patient movement can be minimised with adequate preparation and counselling, and by reducing the time taken for the procedure. The overall complication rate was 4% of all procedures. We had no major complications requring hospital admission or surgical intervention. The common complication encountered was vasovagal reaction. All post-procedure bleeding was successfully controlled with direct pressure. None of the procedures needed to be aborted, giving a 100% technical success rate.

Conclusion: Stereotactic mammographic guidance for vacuum-assisted core biopsy is feasible with upright mammographic units. Awareness of technical differences compared to the prone unit along with good clinical practice will allow good technical success with a low complication rate.

II114/SC

Endovascular Repair of Aortic Aneurysm in Singapore General Hospital

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Aim: This study is a retrospective review of endovascular repair of aortic aneurysm in Singapore General Hospital.

Methods: From October 1998 to February 2002, 20 patients (17 males and 3 females with mean age of 72) with aortic aneurysm (17 infrarenal abdominal aortic aneurysms, 3 thoracic aneurysms) were treated with endovascular stent grafting. Aneurysm size ranges from 4.2 to 7.8 cm (mean 5.8 cm). Repairs were done with bifurcated stent graft in 13 patients, aorto-uni-iliac graft in 3 patients and tube stent graft in 3 patients. The patients were followed up clinically and with serial CT scans for mean of 11.7 months (range, 3 weeks to 35 months).

Results: Technical success was 95% (19 out of 20 patients). The single failure was due to inability to deliver the stent graft system secondary to tight iliac artery stenosis. Follow-up CT scans showed aneurysm sac shrinkage in 58.8% of the patients. Seven patients developed endoleak but 57% of them resolved spontaneously. One patient died within 30 days of the procedure. The death was not procedure-related.

Conclusion: Endovascular stent grafting is a safe and effective technique in the treatment of aortic aneurysm in our short-term review. However, long-term review is necessary to determine the durability of the technique.

II115/SC

Diagnostic Accuracy of Medical Officers in an Emergency Department

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Aim: To compare the effect of intradepartmental teaching and on-the-job supervision on diagnostic accuracy of medical officers at the beginning of a posting and towards the end of the posting.

Methods: A cohort of 13 medical officers posted to the Emergency Department of a tertiary teaching institution from November 2002 to May 2003 were selected. Ten consecutive admissions at the beginning and end of the posting by each medical officer were compared. Admission diagnostic accuracy was determined by classifying the admitting diagnoses as correct, non-specific, or outright wrong. Two independent assessors reviewed the case notes initially, and any differences in opinion were arbitrated by a third.

Results: Wilcoxon signed rank test was performed on the data. The mean number of correctly diagnosed cases was 6.08 at the beginning, and 6.85 at the end, with no significant difference detectable (P = 0.197). The mean number of non-specifically diagnosed cases was 1.69 at the beginning, and 2.31 at the end with no significant difference detected (P = 0.241) However, the number of wrongly diagnosed cases had decreased from a mean of 2.23 at the beginning to 0.85 at the end of the posting. This was statistically significant with P = 0.036.

Conclusion: There had been a significant reduction in the number of wrongly diagnosed cases. There was no statistically significant change in the number of correct or non-specific diagnoses.

II116/SC

The Presence of the Palmaris Longus: A Local Study

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Aim: The palmaris longus (PL), being functionally insignificant in flexion of the wrist, has been harvested for many reconstructive procedures. The prevalence of the palmaris longus in the local population has not been studied. Another study previously done has shown correlation between the absence of the PL and an incomplete superficial palmar arch (SPA). This is relevant in surgeries that involve a disruption of the vascular supply to the hand.

Methods: A total of 418 subjects was screened. The PL was visualised and palpated after the patient was asked to perform resisted flexion at the wrist with a clenched fist. The Standard Allen's test was used to determine if the palmar arch was complete or incomplete.

Results: Of the 418 subjects, 5.7% had an absent PL, of which 29.1% was bilateral. The SPA was complete in all bilaterally absent PL. The arch was incomplete in 17.6% of unilateral PL absence. Of the 24 hands with absent PL, 12.5% was associated with an incomplete SPA.

Conclusion: Our study of a sample of the local population places the presence of PL at 94.3%. Only 12.5% of our cases of absent PL had an incomplete palmar arch, which is lower than the 47% figure quoted in another such study done.

II117/SC

Dominant Versus Non-dominant Hand: A Difference in Maximum Grip Strength?

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Aim: A survey was conducted to establish the difference in maximum grip strength between the dominant and non-dominant hand in the local population.

Methods: The bilateral grip strengths of 402 normal subjects without any hand pathology were measured using a Jamar dynamometer. The population age ranged from 7 to 85 years and there were 255 female and 147 male subjects.

Results: The mean of the maximum grip strength of the dominant hand was 31.59 lb (± 10.57 lb) and that of the non-dominant hand was 29.34 lb (± 10.23 lb). The difference in the mean of the maximum grip strength between the dominant and non-dominant hand was 2.24 lb (95% CI: 1.90-2.58) which was statistically significant (P <0.05). This was also the case when analysed within the female and male subgroups. Interestingly, the difference in the mean of the maximum grip strength between the dominant and non-dominant

hand was only statistically significant within the right hand dominant subjects (P <0.05) and not within the left hand dominant subjects.

Conclusion: The maximum grip strength of the dominant hand was significantly higher when compared to the non-dominant hand. The difference was statistically significant (P <0.05) within the male, female and right hand dominant subgroups, but not so in the left hand dominant subgroup. This data may be useful as a guide in the hand rehabilitation of patients.

II118/SC

Forearm-based Bier's Block is as Effective as a Conventional Bier's Block for Manipulation and Reduction of Distal Radius Fractures – A Prospective Randomised Controlled Trial

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Aim: The Bier's block is an effective regional anaesthesia technique. Modification of the block by placing a tourniquet on the forearm instead of the arm has been described. Advantages of the forearm tourniquet include preservation of the muscles of the long flexors and extensors of the hand, as well as longer tolerance of the tourniquet. This study compares the pain scores and complications of the forearm-based Bier's block versus the conventional Bier's block for the manipulation and reduction of distal radius fractures.

Methods: Patients being seen at the hospital's Emergency Department who were over the age of 16 and had a distal radius fracture that required manipulation and reduction were considered for inclusion. Patient biodata, mechanism of injury and radiological configuration of the fractures were collected. Pre-manipulation and manipulation pain scores were measured using a Visual Analogue Scale (VAS). Statistical analysis was performed using the Mann-Whitney U test.

Results: There were 17 patients in the conventional group and 14 patients in the forearm group. There was no difference in mean age, sex distribution, mechanism of injury or fracture configuration between the 2 groups. Statistical analysis showed no significant difference in the pre-manipulation pain scores, manipulation pain scores and difference between the 2 scores. There were no complications in either group.

Conclusion: The forearm-based Bier's block is as effective and safe as a conventional Bier's block.

II119/SC

Endoscopic Transnasal Approach for Clival Tumours

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Aim: Clival tumours are among the most challenging of skull base lesions to treat. The approaches proposed so far by other authors include anterior transfacial, frontal transnasal, or midface degloving approaches, lateral transtemporal or transpetrous approaches. These are invasive, traumatic and often disfiguring, and associated with morbidity, e.g. hearing loss. We decided to implement a new minimally invasive endoscopic transnasal approach for clival tumours.

Methods: Two patients, 1 with a clival chordoma, and another with a clival carcinoma, were treated with this novel method. Gross total resection was achieved.

Results: The patients recovered very quickly and well from the surgery, with no morbidity or complications. They were able to talk, eat, drink and walk on the same evening after the operation, and were discharged after only a few days.

Conclusion: The endoscopic transnasal approach for clival tumours holds great promise as a new minimally invasive, yet maximally effective surgical technique. However, familiarity and experience with endoscopic surgery is required for this method to be used safely.

II120/SC

Minimally Invasive Carpal Tunnel Decompression with Knifelight

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Aim: Carpal tunnel decompression is a common procedure in orthopaedic and neurosurgery. Endoscopic carpal tunnel decompression offers significant advantages over open surgical decompression. These advantages include a smaller incision, preservation of the overlying palmar fascia, palmaris longus, better post-surgical grip function, less pain and less scarring. However, compared to traditional surgical release, it requires more equipment and setup, such as endoscope, light source and monitor. We devised a new method using the Knifelight tool, which incorporates all the advantages of endoscopic release, but which does not require an endoscopic setup.

Methods: From April 2003 to June 2004, 20 consecutive patients with clinically symptomatic and electrophysiologically confirmed carpal tunnel syndrome were enrolled in our study. All underwent Knifelight release. A small 1-cm incision was made in the wrist crease. The transverse carpal ligament was identified, and a small opening made. The Knifelight was inserted, and the ligament release complete.

Results: All 20 patients experienced at least 90% improvement of their symptoms, and more than half had complete resolution. There were no complications related to the approach. The scar in the wrist crease was practically invisible after 2 months.

Conclusion: Our new Knifelight carpal tunnel release method offers a significant minimally invasive, simple and easy alternative to the current open surgical or endoscopic treatments.

II121/SC

Petrosal Keyhole Approach for Repair of Anterior Inferior Cerebellar Artery Aneurysm

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Aim: The prepontine space anterior to the brainstem is one of the most difficult areas to access in neurosurgery, due to the deep location, extremely narrow surgical corridors, and vital structures present (e.g. cranial nerves, brain stem vessels, brainstem). Surgical approaches to this region are usually complicated and invasive. Anterior inferior cerebellar artery (AICA) aneurysms are very rare, are located in this challenging region and are difficult to treat surgically. We report our experience with a minimally invasive petrosal keyhole approach for repair of AICA aneurysm.

Methods: A 63-year-old Chinese female presented in coma with an acute subarachnoid haemorrhage. Cerebral angiograms showed a large lower basilar trunk aneurysm and a left AICA aneurysm. The basilar trunk aneurysm was near totally coiled by neuroradiology, but the AICA aneurysm was uncoilable.

Results: A minimally invasive approach was used. A 6-cm retroauricular incision was made, and a targeted 3-cm diameter temporal bone drilling though the petrous was used to expose the AICA aneurysm at its junction with the basilar artery. The AICA aneurysm was successfully repaired. The patient recovered well, and eventually regained consciousness.

Conclusion: A rare AICA aneurysm has been successfully repaired with a minimally invasive petrosal keyhole approach.

II122/SC

Petrosal Keyhole Approach for Total Excision of a Giant Intracranial Epidermoid Involving the Posterior and Middle Fossa

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Aim: Intracranial epidermoid/dermoid lesions are rare, and difficult to remove totally. Giant epidermoids pose a formidable surgical challenge, and frequently involve multiple compartments. Their removal usually requires large or multiple craniotomies. We report our experience with a novel minimally invasive petrosal keyhole approach for total excision of a giant intracranial epidermoid.

Methods: A 59-year-old Chinese male presented with progressive right multiple cranial nerve palsies, right sided cerebellar signs, and ataxia. CT and MRI scans showed a giant epidermoid extending from the foramen magnum to the sphenoid ridge, compressing the brainstem anterior, laterally and posteriorly, elevating the floor of the third ventricle, and causing hydrocephalus.

A ventriculoperitoneal shunt was first inserted to relieve the hydrocephalus. A petrosal keyhole approach was used to remove the lesion.

Results: A minimally invasive 6-cm retroauricular incision was used. The petrous temporal bone was drilled to expose both the posterior and middle fossa. The superior petrosal sinus was ligated, and the tentorium was incised. The epidermoid was completely excised. The patient recovered rapidly and well from the procedure, with improvement in his neurological deficits.

Conclusion: The petrosal keyhole approach has been used to successfully excise a giant intracranial epidermoid involving multiple intracranial compartments.

II123/SC

Subtemporal Keyhole Approach for Lesions Involving the Cavernous Sinus

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Aim: Cavernous sinus lesions are extremely challenging and difficult to treat surgically. The neurosurgical approaches are complicated, invasive, and usually require large craniotomies and skull base approaches. We report our experience with a novel minimally invasive subtemporal keyhole approach for the treatment of cavernous sinus lesions.

Methods: From April 2003 to June 2004, 7 patients presented with multiple cranial nerve palsies due to cavernous sinus lesions. One patient had plasma cell granuloma, 1 had trigeminal schwanoma, 1 had haemangiopericytoma, 1 had skull base carcinoma, 1 had metastasis and 2 had meningioma. A subtemporal keyhole approach with a 5-cm pre-auricular incision was used. Limited anterior petrosectomy was performed. The cavernous sinus was opened, and the tumour dissected out.

Results: The patients recovered rapidly and well from this minimally invasive approach. Five patients even experienced improvement in their neurological deficits. None had any worsening of their neurological deficits.

Conclusion: The subtemporal keyhole approach is a novel, minimally invasive alternative to the more invasive established neurosurgical approaches for treatment of lesions in the cavernous sinus.

II124/SC

A New Transorbital Keyhole Approach for Intracranial Aneurysms

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Aim: The pterional craniotomy has been the workhorse for access to anterior circulation aneurysms for several decades. This requires head shaving, a large fronto-temporal incision, large fronto-temporal craniotomy and some brain retraction. We studied all the anterior circulation aneurysms admitted under the author's care from April 2003 to June 2004, to see if a new minimally invasive transorbital approach could be effectively used instead to treat these aneurysms.

Methods: Twenty-five patients who could benefit from this approach were identified. A 5-cm eyebrow incision was made, and a 3-cm orbitofrontal craniotomy was made. The orbital roof was drilled off to the superior orbital fissure. The dura was opened, and retraction was placed on the orbit rather than on the brain. The subarachnoid cisterns opened. The aneurysms were dissected out, and repaired with a neurosurgical clip.

Results: All the aneurysms were successfully repaired. These aneurysms were located at the anterior communicating artery, middle artery bifurcation, posterior communicating artery and internal carotid artery bifurcation. There were no complications or morbidity associated with the approach.

Conclusion: The transorbital eyebrow approach is a viable alternative to the traditional pterional approach for the treatment of aneurysms. Moreover, it offers the following advantages: 1) no hair shaving; 2) small incision, less pain and better cosmesis; 3) small craniotomy, less brain exposed; 4) no brain retraction; and 5) faster postoperative recovery.

II125/SC

Prevalence of Visual Impairment and Blindness Amongst Patients Attending a Geriatric Specialist Outpatient Clinic

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Aim: To assess the prevalence of visual impairment and blindness amongst elderly patients attending a geriatric specialist outpatient clinic and to ascertain the underlying causes of visual impairment and blindness.

Methods: We conducted opportunistic screening of visual acuity for 287 patients attending the Alexandra Hospital Geriatric Centre for non-eye related medical disorders. All subjects with visual acuity 6/18 or worse were referred for a complete ophthalmic evaluation to ascertain the underlying cause for visual impairment and blindness.

Results: The mean age of the 287 patients was 77 years (range, 53-102 years). Of these, 97 were males and 190 were females. Unilateral blindness (defined as visual acuity of worse than 6/60) was found in 16.4%, whereas bilateral blindness was seen in 5.2% of the patients. Unilateral and bilateral visual impairment (defined as vision of 6/18 to 6/60) was detected in 34.5% and 15.7% of the patients, respectively. Of the referred patients, 103 patients returned for a complete ophthalmic examination by an ophthalmologist. The underlying causes of visual impairment and blindness were cataract (62.1%), age-related macular degeneration (13.6%), glaucoma (9.7%) and diabetic retinopathy (7.8%).

Conclusion: The prevalence of visual impairment and blindness was high in elderly geriatric patients and the most common causes of these were cataract and age-related macular degeneration.

II126/SC

Quality of Life of Myopes Before and After Laser Assisted In situ Keratomileusis Lasik

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Aim: To determine the quality of life of myopes using utility value before and after laser assisted in situ keratomileusis (LASIK) and to identify factors that may influence any change in the quality of life after surgery.

Methods: 102 patients (202 eyes) with compound myopic astigmatism seen at The Eye Institute, National Healthcare Group, were interviewed in this prospective study. They were followed-up 3 months after their LASIK surgery. The time tradeoff (TTO) and standard gamble blindness (SGB) methods were applied for generating the pre- and post-LASIK utilities.

Results: Overall, there was an increase in patients' mean utilities after operation. The SGB utility showed 2.04% increase (0.98 to 1), while the TTO utility showed an improvement of 5.38% (0.92 to 0.98). While most patients' TTO utilities increased to 1 after LASIK (n = 44), 2 showed a decline in utilities from a pre-LASIK value of 1. A similar observation was made based on the standard gamble method. Based on the ANOVA model, lifestyle demand was the only significant variable associated with an improvement in post-LASIK TTO utilities (P = 0.047).

Conclusion: The practical difficulties associated with wearing spectacles and contact lens and the limitations they pose on sports and leisure activities have a significant effect on the quality of life of myopic patients. This study reports a better quality of life after LASIK as shown by higher mean post-LASIK utility values using both the time trade-off and standard gamble for blindness methods.

II127/SC

Concordance of Fellowship Vitreoretinal Specialists in Detecting Hard Exudates on Digital Ocular Fundus Images

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Aim: The use of digital fundus images from a non-mydriatic fundus camera to screen the ocular fundus for lesions of diabetic retinopathy is widely

practised. We aim to assess the agreement between 2 independent specialists in detecting hard exudates on digital fundus images of patients screened for diabetic retinopathy.

Methods: Two fellowship-trained retinal specialists independently read 1198 digital fundus images of 565 diabetic patients from a diabetic retinopathy-screening programme for the presence of hard exudates. Of these, 921 (77%) images were gradable. A third retinal specialist was an independent masked adjudicator.

Results: Overall agreement between the 2 specialists was 96% [kappa = 0.71 (95% CI 0.59-0.84)] and 97% [kappa = 0.83 (95% CI 0.74-0.91)] for the left and right eye, respectively. Concordance of the first specialist with the adjudicator was 97% [kappa = 0.81 (95% CI 0.70-0.91)] for the left eye and 98% [kappa = 0.87 (95% CI 0.79-0.95)] for the right eye. Concordance of the second specialist with the adjudicator was 96% [kappa = 0.71 (95% CI 0.59-0.84)] for the left eye and 96% [kappa = 0.76 (95% CI 0.66-0.86)] for the right eye.

Conclusion: A high degree of concordance between independent retinal specialists suggests uniformity in detecting hard exudates on digital fundus images obtained with a non-mydriatic fundus camera.

II128/SC

Giant Frontal Sinus Mucocele Presenting with a Subcutaneous Forehead Mass

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Aim: To report a patient with intracranial extension of a mucocele presenting primarily with a subcutaneous forehead mass and various ocular signs.

Methods: Case report.

Results: A 33-year-old Chinese female presented with blurring of the inferior visual field in the left eye, associated with periorbital swelling and a painless subcutaneous forehead mass above the affected eye. Clinical examination of the left eye revealed proptosis, periorbital swelling, partial ptosis and choroidal folds. An elongated, soft, subcutaneous mass was seen above the left eye. CT scan and MRI both showed a large, lobulated mass of mixed density within the left frontal sinus, measuring 2.6 x 4.5 cm. The mass had eroded the bone and extended intraorbitally and intracranially. A subcutaneous component was also seen but there were no other intracranial abnormalities. Exenteration of the frontal sinus, decompression of the mucocele and endoscopic removal of the mucosa and osteoma were performed. Intraoperatively, a left-sided frontal bone defect corresponded to the region of the soft tissue swelling. Histopathology showed a fibrous connective tissue cyst wall, partially lined by stratified squamous epithelium, with patchy chronic inflammation.

Conclusion: A subcutaneous soft-tissue mass may be the presenting complaint of a frontal mucocele. It is important to consider sinus disease as a differential diagnosis during the clinical workup of a patient with orbital disease presenting primarily with proptosis and ocular symptoms. A careful examination of the surrounding skin may suggest the diagnosis of sinus-related disease.

II129/SC

Non-surgical Management of Brow Ptosis Secondary to Facial Nerve Palsy

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Aim: To describe a non-surgical method of restoring eyebrow symmetry in facial nerve palsy.

Methods: Three patients with brow droop due to facial nerve palsy were chosen for the study. Three patients had recurrent brow ptosis despite direct brow lifts. A new brow was drawn superior to the existent brow to match the height of the opposite side. When the patient was satisfied with her appearance in the mirror and digital picture, the existing brow was shaved.

Results: All patients found the technique easy to perform. It also greatly enhanced their self-esteem.

Conclusion: In patients with brow ptosis, cosmetic makeup can be as effective as surgical techniques in restoring the brow symmetry after facial nerve palsy.

II130/SC

The Choice of Prophylactic Antibiotic Among Junior Ophthalmologists in the Management of Contact Lens Related Keratitis

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Aim: In developed countries, corneal ulcers occur mainly in contact lens wearers. The most common causative agent is *Pseudomonas aeruginosa* which is resistant to chloramphenicol eyedrop, but sensitive to gentamicin or quninolone such as ofloxacin. To prevent the occurrence of ulcers, prophylactic antibiotic for contact lens-related keratitis should target *P. aeruginosa*.

Methods: Telephone interviews of 50 on-call ophthalmologists in 50 eye casualty in the UK to find out which antibiotic(s) would be prescribed for a patient with contact lens-related keratitis (punctate corneal staining on fluorescence without ulcer).

Results: 80% of ophthalmologists recommended chloramphenicol eyedrops. 4% recommended gentamicin and 16% recommended ciprofloxain or ofloxacin.

Conclusion: The prophylactic antibiotic prescribed by most on-call ophthalmologists was ineffective against *P. aeurginosa*, the most common cause of bacterial ulcer in contact lens wearers.

II131/SC

Peripheral Neurectomy of the Inferior Dental Nerve Involved in Trigeminal Neuralgia and its Ultra-Structural Features: A Case Report

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Aim: Trigeminal neuralgia is a painful neurological condition, treated essentially by medication (carbamazepine). Its aetiology is unclear, but central demyelination is a possible cause, leading to spontaneous impulses (Clin J Pain 2002;18:4-13). Interruption of this triggering mechanism is achievable with peripheral neurectomy. The aim of this paper is to present the ultra-structural features of a peripheral nerve involved in trigeminal neuralgia.

Methods: A 50-year-old female who suffered from trigeminal neuralgia affecting her right inferior dental nerve for the last 10 years was operated under general anaesthesia via an intra-oral approach. The inferior dental nerve was identified and avulsed, with release of its terminal branches at the mental foramen. A titanium screw was then inserted into the foramen.

Results: Under the electron microscope, there was evidence of marked proliferative and degenerative changes in the myelin sheath. Some axons with thickened myelin showed loss of periodicity and disruption of lamellae. There was an associated axonal degeneration in some areas. The G-ratio (axon diameter:axon diameter and myelin sheath) appeared to be smaller. There seemed to be an increase in collagen contents in the extra-cellular matrix.

Conclusion: These ultra-structural abnormalities showed comparable features mentioned in previous studies of trigeminal neuralgia involving the ganglion and nerve roots. However, many of these features could also be present in age changes. Therefore, immunohistochemical studies for sodium and potassium channels involved in axonal conduction need to be established to differentiate them.

II132/SC

Accuracy of Fine Needle Aspiration Cytology in the Evaluation of Thyroid Nodules

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Aim: The objective of this study is to evaluate the accuracy of fine needle aspiration cytology (FNAC) in the evaluation of thyroid nodules.

Methods: A retrospective review was conducted on all patients who underwent

preoperative FNAC and subsequent thyroidectomies for thyroid nodules between January 1997 and April 2004 by surgeons from the Department of Otolaryngology–Head and Neck Surgery at the National University Hospital. One hundred and ten patients fulfilled our criteria and their preoperative FNAC and final histology was collated and correlated. True-positive, true-negative, false-positive and false-negative values were derived and the corresponding sensitivity and specificity values calculated. Aspirates which were classified as suspicious on FNAC were considered to be malignant in the analysis.

Results: The final histological diagnosis confirmed 15 malignant neoplasms (13.6%) and 95 benign lesions (86.4%). Nine (8.2%) malignancies, 69 (62.7%) benign nodules and 13 (11.8%) suspicious nodules were diagnosed on FNAC. Nineteen (17.3%) smears were deemed to be non-diagnostic on FNAC. There were 13 true-positives (14.3%), 68 true-negatives (74.7%), 9 false-positives (9.9%), and 1 false-negative (1.1%). The sensitivity and specificity of FNAC in the detection of malignancy in thyroid nodules were hence, 92.9% and 88.3% respectively. The overall diagnostic accuracy of FNAC was 89.0%.

Conclusion: Fine needle aspiration cytology is an accurate tool in the assessment of thyroid nodules. Non-diagnostic and "suspicious for malignancy" lesions contribute significantly to its limitations. Hopefully, they can be minimised with good aspiration technique and ultrasound guided aspiration.

II133/SC
En Bloc Resection of the Temporal Bone for Cancer

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Aim: Malignancies involving the temporal bone are rare and are frequently advanced at the time of diagnosis. Treatment of these tumours usually requires a combination of modalities including surgery. While en bloc resection of the temporal bone during surgery is undoubtedly desirable, it is technically challenging. We describe our experience employing this approach.

Methods: Between February 1996 and May 2004, 9 patients underwent temporal bone resection for a variety of tumours. Six patients had primary malignancies involving the ear and temporal bone (5 squamous cell carcinomas and 1 malignant ceruminoma), while the remaining 3 patients had tumours which secondarily involved the temporal bone (1 osteosarcoma, 1 meningioma and 1 metastatic nasopharyngeal carcinoma). Five patients underwent lateral temporal bone resection preserving the facial nerve, while 4 patients underwent subtotal temporal bone resection. Surgery included neck dissection in 7, parotidectomy in 8, and reconstruction in all 9 patients. Five of the 6 patients who had never been irradiated previously received adjuvant post-operative radiotherapy.

Results: After a mean follow-up of 31 months, 7 patients are alive and disease free, 1 patient is alive with disease, and 1 patient has died of recurrent disease. Post-operative complications occurred in 4 patients (2 CSF leaks, 1 wound dehiscence and 1 major skin flap necrosis).

Conclusion: En bloc resection for malignancy involving the temporal bone is technically challenging. However, our experience is that this approach provides good local control and survival for a variety of tumours. The complications of surgery are acceptable.

II134/SC
Conundrum of the Cocoon Sclerosing Encapsulating Peritonitis Secondary to Peritoneal Dialysis

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Aim: Sclerosing encapsulating peritonitis (SEP), or "abdominal cocoon" as it is descriptively referred to, is an enigmatic condition of unknown aetiology. It is characterised by the diffuse appearance of marked sclerotic thickening of the peritoneal membrane resulting in intestinal obstruction. It is a rare but serious complication of continuous ambulatory peritoneal dialysis (CAPD).

Results: A 14-year-old male with a history of end stage renal failure on CAPD presented with symptoms of acute intestinal obstruction. A CT scan of the abdomen revealed distended small bowel loops clustered and displaced to the right upper quadrant. The overlying peritoneum was markedly thickened and calcified. Laparotomy confirmed the diagnosis of SEP and he was treated with excision of the fibrocollagenous membrane. Postoperatively, he had prolonged ileus requiring parenteral nutritional support and peritoneal dialysis was restarted on postoperative day 10.

Conclusion: A high degree of cognizance is needed to facilitate diagnosis and treatment of this uncommon and potentially life-threatening condition.

II135/SC
Non-surgical Periodontal Treatment and High Sensitivity C-Reactive Protein Levels

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Aim: Diabetes has been found to be significantly associated with periodontal disease. Blood levels of high sensitivity C-reactive protein (HS CRP), which is an acute-phase protein, have been used as a systemic marker of different chronic inflammatory diseases, including periodontitis, and is suggested to be a means of predicting cardiac complications in diabetics. The aim of this study was to determine whether periodontal treatment causes improvement in systemic health, as measured by changes in serum HS CRP levels.

Methods: A single-blinded randomised clinical control trial was carried out on a multi-racial population of Singaporean diabetics with varied levels of metabolic control. The groups compared were oral hygiene instructions group, scaling plus oral hygiene instructions group and a non-treatment control group. Full mouth periodontal recordings made at 3 months were compared to baseline.

Results: A significant and sustained improvement in periodontal parameters was seen in both treatment and oral hygiene instruction groups, while the non-treatment group also showed minor improvement. No concurrent changes were noted in HS CRP levels, and no particular pattern was recognised.

Conclusion: Within the confines of this study, periodontal treatment does not seem to affect systemic health as measured by HS CRP levels. These findings also suggest that HS CRP may not be a sensitive systemic marker for overt infections like periodontitis, and/or the changes are not expressed over short periods of observation.

II136/SC
Influence of Anterior Occlusal Traits on Professional Assessment of Dental Aesthetics

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Aim: The perception of dental attractiveness has been showed to be influenced by the anterior dental features associated with malocclusions. The objective of this study was to determine the influence of anterior occlusal traits on professional assessment of dental aesthetics.

Methods: A sample of 21 orthodontists (mean age 34.5 ± 5.1 years) was asked to assess the dental aesthetics of 50 pairs of black and white photographs of teeth at maximum intercuspation and right buccal view. The 50 pairs of photographs represented a range of malocclusions with various degrees of dental crowding/spacing, overjet and overbite/openbite. The subjects were asked to mark the level of dental attractiveness on a 100 mm visual analogue scale with very unattractive (0 mm) and very attractive (100 mm) as the extremes. Each pair of photographs of the same dentition was scored by the principal investigators for overjet, overbite and crowding/spacing. Multiple linear regression was used for data analysis with the orthodontist's VAS scores as dependent variables, and principal investigators' scores for overjet, overbite and crowding/spacing as independent variables.

Results: The results showed that overjet and crowding/spacing was found to be a significant predictor ($P < 0.05$).

Conclusion: In conclusion, the assessment of dental aesthetics by orthodontists was significantly influenced by the degree of overjet and crowding/spacing while overbite did not play any significant roles.

II137/SC

Glycaemic Control and Responses to Periodontal Therapy in Diabetic Patients

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Aim: Glycaemic control of patients with diabetes has been shown to affect their periodontal disease severity. On the other hand, few intervention studies had examined the effect of periodontal therapy on glycaemic control. The aims of this study are to compare the effects of different treatment modalities on glycaemic control in patients with diabetes mellitus and to correlate the different periodontal parameters with glycaemic control.

Methods: Sixty-eight adult diabetic subjects were randomly assigned to 1 of the 3 groups: test (simple non-surgical peridontal therapy and oral hygiene), oral hygiene and control (no treatment) groups. For all subjects, full mouth periodontal charting and blood samples were collected at baseline, followed by 3 months.

Results: There was a significant improvement in plaque and bleeding scores of those in the oral hygiene and test groups; when compared with the control group (ANOVA P or <8%), no appreciable differences were found.

Conclusion: While simple periodontal therapy improves the periodontal status of subjects, it did not significantly improve glycaemic control in the short term.

II138/SC

Comparing Radiation Fractionation Schedules for Painful Bone Metastases: Are We Blinded to the Quality Of Randomised Evidence?

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Aim: The ideal fractionation schedule for palliation of painful bone metastases is controversial, with proponents for the use of both single and multiple fraction regimens. However, debate of the evidence has not adequately addressed the quality of randomised studies. Given the lack of quality assessment, our aim was to evaluate the quality of randomised studies using a validated checklist, and to discuss implications and future directions.

Methods: We performed a search for studies that could be reliably assessed using the validated quality assessment instrument. Independent assessors scored study quality using the instrument.

Results: The median quality score of the 17 identified randomised studies was 1 out of 5 (range, 0-3). The majority (71%) of points were awarded for the authors describing the study as "randomised". Method of randomisation and description of withdrawals and drop-outs scored poorly for most studies. None of the studies were awarded points for allocation concealment (blinding). The overall quality was deemed poor for 16 out of 17 (94%) studies.

Conclusion: The quality of published randomised evidence comparing efficacy of various fractionation regimens for palliation of bone metastases is uniformly poor, and the deficit should be acknowledged by those publishing meta-analyses. As poor quality studies bias results in uncertain ways, it is not possible to state with any confidence the superiority or equivalence of a particular fractionation schedule. Greater efforts are required by radiation oncology trial groups to improve quality, with a particular focus on developing methods of allocation concealment and comprehensively reporting results.

II139/SC

Combined Laparoendoscopic Intragastric Enucleation of a Stromal Tumour Near Cardia: Description of a New Technique

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Aim: Our aim was to study the feasibility of a combined laparoendoscopic, minimally invasive technique for removal of a benign gastric stromal tumour located in the lesser curve close to the cardia.

Methods: A 52-year-old male presented with epigastric pain. Gastroscopy showed a 3.8-cm smooth submucosal mass in the lesser curve close to the cardia. It was well circumscribed and submucosal on EUS. A diagnostic laparoscopy was performed by creating an open pneumoperitoneum through the umbilicus. A gastroscope was then inserted and three 5-mm ports were inserted transabdominally into the stomach after distending the lumen. The mucosa over the tumour was incised with diathermy and the tumour was enucleated by carefully peeling away the overlying mucosa and underlying muscle. An OGD snare was used to grasp the tumour and aid in retraction and final removal through the oral cavity. The gastric wall defect was closed intraluminally by laparoscopic suturing. Once haemostasis was secured, the 3 ports were removed and the stomach wall defects closed with continuous vicryl sutures.

Results: Gastrograffin study on the third postoperative day was normal. He made an uneventful recovery and remained asymptomatic at 6 months. The final histology was leiomyoma.

Conclusion: Enucleation of well-circumscribed GIST tumours near the cardia can be performed safely using this combined technique without the need for any gastric resection. This method is also more cost effective, as it does not require any staplers or intragastric balloon ports.

II140/SC

Non-occlusive Ischaemic Colitis Following Acute Ischaemic Limb Reperfusion

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Aim: Reperfusion syndrome is a well-recognised sequelae characterised by systemic complications and multi-organ dysfunction (MODS). We report the first case of a patient who developed non-occlusive ischaemic colitis following reperfusion of an acutely ischaemic lower limb, and review its possible pathogenetic mechanisms.

Methods: A 64-year-old male hypertensive chronic smoker presented with acute critical right lower limb ischaemia of 48 hours duration. Immediate exploration revealed thrombus in the right common femoral artery with poor backbleeding from profunda and superficial femoral vessels. A femoro-femoral crossover graft was performed with successful revascularisation. Postoperatively, the patient developed adult respiratory distress syndrome, hypotension, and acute renal failure with gross myoglobulinuria. He complained of worsening lower abdominal pain on POD3 with distension and bleeding per rectum. Sigmoidoscopy revealed ischaemic colitis. Laparotomy confirmed nonviable colon from splenic flexure down to rectum, and resection with defunctioning colostomy was performed. No thrombus was found in the vascular pedicle, and subsequent histology confirmed acute coloproctitis. Postoperatively, the patient demonstrated resolution of MODS and return of normal bowel function with aggressive supportive therapy. A PubMed search using the keywords 'mesenteric ischaemia', 'reperfusion' and 'colitis' was made, and the literature reviewed.

Results: Rat models suggest that lower limb ischaemia-reperfusion causes significant decline in the splanchnic microcirculatory blood flow, disruption of gut mucosal tight junctions, elevation of systemic endotoxin concentrations, and cytokine activation initiating a systemic inflammatory response.

Conclusion: Non-occlusive ischaemic colitis is a rare but potentially fatal complication following attempted salvage in acute limb ischaemia reperfusion.

II141/SC

Fine Aspiration Cytology of Metastatic Carcinoid Tumour Report of a Case and Review of the Literature

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Aim: While carcinoid tumour is a relatively common neoplasm in surgical pathology, FNAC as a method of primary diagnosis has only been reported in the literature a few times. This study analyses FNAC as a useful and safe tool in the diagnosis of carcinoid tumours.

Methods: A 66-year-old Indian female presented with epigastric pain for investigation. Initial work-up included a FBC, LFT and OGD was normal. She subsequently underwent an ultrasound of her hepatobiliary system which showed 2 intra-abdominal masses in the epigastrium. CT and MRI were

performed to further evaluate the masses which found them to be within the omentum, not attached to surrounding viscera. FNA was performed, and was diagnosed as carcinoid tumour. Her urine 5HIAA and capsule endoscopy of her small bowel were normal. She underwent laparotomy and excision of the 2 carcinoid tumours.

Results: While FNA biopsy is a common procedure, the primary diagnosis of metastatic carcinoid tumour by FNA biopsy has only been reported in 7 case reports in the literature to our knowledge. The metastatic sites were widely varied. In our patient, the tumour did not cause her any significant symptoms after her initial admission. If tumours are not causing significant symptoms and a lesion is accessible to FNA biopsy, this may be the preferred method of diagnosis. Pretreatment of a patient with known carcinoid syndrome with antiserotonin and/or antihistamine medications may be advisable before performing FNA biopsy.

Conclusion: Fine-needle aspiration cytology can be a useful and safe tool in the diagnosis of carcinoid tumours, perhaps at times avoiding the need for surgery.

II142/SC
Pancreatic Anaplastic Cancer with Splenic Involvement Causing Splenic Infarct: A Case Report and Discussion

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Aim: Pancreatic cancer has the lowest 5-year survival rate of any cancer. Pancreatic body and tail cancer are notorious for delayed presentation as they are asymptomatic till the spread beyond the organ itself. We are reporting a case of pancreatic cancer with local invasion into spleen causing splenic infarct.

Methods: Our patient was admitted complaining of severe left hypochondrial pain of 1 day duration. History and clinical examination were suggestive of possible septic foci in the left upper quadrant. Inflammatory markers were elevated with normal tumour markers. CT abdomen and ultrasound revealed large hetrogenous mass in region of splenic hilum with invasion into spleen causing splenic infarct. OGD showed extrinsic compression. The patient was vaccinated against pneumococcus, meningococcus and *H. influenzae*. Distal pancreatectomy with splenectomy and partial adrenalectomy were performed on the patient on 19 May 2004. Intraoperative findings of the tumour involved distal pancreas, spleen and adrenal gland with infarction of spleen and metastasis in segments 2, 4 and 7 of liver. Postoperatively, the patient had an uneventful recovery and was discharged on the eighth day.

Results: Histology report showed poorly differentiated ductal adenocarcinoma of pancreas involving the splenic substance. Areas of necrosis were found within splenic parenchyma along with tumour cells. Omentum and adjacent lymphnodes were not involved.

Conclusion: Although pancreatic tail and body cancers are known and discussed in literature, it is very unusual for them to cause splenic infarcts and their association with adenocarcinomas of pancreas is virtually unheard of. Our literature search did not yield any results for associated splenic infarcts.

II143/SC
Pylephlebitis: A Case Report and Literature Review

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Aim: Pylephlebitis is defined as the infected thrombosis of the portal vein. It can complicate any intra-abdominal or pelvic infection that occurs in the region drained by the portal venous system, especially diverticulitis and appendicitis. We report a rare case of cholangitis complicated by pylephlebitis.

Methods: A 70-year-old Chinese woman presented with obstructive cholangitis. Intravenous meropenem was started. Blood culture grew on *Enterobacter cloacae*. On day 2, ultrasound of the hepatobiliary system showed shrunken gall bladder with multiple stones with a 2-cm stone in the distal CBD. PTC was performed as ERCP failed to cannulate the duct. Subsequent CT revealed thrombosis of the main portal vein and its branches. She was started on intravenous heparin. Even though the patient subsequently developed Ranson's 8 pancreatitis, secondary to venous congestion of the splenic veins, the patient responded well to maximal supportive therapy.

Results: The diagnosis of pylephlebitis was made from both the demonstration of portal vein thrombosis using CT and bacteraemia status of the patient. Cholangitis has been a rare cause of pylephlebitis. A review of the English literature only revealed 1 other case of cholangitis

Conclusion: As a result of the low incidence of pylephlebitis, there has been a lack of controlled randomised trials. This limits most of the literature to case reports and case reviews.

II144/SC
Recurrent Small Bowel Obstruction Due to Phytobezoar CT Diagnosis

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Aim: Bowel obstruction by phytobezoars is uncommon and remains a diagnostic challenge. Their formation due to impaired gastric motility and/or poor mastication is well documented. We studied the usefulness of a preoperative CT scan in detecting intestinal bezoars. The role of blenderised diet in prevention was also studied.

Methods: A previously healthy 78-year-old edentulous Chinese male with a history of truncal vagotomy and pyloroplasty presented with acute small bowel obstruction. Conservative therapy failed requiring a laparotomy. A 5-cm ovoid phytobezoar was impacted in the jejunum. A week after discharge, he presented again with acute intestinal obstruction. A CT scan abdomen was done to try and identify the cause of the recurrent obstruction.

Results: CT showed an ovoid intraluminal mass in the distal small bowel with a mottled gas pattern. Proximal to this lesion bowel was dilated and distal to it was abruptly collapsed. These findings were pathognomic of an intestinal bezoar. A second laparotomy confirmed bowel occlusion by another phytobezoar which was surprisingly impacted 30-cm distal to the first enterotomy. A limted resection anastomosis was done. After recovery, the patient was started on blenderised diet regimen and has remained asymptomatic for the past 1 year.

Conclusion: Phytobezoar intestinal obstruction is an important differential in the elderly population. Preoperative CT scan findings are pathognomic and can clinch the diagnosis. It can avoid unnecessary delay in surgical treatment. Using a blenderised diet in high-risk patients may prevent recurrences.

II145/SC
Laparoscopic Adrenalectomy: An Overview of Our Experience at the National University Hospital in Singapore

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Aim: Laparoscopic adrenalectomy is the treatment of choice for adrenal tumours. We describe an overview of the development of laparoscopic adrenal surgery and our experience at the National University Hospital (NUH).

Methods: From 1995 to 2004, 56 adrenalectomies were performed at NUH. Of these, 29 were laparoscopic and the remaining open adrenalectomies (n = 27). About 80% of adrenalectomies had been accomplished laparoscopically in the last 5 years. The majority of laparoscopic adrenalectomies were performed for Conn's disease (n = 19; 66%). We further review our experience of laparoscopic adrenal surgery with pheochromocytoma (n = 4), Cushing's syndrome (n = 3) and compare the results with open adrenalectomy. One patient with bilateral Cushing's adenomas underwent successful total unilateral adrenalectomy and contralateral subtotal adrenalectomy.

Results: Comparing laparoscopic adrenalectomy for Conn's syndrome, Cushing's syndrome and pheochromocytomas, a significant reduction was observed in operative time and duration of hospital stay for the more straightforward Conn's patients. In Cushing's syndrome, patients undergoing adrenalectomy for adenomas fared better than those for bilateral hyperplastic disease. Analysis of pheochromocytomas showed that despite an increase in operative time with the laparoscopic technique compared to open surgery, the mean hospital stay dramatically reduced with the laparoscopic procedure (median 4 days) versus open adrenal surgery (median 10 days).

Conclusion: Laparoscopic adrenalectomy is now applied to a wide variety of adrenal tumours. The results achieved in our experience with laparoscopic

adrenal surgery are promising and in synchrony with published literature. The results affirm that laparoscopic adrenal surgery is the method of choice for organ confined adrenal disease.

II146/SC
Damage Control Surgery in Major Multiple Trauma Patients: Strategies to Improve Patient Outcome

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Aim: Damage control surgery involves resuscitative surgery and adjuvant interventions to control haemorrhage, prevent contamination and correct gross metabolic disturbances before definitive surgery. This study aims to assess outcome of the severely injured multitrauma patients undergoing damage control surgery, review their indications, the immediate post-operative strategies and outcome in these patients.

Methods: Data was obtained from TTSH's trauma registry between January 2002 to May 2004. Patients' age, sex, mechanism of injury, physiological data, injury types and grading, perioperative status, operative procedure(s), blood product requirements, ICU stay and outcome were recorded. Patients with an Injury Severity Score (ISS) of greater than 9 were included. Patients older than 75 years or who had significant intracranial injuries were excluded.

Results: This study included 83 patients. Sixty-three patients underwent definitive surgery (DS group). Eighteen patients underwent damage control surgery (DC group). Damage control included exploratory laprotomy, packing of the liver, retroperitonuem or pelvis, on-table hepatic or pelvic angiograms and embolisation, pelvic fixation, thoracotomy and packing of chest cavity, pericardial window, re-look laparotomy and thoracotomy. Mean ISS for the DS group was 23.7 and the DC group's was 39.4 ($P = 0.0001$). Mortality rates for the 2 groups were, however, not significantly different (DS group 30.15% and DC group 36.84%). Blood product requirements were significantly higher in the DC group (>5 L) than the DS group (<3 L). All DC group patients required ICU stay

Conclusion: Damage control surgery improves on the predicated outcome of major trauma patients undergoing surgery.

II147/SC
High Impact Falls: An Epidemiological Review and an Analysis of the Factors Influencing Outcome

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Aim: High impact falls cause significant injuries. It is the second commonest mechanism of injury in major trauma patients (ISS >9) seen at Tan Tock Seng Hospital. This study aims to define and analyse the epidemiological profiles of these patients. It also looks at whether factors like age, height of fall and intention of fall can predict the outcome.

Methods: Data of high impact fall patients seen at the ED from 2002 to 2003 was collected and analysed (n = 159).

Results: One hundred and eleven (70%) were below 62 years old. Fourteen died in the ED. Of the 145 admitted, 27 died subsequently. Thirty-one (74%) of those who died fell from a height $\geq$ 2 m. Of 118 survivors, only 57 (48%) fell from $\geq$2 m. The mean age of the survivors was 47.0 yrs whereas that of those who died was 50.6 years. Eighty-two (57%) of the 145 admitted underwent surgery and of these, 64 (78%) survived. Sixty-three (43%) of the 145 admitted were managed non-operatively and of these, 54 (86%) survived.

Conclusion: Falls from heights carry a significant morbidity and results in lengthy stays in the hospital. Moreover, the patients are often in their economically productive years. This study hopes to better define and understand the profiles of such patients. The authors hope that this study can help in the formulation of preventive and treatment strategies in managing high impact falls patients.

II148/SC
A Review of Breast Reconstruction Following Mastectomy in Tan Tock Seng Hospital

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Aim: To review the profile of patients who underwent breast reconstruction following mastectomy and to evaluate the outcome.

Methods: The medical records of 60 patients were reviewed retrospectively.

Results: Sixty patients underwent breast reconstruction following mastectomy from March 2000 to April 2004. The mean age of these women was 44.3 ± 7.1 years. Forty-nine were married, 9 were single and 2 were divorced. Fifty-three were Chinese, 4 Malay, 2 Indian and 1 was classified under "others". Eight were post-menopausal and 52 were pre-menopausal. The mean size of the tumour at the time of diagnosis was 25.2 ± 19.9 mm. Fifty (83.3%) had invasive carcinoma and 10 (16.7%) had ductal carcinoma in situ. Thirteen patients had multifocal disease. The patients who opted for breast reconstruction were significantly younger compared to those who underwent mastectomy alone. There was no difference in race, tumour size or histology between the 2 groups. One patient had a breast implant inserted while the rest had myocutaneous flap procedures, most commonly using a trans-rectus abdominis myocutaneous (TRAM) flap. There were no mortalities in this series. One patient developed a cerebrovascular accident, and another developed a flap haematoma which required surgical evacuation. Two patients developed local breast recurrences over a 4-year follow up period.

Conclusion: Younger patients are more likely to opt for breast reconstruction after mastectomy. The TRAM flap procedure is most commonly done in our centre and this is achieved with minimal morbidity.

II149/SC
Mycotic Abdominal Aneurysm Secondary to Melioidosis

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Aim: Melioidosis is a condition caused by *Burkholderia pseudomallei* and is endemic in Southeast Asia and Thailand. The incidence of melioidosis in Singapore is 7%. Melioidosis-causing mycotic aneurysm is rare and there are about 6 reported cases in literature. We present our experience with 2 cases of mycotic aneurysm secondary to melioidosis. The aim was to study and discuss in detail the aetiology, clinical presentation, investigations, and management of mycotic aneurysms secondary to melioidosis and its complications, and review its literature.

Methods: Both cases were Chinese males in their sixth decades with co-morbidities of diabetes mellitus. They presented with fever and abdominal signs. CT scans showed leaking abdominal aneurysms and they underwent emergency laparotomy with ligation of aneurysms and extra-anatomic bypass and cholecystectomy.

Results: The first patient recovered well after rehabilitation. The second case was complicated by aorto-duodenal fistula. He underwent emergency re-exploration and repair of aorto-duodenal fistula but died postoperatively.

Conclusion: Melioidosis is a difficult condition to diagnose and treat. High degree of suspicion is required to diagnose this condition. CT scan is investigation of choice. Early intervention and aggressive surgical treatment is necessary and is the only chance for survival. Extra anatomic bypass is recommended as the procedure of choice. Long-term antibiotics are necessary. Early involvement of ID physicians would be helpful.

II150/SC
Laparoscopic Urology: The First 100 Cases in Tan Tock Seng Hospital

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Aim: We report our single institution experience in laparoscopic urology with regards to the type of surgery, length of operating time, stay in hospital and complications.

Methods: A total of 100 laparoscopic procedures were performed at our institution from August 2001 to May 2004 in 67 men and 33 women. These procedures included radical nephrectomy in 36, simple nephrectomy in 10, partial nephrectomy in 1, nephroureterectomy in 5, adrenalectomy in 6, laparoscopic radical prostatectomy in 3, robot-assisted (Da Vinci) radical prostatectomy in 5, pyeloplasty in 1, deroofing of renal cyst in 5, herniorrhaphy in 22 and miscellaneous procedures in 4. The length of operating time, complications and length of stay in hospital were evaluated.

Results: The median age of patients was 61. The median operating time for radical nephrectomy was 225 minutes, nephroureterectomy was 265 minutes, adrenalectomy was 160 minutes, bilateral herniorrhaphy was 112.5 minutes, robot-assisted radical prostatectomy was 270 minutes and laparoscopic radical prostatectomy was 560 minutes. Complications occurred in 12 (12%) of the patients. This included conversion to open surgery in 6 (6%) patients caused by intraoperative bleeding in 3 and adhesions in 3. There were no mortalities. The median postoperative stay in hospital for radical nephrectomy, nephroureterectomy and radical prostatectomy was 3 days, adrenalectomy was 2 days and herniorrhaphy was 1 day. There were 13 retroperitoneal and 62 transperitoneal approaches used.

Conclusion: Laparoscopic urology is fast replacing many open procedures, with all the advantages of minimally invasive surgery. Complication rates parallel those seen in other major laparoscopic centres with acceptable conversion rates.

II151/SC
Haemorrhagic Acalculous Cholecystitis Presenting as Overt Gastrointestinal Bleeding

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Aim: Haemorrhage is a known complication of cholecystitis, and has been reported in the presence and absence of gallstones. Clinical presentation is usually indistinguishable from that of acute cholecystitis, although there may be suggestive sonographic or CT findings.

Methods: We highlight a case of overt gastrointestinal bleeding secondary to haemorrhagic cholecystitis. The patient, an 82-year-old man, was admitted with symptoms of upper gastrointestinal bleeding and had endoscopic evaluation, which was normal.

Results: Due to persistent bleeding, a coeliac angiogram was performed which showed active contrast extravasation from the cystic artery. An embolisation was performed successfully and the patient had an uneventful subsequent cholecystectomy.

Conclusion: This case highlighted the advantages of angiography in the acute setting of overt gastrointestinal haemorrhage over exploratory laparotomy. It also illustrates that though haemorrhagic cholecystitis is a rare cause of upper gastrointestinal bleeding, it should be considered nevertheless when other common causes have been excluded.

II152/SC
Creating the Twin Peaks—Correction of Rare Synmastia

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Aim: We report a case of a 19-year-old Indian girl referred to us for reduction mammoplasty and correction of her synmastia.

Methods: There is a paucity of literature about this condition, with only 1 report of an attempt to correct this condition. Preoperative evaluation with ultrasonographic and mammographic imaging showed fatty tissues connecting the 2 breasts.

Results: We first performed a vertical scar reduction mammoplasty. Using the same access, we anchored the intermammary dermal/subdermal tisssues to the sternal periosteum using interrupted PDS 1 sutures thus creating a sulcus. The postoperative recovery was uneventful with satisfactory cosmetic result.

Conclusion: A rare condition of synmastia in a 19-year-old girl is presented and our technique for correcting this is described.

II153/SC
Spontaneous Common Iliac Artery Rupture: A Fatal Presentation of Ehlers Danlos Syndrome Type IV

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Aim: Ehlers Danlos Syndrome Type IV is a rare autosomal dominant disorder of connective tissue predisposing to spontaneous rupture of large arteries. We describe our experience of a case of fatal spontaneous common iliac artery rupture.

Methods: A 31-year-old Chinese female presented with abdominal pain, hypotension and pallor, with tenderness in her right flank. Fluid resuscitation was followed by urgent abdominopelvic CT, which revealed a 10.8 x 10.7 cm right-sided retroperitoneal haematoma arising from dissection of the right common iliac artery. The patient developed refractory hypotension with progressive fullness in both flanks. Immediate transabdominal exploration of the retroperitoneum was met with uncontrolled bleeding from spontaneous transection of the right common iliac artery. The patient became asystolic and remained unresponsive despite prolonged cardiopulmonary resuscitation. Posthumously, the family revealed that the patient was diagnosed with Ehlers Danlos Syndrome Type IV in 1992 after genetic profiling. Two siblings had already encountered premature death of unknown causes. The literature was reviewed on this fatal complication.

Results: The incidence of Ehlers Danlos Syndrome Type IV approximates 1 in 625,000. Arising from mutation of COL3A1 gene, its vascular complications include spontaneous haemorrhage and dissection, aneurysm degeneration and fistula formation associated with mortality rates of 63%. Vascular tissue is often friable, making conventional repair near impossible.

Conclusion: Ehlers Danlos Syndrome Type IV is associated with significant mortality. Early suspicion of vascular complications of this rare disease and timely intervention can improve outcomes.

II154/SC
Inguinal Metatases from Mucinous Cystadenocarcinoma of the Pancreas: A Rare Presentation

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Aim: Cystic neoplasms of the pancreas are an uncommon entity. We report the first case of a patient with mucinous cystadenocarcinoma of the pancreas who presented with symptomatic inguinal metastases mistaken for an inguinal hernia, and discuss the diagnostic and therapeutic dilemmas of this condition.

Methods: A 72-year-old Chinese male presented with a 6-month history of a right inguinal swelling with pain and discharge. Surgical exploration revealed a 1.5-cm hard mass adherent to the posterior wall above the deep inguinal ring which was excised. Histology sections revealed metastatic mucin-secreting adenocarcinoma with central necrosis. Serum CA19-9 was normal. Abdominopelvic CT revealed a 6-cm cystic mass in the tail of pancreas with evidence of intraperitoneal and right inguinal metastases. The patient refused further oncological therapy, and passed away 4 months after diagnosis. A PubMed search using the key words 'mucin', 'cyst', and 'carcinoma pancreas' was performed and the literature reviewed.

Results: Frequently asymptomatic, mucinous cystic neoplasms of the pancreas affect predominantly males in the fifth to seventh decades. 65% occur in the pancreatic body and tail. Differentiation of these malignant lesions from inflammatory psuedocysts is mandatory in determining treatment, and MRI remains the diagnostic modality of choice. Extirpation of disease remains the only curative option, with 5-year survival rates of 50% to 75% after resection.

Conclusion: Mucinous cystadenocarcinoma of the pancreas is an uncommon entity which often remains asymptomatic. Inguinal metastases arising from this primary has not been previously reported, and is associated with a dismal outcome.

II155/SC
An Unusual Variant of Lemierre's Syndrome

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Aim: Lemierre's syndrome is characterised by an oropharyngeal infection leading to secondary septic thrombophlebitis of the internal jugular vein. It is classically anaerobic in origin and Fusobacterium necrophorum is the most common pathogen. We report an unusual variant of this syndrome caused by aerobic *Klebsiella* pneumonia infection.

Methods: A 68-year-old male with uncontrolled diabetes presented with necrotising fascitis of left neck. No primary source of sepsis could be identified on examination. Neck x-rays revealed soft tissue gas and CT scan confirmed an extensive neck space infection with large pockets of gas and

thrombosis of the left internal jugular vein. A generous debridement with open drainage of the infected neck spaces was performed under antibiotic cover. Postoperatively, the wound was regularly assessed and debridement was repeated thrice. Prolonged course of antibiotics based on culture results was continued until healing was achieved.

Results: *Klebsiella* pneumonia was isolated and grown from the fluid, tissue and blood samples. No anaerobic organisms were isolated. Follow-up CT neck at 3 months showed resolution of the infection, although the vein remained obliterated. No primary focus of sepsis was detected elsewhere on investigations.

Conclusion: A review of literature shows that Lemierre's syndrome is essentially caused by an anaerobic oropharyngeal infection. Our case is unique in that it shows the classical radiological features of the syndrome in the absence of any identifiable oropharyngeal sepsis. The isolation of *Klebsiella* as a cause has not been previously reported.

II156/SC
Small Flat Rectal Adenoma Can Progress to Advanced Cancer in 3 Years

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Aim: Small flat colorectal adenomas with a high degree of dysplasia were hitherto thought to be exclusive to the Japanese population. Work in this department had previously described a prevalence of around 5% of flat colorectal adenomas in an unselected population presenting for elective colonoscopy. We now report a case of a man diagnosed with advanced rectal cancer 3 years after a small 5-mm flat rectal adenoma was picked up.

Methods: This is a retrospective case report reviewing all clinical, operative and pathology reports.

Results: This patient with a complex medical history of SLE, Klinefelter's and hypogonadism was referred for rectal bleeding in June 2000. Colonoscopy identified a small 5-mm flat rectal adenoma, which was confirmed on histology. The patient defaulted colonoscopic surveillance and presented in July 2003 with advanced rectal cancer. Abdominoperineal resection was performed. The pathology report was that of pT3N1. The patient underwent adjuvant chemoradiation.

Conclusion: This report highlights the importance of identifying flat colorectal lesions and destroying them either by hot biopsy or polypectomy. The rate of malignant transformation is worrying and supports previous reports of aggressiveness of flat colorectal cancers. Accumulation of such reports will add to the understanding of the morphogenesis of flat colorectal cancers.

II157/SC
Severe Acute Respiratory Syndrome (SARS) in Surgical Patients: A Diagnostic Dilemma

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Aim: The diagnosis of severe acute respiratory syndrome (SARS) in surgical patients can potentially be missed based on current World Health Organisation (WHO) case definitions.

Methods: We report a retrospective case series of 10 surgical inpatients diagnosed with SARS following an outbreak in the surgical wards. Patients were included if they fulfilled the WHO case definition of probable SARS, had an active surgical problem and were admitted to the surgical wards during the outbreak period. Clinical histories, laboratory investigations and radiological findings were reviewed and analysed.

Results: Mean age of the cohort was 57.6 years (range, 38-78 years). Nine patients had concomitant medical conditions. Three patients were in the post-operative period, the remaining had not undergone any surgical procedure. All patients presented with fever, 8 had accompanying respiratory symptoms. Lymphopenia and raised lactate dehydrogenase (LDH) was seen in 7 patients. Eight patients had positive bacterial cultures. Six patients tested positive for the SARS coronavirus using RT-PCR. Primary abnormality on chest radiograph was air-space opacification. Rapid progression of radiological changes was seen in 7 patients. Mortality rate for our cohort is 20%.

Conclusion: The diagnosis of SARS in surgical patients differs from that previously described in normal patients. An apparent cause of fever and positive blood cultures cannot exclude a diagnosis of SARS. The current WHO case definition could result in delayed or missed diagnosis. Early isolation of febrile patients with positive contact history must be undertaken, even in the face of another identifiable cause.

II158/SC
Stricture at the Ileal Pouch-Anal Anastomosis after 2235 Cases of Restorative Proctocolectomy: Predictive Factors, Management, Functional Outcomes and Quality of Life

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Aim: Restorative proctocolectomy and ileal pouch-anal anastomosis (IPAA) has now become the preferred surgical procedure for mucosal ulcerative colitis and familial adenomatous polyposis. This study intends to determine the risk factors associated with stricture formation after IPAA performed at a tertiary institution and the functional outcomes.

Methods: Our Pelvic Pouch Database was queried for all patients who had undergone IPAA from 1983 to 2002. Information obtained included patient demographics and potential risk factors such as proximal diversion, anastomotic technique, pouch configuration and anastomotic complications. Functional outcomes of patients with strictures were compared with those without strictures.

Results: A total of 2235 patients underwent IPAA, of which 401 (17.9%) developed anastomotic strictures. Significant predisposing factors were use of proximal diversion, anastomotic complications such as dehiscence and enterocutaneous fistula and S-pouch creation ($P = 0.05$).

Conclusion: The incidence of anastomotic strictures after IPAA is 17.9%. Significant risk factors were proximal diversion, anastomotic complications and S-pouch creation. Most strictures are amenable to dilatation. Functional results for patients with strictures are similar to those without strictures.

II159/SC
Bilateral Breast Cancer

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Aim: To identify a group of patients who are at increased risk of developing bilateral breast cancer.

Methods: The medical records of 30 patients with bilateral breast cancer in the department from 2000 to 2003 were reviewed retrospectively.

Results: Thirty patients with bilateral breast cancer were seen in the department from 2000 to 2003. Sixteen had bilateral invasive carcinoma, 7 had ductal carcinoma in situ (DCIS) in the contralateral breast and 7 had bilateral DCIS. The mean age at diagnosis was 57.3 ± 12.0 years. Twenty-seven were Chinese and 3 Malays. Six had a positive family history of breast cancer. Twenty-two patients were found either on clinical examination or on imaging to have a tumour in the contralateral breast at first presentation. Eight patients were found to have a second tumour on surveillance, after a mean duration of 19 ± 14.9 months from the time of first diagnosis. The size and stage of the second tumour was not significantly different from that of the first. There was no significant difference in the age, race, parity, presenting symptoms, tumour size and stage at the time of diagnosis, or hormonal receptor status between those with bilateral cancer and those with unilateral cancer. On multivariate analysis, those with a positive family of breast cancer were found to be 4.9 times more likely to have bilateral cancers.

Conclusion: Patients with a positive family history therefore constitute a high-risk group and imaging of the contralateral breast is important even when no lumps are detected clinically.

II160/SC
Utility of Video Studies in Adults with Neurogenic Voiding Dysfunction

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Aim: Most adult voiding dysfunction can be evaluated with simple urological assessment. However, complex voiding dysfunction secondary to neurological

diseases requires more sophisticated studies such as video-urodynamic studies. We review our results of video-urodynamic studies for adults with neurogenic dysfunction. In particular, we ascertain whether it significantly assists in diagnosis and management of these patients.

Methods: A total of 106 video urodynamic studies were performed over a 24-month period, of which 79 were for adults with neurogenic voiding dysfunction. Sixty-six were males and 13 were females. Mean age was 50 (range, 17-80). Neurological deficits included spinal cord injuries (66), Transverse myelitis (4), syringomyelia (1), meningomyelocele (4) and cerebrovascular accidents (4). Pre-urodynamic management included indwelling catheter (11) and intermittent catheterisation (50). Twenty-seven had troublesome leakage.

Results: Abnormalities in cystometrogram included detrusor overactivity (26), poor compliance (28), decreased sensation (33) and leakage (47). Abnormalities in pressure-flow studies included detrusor acontractility/underactivity (55) and outlet obstruction (19). The anatomic sites of obstruction on fluoroscopy were external sphincter (8 detrusor sphincter dyssynergia) and prostate (11). Additionally, fluoroscopy revealed vesico-ureteric reflux (4), bladder diverticuli (6) and fir-tree appearance (12).

Conclusion: Video-urodynamics is able to provide urodynamic diagnoses of the neurogenic voiding dysfunction. It gives maximal as well as simultaneous data of the function and anatomy of the lower urinary tract, compared to standard urodynamic study. It is useful in evaluation of adults with neurogenic voiding dysfunction.

II161/SC

Abdominal Compartment Syndrome Complicating Emergent Repair of Ruptured Abdominal Aortic Aneurysm: Use of Silastic "Bogota Bag" Technique

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Aim: Abdominal compartment syndrome (ACS) occurs in 4% of patients with primary closure following ruptured abdominal aortic aneurysm (AAA) repair, and significantly contributes to rapid multi-organ failure. We report a case managed successfully with abdominal decompression and temporary coverage with a silastic "Bogota bag", and discuss management options of this unusual complication.

Methods: A 69-year-old Chinese male hypertensive presented to the emergency department with a ruptured 9.5-cm infrarenal AAA. Immediate exploration and repair was performed using a Dacron graft via a midline laparotomy incision. Primary abdominal closure was unsuccessful due to intestinal edema following aggressive resuscitation, and the wound was covered with a silastic "Bogota bag". Relook laparotomy undertaken 12 hours later arrested bleeding from lumbar vessels with successful abdominal closure en masse after documenting intrabdominal pressure (IAP) of 14 mmHg. The patient subsequently developed ACS with refractory hypotension, oliguria and renal failure despite inotropic support and IAP of 20 mmHg.

Results: Urgent abdominal decompression and Bogota bag coverage was followed by swift restoration of multi-organ function. Delayed primary closure was performed 48 hours later without adverse sequelae and the patient survived. PubMed search using keywords "aortic aneurysm" and "abdominal compartment syndrome" was performed.

Conclusion: Prompt recognition of raised IAP and early decompression improves survival and reverses organ dysfunction caused by ACS. Delayed primary closure following emergent AAA repair does not significantly increase risk of graft infection. Plastic sheets and mesh materials also permit tension-free peritoneal coverage.

II162/SC

Cost Effectiveness of Early Versus Interval Cholecystectomy for Acute Cholecystitis in a Tertiary Institution in Singapore

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Aim: Controversy exists as to whether acute cholecystitis should be surgically treated with early or interval cholecystectomy. The clinical results and cost effectiveness of early versus interval cholecystectomy was compared.

Methods: A retrospective review of the clinical records of all subsidised patients treated for acute cholecystitis in our department between January 2002 and May 2003 was conducted. These patients had their diagnoses confirmed radiologically and were initially started on wide-spectrum antibiotics. Those who did not respond clinically were treated with early cholecystectomy within the same hospital admission. The patients with clinical improvement were treated with interval cholecystectomy after 6 weeks. Parameters reviewed included total duration of hospital stay, complications and total hospital bills incurred.

Results: Forty-six patients were recruited in this study, of which 36 had interval cholecystectomy (Group A) and 10 had early cholecystectomy (Group B). The total bill incurred by the Group A was S$7487 versus S$6170 for Group B. The total length of stay in hospital for Group A was 11.2 days versus 6.5 days in Group B. There was no significant difference in morbidity rates between the 2 groups.

Conclusion: Total costs of treatment and length of stay were on average higher in patients who underwent an interval cholecystectomy versus an early cholecystectomy. The outcomes between the 2 groups were similar. Therefore, early cholecystectomy is a more cost-effective method of treatment for acute cholecystitis.

II163/SC

Acute Renal Failure Complicating Bilateral Retrograde Pyelography and Ureteropyeloscopy: A Case for Staged Endoscopic Evaluation for Upper Tract Haematuria

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Aim: Acute renal failure complicating retrograde pyelography (RPG) is an extremely rare phenomenon. We report the first case of ARF complicating simultaneous bilateral RPG and ureteropyeloscopy (UPS).

Methods: A 42-year-old Caucasian man presented with a 4-month history of right loin colic and gross haematuria. Renal function was normal and CT evaluation of the urinary tract was unremarkable. In view of persistent haematuria, the upper tracts were evaluated under general anaesthesia with simultaneous RPG and UPS. Biopsy of a polypoidal mass in the right lower renal calyx confirmed nephrogenic adenoma. Postoperatively, the patient developed severe bilateral flank pain and complete anuria. Serum creatinine rose to 668 µmol/ml over 2 days with minimal urine output despite intravenous diuretics. No obstruction was identified on serial ultrasonography and CT imaging. Massive diuresis in excess of 4 L/day followed with return of normal renal function by the seventh postoperative day. The patient remains symptom-free with normal renal function 4 months after endoscopic evaluation.

Results: Eight cases of ARF following RPG have been reported to date, but none involving simultaneous endoscopic instrumentation. Postulated mechanisms include bilateral ureteric obstruction and pyelotubular or pyelolymphatic reabsorption of contrast media. Mean duration of anuria was 4.2 days, with full recovery of renal function after 5 to 30 days.

Conclusion: ARF following RPG and UPS is a rare but potentially devastating complication. We advocate a staged approach to endoscopic and radiologic evaluation of upper tract haematuria.

II164/SC

Nephrogenic Adenoma Arising De Novo from the Renal Pelvis

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Aim: Nephrogenic adenomas are uncommon benign metaplastic lesions of the urinary tract. Up to 75% of these occur in the bladder, and the overwhelming majority are associated with urothelial irritation. We report a rare case of nephrogenic adenoma that arose de novo from the renal pelvis, and review the literature on the clinical profile of this rare entity.

Methods: A 42-year-old Caucasian male with no previous history presented with intermittent right loin to groin pain associated with gross haematuria and passage of clots. His symptoms persisted despite normal CT urography. A 1-cm exophytic polyp in the lower calyx of the right kidney was identified on bilateral retrograde pyelography and ureteropyeloscopy, with normal anatomy of both upper tracts. Histology demonstrated papillary renal tissue lined with cuboidal epithelium displaying tubule formation. Immunostaining was positive for CK7 and negative for WT-1.

Results: The patient developed transient acute renal failure following endourological upper tract evaluation, but recovered full renal function and has remained symptom-free for over 6 months. To date, only 24 cases (age 9-67 years) have been described in 3 reports. There is a male predominance (2:1). Identified aetiologies include structural abnormalities (2), previous surgery (1), chronic irritation (2) and urolithiasis (19).

Conclusion: Nephrogenic adenomas arising from the renal pelvis are extremely rare. Surgical options include endoscopic laser ablation or nephrectomy should the patient develop refractory haematuria or pain.

II165/SC

Dermal Vasculitis from Synchronous Renal and Bladder Transitional Cell Carcinoma Metastases to Skin Mimicking Carcinoma Erysipelatoides

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Aim: Cutaneous metastases from bladder account for 2% of extravesical disease. We report the first case of a patient with dermal vasculitis secondary to inflammatory cutaneous metastases from synchronous renal and bladder transitional cell carcinoma, mimicking carcinoma erysipelatoides.

Methods: A 62-year-old Chinese non-smoker male was diagnosed with Grade 2 transitional cell carcinoma in 1996 after presenting with gross haematuria. He developed multiple recurrences of superficial bladder TCC from 1997 to 2003, which were treated with repeated transurethral resection and postoperative intravesical BCG (Bacillus Calmette-Guerin). Radical cystectomy and right nephroureterectomy with urinary diversion via a Wallace Type 1 ileal conduit was performed in July 2003. Histology revealed synchronous Grade 3 transitional cell carcinoma in the bladder and right ureter, with transmural and vascular extension of disease. A month later, the patient returned with fever and a 2-cm inflammatory mass in the lower abdominal wound.

Results: Abdominopelvic CT showed a 3.5-cm mass in the anterior abdominal wall. He developed a painless warm erysipeloid rash over the suprapubic region. Incisional biopsy confirmed poorly differentiated carcinoma. Histology of the dermal rash revealed vasculitis with absence of tumour cells in dermal lypmhatics. The patient declined further treatment with chemotherapy and topical steroids, and passed away 9 months from the onset of cutaneous metastases.

Conclusion: Dermal vasculitis secondary to cutaneous metastases from transitional cell carcinoma of the urinary tract is extremely rare and associated with a dismal prognosis. Palliative chemotherapy remains the mainstay of treatment.

II166/SC

Surgical Complications of Tenckhoff Catheters Used in Continuous Ambulatory Peritoneal Dialysis

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Aim: To determine the surgical complications associated with Tenckhoff catheters

Methods: A retrospective review of consecutively implanted catheters between 2000 and 2003 was performed. All catheters used were double-cuffed, pig-tail Tenckhoff catheters. They were inserted by one of the urological access team surgeons under local anaesthesia, using an open lateral transrectus muscle technique via a paramedian transverse incision. All patients were reviewed until time of transfer to haemodialysis, death, or if alive and receiving CAPD, December 2003.

Results: Of the patients for CAPD, 123 (89%) had no previous renal replacement therapy and 16 (11%) were transferred from haemodialysis. 82% of the patients had multiple co-morbidities, but day surgery for utilised for 41% of the cases. There were no significant intraoperative complications and no deaths were directly attributable to catheter placement. Early complications included 30 cases of wound or exit site infection, 11 cases of wound haematoma (4%), and 12 cases of malposition or poor flow (7%). There was a significant association of early complications with reinsertions, previous abdominal surgery, and long operative duration (>60 minutes). CAPD peritonitis was the most common late complication, accounting for the removal of 16% of the catheters inserted. Mean catheter survival time was 43 months with no significant difference between diabetic and non-diabetic patients.

Conclusion: Tenckhoff catheter insertion under local anaesthesia is safe and for selected patients, a suitable day case procedure. However, early and late complications still result in significant morbidities. Newer techniques may facilitate the decrease of these complications.

II167/SC

Initial Experience of Laparoscopy on Complicated Tenckhoff Catheter Insertion and Revision

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Aim: Tenckhoff catheters are an important access for continuous ambulatory peritoneal dialysis. Though Tenckhoff catheter insertion is a simple procedure, it is not without complications. Poor flow/blockage may warrant "blind" surgical revision/repositioning. With the advent of laparoscopy, surgeons have a window of "vision" for diagnostic and therapeutic revision of complicated Tenckhoff catheters.

Methods: Malfunctioning and potentially complicated cases of Tenckhoff catheter insertion due to previous abdominal surgeries were listed for laparoscopy. The initial experiences of laparoscopy for Tenckhoff catheters are described.

Results: First was a malfunctioning Tenckhoff with poor drainage. Laparoscopy confirmed radiographic findings of migrated tip of catheter to the upper abdomen because of pelvic adhesions. Problem corrected by relocating the Tenckhoff catheter tip into an identifiable space in the pelvis. The second case of laparoscopy showed Tenckhoff catheter wrapped by omentum and adherent to the anterior abdominal wall. Omentum was dissected off the Tenckhoff catheter and adhesiolysis done. The third laparoscopy case was to assist insertion of a Tenckhoff catheter. A high risk for multiple post-operative adhesions was entertained because of numerous previous abdominal surgeries. Laparoscopic evaluation showed minimal adhesions and a Tenckhoff catheter was inserted. All cases exhibited good postoperative functional use of Tenckhoff catheters.

Conclusion: Laparoscopy is a good adjunctive tool for revision of malfunctioning Tenckhoff catheters. It helps identify the causes for Tenckhoff catheter malfunction and its subsequent correction. Laparoscopy is also an option for potentially complicated cases of Tenckhoff catheter insertion. It aids in proper positioning of the Tenckhoff catheter tip.

II169/SC

Initial Experience on Laparoscopic Urology at the National University Hospital, Singapore

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Aim: Minimally invasive surgery is a noble evolving practice from conventional open surgery. Through various "keyhole" incisions, surgeons operate on patients without having to make unavoidable lengthy incisions which may compromise overall patient recovery and satisfaction. We report our first year experience on laparoscopic surgery in urology.

Methods: Between June 2003 to June 2004, 12 cases of various laparoscopic cases done by the Department of Urology of the National University Hospital. A retrospective review of all the cases to obtain the various intra and post-operative data.

Results: To date we have performed 2 cases of laparoscopic nephrectomy, 1 case of laparoscopic nephroureterectomy, 2 cases of laparoscopic exicision of renal cysts, 2 cases of laparoscopic orchidectomy, 1 laparoscopic ureterolithotomy, 1 laparoscopic kidney biopsy, 2 laparoscopic revision of malfunctioning Tenckhoff catheters and 1 laparoscopic insertion of Tenckhoff

catheter. No cases warranted conversion to open urological surgery. All cases were performed via transperitoneal route except for 1 retroperitoneal laparoscopic ureterolithotomy. All cases showed good patient tolerability and satisfaction with no peri-operative untoward complications. Hospital stay varied on a case to case basis but generally showed a shorter length of stay compared to its counterpart conventional open urological surgery. Average hospital stay is 3.75 ± 2.56 days. Average operating time is 153.75 ± 102.74 minutes.

Conclusion: Laparoscopic urological surgery has shown good patient tolerability. Our initial experience with laparoscopic surgery in urology appears promising. With the increasing experience, we would like to further extend the scope of surgery to laparoscopic pelvic surgery.

II170/SC
Application of Object Oriented Methodology for Case Reasoning Data Capture

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Aim: A computerised on-line diagnostic system (NUS TMD v1.1) was developed to address the time lag between RDC/TMD (Research Diagnostic Criteria for Temporomandibular Disorders) administration and generation of clinical diagnosis/psychosocial profiles. The RDC/TMD is not comprehensive due to the lack of data for rarer disorders. The current project aims to expand the clinical utility of NUS TMD v1.1 via incorporation of case-based diagnosis using object oriented methodology.

Methods: Object Oriented Programming (OOP) entails building of independent pieces of code which interact with one another. Microsoft Visual C++ 6.0 was used to develop extension modules incorporating the diagnostic classification of the American Academy of Orofacial Pain. Items included diagnosis for cranial bones, temporomandibular joints and muscle disorders. The program was tailored for deployment on Windows XP and tablet PCs which facilitated data entry by patients and clinicians. Data acquired was automatically archived for statistical analysis and use for case-based reasoning diagnostic criteria development. User acceptance testing (UAT) was subsequently performed.

Results: UAT on random data set confirmed that the new facilities developed satisfied the defined user requirement specifications. Data exported from the extension modules was automatically archived upon program closure. Data imported from TMD v1.1 were also verified.

Conclusion: The enhanced software (NUS TMDv2.0) was backward compatible. Ease of data collection, export and import facilitates collaborative multi-centre clinical trials. In addition to diagnosis, OOP could also be used to facilitate the gathering of treatment and other variables for use with case-based reasoning.

II171/SL
The Influence of Bone Marrow Derived Mesenchymal Stromal Cells on Rate of Tendon Healing in Rabbits

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Aim: Tendon injuries are common and have significant morbidity and socioeconomic impact. Previous studies have shown that the use of bone marrow derived mesenchymal stem cells (bMSC) in tendon defect repair improved biomechanical properties of the regenerated tendon. This study investigates the influence of bMSC on the healing of the primarily repaired tendon.

Methods: The gastrocnemius tendon of adult NZW rabbits was completely lacerated and repaired. For the treated group, bMSCs were introduced into the proximal and distal ends of the repaired tendon as well as around the repair site. The contralateral tendon served as the control and underwent the same procedure except without bMSCs. At 1 and 3 weeks, tendons were harvested for histological analysis. Standard H&E staining and immunohistochemical analysis of collagen I and III were used to observe healing.

Results: H&E stains revealed thicker paratenon in some of the treated tendons as compared to the control in the first week. Collagen I staining showed that at 3 weeks, collagen fibres in the treated tendons (n = 5) appeared to be better organised around the repair site as compared to the controls (n = 5). The fibres were more uniformly arranged and oriented according to the line of force.

Conclusion: bMSCs have some influence on the healing of primary repaired tendons. Histological findings show increased cellular events in the paratenon region and better organisation of collagen I fibres around the repair site. Whether these changes result in improved tendon strength during the healing phase is being addressed in current biomechanical studies.

II172/SL
In Silico Approach of Screening for Candidate Nucleic Acid and Protein Markers for Epithelial Ovarian Cancer Using Published Microarray Expression Data

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Aim: Microarray-based in-silico studies are ideal to study genes involved in oncogenesis pathways. We used an in-silico approach to identify candidate biomarkers for early detection of epithelial ovarian cancer (EOC) based on microarray array expression data with emphasis on regulatory elements.

Methods: Using in-silico approach we tried to identify genes involved in (1) membrane damage, (2) apoptosis and (3) disruption of cytoskeleton plasticity which is key to oncogenesis. Promoter content of target genes were analysed using Match program (Biobase and TRANSFAC Professional database ver7.4) from 14,333 human promoters and 12,000 human non-promoters (our internal human promoter database).

Results: Distinct subset of genes belonging to matrix metalloproteinases (MMP7,9,10,12) involved in catabolism, degradation of the extracellular matrix and lysis of membrane, and keratin subgroups (KRT8,13,18) involved in structural integrity of epithelial cells, cytoskeleton (membrane) maintenance and epidermis development were identified. Promoter analysis of 19 highly over-expressed genes of EOC contrasted to non-promoter sequences showed that several transcription factors (TF) (individually as well as in combinations) play a major role in controlling expression of these genes. We found strikingly different sets of TF binding sites that are present in 1 subgroup but not in the other and vice-versa. Genes and TFs identified during this study have the potential to be applied as clinical biomarkers for EOC.

Conclusion: In-silico approach is suitable for identification of potential target biomarkers since the data output is based gene regulatory elements which control the expression of such genes during the specific diseased state.

II173/SL
The Aneuploidy Screen Using Fluorescence In situ Hybridisation (FISH) for Prenatal Detection of Chromosomal Anomalies – A One Day Analysis on Chorionic Villus Biopsies, Amniotic Fluids and Fetal Bloods

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Aim: Rapidly advancing technology has made prenatal screening and diagnostic tests for expectant women more efficient and precise. With higher resolution ultrasound machines, abnormal fetal markers are noticed at earlier gestational ages. In such situations, parental anxiety runs very high and the demand for immediate resolution arises. With the knowledge that the risk for certain chromosome anomalies increases with abnormal ultrasound and triple test results, karyotyping is advised. The procedures available for prenatal diagnosis are chorionic villus sampling, amniocentesis and fetal blood sampling. A chromosomal karyotype takes between 4 and10 days. However, FISH takes only 24 hours irrespective of sample type.

Methods: This study presents the results of 100 samples with abnormal ultrasound markers and FISH testing confirmed by traditional cytogenetic karyotyping. Vysis (USA) probes were used for FISH for chromosomes 13, 18, 21, X and Y on uncultured cells of all the above samples. At least 100 nuclei were counted for each DNA probe.

Results: Of the total samples referred for FISH, 31.5% had an abnormal karyotype. All were successfully detected by FISH.

Conclusion: Fluorescence in situ hybridisation (FISH) has proven itself to be a sensitive and reliable test in the identification of aneusomies of chromosomes 13, 18, 21, X and Y. This test is very helpful to parents and gives them more time to make informed decisions in planning the future course of the pregnancy.

II174/SL

Haemostatic Status and Fibrinolytic Response Potential at Differnt Phases of the Menstrual Cycle

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Aim: To study the natural hormonal influence on haemostasis and fibrinolytic response at different phases of the menstrual cycle. The influence of natural hormones during the menstrual cycle on haemostasis has been varied.

Methods: Coagulation activation, factors and inhibitors including platelet function and fibrinolytic variables were determined in 30 normal healthy women volunteers aged 18 to 38 years. Coagulation status was determined using the computerised Thrombelastograph. Blood samplings were performed at different phases of the menstrual cycle: menstruation (day 1-3), follicular (day 5-9), mid-cycle (day 10-14), and luteal (day 21-26). The women were later divided into those with normal and overweight according to the WHO classification and the data re-analysed.

Results: No statistical significant differences in the haemostatic parameters studied between the phases of the menstrual cycle except for a reduced D-dimer level at mid-cycle was seen. Significant fibrinolytic response seen was not significantly different between the menstrual phases. In overweight women (n = 8), elevated t-PA antigen, PAI-1 levels except at menstruation, and total protein S except at follicular phase were observed together, with increased plasminogen level only at luteal phase. Similar significant fibrinolytic responses were seen in both normal and overweight women.

Conclusion: The study demonstrated that systemic haemostasis was not influenced by normal hormonal changes occurring during the menstrual cycle except for an associated reduced fibrinolytic state at mid-cycle. The haemostatic system in this small group of healthy overweight women appeared to be physiologically compromised.

II175/SL

Evaluation of Biofilm Formation on Soft Monthly Disposable Contact Lenses Among Healthy Individuals

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Aim: Biofilm, a functional consortium of micro-organisms, can be found on surfaces of many medical devices and cause severe infection. This study aims to study the presence of biofilm on soft, monthly disposable contact lenses among healthy individuals.

Methods: This is a prospective study. Using block randomisation, users were divided into 4groups, i.e. they were asked to dispose their contact lenses either after 1 day, 1 week, 2 weeks and 1 month of usage. These contact lenses were processed and analysed using scanning electron microscope to determine the presence of biofilm.

Results: There were 32 participants, majority (29) were females. Half were using low water, non-ionic polymer contact lenses while the rest were using high water, ionic polymer contact lenses. Biofilm was found in 50% (16) of the contact lenses. Among them, 62.5% (10) had biofilm formation on both the convex and the concave surfaces of the lenses. 25% (4) had biofilm on the concave surface only, while 12.5% (2) had biofilm on the convex surface alone. The likelihood of biofilm formation on contact lenses increased with the duration that the lenses were used for.

Conclusion: Soft disposable contact lenses are known to be a significant causative factor for infective keratitis. This study showed that bacteria in the form of biofilm were present on contact lenses. Disposable contact lenses should be discarded within their recommended time as the risk of biofilm formation increases with usage.

II176/SL

The Intramuscular Nerve Branch in a Lacerated Skeletal Muscle Plays an Important Role in Muscle Recovery After Repair

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Aim: The recovery of lacerated skeletal muscles after repair never completes. Often the intramuscular (IM) nerve is cut and never repaired. This study investigates the recovery in a completely lacerated muscle repaired by epimysial suturing of the cut muscle ends. Two muscle groups were compared, 1 with the main IM nerve cut and the other with the IM nerve preserved intact.

Methods: The medial gastrocnemius (MG) of the adult NW White rabbit was used, with the contralateral muscle as the control. Under general anaesthesia, the laceration was done at the proximal quarter of the muscle, distal to the motor-point of the branch from the tibial nerve.

Results: The lacerated MG with its IM nerve preserved showed improved muscle wet weight, near normal morphology and contractile properties, with return of muscle fibre ratio and size at 28 weeks. The lacerated MG with its IM nerve cut demonstrated fibrosis, mononuclear proliferation with fatty infiltration, increased type I fibres and muscle atrophy of type II muscle fibres in the distal portion at 20 and 28 weeks, resulting in a poorer muscle recovery.

Conclusion: This study was motivated by the clinical question whether the IM nerve should also be re-anastomosed when repairing the lacerated muscle. Our hypothesis is that the IM nerve plays a key role in muscle repair and recovery. This study prompts the microsurgeon to repair the IM nerve in a lacerated muscle for improved recovery and return of function.

II177/SL

Tissue Engineered Vascularised Flaps with PLGA Scaffold: A Model for Soft Tissue Reconstruction

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Aim: The potential application of vascularised tissue engineered flaps is vast. This includes reconstruction of defects secondary to tumour resection, trauma, congenital abnormalities or burns. It addresses the difficult clinical problem of donor site morbidity encountered with harvesting flaps. This project aims to investigate the feasibility of developing tissue engineered vascularised flaps for reconstructive surgery.

Methods: A vascular supply was provided for using a ligated arteriovenous bundle model, as described by Tanaka et al. The arteriovenous bundle is placed into a poly-lactic-co-glycolic acid (PLGA) mesh seeded with human dermal fibroblasts. PLGA has been found to be a suitable dermal matrix, promoting homogenous cell distribution and tissue formation, based on in vitro studies. These experiments were carried out in male nude rats. The rats were sacrificed at the end of 4 weeks and the constructs were harvested. Histological and immunohistological studies were then carried out to evaluate the vascularisation of these constructs and the extent of tissue formation within the matrices.

Results: Histological studies demonstrate neovascularisation within the matrices and these arose from the vascular pedicle. Human fibroblast seeded on the matrices remained viable over the 4-week period of implantation as demonstrated by cell tracer studies. Neo tissue formation within the matrices was also seen on routine histology and on immunohistochemistry.

Conclusion: These results demonstrate that vascularised PLGA mesh seeded with human fibroblasts may serve as a viable model for constructing a vascularised flap.

II178/SL

Activated Caspase in Human Traumatic Brain Injury

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Aim: Apoptosis may play a role in cell death in head injury. The activation of caspase-3 has been considered the final common pathway for apoptotic cell death. Many animal studies have suggested that apoptosis occurs after TBI and the injury is directly related to the predominant localisation of cleaved caspase-3 in neurons. In this study, we sought to determine if the location of this activated apoptotic caspase in animal models directly reflect or illustrates the phenomenon in human pericontusional tissue.

Methods: Pericontusional tissues were collected from 14 patients during surgical treatment for intracranial hypertension. The tissues were fixed in 4% paraformaldehyde and sectioned using a cryostat and mounted on poly-L-lysine coated slides. The sections were double immunofluorescence labelled with cleaved Caspase-3 and NeuN or GFAP for neuronal or glial cells respectively.

Results: Cleaved caspase-3 was expressed in all 14 tissues collected and expression was found in neurons only. The glial cells did not show evidence of activated caspase-3 staining.

Conclusion: Our results suggest that although cleaved caspase-3 is expressed in neuronal and glial cells of animal TBI models, activated caspase-3 is found only in human neuronal cells. This may be an important consideration in the development of novel pharmaco-therapeutic strategies that specifically target apoptosis.

II179/SL

Establishing Human Islet Isolation Unit for Clinical Islet Transplantation

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Aim: The Edmonton Protocol has demonstrated that human pancreatic islet transplantation could lead to long-term (>12 months) insulin independence for Type 1 diabetes patients. NUS/NUH Department of Surgery is coordinating a clinical programme to replicate the Edmonton Protocol. The programme is to provide new medical technologies available in Singapore. The human islet isolation unit forms a major part of this programme, and it has been finally completed after more than 2 years of hard work.

Methods: The human islet isolation involves the following steps: pancreas procurement from cadaveric donor, controlled enzyme delivery via duct perfusion, pancreatic tissue enzymatic digestion, islet purification, islets counting, in vitro and in vivo functional evaluation of the islet, and preparing for islet transplantation.

Results: The basic function of the human islet isolation unit in NUH/NUS is to provide transplantable human islets in a cGMP standard laboratory for the clinical islet transplantation. The unit consists of (1) well trained staff members, (2) isolation facility, and (3) standard operational protocols (SOPs) and cGMP practices for the operations.

Conclusion: The isolation facility includes the following components, each of them essential for the functional laboratory that will produce transplantable islets from cadaveric donor pancreas: (a) class 10,000 clean room, (b) preparation room, (c) storage room, (d) bio-safety cabinets, (e) refrigerated Cobe 2991 cell processor, (f) tissue culture incubators, (g) centrifuges, (h) perfusion chambers, (i) Ricordi Chambers, (j) microscope and camera, and (k) reagents and consumables.

II180/SL

Free Fat Injection: Analysis of Adipocyte Survival and its Clinical Implications

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Aim: Autologous free fat graft has gained popularity as a filler due to its easy availability and abundance. Increasingly, it is used for facial rejuvenation in the outpatient setting. Nonetheless, the results have been unreliable. The main shortcoming is the partial absorption of the injected fat, which necessitates over correction and repeated injection. We believe that the key to successful use of fat as a filler is the maintenance of its viability during processing and reinjection. Survival of cells after trauma of injection through small cannulas needs to be addressed.

Methods: The present study aims to assess the viability of cells after trauma of injection through various cannula sizes. Adipose tissue obtained from manual lipoaspiration, was divided into 5 samples. Four samples were injected through cannulas of different sizes with 1 control. One mL of each sample was explanted for culture. The rest of the sample was processed to obtain processed lipoaspirate, which was then cultured. An initial cell count of each sample was performed. Assessment of cell vitality and growth was carried out on day 21 and day 28.

Results: Cell vitality assays using Alamar Blue and histological examination demonstrated adipocyte proliferation in all cannula sizes. No statistical difference was demonstrated in cell count and adipocytes viability.

Conclusion: On the basis of these quantitative data, we conclude that subjecting the adipose tissue to the trauma of the small sized cannulas does not affect the cell viability.

II181/SL

Viability of Human Adipose Tissue Processed Cell Population Obtained from Pump and Syringe Liposuction

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Aim: Correcting soft tissue defects by autologous fat grafting is routine in plastic surgery. Liposuction for autologous grafting is done with a hand-held syringe. The vacumn pump-assisted technique is not used on the understanding that cells harvested are not viable due to the harsher suction conditions. There is as yet no study to ascertain the viability and adipogenic potential of the pump lipoaspirated cells.

Methods: The metabolic profiles of cells processed from pump (pPLA) and syringe (sPLA) lipoaspirates were assessed. These cells were induced along the adipogenic lineage to compare their adipogenic potentials. Metabolic estimates were determined with AlamarBlueTM assay. The extent of adipogenic differentiation was measured using a digital photo counting software.

Results: Metabolic profiles of all (n = 8) were similar (pPLA cf. sPLA over 10 days). There were more cells in the uninduced culture cf. adipogenic induction culture. Cells under induction do not proliferate in comparison to cells cultured with normal growth media (more found at the end of 2 months). Results indicated comparable metabolic activity and adipogenic potential of cell populations.

Conclusion: Adipose tissue presents itself as a potential source of stem cells for tissue engineering. Using pump-assisted liposuction to harvest large volumes of adipose tissue with ease and efficiency for stem cell therapies and/or tissue augmentation would be advantageous and reduce operation time. This study is the first novel step towards the possibility of aspirating fat with a pump and was supported by grant number NMRC/0747/2003.

II182/SL

Cranioplasty Following Trephination Using a Novel Biodegradable Burr Hole Cover

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Aim: Rapid prototyping technologies have successfully been introduced in diagnosis, in surgical planning and in the fabrication of custom made implants for craniofacial reconstruction. A novel biodegradable polymers implant made of olycaprolactone by rapid prototyping technology fused deposition modelling and evaluated them in a clinical pilot study for cranioplasty.

Methods: Five patients with the diagnosis of chronic subdural haematoma were included in the study. Following trephination and evacuation of the

subdural haematoma, the burr hole (14 mm in diameter) was closed using a biodegradable polymer plug made of polycaprolactone (PCL). The implants have a computer controlled design with an upper rim diameter of 16 mm, a body of 14 mm in diameter, and fully interconnected honeycomb-like pore architecture of 400-600 micro metres in size.

Results: Postoperative CT scans indicated that the plugs were stable anchored in the osseous host environment and with no fluid collection present. The postoperative course was uneventful and patients were discharged after 5 days. Follow up scans after 3, 6 and 12 months showed the implants in situ, well integrated in the surrounding calvarial bone with new bone filling out the porous space.

Conclusion: These novel polymer scaffolds made of the slow degrading material polycaprolactone represent a suitable implant for closure of post trephination defects. The potential of rapid prototyping techniques to fabricate customised implants based on imaging information in combination with the above described biomaterial processing therefore offers a promising therapeutic potential for calvarial reconstruction.

II183/SL
Histological Morphology and Biocompatibility of Thin PCL Films as a Dural Substitute in Rabbits

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Aim: The possibility of the transmission of Creutzfeldt-Jakob disease and slow virus infection (HIV) by cadaveric dural implants made it necessary to find a synthetic, biocompatible and absorbable substitute for dural implants. Polycaprolactone (PCL) has been considered as a potential substrate for wide applications, such as drug delivery systems, tissue engineered skin and scaffolds for supporting fibroblasts and osteoblasts. A preliminary study using processed thin PCL films as a dural substitute in rats has been shown to be successful. The main aim of this study is to evaluate the histological morphology and biocompatibility of thin PCL films in vivo as a dural substitute in rabbits

Methods: Fifteen New Zealand white rabbits, weighing 3-4 kg, underwent craniotomy and durectomy in which 2 full thickness circular dural defects were created bilaterally equidistant from the saggital sinus in the pericranium. One defect was implanted with thin PCL film while the contralateral defect was implanted with resected autologous dura to serve as a control. Seven and 8 rabbits were sacrificed 6 weeks and 12 weeks postoperatively respectively, with histological specimens taken from the dural defect sites.

Results: No seizures, infection or neurological deficit was noticed in the rabbits during the follow-up period. Histological assessment of the control (dura) and PCL implant was similar.

Conclusion: PCL demonstrates a favourable biologic response as a dural substitute in rabbit model. It is a promising biomaterial for dural replacement.

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II184/SL
Development of a Biodegradable Polycaprolactone Membrane as a Dural Substitute

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Aim: A variety of bioabsorbable synthetic materials such as polyglactin and polydioxanone have been applied as dura substitutes but have proven to be less than satisfactory, causing cortical adhesions and persistent inflammatory reactions. In this study, the authors review their preliminary experience with an ultrathin biodegradable polycaprolactone (PCL) membrane.

Methods: In 12 New Zealand white rabbits, 2 full thickness circular bone flaps lateral to the sagital sinus were excised and on the left side the dura was removed. The PCL membranes (Ø 10 mm) were treated with sodium hydroxide, and then implanted and sealed with fibrin glue. On the right side, the dura was excised and re-attached as an autograft. The dural grafts were removed after 6 and 12 weeks examining for cortical adhesions and a sample of cerebralspinal fluid was taken to examine for the presence of inflammatory immunogens. The surrounding bone and brain was also removed en bloc, fixed in 2.5% formaldehyde and examined macroscopically and microscopically.

Results: No clinical complications were observed in the weeks following surgery. In all the animals, there were no cortical adhesions and a translucent membrane had regenerated over the PCL implant. No inflammatory immunogens were found in the cerebralspinal fluid. Histological examination revealed that the neomembrane consisted of fibroblasts and a regular network of collagen fibres.

Conclusion: This preliminary study shows that polycaprolactone can be a suitable dural substitute. However, long-term and clinical studies must be carried out to ascertain its use in humans and rule out the possibility of adverse effects.

II185/SL
Catheter Associated Urinary Tract Infection in a Tertiary Hospital and its Resistance Profile Over Time

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Aim: To identify the predominant uropathogens responsible for catheter associated urinary tract infection (CAUTI) and its antibiogram percentage resistance over time.

Methods: Comparison of urine culture results of catheterised patients in surgery wards in 1990 and 2003 was done. Positive urine culture infective organisms and antimicrobial resistance susceptibility data were collected.

Results: The most common organisms identified in 1990 and 2003 were *Escherichia coli*, *Klebsiella sp.*, *Proteus* and *Acinetobacter*. *Pseudomonas* and methicillin-resistant *Staphylococcus Aureus* (MRSA) have emerged as new strains of catheter associated urinary tract infection. From 1990 to 2003, most antimicrobials have shown increasing resistance over time. Ciprofloxacin has shown the worst antibiotic resistance over time. Ampicillin, imipinem and co-trimoxazole have maintained their resistance to *Klebsiella* over time. Amikacin has shown good results of decreased resistance to *Klebsiella* and the same with cefuroxime to *Proteus sp.* Imipinem maintains to have no resistance to *E. coli*. There are 6 cases of MRSA with no resistant strains to drug of choice, vancomycin. In vitro culture studies also show no resistant strains to nitrofurantoin and fusidic acid. For pseudomonas, there are varying levels of resistance but ciprofloxacin has shown the highest resistance.

Conclusion: Most common infective organisms associated with CAUTI (*Escherichia coli*, *Klebsiella sp.*, *Acinetobacter* and *Proteus sp.*) have not changed over time. However, there is emergence of *Pseudomonas* and MRSA as uropathogens of CAUTI. There is a general increase in resistance of infective organisms to majority of available antimicrobials. Strict antibiotic surveillance policies, asepsis, judicious use of antimicrobials and early catheter removal are recommended.

II186/SL
Periapical Dynamics: Possible Cause of Persistent Periapical Periodontitis

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Aim: Periapical diseases are dynamic in nature with numerous associate factors and interactions. An understanding of these factors and interactions is essential for clinicians during diagnosis and treatment. Previous studies have highlighted that percolation of periapical exudate into an incompletely filled root canal accounted for 60% of endodontic failures. However, these studies did not show how and why leakage of periapical exudate occurs and their role in persistent infection. This study aims to investigate the biomechanical response at the periapical region and correlate these findings with microscopic investigation of the apical portion of extracted endodontically treated teeth.

Methods: The experiments were conducted in 3 stages. (1) Digital photoelastic experiment was conducted to study the behaviour of dento-osseous structures during biting. (2) In vitro cyclic testing on extracted teeth was conducted to

study the fluid dynamics at the periapical region during biting. (3) Scanning Electron Microscopy examination of the root apex of extracted, previously endodontically treated teeth was conducted.

Results: These experiments showed distinct stress distribution and 'bite pressure influenced fluid movement' at the periapical region. This resulted in a significant influx of fluid from the periapical region into the apical portion of the root canal (P <0.001). The microscopic examination of clinical specimens displayed multi-bacterial biofilm in the extraradicular and apical region of endodontically treated teeth.

Conclusion: It is apparent from this study that biting forces would result in periapical fluid influx, and this may facilitate extraradicular bacterial biofilm formation, and subsequent persistent apical periodontitis.

II187/SL
Effects of Acidic Dietary Liquids on Resin Restorative Materials

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Aim: To investigate the effects of pH on surface microhardness of resin-based restorative materials.

Methods: The materials evaluated included an ormocer (Admira [AM]), a giomer (Beautifil [BF]), 2 compomers (Compoglass F [CF], Dyract Extra [DY]), a minifill (Esthet X [EX]) and a nanofill (Filtek Supreme [FS]) composite. Eight specimens were made for each material-medium. Immediately after light polymerisation, the materials were preconditioned in Fusayama's artificial saliva (AS) at 37ºC for 24 hours. They were then stored in citric acids with following pH values at 37ºC for 1 week: pH 4, pH 3 and pH 2. Specimens stored in AS (pH 5.5) were used as control. After conditioning, Knoop Hardness Number (KHN) of the 6 materials was examined with a digital microhardness tester. The mean KHN was subsequently calculated and tabulated. Data were subjected to ANOVA/Scheffe's test (P <0.05). The surface morphology was examined by Scanning Electron Microscope (SEM).

Results: With the exception of the ormocer AM, all materials were significantly softened after conditioning in citric acid with pH 3. Resin-based materials with glass-ionomer constituents (BF, CF and DY) showed dramatic decrease in hardness with decreasing pH values. SEM examination showed that the aluminosilicate glass fillers were susceptible to dissolution by acids.

Conclusion: Resin-based dental composites may be degraded by acids of low pH. Materials with glass-ionomer constituents were more susceptible to acid degradation. The effects of pH on change in surface hardness were material dependent.

II188/SL
Influence of Food Liquids on the 2-Body Wear of Resin Restorative Materials

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Aim: This study investigated the influence of food-simulating liquids on resin-based restorative materials.

Methods: The materials evaluated included an ormocer (Admira [AM]), a giomer (Beautifil [BF]), 2 compomers (Compoglass F [CF], Dyract Extra [DY]) a minifill (Esthet X [EX]) and a nanofill (Filtek Supreme [FS]) composite. Six specimens were made for each material-medium. After light polymerisation, the materials were preconditioned in Fusayama's artificial saliva (AS) at 37°C for 24 hours. The materials were then stored in the following food-simulating liquids at 37°C for 1 week: heptane (HP), 50% ethanol-water solution (ES), citric acid at pH3 (CR) and distilled water (DW). Specimens stored in AS were used as control. After conditioning, the materials were subjected to wear testing using a reciprocal compression-sliding wear instrumentation. Wear depth was measured using profilometry every 10,000 cycles up to 30,000 cycles

Results: Results of statistical analyses (ANOVA/Scheffe's; P <0.05) of wear data were as follows: AM-AS, DW > CR, ES > HP; BF- ES, AS > CR, HP > DW; CF-AS > DW, CR, ES > HP; DY-AS, DW, ES > HP, CR; EX-DW > HP, ES > AS, CR; and FS-AS > HP, DW, ES, CR (> indicates significantly more wear). With the exception of EX, the greatest wear was observed with conditioning and wear testing in AS. This ranged from 90.0 (5.5) µm for BF to 52.5 (3.7) µm for DY.

Conclusion: The effects of the different food-simulating liquids on 2-body wear were material-dependent.

II189/SL
Effect of Aqueous Environment on Surface Properties of Highly Viscous Glass Ionomers

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Aim: This study was conducted to evaluate the effect of aqueous environment on surface mechanical properties of highly viscous glass ionomer cements (HVGICs).

Methods: Three different HVGICs were selected for this study: Fuji IX Fast ([FN], GC), KetacMolar ([KM], ESPE) and KetacMolar Quick ([KQ], ESPE). Fourteen specimens were made for each material and kept in 100% humidity at 37ºC for 1 hour. Specimens were then divided into 2 groups (n = 7): Group A – stored in 100% humidity at 37ºC; Group B – stored in distilled water at 37ºC. After 4 weeks, surface hardness and elastic modulus were determined by depth-sensing micro-indentation testing. Results were analysed using ANOVA/Scheffe's post-hoc test (P <0.05).

Results: Mean displacements were from 24.2 to 28.4 µm that were greater than glass particle size in HVGICs. Mean hardness ranged from 65.2 to 98.2 HV while mean modulus ranged from 14.3 to 19.3 GPa. No significant differences were observed between HVGICs in Group A. Depending on the type of HVGICs, specimens in Group B showed increased or similar hardness and modulus when compared with those in Group A.

Conclusion: Regardless of the type of HVGICs, exposure to an aqueous environment may be beneficial for improving or maintaining surface mechanical properties of HVGICs.

II190/SL
Effect of Environmental pH on Surface Hardness and Indentation Modulus of Glass Ionomers

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Aim: This study was to evaluate the effect of environmental pH on surface hardness and modulus of resin-modified glass ionomer (RMGIC) and highly viscous glass ionomer cement (HVGIC).

Methods: A RMGIC (Fuji II LC, [FL], GC) and a HVGIC ([FN], GC) were evaluated in this study. Three solutions with constant concentration of KCl (150 mM) at different pH were used: Group A – pH 7; Group B – pH 5; Group C – pH 3. They represented pH of saliva, critical pH of demineralisation and pH of acidic beverage. Seven specimens of each material and solution were made and kept in different pH conditions at 37ºC for 4 weeks. Surface hardness and elastic modulus were determined by depth-sensing micro-indentation testing. Results were analysed using ANOVA/Scheffe's post-hoc test (P <0.05).

Results: HVGIC showed higher hardness/modulus than RMGIC in all groups. The variation in hardness and modulus with environmental pH were observed in both HVGIC and RMGIC: Hardness – Group A, Group B > Group C; Modulus – Group A > Group B > Group C.

Conclusion: Acidic beverages might have negative effects on surface properties GICs. The surface properties of RMGIC and HVGIC are not affected by the pH of saliva and the critical pH of demineralisation.

II191/SL
Early Expression Profile of PDGF in a Tooth Replantation Model

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Aim: To investigate PDGF expression, during the early healing phase of

immediate and delayed replanted teeth compared to the normal periodontium using immunohistochemistry.

Methods: Fifty-eight roots from 6 dogs were endodontically treated and extracted to simulate avulsion injury. Non-experimental group teeth were not extracted. In immediate replantation group, the teeth were replanted immediately while roots in the delayed group were bench-dried for 1 hour prior to replantation. The roots and surrounding structures were harvested after ½, 2, 3 and 4 days observation for immunohistomorphometric evaluation of the percentage of immunopositive cells and the immuno-intensity of the ECM of cementum, PDL and bone. Kruskal-Wallis and Mann-Whitney U tests were used for statistical analysis.

Results: PDGF was observed in the cells and ECM of all the 3 periodontal structures of the non-experimental group. The percentage bone cell count was significantly lower than cementum at ½ day ($P = 0.01$) and 3 days ($P = 0.02$) delayed replantation group; as well as lower than PDL at ½ day ($P = 0.01$) and 3 days ($P = 0.00$) immediate and ½ day ($P = 0.00$) delayed replantation groups. There was no significant difference among the non-experimental and experimental groups at any particular observation time.

Conclusion: PDGF was expressed in the 3 periodontal structures of the non-replanted and healing replanted teeth under optimal and adverse condition, implicating the role of PDGF in periodontal healing of replanted teeth. PDGF might up-regulate the paravascular progenitor cells during the healing process.

II192/SL
Effects of Ageing on Shear Strength of Dental Composite Restoratives

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Aim: This study aimed to investigate the effect of ageing on the shear-punch strength of dental composite restoratives.

Methods: The materials investigated were from the ssame manufacturer (3M ESPE) and included Z100, Filtek Z250, Filtek Flow (FF), F2000 and A110 composites. Fourteen specimens (8.0 mm diameter and 1.0 mm thick) of each material were prepared, randomly divided into 2 groups of 7 and conditioned for 1 week and 1 month, respectively, at 37ºC. At the end of the conditioning period, the specimens were restrained and subjected to shear-punch strength testing using a 2.0 mm diameter punch at a crosshead speed of 0.5 mm/min. The shear punch strength (sS) of the specimens was computed and data was subjected to ANOVA/post-hoc Scheffe's tests and independent samples *t*-test at a significance level of 0.05.

Results: At 1 week, the sS of Z100 was significantly higher than all other materials evaluated. The resistance to shear deformation of A110 and Z250 was significantly higher than F2000, which was higher than FF. Same material ranking was observed for the 1 month specimens with the exception that there was no significant difference between Z100 and Z250. The sS of FF was significantly higher after 1 month of aging.

Conclusion: The effect of ageing on shear strength of resin-based dental composite restoratives was material-dependent. The shear strength of microfilm FF, which was GDMA based, was significantly higher after ageing.

II193/SL
Mechanical Characterisation of New Monomers Synthesised for Dental Restorations

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Aim: The objective of this study was to determine and compare the hardness and modulus of newly synthesised POSS based dental polymers (MA-POSS and ME-POSS) with unfilled 1:1 Bis-GMA/ TEGDMA polymeric resins (control). The setting reaction of all the polymeric resins in air and distilled water stored at 37ºC was also investigated over a 7-day period.

Methods: The hardness and modulus of the materials (n = 8) were determined using depth-sensing microindentation testing with the Instron Micro Tester at time intervals of 0, 1 and 7 days. Hardness data was obtained by dividing the peak load over the maximum projected contact area while modulus was calculated by analysis of the loading/unloading load-displacement (P-h) curves and the analytical model according to Oliver and Pharr. Results obtained were analysed using 1-way ANOVA/Scheffe's post hoc test ($P < 0.05$).

Results: When stored in both air and distilled water, both hardness and modulus of MA-POSS and ME-POSS were found to be significantly lower than the control at all time intervals. Elastic modulus and hardness generally increased on storage. Both hardness and modulus decreased on day 7 after storage with the exception of hardness values for ME-POSS.

Conclusion: POSS-based dental polymers resulted in lower hardness and modulus values when compared to the conventional Bis-GMA/TEGDMA systems. All polymeric resins continued to polymerise for at least 1 day after light activation.

II194/SL
Osteogenic Differentiation of Mesenchymal Stem Cells from Bone Marrow

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Aim: Mesenchymal stem cells (MSCs) represent an ideal source for cell therapy especially for bone regeneration.

Methods: In this study, iliac marrow was extracted and MSCs were isolated. Due to limited number of true MSCs in bone marrow, MSCs were expanded to a large number in vitro for 14 days. MSCs were then induced to differentiate in the DMEM medium with 10% FBS supplemented with β-glycerol phosphate, L-ascorbic acid and dexamethasone. The medium was changed every 3 days.

Results: After 21 days, differentiated MSCs were characterised as osteogenic cells in HE, Von Kossa, Alizarin red stained histology, ALP histochemistry, immunohistochemical staining against osteonectin (ON) and osteopontin (OP) and quantitative measurements of ALP activity.

Conclusion: Bone marrow MSCs can be differentiated into osteogenic cells and this might be a potential therapy for various applications.

II195/SL
Directed Differentiation of Adult Bone Marrow Mesenchymal Stem Cells Towards Cardiomyocytes

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Aim: Transdifferentiation of adult bone marrow stem cells (ABMSCs) into cardiomyocytes is a rare phenomenon and thus remains a poorly understood mechanism. We seek to characterise the cardiomyogenic plasticity of ABMSCs under the influence of 3 classes of differentiating agents.

Methods: Bone marrow cells were isolated from the sternum of patients undergoing coronary artery bypass graft surgery. Plastic-adherent mesenchymal stem cells (MSCs) were obtained from marrow cells following depletion of mature blood cells and purification in a Histopaque-Ficoll gradient. The MSCs were then separately cultured in DMEM or a cardiomyocyte-promoting medium (CM) supplemented with 5-azacytidine (CM-AZA), butyric acid (CM-BA) or amphoterin-B (CM-AMB). The expression of specific cardiomyogenic markers was assessed by RT-PCR on mRNAs extracted from MSCs cultured under different conditions.

Results: CM promoted the expression of cardiac α-actin (CAA), myocyte enhancer factors (MEFs) 2A, 2C and 2D, troponin-c, troponin-t and skeletal muscle α-actin (SMAA) in the differentiating cells. Only basal expression levels of CAA, MEFs 2A, 2C and 2D were detected in cells cultured in DMEM. Cells treated with AZA, BA and AMB showed similar expression profiles of cardiac markers, although cardiac troponin-t expression was notably induced with BA and AMB.

Conclusion: Human adult bone marrow stem cells can be differentiated in CM to become cardiomyocytes. These ex-vivo differentiated cardiomyocytes may be potentially valuable for repairing damaged myocardium.